



Investigating the impact of Sexual Assault Evidence Collection Kits (SAECKs) as evidence in rape cases prosecuted in the Western Cape High Court between 2012 and 2016

by

SMANGELE BENEDICTOR MALEMA
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Supervisor: Dr Marise Heyns

Co-supervisor: Dr Itumeleng Molefe

Affiliation: Division of Forensic Medicine and Toxicology, Department of Pathology

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Abstract

Background: The Republic of South Africa (RSA) is facing a rape crisis, with women and children being the most vulnerable. DNA evidence is used to aid in suspect identification and to confirm sexual contact. The collection of biological forensic evidence after a rape incident is routine in RSA, however, its contribution to the outcome of rape cases is still unclear. This study aimed to investigate the use of Sexual Assault Evidence Collection Kits (SAECKs) and their impact on the outcome of rape cases.

Methods: Data for this study was collected by conducting a retrospective review of rape cases (n=98) prosecuted and finalised at the Western Cape High Court between 1st January 2012 and 31st December 2016. Court dockets were examined and data was collected using a set of predefined variables. Backward logistic regression was used to analyse whether there is an association between the accused being found guilty and the use of SAECKs and the presentation of DNA evidence.

Main findings: In 61% (n=60/98) of the cases a SAECK was used during the medical examination and a DNA report was generated and available for use in 77% (n=46/60) of these cases. There was a higher conviction rate when a SAECK was used (88%, n=53/60) in comparison to when it was not used (53%, n=8/15). Contrary to our expectation, the use of SAECKs was not found to be positively associated with the conviction when using backward logistic regression. This means the use of a SAECK decreased the odds of finding the defendant guilty of rape, albeit by a small degree (OR=0.196, p-value=0.040). DNA was not associated with the case outcome. The majority of cases were stranger rapes (64%, n=63/98), that occurred outdoors (64%, n=61/95) and mostly in the township locations such as Khayelitsha, Phillipi, Nyanga, areas located on the Cape Flats, with only a single perpetrator. Injuries were documented in 50% of the cases (n=49) and almost 48% (n=46/95) of the victims were coerced and threatened with a weapon. Our binary model found only the location of incidence (p-

value= 0.006) to be significantly associated with case outcome with an odds ratio of 19.827.

Conclusions: The findings from this study are significant as they point out that health care practitioners are adequately trained and equipped to provide quality health care responses and to work effectively with police officers. SAECKs are utilised routinely during rape investigations. However, there are various factors relating to the victim, perpetrator and assault characteristics that influence the judge's verdict. This study raised questions relating to how those factors are measured or weighed and are predictive of case outcome. Although we found no positive associations between the variables investigated (except the location of the incident) and court outcome, future research, including larger sample size, should investigate these variables in order to obtain true significance, especially concerning the use of SAECKs and its impact on the court outcome.

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List of Abbreviations

DNA- Deoxyribonucleic Acid

GBV- Gender-based violence

LSD- Lysergic acid diethylamide

MDMA- 3,4-Methylenedioxymethamphetamine

NPA- National Prosecuting Authority

PCR- Polymerase Chain Reaction

RSA- Republic of South Africa

SAECKs- Sexual Assault Evidence Collection Kits

SAPS- South African Police Service

STR- Short Tandem Repeat

UCT- University of Cape Town

USA- United States of America

VIS- Victim Impact Statement

WC- Western Cape province

WHO- World Health Organisation

Chapter 1: Literature review

Investigating the role of forensic DNA evidence and impact of Sexual Assault Evidence Collection Kits (SAECKs) as evidence in rape cases

1.1 Introduction

The Republic of South Africa (RSA) is facing a rape crisis, with women and children being the most vulnerable group (Sibanda-Moyo et al., 2017). Although recent rape statistics show an increase in the number of reported rapes, studies have shown that rape is one of the most under-reported and under-prosecuted type of criminal offence (Felson & Paré, 2005; Rich & Seffrin, 2012; Campbell et al., 2014; Venema, 2018). Furthermore, cases tried in court do not often result in a conviction (Frazier & Haney, 1996; Lonsway & Archambault, 2012).

Historically, the continuing low rates of convictions resulted in the implementation of standardised rape kits that could help gather better quality forensic evidence (Shelby, 2018). Louis R Vitullo, a Chicago police sergeant and chief microanalyst and Martha 'Marty' Goddard, a sexual assault survivor, spent three years working together and were credited with developing the United States of America's (USA) first rape kit, which was first utilised in Illinois, in September 1978 (Shelby, 2018). Decades later, the utilisation of rape kits has become a vital tool in solving rape crimes.

Over the last few years, DNA analysis has revolutionised the way crime is investigated (Bright et al., 2014). In developed and some developing countries, the collection and analysis of DNA evidence have become a routine part of rape investigations (Smith et al., 2017). However, despite the advances in DNA technology and the significance of forensic DNA evidence in criminal investigations, there is still limited research and understanding in the role of forensic DNA evidence during the prosecution and conviction of rape cases (Menaker et al., 2017).

After a rape incident has occurred, there are three crime scenes: the crime scene location where the incident took place, the victim's body and the perpetrator's body. DNA evidence

is recovered from the crime scenes and tested. Matching DNA evidence may be evidence used to identify the perpetrator and confirm sexual contact (Magalhães et al., 2015). In RSA, biological and non-biological forensic evidence is collected routinely after a rape incident has occurred using what is known as a Sexual Assault Evidence Collection Kit (SAECK).

Regrettably, there have been concerns regarding the kits not being analysed and the lack of trained staff to properly conduct clinical forensic medical examinations (Campbell et al., 2015; Fouché et al., 2018). However, when properly collected and analysed, forensic DNA evidence can have a crucial role in criminal investigations, court proceedings and legal outcomes of rape cases (Johnson et al., 2012). Therefore, it is hypothesised that the use and presentation of forensic DNA evidence, along with other evidence, results in a higher conviction rate, in comparison to cases without DNA evidence.

Aim

This literature review aims to discuss rape as a social issue, including factors associated with late disclosure and RSA's national policy guideline for victims of sexual offences. Furthermore, the review outlines various aspects relating to the significance of forensic DNA evidence, the method of extracting DNA, maintaining the integrity of the DNA evidence and the impact of forensic evidence in rape case investigation, case progression and legal outcomes.

Method

This literature review was written by using peer-reviewed published research articles and online sources. Different electronic databases (Google Scholar, PubMed, Scopus, Africa-Wide Information) were used to search for the articles using the following keywords and combinations thereof: - "Sexual assault kit; SAECK; sexual assault evidence collection kit; rape kits; forensic evidence; DNA evidence; sexual offence/assault/rape; use/influence/impact; investigation(s)/court".

1.1.1 Definitions

i) *Rape, sexual assault and sexual violence*

The term "rape" is often used interchangeably with other terms such as "sexual violence" and "sexual assault." However, these terms have different legal definitions in different countries (World Health Organization, 2003). In RSA, rape, sexual assault and sexual violence are all forms of sexual offences and are defined by the *Criminal Law (Sexual Offences and Related Matters) Amendment Act 32 of 2007*.

Sexual assault is described as an act in which an individual intentionally and unlawfully *sexually violates* another person without consent. On the contrary, rape is an act of *sexual penetration* performed intentionally and unlawfully with another person without their consent. This definition includes penetration into the mouth, anus or the vagina of a person; penetration into the vagina and anus by a penis, foreign object, other body parts of another person; and the penetration of a person's mouth with a genital organ, regardless of the sex (*Criminal Law (Sexual Offences and Related Matters) Amendment Act, No. 32 of 2007, 2007*).

Sexual violence is a sexual act that includes rape and other forms of sexual behaviours, including sexual harassment, unwanted sexual comments or advances, trafficking and sexual exploitation and using coercion (*Criminal Law (Sexual Offences and Related Matters) Amendment Act, No. 32 of 2007, 2007*).

The new amended act not only made the definition of rape gender-neutral but it extensively included all types of sexual violations committed without consent. Furthermore, the Act created provisions for sexual offences committed against individuals that are mentally disabled and against children.

ii) *Consent*

When deliberations took place regarding the Criminal Law (Sexual Offences) Amendment Bill in 2003 and 2004, the Justice and Constitutional development portfolio committee argued the issue of "consent" (Artz, 2004). The Sexual Offences Act in the previous

legislation stated that for sexual intercourse to be considered non-consensual, an individual must have demonstrated physical resistance, showed dissent or verbally said 'no' (Artz, 2004; Pugh & Becker, 2018).

Currently, the Criminal Law (Sexual Offences and Related Matters) Amendment Act 32 of 2007 includes “coercive circumstances” and defines *consent* as an agreement that is not coerced. Coercion refers to the use of force, psychological intimidation, abuse of power, threats, pretence and blackmail that results in the complainant being unable to indicate unwillingness or resistance (*Criminal Law (Sexual Offences and Related Matters) Amendment Act, No. 32 of 2007, 2007*). Instances where the complainant is unable to consent include:

- i) Lack of mental capacity, for example
 - a) Mental defect: Depending on severity, individuals with mental impairments are at an increased risk of sexual violence. Therefore, it is argued whether they have sexual consent capacity.
 - b) Age: The age of consent to sex is 16 years. The *Criminal Law (Sexual Offences and Related Matters) Amendment Act, No. 32 of 2007* states: “ A person ('A') who commits an act of sexual penetration with a child ('B') who is 12 years of age or older but under the age of 16 years is, despite the consent of B to the commission of such an act, guilty of the offence of having committed an act of consensual sexual penetration with a child, unless A, at the time of the alleged commission of such an act, was (a) 12 years of age or older but under the age of 16 years; or (b) either 16 or 17 years of age and the age difference between A and B was not more than two years”.
 - c) Under the influence of drugs or intoxicated: When judgement is adversely affected by an altered state of consciousness.
- ii) Asleep: Mentally incapable to give consent when asleep or hypnotised.
- iii) Lack of physical capacity: Under duress, being physically disabled or unable to indicate unwillingness.

1.1.2 Crime statistics

RSA's crime statistics for 2018/19 showed that the police recorded 41 583 rape cases. This is an increase from the previous year's report, which showed that police recorded 40 035 rape cases in 2017/2018 (Department of Police, 2019). The rise in the number of reported cases might be indicative of more victims being confident in the criminal justice system. However, it is unclear or unknown whether there is corresponding improvement in the way rape cases are investigated and prosecuted by the state (Daly & Bouhours, 2010).

1.1.3 Sexual offences conviction rate

The Department of Justice and Constitutional Development for the 2018/2019 period showed an improvement and exceeded the set conviction rate in sexual offences target by 6%. Overall, a conviction rate of 74.4% was obtained. There was a total of 6 353 finalised cases and 4 724 ended in a conviction. This was reported to be the highest in the past seven years, possibly indicating that prosecutors are committed to fight against sexual crimes and to give justice to the victims (Department of Justice and Constitutional Development, 2019). However, there is also a clear indication that there is a large gap between the reported rapes and the cases prosecuted or taken to court.

1.2 Issues with reporting the crime of rape

1.2.1 Rape myths and predictors of delayed disclosure

The collection of biological evidence from the victim's body is crucial and should be done promptly after the alleged incident of rape has occurred to maintain the integrity of biological material and to minimise loss and degradation of the DNA evidence (De Wet et al., 2011).

Unfortunately, victims of rape do not always report or disclose the incident immediately (Hassan et al., 2007). One of the most significant factors perpetuating this is the concept

of rape myths, which originated during the 1970s. Rape myths are defined as false beliefs and attitudes, including cultural stereotypes held by society to deny claims and justify the sexual violence against victims, especially women (Burt, 1980).

Most rape myths lay the blame on the victim for the way they behaved or were dressed, the involvements of alcohol and drugs and sexual history are some of the factors that perpetuate rape stereotypes, making it seem like the victim was "asking for it". Studies have demonstrated through experimental research that victims who were intoxicated with alcohol during a rape incident have higher self-blame and are less likely to report the incident to the police (Wolitzky-Taylor et al., 2011; Flowe & Maltby, 2018). Chen & Ullman (2010) investigated sexual assault characteristics and the likelihood of reporting the crime to the police and found that factors such as weapon use, injury and victim-perpetrator relationship (when the perpetrator is a stranger) increased the odds of victims disclosing the incident.

Furthermore, some victims do not report rape because of personal humiliation, fear of intimidation by the perpetrator, lack of access to proper rape centres and services, lack of social support, psychological trauma, financial dependence on the perpetrator, culture and stigma. These factors further lead to under-reporting as rape victims suffer feelings of shame and guilt (World Health Organization, 2002).

Hassan et al. (2007) reported that victims do not know the different agencies they can report to or how to react as there are no clear guidelines developed for victim and family responses to sexual acts. Due to the lack of knowledge, some victims bath and change clothes after being sexually violated, resulting in the loss of forensic DNA evidence. Bicanic et al. (2015) investigated the predictors of delayed disclosure and reported that factors such as age, prior trauma and familial relationship have a role in victims not reporting the crime of rape on time.

1.2.2 Psychological consequences of delayed disclosure

Several studies investigated the psychological consequences of delayed disclosure and reported that victims who wait longer to disclose are more likely to suffer from Post-Traumatic Stress Disorder, anxiety, substance abuse problems and sleep disturbances (Noll et al., 2006; Babson & Feldner, 2010; Mgoqi-Mbalo et al., 2017). Furthermore, it is hypothesised that victims of childhood rape who disclose victimisation early, are at a lower risk for experiencing psychosocial difficulties later in life (Ruggiero et al., 2004).

The above findings suggest that rape is a serious societal issue because not only does it cause physical harm but results in psychological, emotional and social consequences. Furthermore, previous studies have shown that rape myths lead to attrition, which is defined as a case that is less likely to progress through the legal process from reporting to prosecution and conviction (Hester & Lilley, 2016). However, not reporting or disclosing the crime of rape can have dire consequences. Not only does the delay impede proper treatment of injuries, medical care, prevention of unwanted pregnancy and sexually transmitted diseases but it delays the collection of high-quality forensic DNA evidence (Crawford-Jakubiak et al., 2017).

1.3 National Policy Framework on Management of Sexual Offence Matters

1.3.1 Procedure

i) At the Police station

RSA has a public policy framework for management of sexual offence victims (Department of Justice and Constitutional Development, 2012). After an alleged crime of rape is committed, ideally, the victim voluntarily reports the crime to the nearest South African Police Service (SAPS) station either in person or by telephone. However, if the victim is a child or is mentally disabled, there is mandatory reporting by any person who has knowledge or suspects that sexual violation was committed (*Criminal Law (Sexual Offences and Related Matters) Amendment Act, No. 32 of 2007, 2007*). Thereafter, an

investigating officer from the Family Violence, Child Protection and Sexual Offences (FCS) Unit is appointed and the victim/parent/guardian is informed of the police procedures and the requirement of a medical examination should they wish to lay a charge of rape and for the investigation to continue. The investigating officer then completes an SAP 308 form, a docket is opened, the case is registered with a unique Crime Administrative System (CAS) number and an affidavit stating relevant details of the sexual offence is completed. Thereafter, necessary arrangements are made for the victim to be transported to the nearest forensic health care centre or rape centre for a forensic medical examination. A J88 form (Appendix 1) is completed by a health practitioner and handed to the investigating officer, along with forensic examination kits.

However, not all rape victims seek the involvement of police officers. A mentally competent adult may choose not to involve the police and go directly to the rape center or hospital for the medical examination and/or treatment (Corum & Carroll, 2014). In such cases, if the rape victim wishes to lay a charge, the attending health care practitioner is required to contact the SAPS and request an investigating officer to come to the facility instead of sending the victim to first report the crime to SAPS (Tiemensma, 2016).

Unfortunately, there have been concerns about how SAPS officers respond to rape victims (Basdeo, 2018). Despite the improved systematic reforms in health policy and sexual offences legislation, there are still challenges in offering efficient services because of a lack of resources and trained staff. Furthermore, police officers are often not sympathetic and may be uninformed (Basdeo, 2018). It was previously reported that the rape training component of the SAPS was too theoretical and the components of the procedural, legal and social aspects of rape were fragmented, thereby resulting in the lack of proper training and management of rape survivors (Naidoo, 2013).

