SEXUAL VIOLENCE RESEARCH INITIATIVE

The uses and impacts of medico-legal evidence in sexual assault cases: A global review

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Executive summary

This review was commissioned by the World Health Organization for the Sexual Violence Research Initiative to provide a global overview of the uses and impacts of medico-legal evidence in cases of sexual assault of adolescents and adults. It examines the existing peer-reviewed scholarly and grey literature from industrialized and developing regions. These documents were drawn primarily from a number of English-language sources, derived from searches of electronic databases, the Internet, and web sites of international, intergovernmental organizations, governments, nongovernmental organizations, civil society organizations and research centres, as well as from consultations with knowledgeable academics, policy-makers and practitioners to obtain information on potentially relevant published and unpublished materials.

The review outlines the historical and contemporary medico-legal responses to sexual assault victims, broadly describing the professionals, protocols and procedures involved in the collection and processing of medico-legal evidence. Findings are presented from studies that have evaluated the legal impact of such evidence in sexual assault cases, and factors that may create barriers to its successful use in criminal justice proceedings are discussed. The review concludes with a summary, identifies salient knowledge gaps and offers research recommendations for addressing them.

Context

Sexual assault is a common, widespread and insidious problem that has serious physical, psychological, emotional and social consequences. In most regions, rape myths, which are a product of patriarchal attitudes, have shaped the ways in which women have been treated by health services, police, the judiciary and in law. As a result, victims have frequently chosen not to report their assault or have been filtered out of criminal justice systems, resulting in low charge-laying/filing and conviction rates. In many instances, the collection of medico-legal evidence, often demanded in the law or policy for corroborative purposes, has been inconsistent, severely limited in quality and scope, or not undertaken.

Medico-legal services

Medico-legal services have increasingly been developed worldwide to improve the collection of medico-legal evidence and provide better care to victims. These services document and collect available evidence (e.g., injuries and semen) in order to corroborate accounts of sexual assault for courts of law. The settings, staff and protocols of such services operate on different models and are unevenly developed and implemented across and within regions.

Impact of medico-legal evidence on legal outcomes

Only a few dozen studies have evaluated the relationship between medico-legal evidence and legal outcomes (e.g., charge filing and guilty verdicts). All but two were conducted in industrialized countries such as Australia, Canada, Denmark, Finland, Norway, the United Kingdom and the United States. Attrition of cases was high in these studies, with fewer than half of the sexual assaults

reported to the police having resulted in a charge being laid or filed (15% to 47%) and less than one third ending in conviction (7% to 32%). In just under half (44%) of those that examined the presence of general physical injury, a significant positive association with legal outcome was found. Less than a third of pertinent studies reported that the occurrence of ano-genital trauma (29%) or collection of biological and/or non-biological samples (31%) was related to a positive outcome. No study demonstrated a positive relationship between legal outcome and the detection of sperm or semen specifically, nor the documentation of the emotional state of the victim. Moreover, the authors of some descriptive studies have commented that medico-legal evidence appears to be of minimal importance to the courts and not always necessary for a case to progress. Among cases reported to the police, a substantial proportion of victims did not sustain general physical injuries (10% to 71%) or ano-genital trauma (33% to 91%). The proportion of those for whom there was no documented sperm or semen present was greater (41% to 99%).

Sociocultural conditions of the use of medico-legal evidence

Male dominance and gender inequality can influence the allocation of resources for sexual assault services and, ultimately, the existence, quality and effectiveness of medico-legal evidence. These forces may determine the availability of trained staff, adequate facilities for the collection of evidence and the effective interagency coordination necessary for its processing. They may negatively influence the ways in which medico-legal protocols and technologies are constructed, as well as the practices of the professionals responsible for their use. At the same time, a number of encouraging initiatives have emerged and are being more widely implemented, such as the development of standardized medico-legal guidelines that are accessible and adaptable to specific circumstances with respect to regional resources, policies and procedures, and the training and staffing of specialized forensic nurse examiners. These and other similar efforts show promise for facilitating the improved collection and use of medico-legal evidence.