A national survey conducted in New York revealed problems with police hostility, inaction, bias and dismissiveness (Coker et al., 2015). It was recommended that police should be better trained with regards to how they should respond to rape victims and inform

survivors about the process of the criminal investigation and available services (Coker et al., 2015; Yung, 2016).

Although there are many issues requiring change, some government departments in RSA such as the Department of Justice and Constitutional Development and the Department of Police have taken on initiatives to improve and acquire the necessary skills required to handle sexual offence matters more effectively and are committed to combating sexual violence (Parliamentary Task Group on the Prevention of Sexual Abuse of Children, 2002; Department of Justice and Constitutional Development, 2019).

ii) At the health care centre

One of the regulations of the *National Health Act No.61 of 2003* includes clinical forensic medicine services, which refer to the practical application of clinical investigations to determine causal factors of injuries observed in living victims of rape (*National Health Act, No. 61 of 2003*, 2003). At the health care centre, the clinician is responsible for the medical management and arranging counsel for the victim. The victim is first prepared for a forensic medical examination. Then, as part of the medical management, medical tests are performed for HIV and sexually transmitted infections and post-exposure prophylaxis are prescribed for both tests. Furthermore, a urine pregnancy test is performed and emergency contraception are offered within 120 hours if indicated. Thereafter, arrangements for a follow-up visit are made (McQuoid-Mason, 2009; Tiemensma, 2016).

iii) At the medical examination

During the medical examination, only an accredited and trained health care practitioner or nurse appointed by the Department of Health is authorised to conduct the examination (Department of Justice and Constitutional Development, 2012). During the physical examination, the medical examiner explains the procedure of the examination to the victim. Thereafter, informed consent is requested before the collection of forensic evidence (McQuoid-Mason, 2009). The forensic medical examiner will then collect forensic evidence in a systematic head-to-toe examination. The purpose of the forensic medical examination is to identify and carefully document and interpret injuries observed

on the victim's body on the J88 form and to collect any non-biological or biological evidence that could help link the accused to the victim or the crime scene (Ingemann-Hansen & Charles, 2013). The interpretation of the injuries and their patterns may be used to draw inferences on circumstances surrounding the alleged rape and therefore assist during the case proceedings (NACOSA, 2015). The medical examiner decides what samples to collect based on the case history. However, if the victim is unsure about laying a charge, the medical examiner could still collect the evidence with consent from the victim and keep the evidence secured in the health care centre for 30 days (*Criminal Law (Sexual Offences and Related Matters) Amendment Act, No. 32 of 2007, 2007*).

Smith et al. (2017) challenges the idea that DNA evidence must be collected only by trained medical professions because some developing countries and remote geographic locations lack resources. Thus, victims are disadvantaged and therefore, should be allowed to collect intimate DNA swabs themselves and the swabs should still be admissible in court.

1.3.2 Consent for medical examination

Whenever a clinical forensic examination is conducted, informed consent is required from the victim (Health Professionals Council of South Africa, 2008). If a victim is not capable of consenting to medical treatment due to mental disabilities, then consent is obtained based on section 32 of the *Mental Health Care Act, No. 17 of 2002 (Mental Health Care Act, No. 17 of 2002, 2002)*. Currently, children who are 14 years and above can consent independently to medical treatment and those below the age of 14 would require consent from a parent, legal guardian, or other designated person (*Children's Amendment Act, No. 41 of 2007, 2007*). Furthermore, consent is also required when performing surgical operations on victims that have been injured due to the rape incident. Children at 12 years of age can consent independently to medical treatment and surgical operations (*Children's Amendment Act, No. 41 of 2007, 2007*).

1.3.3 National Clinical Forensic Medicine Service Committee

In the RSA, there is a National Clinical Forensic Medicine Service Committee which consists of a representative who teaches clinical forensic medicine or provides such service from each academic institution and one health official with experience in clinical forensic medicine service. The mandate of this committee is to ensure and maintain standardised guidelines to be followed when performing clinical forensic medical services. Furthermore, the committee is concerned with the safety and health standards of accredited designated health facilities and matters related to strategies and health policies concerning clinical forensic medicine and the management of rape victims (*National Health Act, No. 61 of 2003, 2003*).

1.4 What is a Sexual Assault Evidence Collection Kit (SAECK)?

The SAECK is a DNA free, pre-packaged kit used to collect and preserve both biological forensic evidence and trace evidence and is commonly called the rape kit (Figure 1) (DNA Project, 2017), Rape kits or evidence collection kits vary between countries (Newton, 2013), however, they are all similar in scope and purpose. In the RSA, the contents of the kit include a user guide which clearly explains to the examiner how the evidence must be collected and packaged; a J88 form used to document and demonstrate the victim's injuries; a triplicate collection of evidence form, seven peel pouches containing items such as swabs and bags for evidence collection and packaging; and temper evident seals to seal the kit after the evidence has been collected. Each kit has a unique set of barcodes. The purpose of the barcode is to help manage and keep the chain of custody for the collected evidence (DNA Project, 2017).

SAECKs have undergone several changes since their first use in RSA (Jina et al., 2011). When the kits were first introduced, they were mainly for blood group typing and enzyme determination (Molefe, 2017). In addition, all the different pouches were contained in a single box. As medical technology and method of analysis improved, the SAPS forensic unit restructured and changed the all-in-one D1 Adult SAECK into different and separate

collection evidence kits (Tiemensma, 2016). The new kits are now used based on the type of sample or evidence collected during the forensic examination. The Acino Healthcare Group (Pty) Ltd supplies the SAECKs to most medical facilities across RSA (Acino Forensic, n.d). It was reported that they took over from Litha Healthcare in 2017 due to a shortage of the kits and corruption between the suppliers and the SAPS forensic unit (Lindwa, 2019).



Figure 1: Image of different types of SAECKs

1.5 Types of evidence collected

The core of forensic/ biological evidence analyses is based on *Locard's exchange principle*, which says that “whenever a perpetrator enters or leaves a crime scene, they will leave something and take something with them” (Mistek et al., 2019). This includes any biological material that could be tested for DNA, hairs, fibers, or latent prints. Not all

the evidence collected in SAECKs is tested for DNA by the SAPS forensic science laboratories. Other evidence, such as urine and blood are sent to the Forensic Chemistry Laboratory, Department of Health, for toxicological analysis. These evidentiary materials can then be used to link the alleged perpetrator to the crime scene (Ingemann-Hansen & Charles, 2013). Similar to a rape incident, the physical interaction between the accused and the victim often results in the reciprocal transfer of biological and non-biological material. Table 1 shows the different types of SAECKs used by both the accredited health care practitioner or nurse and the pathologists, and the forensic evidence that can be collected from the victim and the alleged perpetrator (Tiemensma, 2016; Acino Forensic, n.d).

1.6 Timing of forensic evidence collection

In RSA, the forensic examination is conducted and the evidence is collected within 72 hours (*National Health Act, No. 61 of 2003, 2003*). However, a forensic medical examination should still be conducted even if the victim did not report timeously or has washed and changed clothes because the possibility of obtaining possible DNA evidence cannot be discounted (Watson, 2008). In the USA, most jurisdictions collect DNA evidence only up to 72 hours. However, the time limit depends on the jurisdiction and can range from 72 to 120 hours (U.S. Department of Justice, 2013).

1.7 Considerations in timing of forensic evidence collection

Some studies argue that these general guidelines are not suitable for prepubertal victims. A study conducted in Philadelphia reported that swabbing a prepubertal victim after 24 hours was unnecessary as semen or sperm was unidentified nine hours after the documented assault and blood was unidentified 13 hours after the alleged incident (Christian et al., 2000). Similarly, a study conducted in RSA reported that it was more likely to obtain DNA evidence in juvenile and adult cases in comparison to obtaining DNA evidence from children (Gingras et al., 2009). However, a study by Thackeray & Hornor (2011) challenged this and stated that a forensic examination conducted on pre-pubertal

children 24 hours after the alleged sexual assault may still yield possible DNA evidence. Gingras et al. (2009) reported that there was a low likelihood (15%) of obtaining DNA evidence from children under the age of 10 and it was better to collect evidence mostly through clothing or skin swabs. Similarly, Christian et al. (2000) suggested that clothing and linen could yield better DNA results and this was supported by Brayley-Morris et al. (2015) who reported that laundered semen-stained clothing could result in detectable DNA profiles despite the clothes being washed or stored for several months after the incident (Brayley-Morris et al., 2015).

It is important to note that medical treatment takes preference over the collection of forensic evidence if the victim is injured (Department of Justice and Constitutional Development, 2012). This, however, has its disadvantages such as causing a delay between the time of the alleged incident and the collection of forensic evidence and might result in the contamination and/or degradation of the suspect's DNA (Ingemann-Hansen & Charles, 2013). As such, measures to preserve the evidence should be taken to prevent the loss of crucial evidence. For example, keeping the ambulance sheets that the victim used when they were being transported and folding them in such a manner that the fibres and debris would not be lost or taking photographs of injuries if the management of the injuries precludes the full forensic medical examination (Linden, 2011). In cases where the victim/survivor is transferred from one facility to the next, it is necessary to ensure that the next facility is informed if forensic evidence has not yet been collected from the rape victim (Tiemensma, 2016).

Although the preservation of DNA is essential, it was suggested that the timing of the examination should consider other factors affecting the victim and should be balanced between dealing with emotional and physical issues and the availability of qualified medical examiners (Christian, 2011).

Table 1: The different types of SAECKs used by medical examiners and pathologists, their names and examples of forensic evidence that can be collected by each kit

Type	Name	Example of evidence collected
D1	Adult Sexual Assault Evidence Collection Kit	Swabs collected from external genitalia, swabs from vulva, vestibule, vaginal vault, cervical and anorectal, swabs from underwear and clothing, sanitary pad/tampon
D2	DNA Evidence from Body Collection	Body fluids; blood; fingernail debris; debris. (if the victim's body has bite marks, saliva, or nail scratches)
DB	DNA Reference Sample Collection Kit	Buccal cells
D3	Reference Hair Sample Collection Kit	Trace evidence from pubic and head hair (pulled and loose)
D5	Clothing Collection Kit	Underwear, clothing (for the perpetrator's saliva and/or blood; and trace evidence such as debris and fibers)
D6	Tissue Collection Kit [^]	Body tissues for DNA analysis
D7	Paediatric Sexual Assault Evidence Collection Kit *	Internal genital samples: swabs collected from external genitalia (vulva/scrotum); vagina/penile shaft and glans; or perianal area
DD	Containers and Catch paper Collection Kit	Items that may contain DNA evidence from the crime scene
DC	Swabbing Evidence Collection Kit	Touch DNA
DE	Bags for Evidence Collection Kit	Items that may contain DNA Evidence from the crime scene
DF	Sharp and Dangerous Items Collection Kit	Sharp and dangerous items i.e. knives
PMD1	Deceased Sexual Assault Evidence Collection Kit [^]	Ano-genital area of the deceased; tampons or sanitary pads
PMD2	Deceased Reference Blood Sample Evidence Collection Kit [^]	Reference blood sample from the deceased
Blood Alcohol	Blood Alcohol Collection Kit	Blood sample

** Paediatric SAECK used if the victim is younger than 14 years of age*

[^]D6, PMD1 and PMD2 used exclusively by forensic pathologists

1.8 Skills required for the utilisation of the SAECK

1.8.1 Clinical Forensic Medicine training curriculum

The forensic examination must be performed consistently based on the national forensic medical examination policy guidelines (Ingemann-Hansen & Charles, 2013). In RSA, medical students are required to train in clinical forensic medicine and it is a prerequisite for the undergraduate education and training of the Medical and Dental Professions Board (Fouché et al., 2018). However, over time some universities have amended this specific curriculum and Fouché et al. (2018) reported that this has led to community-service doctors being unable to conduct and properly manage medico-legal cases.

1.8.2 Competence of forensic medical examiners

Regrettably, there have been concerns regarding the competence of forensic medical examiners. Fouché et al. (2018) conducted a quantitative retrospective study and randomly targeted 150 community service doctors across the RSA to assess their knowledge and experience in managing medico-legal cases. Indications of incompetence were noted in some doctors having difficulties in completing J88 forms and some did not know what a SAECK is before starting their community service (Fouché et al., 2018).

Furthermore, some participants did not wait to ensure that the samples were dry before packaging them, while others did not personally seal the samples before placing them in the kit (Fouché et al., 2018). Although this study does not have a large sample size and therefore the results might not be a true reflection of what is happening in RSA, it is still worth noting that forensic medical examiners need proper training in medico-legal documentation, evidence collection and packaging. This will ensure the timely and accurate collection of forensic evidence.

Similarly, a cross-sectional study in RSA assessing the extent of completion of the kits was conducted in 2011 (Jina et al., 2011). Reports of usage shortcomings included incorrect packaging and labelling of evidence and incomplete specimen collection. The

researchers suggested that this could be due to the lack of availability of trained staff and the inadequate facilities for the proper collection of DNA evidence.

Courts rely on medico-legal evidence during the prosecution of the rape cases. Therefore, there must be competence among forensic medical examiners as the lack thereof could negatively impact the integrity of the evidence. In addition to taking forensic specimen correctly, forensic medical examiners must appropriately maintain the chain of custody. Chain of custody refers to the historical documentation of the persons in whose custody the evidence is always placed (Evans & Stagner, 2003). This includes personally sealing the collected evidence. Maintaining the chain of custody ensures traceability, validity, accountability and admissibility of the forensic evidence in court. Improper evidence collection can lead to acquittals of guilty individuals who were accused of rape, resulting in victims not receiving the justice they deserve.

1.9 Collected kits not analysed

Victims are also denied justice because police officials do not routinely submit the SAECKs for analysis (Campbell & Fehler-Cabral, 2018). The use and collection of forensic evidence are invasive and time-consuming, therefore failure to submit and test the kit is a breach of trust to the victim and may compromise case advancement in the criminal justice system (Fallik & Wells, 2015). There has been criticism concerning DNA backlogs and delays in obtaining timeous forensic reports from the SAPS Forensic Science Laboratory (Omar, 2016). However, in an interview, the national SAPS spokesperson denied these claims and stated that there are no backlog issues at the forensic science laboratories (Ngqakamba, 2018). Furthermore, it was reported that the police, along with the NPA, had an agreement to ensure timeous forensic results for high profile cases. The question that needs to be asked is whether rape cases form part of the "high profile cases."

Campbell et al. (2015) did an extensive review of the national problem of untested kits in the USA and reported that between 1982 and 2007, there have been approximately 200 000 untested kits in police property. Since studies have reported on the existence of

potentially valuable forensic evidence that has not been submitted, various initiatives such as “end the backlog” by Joyful Heart Foundation have been formalised to deal with the issue (Speaker, 2019). This includes measuring the backlog at the laboratories and the kits that have never been submitted for analysis and are monitored at different police jurisdictions. Additionally, there are mathematical models generated that could assist with estimating the backlog of untested kits (Speaker, 2019; Wang & Wein, 2018).

In the USA, it was suggested that training would be crucial to improve storage, sampling and faster generation of DNA report (Speaker, 2019). However, there may be competition for allocated funds because of limited resources and thus some prioritisation should be made (Campbell et al., 2016; Strom & Hickman, 2016). Nonetheless, the main objective of doing this remains the societal benefits of rape survivors, which include cases being resolved and the prevention of repeated sexual violations from serial rapists (Speaker, 2019).

1.10 Methods of extracting DNA

Short Tandem Repeat (STR) profiling is a form of a DNA analysis that is widely accepted (Caliebe et al., 2017). At the SAPS Forensic Science Laboratory, a presumptive test is first performed on the crime scene exhibit in order to identify and recover any biological samples that contain DNA such as blood, saliva, semen/spermatozoa, vaginal secretions or any skin cells. DNA is then isolated from the cells and a set of high proportional STRs are selected and amplified through a method known as Polymerase Chain Reaction (PCR) to generate a DNA profile.

The STR markers are found on the non-functional part of the human genome and are selected based on their independence, informativeness, size range, ability to co-amplify, high throughput, amplification fidelity and low error and mutation rate. The results obtained consist of a unique string of alphanumeric characters as a combination of genotypes that provide identity reference. This is referred to as a DNA profile and everyone's profile is unique (De Wet et al., 2011).

After the DNA profile is extracted, it can be added to a DNA database. A DNA database has reference DNA profiles from previous arrestees and convicted offenders (Doleac, 2017). DNA profiling has been used in RSA since 1998, but it was not until 2015 that a legal framework around the use and storage of DNA profiles was generated (DNA Project, 2017). DNA profiles generated from evidentiary samples are compared with reference samples of known origin or profiles already in the DNA database with the aim of finding a match, often referred to as a “hit” (Campbell et al., 2015). The results of the DNA profiling are often highly discriminative and informative. In the USA, the results are expressed probabilistically based on accepted population genetics theory and are utilized according to specifications of the National Research Council Committee of Forensic DNA Analysis (Bickel, 1997). The SAPS Forensic Science Laboratory employs the same form of DNA profiling interpretation and is managed by the South African National Accreditation System (SANAS) (De Wet et al., 2011).

1.11 Use of DNA evidence

The presence of DNA evidence is used to aid in suspect identification and to confirm sexual contact. A qualitative study was conducted in the North Eastern United States to assess how prosecutors perceived biological evidence and injury in sexual assault cases (Alderden et al., 2018). The results showed that an examination reinforced the victim’s credibility. Furthermore, DNA was more useful in confirming sexual contact and identifying unknown perpetrators, especially when the victim was incapacitated, too traumatized to recall what had happened, mentally challenged or too young to identify the suspect (Alderden et al., 2018). Suspect identification can be most useful in cases of rape homicide (Briody, 2004).

DNA can also be useful in identifying serial offenders through the utilization of DNA databases and exonerate individuals that were falsely accused. In 1992 at the Cardozo School of Law in the United States, a non-profit organization called the "Innocence Project" was formed. Their mandate was to prevent injustice by helping convicted individuals who were wrongfully accused by using DNA testing.

DNA results cannot be considered in isolation of other related evidence. One of the limitations of DNA evidence is that although it aids in confirming sexual contact, it cannot be used to prove or disprove consensual sexual contact (Campbell et al., 2015). There is a considerable amount of sexual violations that occur among acquaintances, intimates and friends. If the accused is known as the complainant's sexual partner, the accused might claim that sexual contact happened, but the challenge would be to overcome the consent defence (Campbell et al., 2015). Therefore, prosecution will have to rely on other types of forensic evidence such as injuries and possibly, witness statements to corroborate the victim's account of events.

A study conducted to assess how investigators from the Houston Police Department use DNA evidence, showed that DNA evidence is valuable when there are other evidentiary factors (Menaker et al., 2017). Research in RSA (Jewkes et al., 2009) and other international countries such as Norway (Forr et al., 2018) has been conducted to evaluate the relationship between the use of forensic DNA evidence and other non-biological forensic evidence and their impact on the prosecution of legal cases and court outcomes.

1.12 Evaluating the role and impact of forensic DNA evidence

1.12.1 DNA as evidence in arrest, charge, case reaching court and court outcome

A retrospective, descriptive study was conducted in the Sør-Trøndelag police district of Norway to determine if there is an association between DNA results and the legal outcome. Trace evidence was collected from 299 (92%) victims and of those, the police requested analysis in only 135 (45%) (Forr et al., 2018). A DNA match was obtained in 40% of the cases. This study showed that it was more likely for a case to progress to trial if there was a DNA match. Among the cases prosecuted (n=29), 20 (69%) had a DNA match. Although part of their aim was to evaluate the association between DNA and conviction, they were unable to do so because of missing reference samples from the suspect, missing evidence collection and some of the collected evidence was not sent for

analysis (Forr et al., 2018). This study also highlighted the importance of proper evidence collection and maintaining the chain of custody.

A study conducted by Johnson et al. (2012) in the USA aimed to identify the type of evidence that contributed most to the court outcome. Forensic evidence was obtained in 63.8% of the cases. Of that, a third was submitted for examination and only 18.6% was examined. Cases that presented forensic evidence mostly resulted in arrests and charges but not in the conviction of the suspects (Johnson et al., 2012). This was further supported by two other studies that found biological evidence to be significantly correlated to arrest of the suspects (Tasca et al., 2013; Peterson et al., 2013).

Similarly, another study reported that DNA evidence was used to confirm arrest decisions and was a predictor of the case reaching court (Briody, 2018). This study demonstrated that DNA evidence led to the jury finding the defendant guilty and sentenced longer to prison (Briody, 2018). In accordance with, Golding et al. (2000) conducted a mock experiment and reported that DNA evidence significantly increased the likelihood of a jury finding the defendant guilty compared to when the case relied on an eyewitness statements only (Golding et al., 2000).

Cross et al. (2017) critiqued the studies that investigated the association between biological evidence and case outcome without looking at the timing between the arrest and the availability of the forensic DNA report. Their study examined the timing of crime scene laboratory reports and arrests made. Most cases had a DNA report available prior to an arrest and therefore it was hypothesised that the probable cause to make an arrest was the DNA results (Cross et al., 2017).

1.12.2 DNA as evidence in strengthening and progression of criminal cases in the justice system

A retrospective review study was conducted in RSA aimed at evaluating the processing of rape cases reported at Gauteng province police stations (Jewkes et al., 2009). The cases selected were provincially representative and 85% (n=1547) of the rape cases that were analysed, had medical examinations. A forensic evidence kit was completed in 56

% (868) of the cases, but only 43% (n=659) kits were submitted for testing. Furthermore, DNA reports were available for use in court only in 1.4% (n=22) of the cases (Jewkes et al., 2009). The researchers reported that a DNA report with no match led to an acquittal in this cohort. However, a DNA match did not assume a conviction as there were cases in which there was an acquittal despite matching profiles (3 children and adult). In these instances, other forms of forensic evidence were required to strengthen the case during the court proceedings (Jewkes et al., 2009).

Hagemann et al. (2011) conducted a retrospective descriptive study and reported that only one-third of the kits were sent to forensic laboratories for analysis. Unlike the study conducted by Forr et al. (2018), this study showed that the analysis of trace evidence was associated with charge filing despite the results of the DNA analysis. However, the researchers did not discuss how it aided in the conviction of the suspects but mentioned that the non-use of trace evidence had a negative impact on the progression of the case in the justice system (Hagemann et al., 2011).

Cupido (2014) from the Division of Forensic Medicine and Toxicology, University of Cape Town (UCT), assessed the utility and impact of SAECKs in suspected cases of rape (n=39) that were tried and prosecuted at the Cape Town Regional and Magistrate courts, in the Western Cape. The results from this study showed that SAECKs were only analysed in 28% (n=11) of the cases and DNA reports were available in only 45.5% (n=5) of these cases. In addition, most withdrawals were due to the victim's actions or their unavailability, reconciliation and mediation rather than the outcome of DNA analysis. Therefore, this study could not adequately measure the impact or use of SAECKs as evidence in rape cases that were tried in specialised sexual offence courts.

1.13 Evaluating the presence of injuries as evidence in rape cases

When DNA evidence is inadequate to overcome the question of consent and to prosecute the perpetrator, other forms of forensic evidence are considered to corroborate the victim's account of events and credibility. One such necessary type of evidence is the presence of injuries. During a physical examination, a medical examiner carefully takes

note of injuries on the victim's body and genital areas such as abrasions, lacerations, bite marks, or bruises and thoroughly documents these. This is important as it often assists during the case proceedings and may be used to draw inferences from injury patterns and the circumstances surrounding the alleged rape (NACOSA, 2015).

The study conducted by Hagemann et al. (2011) showed that documentation of the injuries sustained by the victims during the offence was not linked with charge filing. This contrasts with a retrospective review study conducted in RSA by Jewkes et al. (2009) that showed the documentation of injuries led to the case going to trial. In adult cases, a conviction was more likely if there was a documented injury, regardless of its position. This was consistent with the findings from Sague-Castillo (2009).

Although these studies demonstrated the value of using non-biological evidence, it is still worth noting that not all rape cases present with injuries. Therefore, the utility of DNA evidence, its collection and the analysis thereof remain essential in combination with documentation of injuries. McLean et al. (2011) investigated genital injuries between penile-vaginal penetration with and without consent. The results showed that while most rape victims do not sustain genital injuries, rape victims were three-time more likely to sustain a genital injury compared to when an individual was having consensual intercourse (McLean et al., 2011).

1.14 Conclusion

Rape is a serious societal issue that should currently be regarded as a global crisis. DNA analysis of biological evidence has increased the ability to link offenders to their victims with high probabilities (Johnson et al., 2012); and it is useful in confirming sexual contact and identifying unknown perpetrators, especially when the victim is intoxicated, drugged, or too traumatized to recall what had happened. Furthermore, DNA evidence can play an essential role if the victim is deceased, mentally challenged, or too young to identify the suspect (Alderden et al., 2018).

While there is value in the use of forensic DNA evidence; all the different parties, including the victim, police officers, forensic medical examiners and forensic science laboratories need to contribute to the preservation and proper analysis of the evidence in order for it to be admissible in court. Johnson et al. (2012) suggest that various factors affect the success of forensic investigations, such as the type of evidence under examination, the quantity and quality of the DNA evidence and the analytical capabilities of the laboratory

It can also be observed that not all the collected evidence is sent for laboratory analysis and not all evidence received by the laboratories is analysed. Even if it was analysed, one could not assume that the evidence will be presented in court. There are various factors affecting decisions to send collected evidence to the laboratory for analysis, but it remains unclear what factors determine criteria for analysis and the results thereof are used variably in subsequent court proceedings. Although there have been studies demonstrating the importance of forensic DNA evidence in rape cases, its actual contribution to legal processes and case outcome are unknown. Therefore, more studies need to be conducted on the role and impact of SAECKs as evidence in rape cases, especially in RSA.

Justification and problem statement

There is a high incidence of rape in RSA. Rape does not only cause physical harm but negatively impacts the psychological, emotional and social well-being of the victim. In RSA, the Criminal Law (Sexual Offences and Related Matters) Amendment Act 32 of 2007 was enacted on the 16th of December 2007. One of its aims is to ensure that rape victims receive the necessary medical treatment required, as well as the collection and analysis of forensic evidence. Given that RSA has started various initiatives and has a national policy framework on the management of sexual offences, it is crucial to establish whether SAECKs are routinely used for the collection of DNA evidence and whether such evidence is presented in court and has impact in legal case outcome. The value of DNA evidence cannot be measured in isolation of other related evidence presented in court; therefore, it is equally important to measure the role and impact of DNA evidence relative

to other evidence. This includes non-biological factors that are considered crucial during the legal progression of the case and court verdict.

Hypothesis

The conviction rate is higher in rape cases when DNA evidence, along with other evidence, is presented in court, in comparison to cases without DNA evidence.

Aim

To investigate the use of SAECKs and their impact on the legal outcome of rape cases presented at the High Court in Cape Town, Western Cape, Republic of South Africa.

Objectives

- Obtain access and analyse court documents for closed rape cases between 1st January 2012 and 31st December 2016
- Obtain and analyse the police records of rape cases
- Obtain and record information on the analysis of the forensic evidence, performed at the South African Police Service (SAPS) Forensic Science Laboratory

Chapter 2: Methodology

2.1 Sampling

Data for this study was collected by conducting a retrospective review of rape cases (n=98) prosecuted at the Western Cape High Court. One case file can consist of multiple rape cases and each rape victim is assigned an individual court docket. For the inclusion criteria, the case must have been documented in the Western Cape High court criminal case register between 1st January 2012 and 31st December 2016 and legally concluded. Therefore, subjects in the study will be inclusive of all sexes and ages. The case must have involved sexual penetration; therefore, sexual assault or attempted rape cases were not considered.

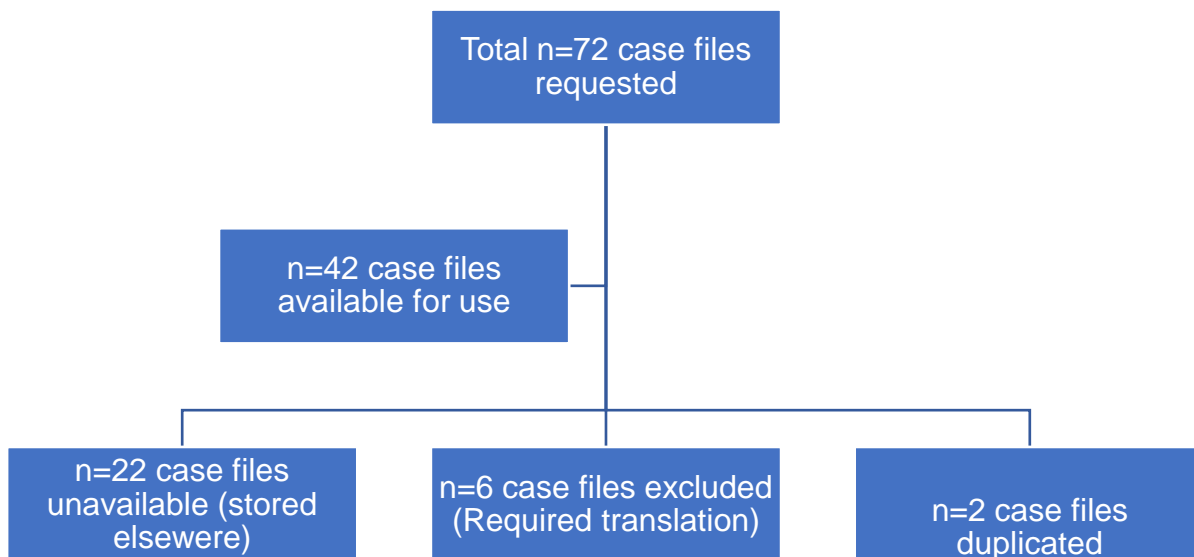


Figure 2: Flow chart of the number of criminal case files that met the inclusion criteria and were retrieved from the storage archive at the Western Cape High Court.

2.2 Procedure

Each case file consisted of court dockets, police dockets, J88 forms (Appendix 1) on which medical examinations and injury findings were recorded and various other reports such as the post-mortem reports, victim impact statements, witness statements, crime scene sketches and reports and SAPS Forensic Science Laboratory DNA profiling reports. Information regarding the victim demographics, assault characteristics, medico-legal examination findings and the court outcome was collected using a set of predefined variables and collated in an excel spreadsheet.

2.3 Variables

While there is an extensive amount of information that could be gathered from the above-mentioned files and reports, it was imperative to focus on collecting information pertaining to the rape and answer our research questions. The criteria for inclusion of variables was based on previous research (Jewkes et al., 2009; Tasca et al., 2013; Makasa & Heathfield, 2018). Furthermore, the variables included in the predictive analysis were based on factors the prosecutors used to strengthen the case against the accused and factors which the judge considered when giving the final court verdict and during sentencing. This information was available in each case docket. Information collected consisted of:- the sex and age of the victim; the location and place (exact location) where the incident occurred; the number of perpetrators and their relationship to the victim; self-reported use/ influence of illicit substances; use of weapons and types; the time between assault and report to the police and/or hospital (including rape centers and clinics used for clinical examination), time between assault and post-mortem examination; presence or absence of bodily and genital injuries and its description (i.e. type of injury); use of SAECKs and type of samples collected; laboratory findings (DNA report generated); criminal history of the accused; victim impact statements and court outcomes were recorded for each case.

2.4 Study approval

Before commencement of the study, ethical approval was obtained from the UCT Faculty of Health Sciences Human Research Ethics Committee (FHS HREC 209/2019) and permission to access the case files was granted by Judge President Hlophe, Judge President of the Western Cape Division of the High Court in South Africa.

2.5 Statistical Analysis

For part A, the descriptive analysis, Prism software version 8.1.2 (GraphPad, USA) was used to perform the descriptive and statistical analysis of the data. For part B, the predictive analysis, backward binary logistic regression analysis was conducted to identify variables that increase the likelihood of a conviction. That is, to determine whether the use of SAECK and presentation of DNA evidence was predictive of a positive court outcome. The dependent variable was the court decision, which was binary (guilty or not guilty). The independent variables included the age of victim, sex of victim (male vs female); victim-accused relationship (strangers vs. non-strangers, the latter containing all forms of relationship where the victim knew the accused prior to the incidence, including neighbours, acquaintances, partners and ex partners, friends and relatives); location of incidence (indoors vs outdoors); number of perpetrators (1 or more); influence of illicit substances (yes vs no); presence/ absence of injuries (body/genital); victim's activity after the rape incident (nothing vs bathed/urinated/change clothes); use of SAECK (yes vs no); DNA report generated from SAECK analyses (yes vs no); use of weapons (yes vs no); Victim Impact Statement (VIS) (yes vs no); and the criminal history of perpetrator (yes vs no). missing data was coded as 'na'. The independent variables were either continuous or categorical and were coded dichotomously, except for age (Appendix 2). In backward elimination in Part B, the individual predictors were examined and the ones with the least significant effect were removed and excluded from the model. The process was repeated until only the significant predictors (p-value < 0.05) remained. The IBM 'Statistical Package for the Social Sciences' (SPSS) version 24 (IBM, Armonk, NY, USA) program was used to perform the statistical analysis.

Chapter 3: Results

Part A: Descriptive analysis

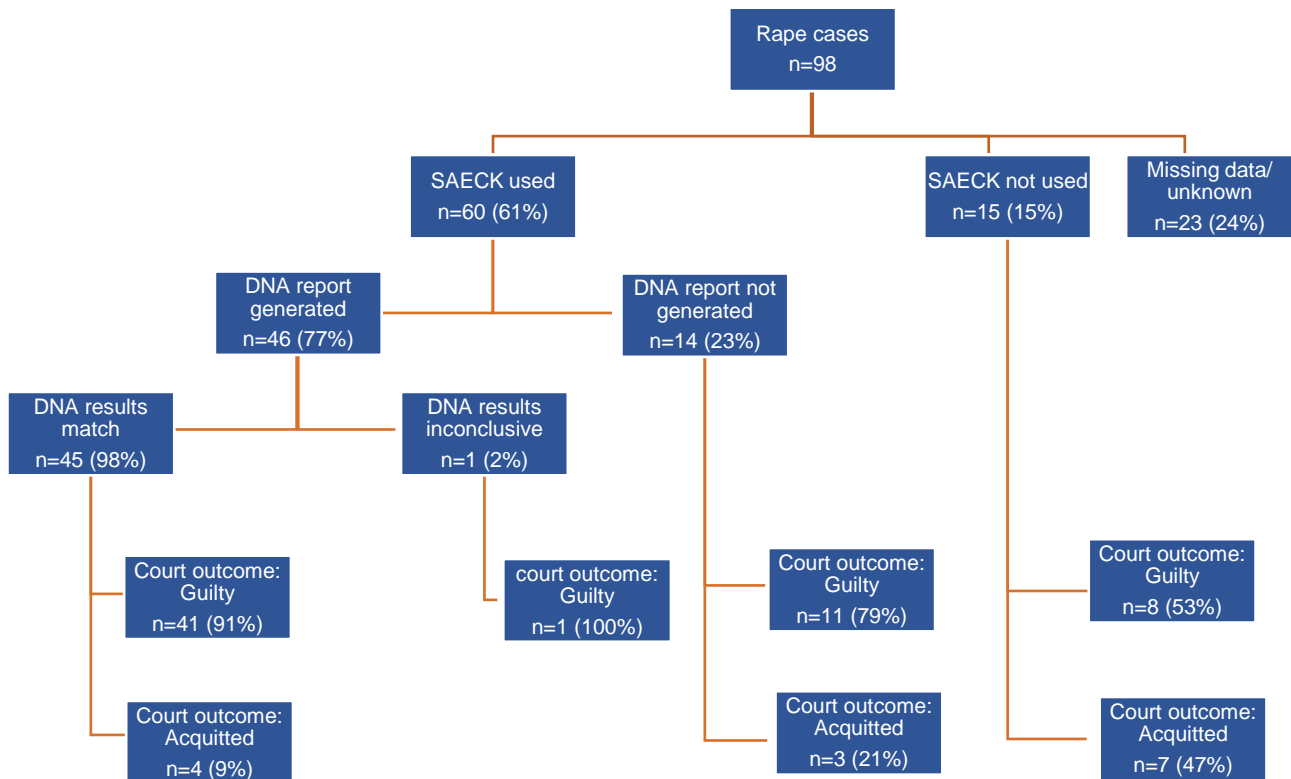


Figure 3: Flow Chart representing the number of cases that used SAECKs and the ones that did not and their relative court outcome.

A total of N=98 rape cases prosecuted between the 1st January 2012 and 31st December 2016 in the Western Cape High Court were identified. The total number of case files was N=42. Some case files consisted of multiple rape cases and each rape victim was assigned an individual court docket. These cases were finalised and the legal outcome was known. Table 2 shows the victim demographics and assault characteristics. Due to the nature of retrospective analysis, the number of subjects (n) differs depending on data

availability of cases. Several court dockets were incomplete and had missing data, therefore, certain variables had a sample number lower than 98.

3.1 Victim demographics

Included in this study were cases of rape homicide, because of the 98 rape victims, 26 were found deceased and 72 were alive. Most of the victims in the sample (n=95/98, 97%) were females, with the mean age of 21 years and three victims (3%) were males with the mean age of 14 years. 52% (n=40/77) of the cases comprised of victims that were over the age of 18 years. However, there was also a considerable proportion (n=26/77, 34%) of victims between the ages of 2-12 years, with most of them still in a prepubertal stage, which is defined as the period before sexual maturation and development of secondary sex characteristics.

3.2 Assault characteristics

3.2.1 Place and location of incident, number of perpetrators and prior convictions

The place of incident was considered as the exact name of the location where the rape incident took place. Figure 4 represents the different locations where there was more than one rape incident that took place (Refer to Appendix 4 for the Western Cape and Cape Town Map, indicating the areas). The majority of the cases in this study, 30% (n=29/98), occurred in Khayelitsha, a township located on the Cape Flats. In 64% (n=61/95) of the cases, the incident of rape occurred outdoors, mostly in secluded areas that offered an easy escape for the offender, such a bush, park, forest, or train station and in 97% (n=95/98) of the cases, there was only one perpetrator. In addition, there was a small proportion (20%, n=20/98) of cases where the same perpetrator was implicated in more than one rape incident (same perpetrator vs. two or more victims) (Refer to Table 2) and in about 25% of the cases (n=22/88), the accused had a criminal record with prior convictions (type of offence was not specified).

Table 2: Distribution of victim demographics and assault characteristics of the cases (N=98)

Variable	Number of cases n (%)
Sex	
Female	95 (97%)
Male	3 (3%)
Age in years (n=77)	
Mean age females (range)	21 (2-86)
Mean age males (range)	14 (12-17)
Age groups (n=77)	
2-12 years	26 (34%)
13-17 years	11 (14%)
18-86 years	40 (52%)
Location of incident (n=95)	
Indoors	34 (36%)
Outdoors	61 (64%)
Number of perpetrators	
1	95 (97%)
2	3 (3%)
Proportion of cases with the same accused: (1 perpetrator) ^	
2 victims	10 (10%)
3 victims	5 (5%)
5 victims	2 (2%)
7 victims	1 (1%)
11 victims	1 (1%)
13 victims	1 (1%)
Accused had a prior conviction (n=88)	22 (25%)
Use of alcohol and/or drugs prior to the offence	23 (24%)
Use of a weapon to threaten victim (n=95)	46 (48%)
Victim impact statement	31 (32%)
Victim's activity after the rape (n=54)	
Bathed/urinated/changed clothes	24 (44%)
Victim found deceased	26 (27%)

**n differs depending on data availability of cases. The total number of cases is N=98. Several court dockets were incomplete and had missing data.*

^Demonstrate repeat / serial rapists

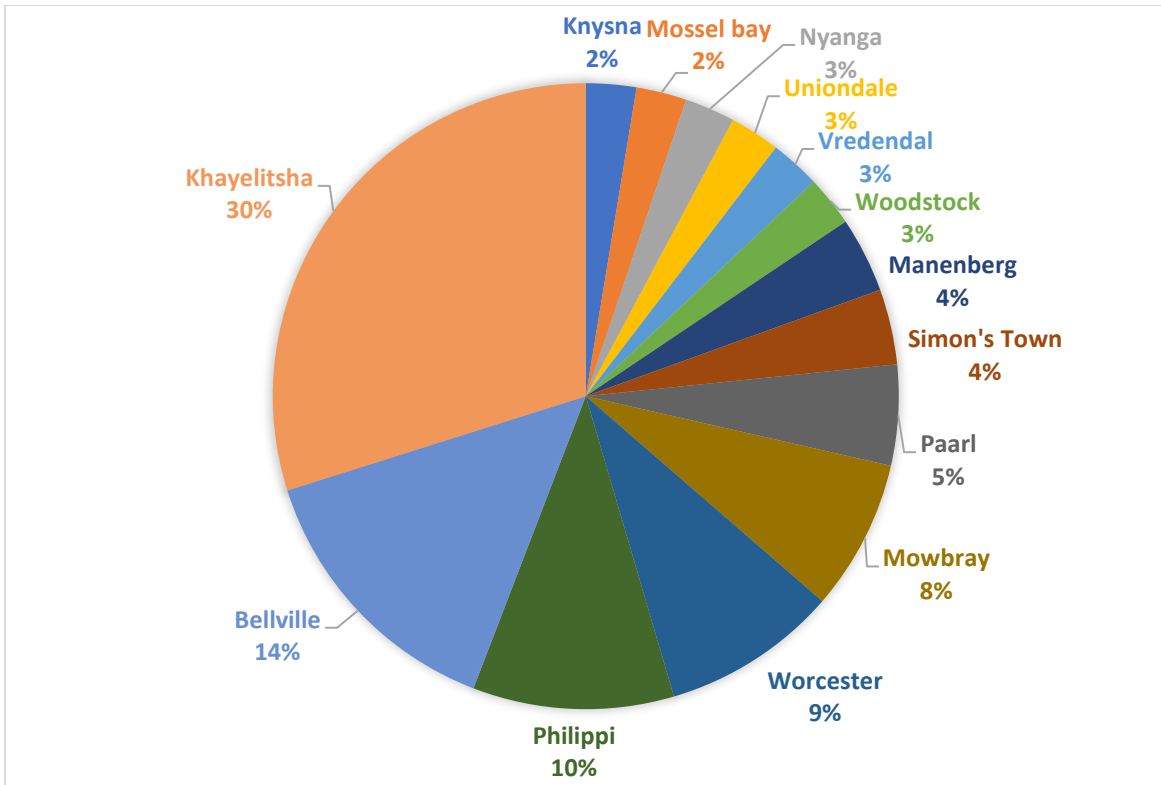


Figure 4: Shows the distribution of areas with the most rape occurrence

3.2.2 Victim-accused relationship

Figure 5 shows the victim-accused relationship and the proportion of cases that fall within each category (N=98). In 64% (n=63/98) of the cases, the victim was assaulted by an unknown individual/stranger (Figure 5). Furthermore, it was observed in this study that half of the children between the ages of 2-12 years were assaulted by a relative (n=3, 12%) or neighbour (n=10, 38%). In contrast, the older victims (>18 years of age) were raped either by a stranger (n=25, 62%), an acquaintance (n=2, 5%), a friend (n=8, 20%) or an individual they were at present or previously in a romantic relationship with (n=5, 13%).

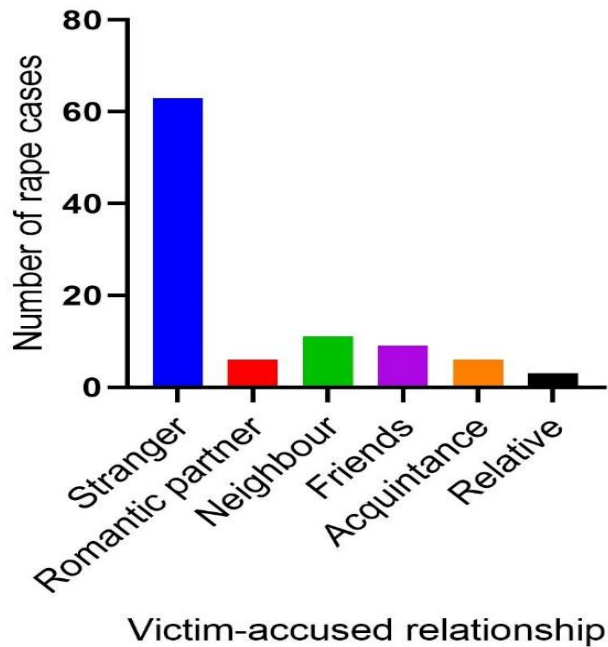


Figure 5: Victim-accused relationship

3.2.3 Influence of alcohol/drugs

There was a self-reported (from accused or victim) drug and alcohol intake before the rape incident in 24% (n=23/98) of the cases analysed (Table 2) (Appendix 6). Among these cases, 74% (n=17/23) showed that a weapon was used to coerce the victim and in 43% (n=10/23) of the cases, the rape victims were found deceased. The type of drugs that were reported included most commonly drug alcohol (n=18/23, 78%) and other illicit substances such as methamphetamine, most commonly sold as tik (n=5/23, 22%), Lysergic acid diethylamide (LSD) (n=1/23, 4%), 3,4-Methylenedioxymethamphetamine (MDMA commonly known as ecstasy) (n=1/23, 4%) and cannabis (n=1/23, 4%). None of the self-reported statements were confirmed by toxicological testing since it is not routinely performed during rape investigations in RSA. Furthermore, there were no correlation calculations regarding the reported use of drugs/alcohol before the assault and weapon use.

3.2.4 Coercion and use of weapons

Almost 48% (n=46/95) of the victims were coerced and threatened with the use of a weapon (Table 2). Different types weapons were used to coerce the rape victims; however, the most common types of weapon were knives/ sharp objects (n=28/46, 61%), guns (n=7/46, 15%), stones/rocks (n=7/46, 15%) and ligatures (n=3/46, 7%).

3.3 Elapsed time between rape incident and reporting

3.3.1 Time between rape incident and reporting to the police

The average delay in reporting time to the police was 36 hours, it was calculated as time (in hours) elapsed from the rape incident to the victim or victim's family reporting the offence to the police. This data was available in only 29 cases. 59% (n=17/29) of the victims reported the assault to the police in the first 24 hours, while 34% (n=10/29) reported within 24-48 hours. Only 7% (n=2/29) waited more than 48 hours to report the assault (Figure 6).

3.3.2 Time between rape incident and medical examination

Only 41% of cases (n=40) had data available to calculate how long it took victims to report for medical examination either at a local rape center, clinic, or hospital. In 50% of these cases (n=20/40), the victims were examined in less than 24 hours after the rape incident occurred; 33% (n=13/40) were examined between 24 and 48 hours and 17% (n=7/40) were examined after a passage of more than 72 hours (Figure 6).

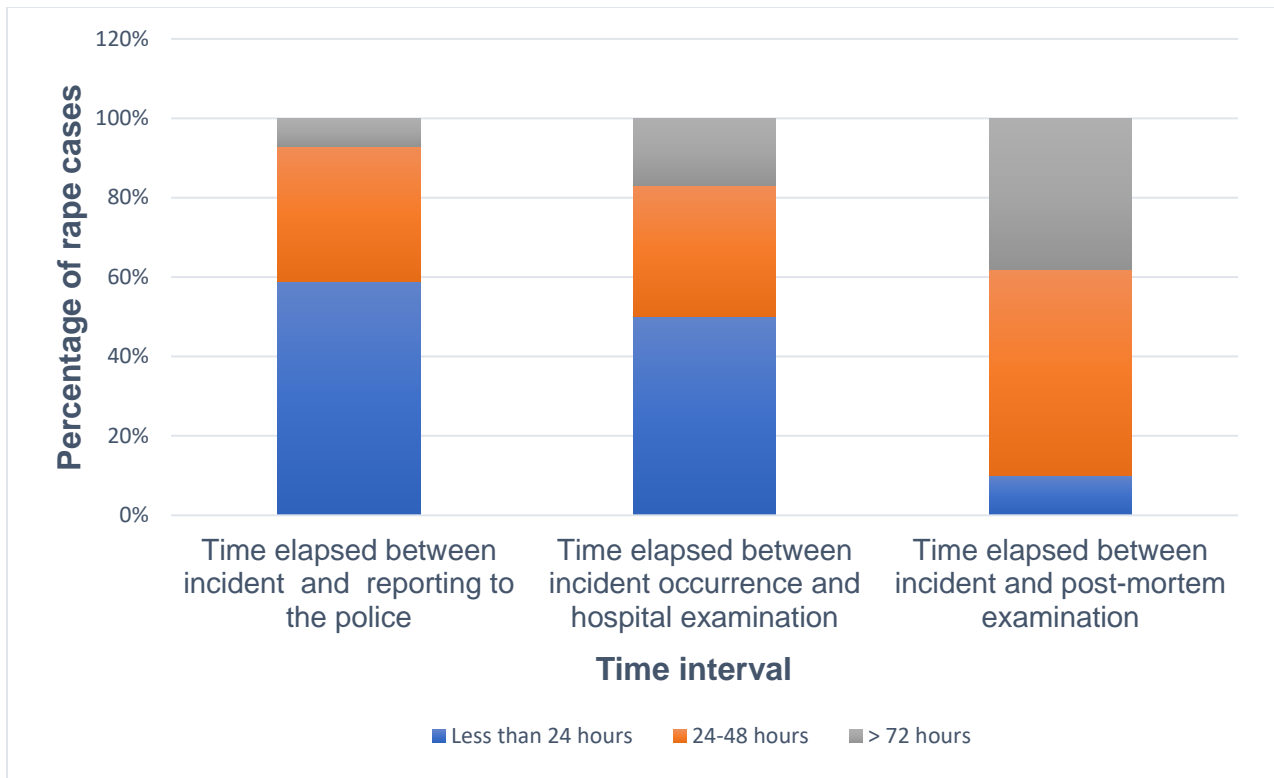


Figure 6: Graph depicting the percentage of cases and the elapsed time between the incident occurrence and report to police; hospital examination and post-examination of the deceased

3.3.3 Time between rape incident and post-mortem examination

Forensic pathologists completed the collection of forensic evidence using the SAECK during the post-mortem. Twenty-six victims were found deceased after the rape incident; however, post-mortem data was only available for only 21 cases. For the other 5 cases, the post-mortem report was not included in the court dockets. In 52% of the cases (n=11/21), the post-mortem was performed within 24 hours. In 10% (n=2/21) of the cases, the medical examination was conducted between 24-48 hours, followed by 38% (n=8/21) of the cases examined after 72 hours (Figure 6).

3.4 Medical examination and findings

3.4.1 Use of Sexual Assault Evidence Collection Kit (SAECKs)

The medical practitioner collects forensic evidence using a SAECK during the medical examination. Cases were divided into two groups: SAECK used and those without the use of a SAECK and their relative court outcome (Figure 3). It was observed that in 61% of the cases (n=60/98), a SAECK was used and a DNA report was available in 77% (n=46/60) of the cases. Of these 60 cases, 88% (n=53/60) ended in a guilty verdict, even though a DNA report was not available for use in court in 23% (n=14/60) of cases. A match did not assure conviction, as there were cases (n=4) that the accused was acquitted even though a DNA match was found. In one case, the DNA results were inconclusive, but the accused was still found guilty. In 15% of the cases (n=15), it was indicated that a SAECK was not used. Of those, 53% (n=8) led to a guilty verdict and in 47% (n=7) the accused was acquitted.

3.4.2 Types of samples collected with the SAECK

The information was available only in 39% (n=38/98) of the cases. Although there is a standardised procedure for the collection of forensic samples, the type of samples collected were case dependent. The most common type of samples collected were vaginal vault swab (n=29/38, 76%), rectal swab (n=24/38, 63%), vulva swab (n=22/38, 58%), vestibule swab (n=17/38, 45%), fingernail and finger swab (n=14/38, 37%), oral swab (n=12/38, 32%), perineum swab (n=8/38, 21%), head hair and pubic hair (n=7/38, 18%) and nail clippings (n=5/38, 13%). Underwear (n=15/38, 39%), clothing (n=10/38, 26%), and linen (n=2/38, 5%) was also collected. The type of sample analysed at the SAPS Forensic Science Laboratory was not noted.

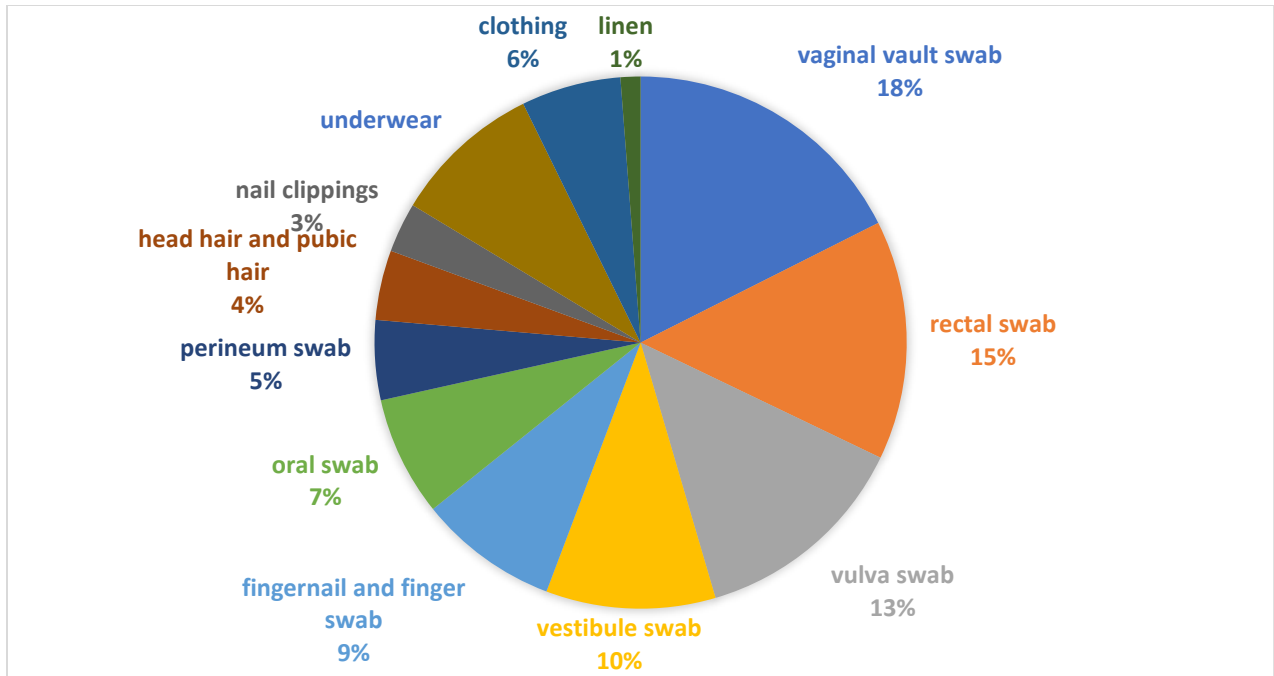


Figure 7: Evidence collected during clinical and post-mortem examinations for DNA analysis

3.4.3 Presence of injuries

The medical examiner or forensic pathologist also examined bodily and genital injuries resulting from the rape incident. The documentation of injury was observed in 50% of the cases (n=49). Of these, 39% (n=19/49) of the victims were between the age of 2 and 12 years, 8% (n=4/49) were between 13 and 17 years and 53% (n=26/49) were above 18 years of age. The severity of the injuries was age dependent. Extensive extragenital and anogenital injuries were observed mostly in victims between the age of 2 and 12 years. These injuries consisted of extensive lacerations, contusions and abrasions on the genital area comprising hymenal tears, vaginal tears extending into the anus, bleeding and inflammation. In contrast, the injuries sustained by victims above the age of 12 were mostly bodily injuries, which consisted of blunt trauma to the head and body, cuts on hands and face, abrasion and scratches on knees and small tears, bruises and abrasions around the genital area.

Part B: Predictive analysis

For predicting the likelihood of a rape conviction, a binary logistic regression analysis was conducted and the results are shown in Table 3 (Refer to Appendix 5 for the rest of the models that were excluded). The model that fit our data was statistically significant ($\chi^2 = 23.810$, $p < 0.01$) and correctly classified 86.1% of the rape cases that resulted in a conviction and those that were acquitted. Furthermore, we observed a Cox and Snell R-squared value of 0.282 and Nagelkerke R-squared value of 0.449. Only the location of incidence (p-value= 0.006) was found to significantly increase the likelihood of a conviction with an odds ratio of 19.827. The use of SAECKs (p-value= 0.040) had an odds ratio of less than 1 (OR= 0.196), which indicates a negative relationship with the likelihood of a conviction. This means that there is a lower risk of a suspect being convicted of rape when a SAECK is used. The 95% confidence interval for both predictors does not include 1; therefore, there is an association between these independent variables and the dependent variable.

The models were adjusted and cases with missing data pertaining to the use of a SAECK were excluded (i.e. if there was no clear indication in the case file whether a SAECK was used or not). The use of SAECKs and presentation of DNA evidence was still found not to be significant, with a p-value of 0.38 (OR= 5.82) and 0.246 (OR= 5.509), respectively. Surprisingly, the location of incidence was found to be significant (p-value 0.02), however the odds ratio decreased from 19.827 to 0.005.

Table 3: Binary logistic regression analysis showing the predictors that are positively associated with the outcome of a conviction (N=98)

Predictor	B	S. E	P-value	OR	95% C.I. for OR	
					Lower	Upper
Location of incidence	2.987	1.097	.006	19.827	2.308	170.298
Use of SAECKs	-1.628	.792	.040	.196	.042	.927
Constant	-2.231	1.207	.065	.107		

**p ≤ 0.05*

OR: odds ratio; SE: standard error; CI: confidence interval

Chapter 4: Discussion

RSA has a high incidence of rape, with women and children being the most vulnerable group. RSA consist of nine provinces, which are specific regions or districts that have their own capital city. In the provincial overview of the 2018/2019 crime statistics, Western Cape (WC) was reported as the fourth leading province in the number of reported rapes, the second highest after Gauteng province in sexual crimes against women and the leading province in sexual crimes against children (Department of Police, 2019). Although the Criminal Law (Sexual Offences and Related Matters) Amendment Act of 2007 attempted to strengthen the laws dealing with rape, there is still an increase in the number of reported rapes in most provinces, with only North West and WC showing a slight decrease of 3% and 2%, respectively (Department of Police, 2019). In 2019, the continuation of gender-based violence (GBV) sparked a national march, with thousands of women pleading with the president of RSA to declare GBV a national crisis (Francke, 2019).

Despite the advancements in the field of forensic science and the value of DNA evidence in rape investigations, there is still limited understanding of how the use of SAECKs impacts the prosecution and specifically the legal outcome of rape cases. Based on previous research (Peterson et al., 2013; Forr et al., 2018; Briody, 2018; Nielsen et al., 2018) that investigated the value of DNA evidence and its contribution to criminal investigations, case progression and the legal outcome, it was hypothesised that the conviction rate will be higher in rape cases when DNA evidence along with other evidence is presented in court, in comparison to cases without DNA evidence. A retrospective review of n=98 rape cases, including rape homicides prosecuted in the Western Cape High Court was undertaken.

There is a myriad of factors and a combination of evidentiary materials that the judge takes into consideration when deciding the outcome/verdict of each rape case. This study aimed to assess the use of SAECKs in rape investigations. Furthermore, in order to investigate its impact in the court outcome, we opted to perform a statistical analysis that will determine whether the use of SAECKs and presentation of DNA evidence is predictive

of conviction, among other types of evidence and other factors the prosecutors used to strengthen the case against the accused and factors the judge considered when handing the final court verdict and sentencing (Appendix 2 and 3). This raised questions relating to how these factors are measured or weighed and become predictive of case outcome; that is, assess whether they represent a negative, positive, or no association between each factor and the outcome.

There is limited research in RSA concerning this type of study. Thus, the majority of the previous research used as reference for the interpretation of results was based on studies not conducted in RSA. There is a difference in the judicial system between countries. RSA depends only on a judge to make a final verdict, while other countries have a jury during the prosecution of cases. A jury comprises a group of ordinary civilians with no professional legal training, tasked to listen to the facts presented by both the prosecutor and the defendant and sworn to give an unbiased judgment and verdict on a case. A judge is a highly trained and experienced individual who presides over court proceedings. After the presentation of all the evidence, he/she evaluates the facts of the case and gives a verdict based on his/her interpretation of the law and judgement and in some cases, does so with support from an assessor.

In this chapter, we will be analysing all the results obtained from the study and their potential impact.

4.1 Forensic medical examination and availability of a DNA report

We reported that a medical examination was performed and the SAECK was used in 61% (n=60) of the cases. This implies that in the majority of the cases, when a crime of rape is reported, a SAECK is used during the medical examination. However, there were flaws in the system as SAECKs were not always analysed. A DNA report was generated and available for use in court for 46 of the 60 cases (77%). The rate of analysed SAECKs in this study is still high as previous studies conducted in Norway and Scandinavia, reported a 45% (n=135/299) and 50% (n=60/118) rate of analysed kits, despite a medical examination being performed and forensic evidence collected in 84% and 92% of cases,

respectively (Nesvold et al., 2011; Forr et al., 2018). . In a study conducted in RSA, Jewkes et al. (2009) reported an even lower rate and found that DNA reports were available in 1.4% (n=22/1547) of cases, despite 85% of -victims in that study having had a medical examination and SAECK collected.

The results of our study indicate that most of the forensic DNA evidence collected is submitted for analyses and processed routinely. In RSA, considerable resources have been invested in establishing proper collection and use of DNA evidence in rape cases. The results reported from this study are relevant as they show that the national policy guidelines for managing victims of sexual offences are adhered to by both SAPS and health care practitioners. In addition, the SAPS Forensic Science Laboratory processes the SAECKs in time for the DNA reports to be admissible in court as evidence.

Previous studies have also demonstrated that the collection of forensic evidence appeared to have a positive influence on the case progression during prosecution and court outcome, supporting our study hypothesis. Overall, there was a higher conviction rate when a SAECK was used (88%, n=53/60) in comparison to when it was not used (53%, n=8/15). In comparison to other studies, Lundrigan et al. (2019) found a conviction rate of 75%, while other studies conducted in RSA, Zambia and British Columbia all reported a conviction rate of less than 15% in rape cases (Martin, 2002; McGregor et al., 2002; Jewkes et al., 2009; Makasa & Heathfield, 2018).

Golding et al. (2000) and Briody (2018) found that the jury was more likely to convict or find the defendant guilty - when DNA evidence was present. This was further supported by McGregor et al., 2002 and Gray-Eurom et al., 2002, who reported that the implementation of SANE, a programme that deals explicitly with managing rape victims, conducting a medical examination and gathering forensic evidence to assist the courts, was critical in the prosecution of sexual assault perpetrators. Furthermore, they highlighted that convictions were more likely to be secured following the implementation of SANE. While our results are consistent with these findings, the effect of SAECKs in the

court outcome could not be measured without statistically analysing this variable among other types of evidence and factors.

4.2 Results of a DNA report

DNA matches were obtained in 98% (n=45 out of 46) of the cases that had DNA analysed and of those, 91 % (n=41 out of 45) resulted in a guilty outcome. However, a DNA match did not assure that the defendant will be convicted of rape as there were cases (n=4) in which the accused was still acquitted despite a DNA match. These results were consistent with those reported by Jewkes et al. (2009) and Forr et al. (2018), who found that although the DNA profile of the suspect matched the DNA profile found on the victim, the cases were dismissed due to insufficient evidence. The number of dismissed cases was unspecified in Jewkes et al. (2009); however, Forr et al. (2018) reported that 61% (n=35/57) of the cases which showed a match were dismissed due to insufficient evidence. In addition, there was a case in this study where the DNA results were inconclusive. The DNA test could neither exclude nor include the suspect as the primary source of the biological evidence; however, the judge still found the defendant guilty of rape. Jewkes et al. (2009) found that when there was no DNA match, the defendant was acquitted.

The most crucial argument around DNA results is the issue of consent. Therefore, although biological evidence is essential in identifying suspects, confirming sexual contact and expediting investigation by excluding suspects; it is not always enough to prove beyond reasonable doubt that the defendant is guilty of rape. In these cases, other forms of forensic evidence such as witness statements, suspect confession, victim impact statement, crime scene sketches and injuries were required to corroborate the victim's account of the event and to improve the victim's credibility and strengthen the case during the prosecution. Therefore, if there was lack of evidence that could possibly prove that the victim was coerced, the defendant was sometimes acquitted.

4.3 Untested kits/unavailable DNA reports

It is unascertained as to how the untested kits or the unavailability of the DNA reports could have influenced the outcome of the rape cases. Of the 14 (23%, 14/60) cases that did not have a DNA report included in the court documents, despite a SAECK being used and the J88 documents showing that it was submitted for analysis, 11 (79%, n=11/14) resulted in a conviction. Therefore, one could argue that the use of SAECKs and the presentation of the DNA evidence sometimes has a limited impact on the case outcome since some cases can result in a guilty verdict without the use of DNA evidence. Forensic evidence is weighted differently in each rape case. Contrary to our results, Johnson et al. (2012) found that only 5.5% of the cases without DNA evidence resulted in a conviction.

Investigating justification as to why some of the collected forensic evidence was not submitted or analysed was beyond the scope of this study. However, Ingemann-Hansen et al. (2008) and Campbell & Fehler-Cabral (2018) proposed several reasons for not submitting the evidence. They included investigators questioning whether a case warrants a full investigation, suspect not identified, victim's credibility and the lack of victim cooperation. In some cases, even when the forensic evidence is submitted to the laboratory, it is not always analysed (Strom & Hickman, 2016). This may be due to lack of resources and staff to test the kits (Ingemann-Hansen et al., 2008; Campbell & Fehler-Cabral, 2018) However, with the advent of DNA databases and projects dedicated to testing the backlog of kits, biological evidence may still contribute and resolve future cases and cases that were not prosecuted due to lack of forensic evidence (Ge et al., 2014; Campbell et al., 2018).

4.4 Evaluating the association between the use of SAECK and its impact on case outcome

Theoretically, a conviction in a rape case is influenced by different factors and is based on a combination of evidence presented and socio-demographic variables. Evidence is weighted differently in each case. Although we observed that more cases where a SAECK was used resulted in a conviction, the predictive analysis did not generate the expected

results. Contrary to our expectation, the use of SAECKs was found to be negatively associated with the prediction of a conviction, when analyzed against other variables. This means the use of a SAECK decreased the odds of finding the defendant guilty of rape, albeit by a small degree (OR=0.196, p-value=0.040). The logistic regression models of the association indicated that the use of a SAECK was not associated with conviction as a case outcome.

Furthermore, the availability of a DNA report or its results were not statistically significant and therefore there was no association between these factors and the court outcome. Although we know the importance of forensic DNA evidence, no study has reported DNA evidence associated with a favourable legal outcome. This finding was repeated in studies that found that the SAECK alone was not significant, but the injuries were significant (Hagemann et al., 2011). Previous research (Johnson et al., 2012; Tasca et al., 2013; Peterson et al., 2013; Cross et al., 2017) reported that biological evidence significantly correlated with arrest and charge but not with the conviction.

4.5 Evaluating the association between other variables of interest and the effect in the court outcome

Victim's demographics

4.5.1 Sex and age

The majority of the victims in this study were female (97%) and almost half were children (48%). The department of Social Development in RSA defines a '*child*' as an individual who is younger than 18 years. This study shows that women and children are the most vulnerable and at the highest risk of rape and sexual assault, as previously reported by (Kaushik et al., 2016; Sibanda-Moyo et al., 2017; Waterhouse et al., 2016). This does not imply that boys or men are not raped. However, the majority of disclosed and reported sexual crimes are commonly committed against vulnerable groups, including the elderly,

LGBTI community (lesbian, gay, bisexual, transgender and intersex) and people with disabilities.

We found no association between age, sex and conviction. Contrary to our results, Gray-Eurom et al. (2002) found that victims who were below the age of 18 years were associated with successful prosecution and Lundrigan et al. (2019) reported that the odds of convicting a defendant increased with the age of the victim. Lundrigan et al. (2019) suggest that older victims are more credible as compared to children. However, similar to our results (Jewkes et al., 2009) found no significant association between the age and the likelihood of conviction.

Assault characteristics

4.5.2 Place of incident (geographic)

The place of the incident was a variable of interest in determining the effectiveness of managing rape victims. Despite the improved systematic reforms in health policy and initiatives that were established to better manage rape survivors, in some geographical regions, lack of resources and trained staff still present a challenge (Basdeo, 2018). Previous research has suggested that rape perpetration is driven by violence, drug and alcohol abuse, factors which could be associated with male disempowerment, social marginalisation and poverty (Jewkes et al., 2016). Although data regarding the socio-economic status, i.e. education or employment, of the perpetrator or victim was not collected in this study, it was interesting to observe that most of the rape incidents occurred in informal settlements/townships such as Khayelitsha, Nyanga and Philippi. Informal settlements are known to have difficulties with regards to the management of rape survivors and preventing rape crimes due to lack of resources and trained staff. However, this study found that most rape victims from the informal settlements were able to undergo medical examinations at local rape centres or hospitals and the evidence was used in court.

4.5.3 Number of perpetrators, location of the incident and victim-accused relationship

In this study, most of the incidents occurred outdoors (64%) and almost all the victims reported having one perpetrator (97%). Although there were no univariate analyses performed, the location of the incident could be linked to the victim-accused relationship. Most victims in this study were violated by strangers (64% n=63/98), usually in secluded areas that offered an easy escape for the offender, such a bush, park, forest, or train station. The victims did not know the perpetrators; therefore, they were unlikely to invite them into their homes.

Outdoor rapes are different from indoor rapes, the latter occur mostly inside the victim's home, the perpetrator's home, a friend's house, abandoned houses, cars, or clubs. Our results show that there were 34 cases (36%) of indoor rapes. These types of rapes are usually committed by individuals known to the victim, such as an acquaintance, friend, family, relationship partners or ex-partners. While the relationship between the victim and the accused sometimes determines whether the rape incident occurs indoors or outdoors, the correlation needs to be further examined in future studies.

Contrary to our results, Waterhouse et al. (2016) found that most rapes (74.7%) were reported to have occurred indoors, either at the victim's home, perpetrator's home, their shared house, or a friend's house. This was found to be significantly associated with the type of rape, referred to this study as 'victim-accused relationship'. The majority of the rapes were domestic or acquaintance rapes, committed by individuals known to the victim. Furthermore, the offender and victim were found to be in the same space during night activities such as visiting a bar, pub, or club.

Our results show that the outdoor location was a significant predictor in the likelihood of a conviction by an odds ratio of 19.827 (p-value= 0.006). This was consistent with results reported by Lundrigan et al. (2019), who reported that offence location was significantly associated with case outcome (chi-square= 6.51, p-value=0.03). However, in contrast,

Kelly et al. (2005) found that offences which occurred indoors increased the likelihood of a conviction, while Du Mont & Myhr (2000) found no association between case outcome and the location of the incident.

Regarding the number of perpetrators, our results supported those reported by Kaushik et al., (2016), who found that in 94.20% of the cases, the sexual assault was committed by a single perpetrator. In this study, the involvement of a single perpetrator made the DNA results interpretation simpler as there was only one DNA profile for comparison. Although there were three cases that involved two perpetrators violating the same victim during the incident, the DNA analysis was still able to individualise and characterise each of the perpetrator's DNA profile and match it to the DNA found on the victim. Our results were similar to those reported by Spohn & Spears (1996), who found no correlation between the case outcome and the number of perpetrators. However, contrary to LaFree (1980), it was found that cases in which the victim was violated by more than a single perpetrator increased the odds of a guilty verdict.

In 64% (n=63) of our cases, the victim was assaulted by an unknown individual/stranger. This high rate of stranger rapes was because adults had to travel early in the morning, while it was still dark or at night and had to use public transport such as trains or wait at bus stops alone. In addition, due to the scarcity of jobs, perpetrators could pretend to offer jobs and thereafter attack and sexually violate the victims. In addition, parents usually went to work for long hours, leaving children unattended. This led to children being violated by both relatives and neighbours.

Contrary to our results, Kaushik et al. (2016) found that most of the victims (86.76%) were sexually violated by an individual they were familiar with and this was supported by Suri & Khan (2013) who reported that in 78% of their cases, the perpetrator was known to the victim. Similar to our study, Sommers & Baskin (2011) found that the relationship the victim had with the perpetrator did not affect the likelihood of a conviction. However, contrary to these results, a recent study conducted by Kebede (2018) found that the odds for conviction were six times more likely if the victim did not know the perpetrator.

In comparison to other studies, Hester & Lilley (2016) reported that the victim-perpetrator relationship was a crucial element in determining the rate of attrition, which is loosely defined as the "loss" of the case through the progression of a criminal investigation. Furthermore, the study found that cases in which the victim was acquainted with the perpetrator led to few convictions, while Gregory & Lees (1996) reported that acquaintance rapes were most likely not seen as crimes to begin with; therefore intimate partner rape cases did not proceed within the criminal justice system.

4.5.4 Influence of alcohol/drugs

The results from this study indicate that alcohol or drug testing is not routinely performed. There were no toxicological reports despite the post-mortem report indicating that blood was obtained for toxicological analyses, as is routinely conducted. Toxicological testing is important because the involvement of alcohol or drugs before a rape incident may affect the victims ability to give consent (*Criminal Law (Sexual Offences and Related Matters) Amendment Act, No. 32 of 2007, 2007*), and is occasionally seen as a mitigating factor in rape investigations as the victim's credibility is often questioned (Nielsen et al., 2018).

Although we found no significant association between the use of drugs/alcohol and the likelihood of conviction, Hansen et al. (2019) reported that the likelihood of a rape case continuing for prosecution significantly decreased if the victim was intoxicated, this was also supported by Hohl and Stanko (2015). Briody (2018) found that a jury was 30 times more likely to acquit if the victim was under the influence of alcohol or drugs. A weakness in this argument, however, is that intoxicated individuals are vulnerable and may generally lack the capacity to consent to sexual intercourse. Therefore, it remains questionable why rape victims found to be under the influence of alcohol or drugs are subjected to such scrutiny and perceived as less credible.

4.5.5 Use of weapons

In this study, the use of a weapon by the perpetrator was not significantly associated with the likelihood of a conviction and this is in accordance with previous studies (Du Mont & Myhr, 2000; Lundrigan et al., 2019). On the contrary, Gray-Eurom et al. (2002) found that the probability of the perpetrator being convicted was higher when a weapon was used to coerce the victim.

It is important to note that different types of methods could be used by the perpetrator to coerce the victim as observed in the case files reviewed for this study. These included physical force, psychological intimidation, abuse of power, threats, pretence, blackmail and abuse of power. Therefore, the approach used by courts to measure the extent of intimidation by the presence of a weapon fails to consider other forms of coercion that should be equally weighted as it is not known how it impacts the victim's life.

4.5.6 Interval from rape incident to reporting at the police station and hospital/clinic

The timely collection of biological evidence is crucial because it ensures that the integrity of the samples is maintained and the loss of DNA evidence is minimised. This is influenced by both the time interval between the rape incident and reporting to the police, having a medical examination, or post-mortem examination. 59% (n=17/29) of the victims reported the assault to the police in the first 24 hours, while 34% (n=10/29) reported within 24-48 hours. These results were similar to the Tasca et al. (2013), who found that three-fourths of the cases studied involved victims who reported their assault to the police immediately after it had occurred.

In RSA, the forensic examination is conducted and the evidence is collected within 72 hours (1-3 days) post-assault (Tiemensma, 2016). Although there were only 40 cases that had available data to calculate the time interval between the rape incident and the

evidence collection, the results show that most (n=33/40; 82.5%) of those victims had a medical examination within the recommended time frame, with 50% of those cases (n=20) having an examination in less than 24 hours. Similar to our study, Jänisch et al. (2010) reported that 92.4% of the medical-forensic examinations were performed within 72 hours post-assault. In contrary, Hassan et al. (2007) found that 75.6% of the victims went for a medical examination more than 72 hours after the assault.

In this study, a SAECK was used in all the victims that presented at the hospital/ clinic within or after 72 hours post-assault. On the contrary, Jewkes et al. (2009) found that 6.3% of adults and 23.8% of children did not have the SAECK used despite them presenting for medical examination within 72 hours. There is a higher probability of obtaining good quality DNA evidence for testing when medical examinations are conducted promptly after the alleged incident. This was further demonstrated in cases where the victim was found deceased and a post-mortem was conducted in less 72 hours after the rape incident. In a total of n=13 cases (rape homicide) where a SAECK was taken between 1-12 hours post-assault and good quality DNA evidence was obtained , the results showed a match and the suspect was identified.

Medical examination findings

4.5.7 Presence or absence of Injuries

Although the severity of the injuries was not measured using a predefined scale, there was a difference in the type and severity of injuries suffered by children, teenagers and adults in this study. Most of the victims under the age of 6 years sustained more severe genital injuries.

Medical findings of injury assist in corroborating the victim's account of the event and thus improve the victim's credibility. Furthermore, the documentation of injuries can have a significant role in the prosecution and conviction of rape trials (Hagemann et al., 2011). It is essential to note that not all rape cases present with injuries. Therefore, the absence of injuries that does not exclude the possibility that the victim was raped and/or that there

was forced penetration. Furthermore, the converse is also true; the victim's injuries do not ascertain that a rape incident had occurred (Jina et al., 2015). Unfortunately, there are still inconsistencies in the methods used by medical examiners in RSA in the interpretation of what constitutes genital trauma and the significance thereof; the absence of injuries is not well understood (Jina et al., 2015). Although the presence of injuries was not associated with conviction in this study, Jewkes et al. (2009) and Kaushik et al. (2016) reported that the presence of injuries was positively associated with conviction and Sommers & Baskin (2011) found that injury was the strongest predictor of case outcome. Gray-Eurom et al. (2002) highlighted that prosecutions were difficult when there was a lack of anogenital injuries.

Other factors of interest used against the defendant/perpetrator

4.5.8 Previous conviction and victim impact statements

Other important factors that both prosecutors and judges used against the defendant is whether the defendant had a prior conviction and a victim impact statement (VIS), which is a statement provided by the victim or his/her family that explains to the court how the rape incident has affected the victim or family's life, including the relationships with loved ones and the community. In this study, the prosecutor used the VIS to strengthen the case against the accused. It showed that rape is a serious societal issue because not only does it cause physical harm but results in psychological, emotional and social consequences. This has been observed to influence the judge's verdict. The majority of the perpetrators (78%) in this study were first-time offenders, as similarly observed by Cupido (2014), who found that 70.7% of the accused were first time offenders. None of these factors were found to be predictive of conviction. On the contrary, Nielsen et al. (2018) found that suspects who had a prior sexual assault charge were more likely to be convicted of a rape offence.

4.6 Use of DNA evidence

4.6.1 Cases where DNA evidence was useful

i) *Serial rapists*

Serial rapists are defined as individuals who commit multiple rapes with different victims over a period of time. There was a total of 20 rape cases in this study where the perpetrators raped two or more victims over a period of time. The timely and proper collection and analysis of DNA evidence resulted in police being able to compare the obtained DNA profiles between cases and thus reduce the number of suspects. Although in some cases, it took longer than expected to find the perpetrator, once found, they were easily identified by the victims from the police line-up/ identification parade. This ultimately led to the accused being arrested and charged.

Furthermore, the perpetrators were strangers who denied sexual contact and their involvement in the crime. However, the high proportion of rape cases in this study involved stranger rapes and therefore DNA had value and the potential to contribute. The power of DNA evidence had its most significant impact on stranger offenders. This further proves the importance of having a DNA database as the serial nature of these crimes could help police connect rape incidents that are committed by the same individual.

ii) *Cases that involved victims that were children*

While most of the perpetrators involved in child rapes were known (neighbour or relative), the children could not identify the perpetrator. Furthermore, some children were unable to properly articulate or recall what had happened and some were too afraid to speak. Therefore, the use of a SAECK was necessary because the DNA was used to link the perpetrator to the children and confirm sexual contact.

iii) Rape homicide

This study found that 27% (n=26/98) victims were found deceased and crime scene photographs, including post-mortem images, indicated the possibility of them being raped. Rape homicide is not a rare event in RSA. Although DNA could not be obtained from all the cases, it still played a significant role in the identification of the perpetrator in half of the cases (n=13).

4.6.2 Cases where DNA evidence was least useful

i) Intimate relationship between the victim and perpetrator

DNA reports were sometimes of little use in cases where the suspect is known as the victim's partner and did not deny sexual contact. In these cases, the use of DNA evidence alone was not enough to convict and resulted in investigators and prosecutors relying on other types of evidence such as witness statements, the victim's affidavit and injuries in order to corroborate the victim's account of events.

4.7 Evidence collection

Evidence collection was based on the details and history of each rape incident. The availability of good quality DNA evidence was influenced by several factors, including the actions that occurred at the time of rape incident, the victim's actions after the rape incident and whether the perpetrator ejaculated or not. These factors were in accordance with what Jina et al. (2011) found.

Results from this study showed that there were cases where the victim had already bathed, urinated or changed clothes by the time they arrived at the hospital for medical examination and other victims arrived at the hospital more than 72 hours after the rape had occurred. There are varied reasons why victims choose to report the crime of rape late. For example, the victims might not know the different agencies they can report to;

how to react or respond after being raped, resulting in the loss of crucial forensic DNA evidence.

Furthermore, cases where the victim was found deceased, the body was sometimes found decomposed, skeletonized and in one case, it was burnt. Therefore, DNA could not be recovered. The majority of the samples collected included genital swabs. Jina et al., (2011)'s findings suggest that there is always a better chance of recovering DNA evidence when genital specimens are obtained; however, the type of samples tested at the laboratory and determining which samples were better in the recovery of DNA was beyond the scope of this study.

4.8 Limitations

There were a few limitations in this study. Although this study was well designed, as a retrospective review of court dockets and police files, data collected were incomplete due to poor record keeping. In addition, time constraints limited the researchers' ability to follow-up on missing data, such as the unavailability of DNA reports. Our data were obtained from cases prosecuted at the Western Cape High Court. Therefore, the findings generated are not representative of other areas and cannot be generalised.

The method used to analyse the results also had limitations statistically. The sample size (N=98) was too small. The logistic regression analysis was not adjusted for potential confounding factors and aspects as to why DNA was not analysed or included were not clearly defined.

The weighting of the evidence by the judge was also not considered. There could have been additional factors influencing convictions, notably how reliable the witnesses were and possible bias from judges. There could also be an inherent bias from sampling in that we studied High Court cases and these are usually deemed "high profile" and thus, one would expect much thorough investigations by the police guided by more experienced prosecutors. Some of the cases in this study included rape homicide . Therefore, the court's decision to convict the rape charge could have been influenced by the murder

charge, in that the murder charge may have negated the rape charge. All these factors were not considered during the predictive analysis. Therefore, the accuracy of the models or analysis cannot be measured.

4.9 Conclusion and Potential Implications

Our study resulted in new knowledge on the use of SAECKs and its predictive capacity in convictions. The findings from this study are important as they highlight that health care practitioners are adequately trained and equipped to provide quality health care responses and work effectively with police officers. There exists established guidelines, policies and training for forensic medical examiners and this has led to the proper management of rape victims which results in better quality DNA evidence obtained. In addition, we have shown that the probative value of DNA evidence depends on the circumstances of each case. However, even in cases where the perpetrator does not deny sexual contact (acquaintance, friends and partner rapes), the use of DNA evidence is not warranted insignificant.

Although our logistic regression models in this study show that the use of SAECK decreases the odds of conviction; in reality, this is not true. There was a higher conviction in cases where a SAECK was used in comparison to when it was not. This is not to assume that DNA alone results in a conviction. DNA evidence is highly incriminating and can individualise its source with high probability. However, it is essential to note that its use alone is not sufficient to prove beyond reasonable that the defendant is guilty. There are various factors relating to the victim, perpetrator and assault characteristics that influence the judge's verdict. This study raised questions relating to how those factors are measured or weighed and ultimately become predictive of case outcome. Although we found no positive associations between the variables investigated (except the location of the incident) and court outcome, future research, including larger sample size, should investigate these variables in order to obtain true significance, especially concerning the use of SAECKs and its impact on the court outcome.

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Chapter 5: Appendices

Appendix 1: J88- six-page form that includes comprehensive questionnaire of the victim's account of events, sexual history and the description of all physical (including genital) injuries sustained

G.P.S. 01/02

(81/805259)



Police Station:	CAS/ No / /
Name of Investigating officer:	Contact No:.....

REPORT ON A MEDICO-LEGAL EXAMINATION BY A HEALTH CARE PRACTITIONER

To be diligently completed electronically or in legible handwriting and signed on every page

PART I

CERTIFICATE IN TERMS OF SECTIONS 212(4), 212(8) AND 213(3) OF ACT 51 OF 1977 (AS AMENDED)

I,

(Full names and Surname)

hereby certify as follows:

- I am in the service of the *State/in the service of or attached to a university in the Republic in my capacity as

*registered medical practitioner/nurse/other *(please specify)*

- On the day of *(month)* *(year)* at H..... *(time of examination)*

- and at *(state place where examination took place)*, I examined the person indicated in Part II, Paragraph B.1 (page 2 of 6) of this **J88** form.

- I recorded my findings and observations on pages 2 to 6 of this **J88** form and any additional pages indicated. The facts recorded on pages 2 to 6 of this **J88** form, including any additional pages used where indicated, were established by means of an examination requiring skill in anatomy and pathology.

- In the performance of my official duties:

* a) I received and collected from *(name of person/institute/ State department or body)* clothing; object/s; specimens and/or tissue described in this **J88** form.

* b) I delivered or dispatched to *(name of person/institute/ State department or body)* the clothing, object/s, specimens and/or tissue specified in this **J88** form.

- * I packed and marked the clothing; object/s; specimens and/or tissue in the manner described in this **J88** form.

The contents of this **J88** form is true to the best of my knowledge and belief and I am making this statement knowing that, if it were tendered in evidence, I would be liable to prosecution if I willfully stated in it anything I knew to be false or which I do not believe to be true.

DATED AT *(place)* ON THE DAY OF *(month)*..... *(year)*
AT H *(time)*.

.....
SIGNATURE OF	PRINT NAME AND SURNAME	STAMP OF
HEALTH CARE PRACTITIONER		HEALTH CARE PRACTITIONER

(NB: Section 212(4) and 212(8) provide for a certificate issued in terms of either of these sections to constitute, upon its production at criminal proceedings, prima facie proof of the facts alleged.)

*** Delete which is/are not applicable**

D. HISTORY OF RELEVANCE TO A SEXUAL OFFENCE (delete if not applicable)

1. Since the alleged offence took place has the patient:

Wiped Yes No Bathed/washed Yes No

Urinated Yes No Defecated Yes No

Showered Yes No Swam Yes No

Been exposed to rain Yes No

2. Menstruating

At time of alleged sexual offence: Since the alleged sexual offence: Yes No

Currently menstruating: Yes No

3. During alleged sexual offence was: Condom used: Yes No

Lubricant used: Yes No

4. Currently pregnant: Yes No

If yes, indicate Duration: ___ weeks

5. Ever had vaginal delivery: Yes No

If yes, indicate Number: ___

E. GENERAL EXAMINATION

1. Physical Appearance

a. Height _____ cm b. Weight _____ kg

c. General body build: *Frail /Normal /Muscular /Obese /Other: _____ Percentiles (children only): _____

2. Clothing

a. Left clothes at the scene: Yes No (If yes, move to section E 3)

b. Changed clothes: Yes No

If clothing is available:

c. Torn/ripped/damaged: Yes No Specify item of clothing: _____

Describe:

d. Stained: Yes No Specify item of clothing: _____

Possibly blood: Yes No Swabbed: Yes No

Describe where on clothing:

Possibly semen Yes No Swabbed: Yes No

Describe where on clothing:

Other: Yes No Swabbed: Yes No

Nature of specimen: _____

Describe where on clothing:

e. Clothing collected for Forensic analysis Yes No } **Record sample seal number in Section H**

If yes, list the items:

3. Clinical evidence of drugs / alcohol at time of examination (e.g. Nystagmus, ataxia, slurred speech, dilated pupils):

Intoxicated / drugged Yes No

Blood samples taken Yes No

Alcohol evidence collection kit completed Yes No

Urine samples taken Yes No

} **Record sample seal number in Section H**

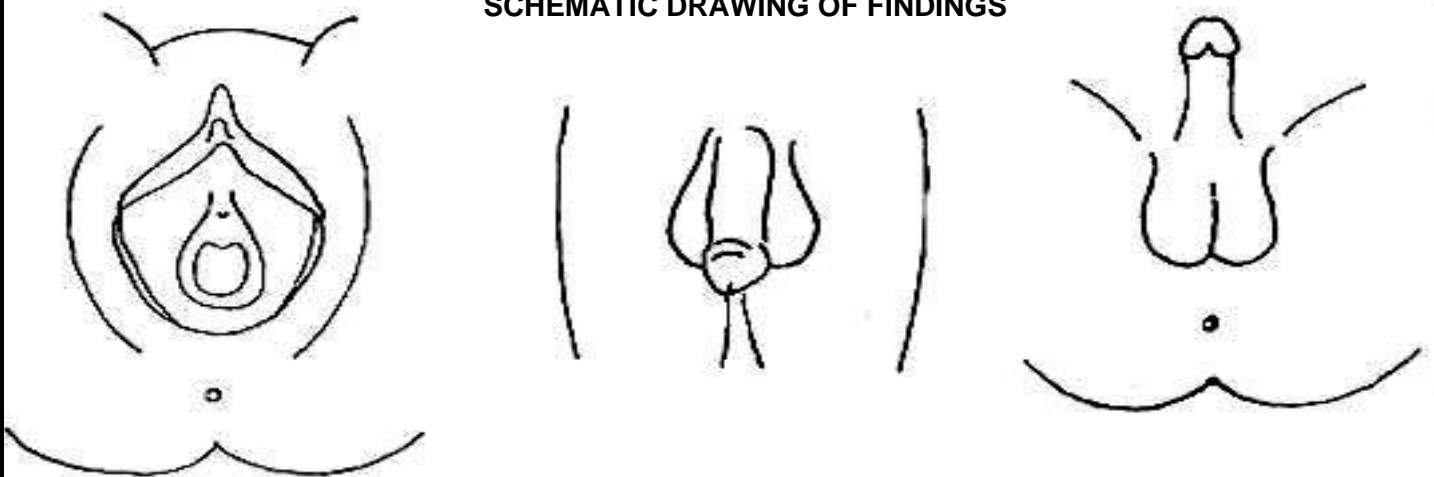
* **Delete which is/are not applicable**
Mark appropriate block

Signature of health care practitioner

G.4 GYNAECOLOGICAL EXAMINATION (delete if not applicable)

1. Breast development (children) Tanner stage 1-5: <input type="text"/>	2. Pubic hair (children) Tanner Stage 1-5: <input type="text"/>
3. Mons Pubis	4. Clitoris
5. Frenulum of clitoris	6. Urethral orifice
7. Labia Majora	8. Labia Minora
9. Posterior fourchette/Commissure	10. Vestibule Fossa navicularis Paraurethral area
11. Hymen Configuration: Posterior rim: Margin or edge of hymen:	
12. Vagina	13. Discharge (describe)
14. Cervix	15. Other injuries noted:

SCHEMATIC DRAWING OF FINDINGS



H. SPECIMENS COLLECTED FOR INVESTIGATION (delete if not applicable)

1. Sexual assault evidence collection kit seal no./ sticker	2. Alcohol collection kit seal no./ sticker
3. Clothing kit seal no./ sticker	4. Urine and/or other samples (specify & provide seal no.)

I. TECHNOLOGY USED (delete if not applicable)

Photographs taken <input type="checkbox"/> Yes <input type="checkbox"/> No	Colposcope used <input type="checkbox"/> Yes <input type="checkbox"/> No
Name of photographer:	Toluidine Blue used <input type="checkbox"/> Yes <input type="checkbox"/> No
	Other (specify):

J. ADDITIONAL PAGES USED AND ATTACHED

Number of pages added:

K. CONCLUSIONS (take account of history and all findings, both positive and negative)

Motivate reasons for conclusions made:

.....

.....

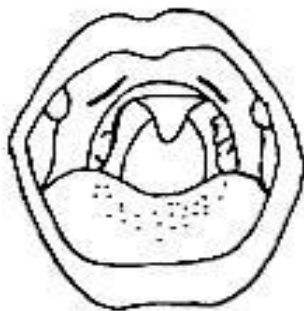
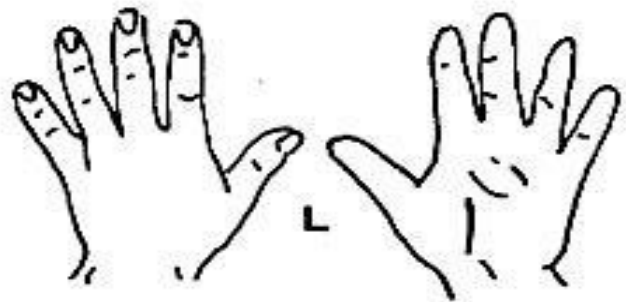
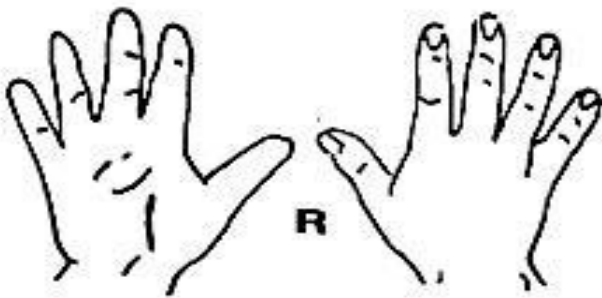
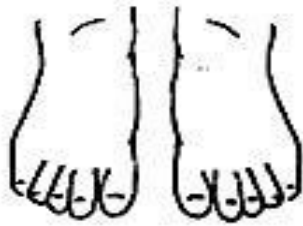
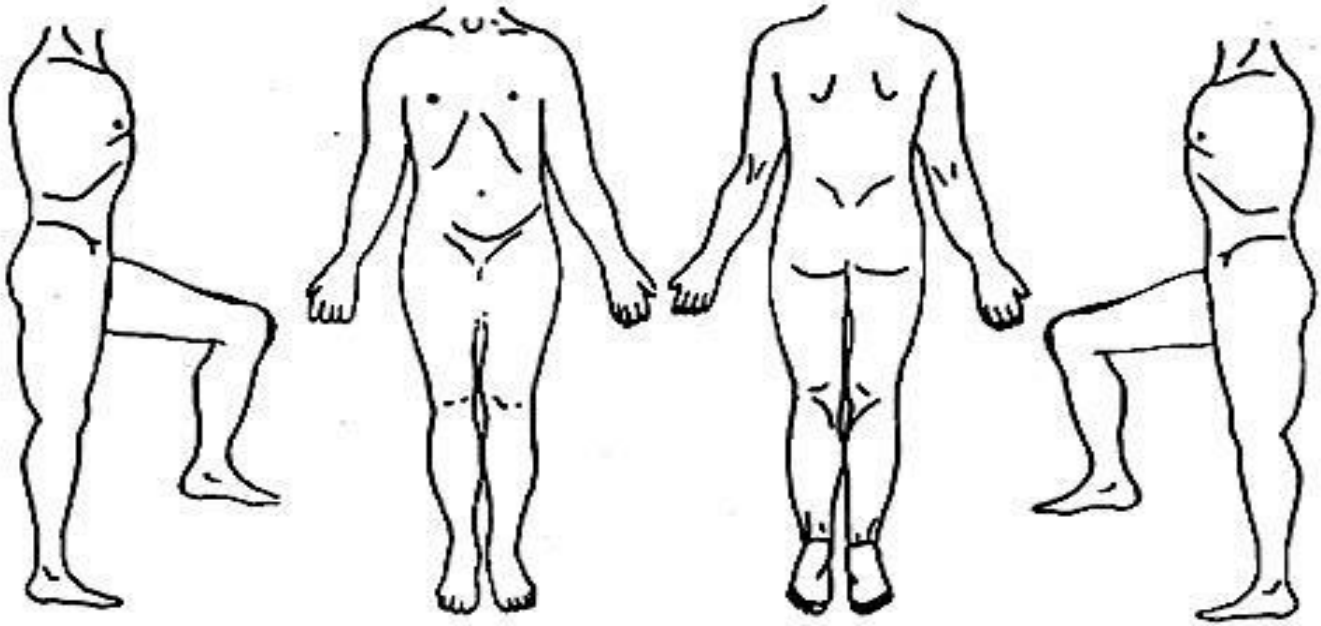
.....

L. TRANSFER DETAILS

J88 form handed to:

Name: Rank:
Signature: Contact No.:

Signature of health care practitioner



Signature of health care practitioner

Appendix 2: Variable table and coding for binary logistic regression analysis

Age	(years)
Sex	Female=0 Male=1
Victim-accused relationship*	Stranger=0 Known=1
Location of incidence	Indoors=0 Outdoors=1
Number of perpetrators	1=1 2=2
Influence of illicit substances prior to offence	Yes=0 No/not indicated=1
Presence of injuries	Yes=0 No=1
Victim's activity after the rape incident	Bathed/urinated/change clothes=0 Nothing/not indicated=1
SAECK used	Yes=0 No=1
DNA report generated from SAECK analysis	Yes=0 No=1
Use of weapons	Yes=0 No=1
Victim impact statement	Yes=0 No=1
Perpetrator has previous conviction	Yes=0 No=1
Court outcome	Guilty=0 Acquitted=1

**The relationship between the victim and the accused was defined as strangers vs. non-strangers, the latter containing all forms of relationship where the victim knew the accused prior to the incidence, including neighbours, acquaintances, partners'/ ex partners, friends and relatives.*

Appendix 3: Data available for SAECK used (n=60) and SAECK not used (n=15), N=75

Variable	Number of cases (N=75)
Sex	
Female	72 (96%)
Male	3 (4%)
Age	73 (97%) [mean \pm sd 20.49 \pm 15.6]
Missing	2 (3%)
Victim-accused relationship	
Stranger	43 (57%)
Known	32 (43%)
Location of incidence	
Indoor	31 (42%)
Outdoor	41 (55%)
Missing	3 (4%)
Number of perpetrators	
1	73 (97%)
2	2 (3%)
Self-reported influence of alcohol and/ drugs	
Yes	19 (25%)
No	56 (75%)
Presence of Injuries	
Yes	47 (63%)
No	22 (29%)
Missing	6 (8%)
Victim activity after the rape incident	
Bathed/urinated/changed clothes	23 (31%)
Nothing (went straight for medical examination)	27 (36%)
Missing (not indicated)	25 (33%)
DNA report generated	
Yes	46 (61%)
No	14 (19%)
Not applicable (SAECK not used)	15 (20%)
Previous conviction	
Yes	18 (24%)
No	48 (64%)
Not indicated/missing	9 (12%)

Use of weapon	
Yes	34 (45%)
No	40 (54%)
Not indicated	1 (1%)

Victim impact statement	
Yes	17 (23%)
No	58 (77%)

Appendix 4: Western Cape map and Cape Town map indicating all the areas where the rape incidents took place



Figure a: Western Cape map

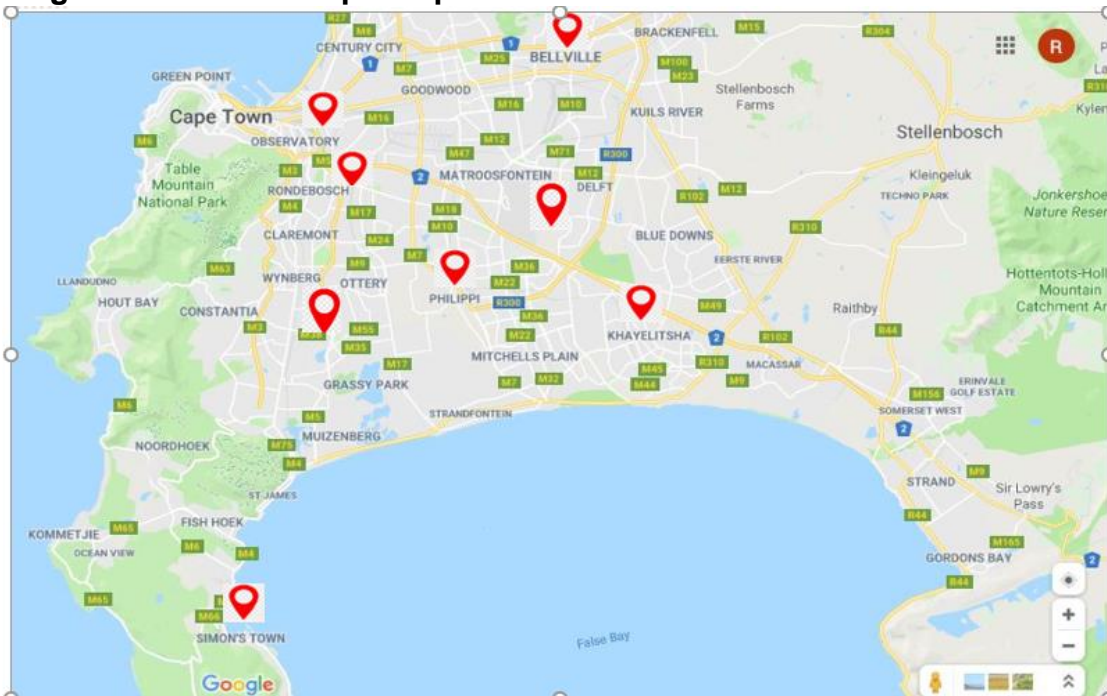


Figure b: Cape Town map

Appendix 5: Logistic Regression models (back wise method)

Model 1

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Age of victim	.026	.040	.421	1	.517	1.026	.949	1.109
Sex of victim(1)	15.814	40192.992	.000	1	1.000	7374846.2	.000	.
Victim-accused relationship(1)	-2.790	1.844	2.289	1	.130	.061	.002	2.280
Location of incidence(1)	1.565	1.269	1.521	1	.217	4.784	.398	57.562
Influence of illicit substances(1)	-2.372	1.629	2.120	1	.145	.093	.004	2.272
Presence (yes) or absence(no) of injuries (body/genita	-.765	1.322	.335	1	.563	.465	.035	6.212
Victim's Activity after the rape incident(1)	.809	1.266	.409	1	.522	2.246	.188	26.837
SAECK used(1)	-1.891	1.825	1.074	1	.300	.151	.004	5.398
D report generated from alysis of SAECK(1)	-.322	1.163	.077	1	.782	.725	.074	7.079
Use of weapons(1)	1.052	1.375	.585	1	.444	2.864	.193	42.413
Victim Impact Statement(1)	-.385	1.612	.057	1	.811	.680	.029	16.040
Constant	-16.040	40192.992	.000	1	1.000	.000		

Model 2

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Age of victim	.026	.040	.421	1	.517	1.026	.949	1.109
Sex of victim(1)	15.814	40192.992	.000	1	1.000	7374846.2	.000	.
Victim-accused relationship(1)	-2.790	1.844	2.289	1	.130	.061	.002	2.280
Location of incidence(1)	1.565	1.269	1.521	1	.217	4.784	.398	57.562
Influence of illicit substances(1)	-2.372	1.629	2.120	1	.145	.093	.004	2.272
Presence (yes) or absence(no) of injuries (body/genita	-.765	1.322	.335	1	.563	.465	.035	6.212
Victim's Activity after the rape incident(1)	.809	1.266	.409	1	.522	2.246	.188	26.837
SAECK used(1)	-1.891	1.825	1.074	1	.300	.151	.004	5.398
D report generated from alysis of SAECK(1)	-.322	1.163	.077	1	.782	.725	.074	7.079
Use of weapons(1)	1.052	1.375	.585	1	.444	2.864	.193	42.413
Victim Impact Statement(1)	-.385	1.612	.057	1	.811	.680	.029	16.040
Constant	-16.040	40192.992	.000	1	1.000	.000		

Model 3

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Sex of victim(1)	16.547	40192.946	.000	1	1.000	15354755.	.000	.
Victim-accused relationship(1)	-2.153	1.454	2.194	1	.139	.116	.007	2.006
Location of incidence(1)	1.646	1.284	1.642	1	.200	5.184	.418	64.254
Influence of illicit substances(1)	-2.287	1.594	2.060	1	.151	.102	.004	2.307
Presence (yes) or absence(no) of injuries (body/genita	-.601	1.262	.227	1	.634	.548	.046	6.508
Victim's Activity after the rape incident(1)	.933	1.215	.589	1	.443	2.542	.235	27.526
SAECK used(1)	-1.460	1.685	.750	1	.386	.232	.009	6.316
D report generated from alysis of SAECK(1)	-.441	1.168	.142	1	.706	.644	.065	6.347
Use of weapons(1)	.876	1.285	.465	1	.495	2.402	.194	29.796
Victim Impact Statement(1)	-.384	1.537	.063	1	.803	.681	.033	13.853
Constant	-16.783	40192.946	.000	1	1.000	.000		

Model 4

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Victim-accused relationship(1)	-2.174	1.443	2.269		1 .132	.114	.007	1.925
Location of incidence(1)	1.638	1.282	1.632		1 .201	5.143	.417	63.430
Influence of illicit substances(1)	-2.311	1.584	2.128		1 .145	.099	.004	2.211
Presence (yes) or absence(no) of injuries (body/genit	-.611	1.260	.235		1 .628	.543	.046	6.420
Victim's Activity after the rape incident(1)	.937	1.216	.593		1 .441	2.552	.235	27.678
SAECK used(1)	-1.460	1.688	.748		1 .387	.232	.008	6.352
D report generated from alysis of SAECK(1)	-.448	1.168	.147		1 .702	.639	.065	6.309
Use of weapons(1)	.886	1.284	.476		1 .490	2.425	.196	30.059
Victim Impact Statement(1)	-.371	1.534	.059		1 .809	.690	.034	13.948
Constant	-.223	2.051	.012		1 .913	.800		

Model 5

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Victim-accused relationship(1)	-2.244	1.416	2.513		1 .113	.106	.007	1.699
Location of incidence(1)	1.675	1.277	1.720		1 .190	5.337	.437	65.212
Influence of illicit substances(1)	-2.242	1.540	2.121		1 .145	.106	.005	2.172
Presence (yes) or absence(no) of injuries (body/genit	-.680	1.232	.304		1 .581	.507	.045	5.667
Victim's Activity after the rape incident(1)	.896	1.226	.534		1 .465	2.450	.222	27.091
SAECK used(1)	-1.592	1.636	.947		1 .331	.204	.008	5.025
Use of weapons(1)	.808	1.264	.409		1 .523	2.243	.188	26.688
Victim Impact Statement(1)	-.508	1.462	.121		1 .728	.602	.034	10.563
Constant	-.218	2.060	.011		1 .916	.804		

Model 6

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Victim-accused relationship(1)	-2.364	1.363	3.012		1 .083	.094	.007	1.358
Location of incidence(1)	1.669	1.264	1.745		1 .187	5.309	.446	63.195
Influence of illicit substances(1)	-2.381	1.511	2.482		1 .115	.093	.005	1.788
Presence (yes) or absence(no) of injuries (body/genit	-.712	1.214	.345		1 .557	.490	.045	5.293
Victim's Activity after the rape incident(1)	.758	1.133	.447		1 .504	2.134	.231	19.674
SAECK used(1)	-1.756	1.549	1.285		1 .257	.173	.008	3.595
Use of weapons(1)	.888	1.249	.506		1 .477	2.431	.210	28.103
Constant	-.097	1.967	.002		1 .961	.908		

Model 7

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Victim-accused relationship(1)	-2.184	1.296	2.840		1 .092	.113	.009	1.428
Location of incidence(1)	1.674	1.265	1.752		1 .186	5.335	.447	63.656
Influence of illicit substances(1)	-2.208	1.461	2.284		1 .131	.110	.006	1.926
Victim's Activity after the rape incident(1)	.653	1.102	.351		1 .553	1.922	.222	16.670
SAECK used(1)	-2.112	1.453	2.112		1 .146	.121	.007	2.089
Use of weapons(1)	.569	1.108	.263		1 .608	1.766	.201	15.503
Constant	-.096	1.961	.002		1 .961	.908		

Model 8

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Victim-accused relationship(1)	-2.141	1.290	2.754		1 .097	.118	.009	1.474
Location of incidence(1)	1.692	1.267	1.785		1 .182	5.432	.454	65.038
Influence of illicit substances(1)	-1.978	1.367	2.092		1 .148	.138	.009	2.018
Victim's Activity after the rape incident(1)	.472	1.043	.205		1 .651	1.604	.208	12.389
SAECK used(1)	-2.009	1.453	1.914		1 .167	.134	.008	2.310
Constant	.125	1.884	.004		1 .947	1.133		

Model 9

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Victim-accused relationship(1)	-.592	.880	.454		1 .501	.553	.099	3.100
Location of incidence(1)	2.792	1.192	5.488		1 .019	16.317	1.578	168.741
Number of perpetrators(1)	-.321	1.515	.045		1 .832	.725	.037	14.128
Influence of illicit substances(1)	-.586	.823	.506		1 .477	.557	.111	2.793
SAECK used(1)	-1.554	.832	3.486		1 .062	.211	.041	1.080
Constant	-1.426	2.055	.481		1 .488	.240		

Model 10

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Victim-accused relationship(1)	-.560	.862	.422		1 .516	.571	.105	3.094
Location of incidence(1)	2.827	1.180	5.737		1 .017	16.891	1.671	170.724
Influence of illicit substances(1)	-.572	.819	.488		1 .485	.565	.113	2.809
SAECK used(1)	-1.575	.828	3.619		1 .057	.207	.041	1.049
Constant	-1.756	1.341	1.715		1 .190	.173		

Model 11

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Location of incidence(1)	3.109	1.113	7.805		1 .005	22.392	2.529	198.276
Influence of illicit substances(1)	-.609	.821	.550		1 .458	.544	.109	2.718
SAECK used(1)	-1.685	.803	4.400		1 .036	.185	.038	.895
Constant	-2.104	1.215	3.001		1 .083	.122		

Appendix 6: Table showing the number of cases with self-reported alcohol and drug use (either from the victim and/or accused) before the incident and of those the number of cases the victim died

INDIVIDUAL UNDER THE INFLUENCE OF ALCOHOL AND/OR DRUGS DURING RAPE	NUMBER OF CASES (N=23)	CASES WHICH RESULTED IN DEATH OF VICTIM (N=10)
VICTIM AND ACCUSED	10 (44%)	4 (40%)
VICTIM ONLY	4 (17%)	1 (10%)
ACCUSED ONLY	9 (39%)	5 (5-%)

Appendix 7: Table that summarises the individual who was under the influence prior to the offence, the type of drug and the type of weapon used by the accused to coerce or hurt the victim

	Which individual	Type of drug	Type of weapon
1	Victim	Alcohol	knife
2	Accused	Alcohol	knife
3	Victim and accused	Alcohol	sharp object
4	Accused	Alcohol	knobkerrie
5	Accused	Alcohol + dagga	crutch
6	Victim and accused	Alcohol	gun
7	Accused	Alcohol	stick
8	Victim and accused	Alcohol	stone
9	Victim and accused	Tik	knife
10	Accused	Alcohol + drugs*	Knife
11	Victim and accused	Alcohol + drugs*	knife
12	Accused	Alcohol	hammer
13	Victim and accused	Alcohol	rock
14	Victim and accused	Alcohol + Tik	ligature
15	Accused	Tik [^]	knife
16	Accused	Tik	ligature
17	Victim	Alcohol	knife

**Type of drug was not specified*

[^]tik is a highly addictive drug that looks like white or small blue crystals. It is usually injected into the veins but can also be snorted, swallowed, or smoked.