Conclusions

Globally, there is a striking paucity of information and evaluative studies from which to assess the impact of medico-legal evidence on sexual assault cases. The design limitations of the research conducted to date are such that it is not possible to draw robust conclusions, nor generalize from the findings, particularly to lower- and middle-income countries. To address these gaps and to shed further light on whether and how medico-legal evidence might be used more effectively, research in a number of areas should be pursued. First, further investigation into the impact of medico-legal evidence on the progression of sexual assault cases through criminal justice systems is required, and could be realized through carefully designed and implemented international comparative studies carried out in several low-, middle- and high-income countries. Second, the social and legal conditions that influence the use of medico-legal evidence should be more systematically studied. Attention could be paid to the operations and resources, protocols, and professional practices that are a part of the collection and processing of medico-legal evidence across jurisdictions. Finally, the value and meaning of medical forensic examinations for sexual assault victims, as well as alternative legal measures that could enhance justice for them, should be examined.

SECTION ONE

Introduction

1. Purpose

This review was commissioned by the World Health Organization (WHO) for the Sexual Violence Research Initiative (SVRI). This initiative is supported by the Global Forum for Health Research and was hosted, at the time, by WHO's Department of Gender, Women and Health. As part of the SVRI's objective to promote and disseminate research to prevent and respond to sexual violence, the intention of this review is to provide an international overview of the uses and impacts of medico-legal evidence in cases of sexual assault of adolescents and adults. Specifically, it is intended to describe the purpose of medico-legal evidence, its types and relationship to criminal justice outcomes, as well as how it is generated and used.

2. Organization

The remainder of *Section one* lays out the scope of this review, including the range of sexually violent acts that are of relevance to it and terms used for sexually assaulted people and their aggressors. It also gives details of how the scholarly literature was collected and explains the sourcing of non-scholarly works.

Section two provides a brief overview of the context of sexual assault, introducing the concept of rape myths, which play a key role in perpetuating and shaping the responses to it. This is followed by a profile of the magnitude of the problem, as well as a description of the historical legal and medical responses to sexual assault victims.

Section three outlines the services that have been established to improve the viability of medico-legal evidence. It describes the specific purposes of such evidence, how it is constituted, and the ways in which it may be collected and processed.

Section four systematically examines the research related to the impacts of medico-legal evidence on the progression of sexual assault cases through criminal justice systems. It summarizes the types of evidence found to have been significantly associated with legal outcomes, discusses the methodological limitations of the studies conducted to date and presents examples of promising research in progress.

Section five describes the sociocultural conditions of the use of medico-legal evidence. It outlines the potential role of anti-woman biases and rape-supportive attitudes in the allocation of resources for sexual assault services, the development and implementation of protocols and technologies, and the practices of medico-legal professionals who collect and process evidence (i.e., sexual assault examiners, police, forensic analysts and legal personnel).

Section six summarizes the findings of the review regarding the impacts and uses of medico-legal evidence as they vary across and within regions, highlights salient knowledge gaps and provides recommendations for future research that might help to address them.

3. Scope

This review includes information from industrialized and developing nations. It draws on peer-reviewed scholarly works and non-peer-reviewed and grey literature, incorporating perspectives from criminology, law, medicine, nursing, psychology, public health and sociology. Although not limited to materials written in a particular language, most of those located and used were in English.

Definitions of sexual violence vary from jurisdiction to jurisdiction. While recent years have seen a growing recognition worldwide of the range of acts that may be considered sexual violence (e.g., unwanted sexual advances, sexual harassment, female genital mutilation, forced marriage, abortion and prostitution) (*1*, *2*), this review focuses on those types most relevant to increasing our understanding of the role of medico-legal evidence in legal proceedings. These are referred to generally as rape and sexual assault (which may include rape) and encompass,

> completed or attempted contact between the penis and the vulva or the penis and the anus involving penetration, however slight; ... contact between the mouth and the penis, vulva, or anus; ... penetration of the anal or genital opening of another person by a hand, finger, or other object; ... intentional touching, either directly or through the clothing, of the genitalia, anus, groin, breast, inner thigh, or buttocks (*3*, p.9).

4. Glossary

There is an extensive body of literature that has shown sexual assault to be a gendered problem. While adolescent and adult men can be sexually assaulted and may be more prone than women to under-report their victimizations, research has shown that most sexual assaults are committed against women and most perpetrators are male (*2*, *4–10*). Accordingly, feminine terms are used here to refer to persons who have been sexually assaulted and masculine terms to refer to their aggressors. Also, the term "victim" is used, as this review is focused on the medical, law enforcement and legal sectors. This is not intended to negate terms that have been utilized in other contexts to refer to sexually assaulted women, such as "survivor" (*11*).

The following terms are also employed in the review:

- *acid phosphatase*: an enzyme secreted by the prostate gland that is found in large amounts in seminal fluid;
- *anoscope*: a small lighted optical speculum that is inserted into the anus for examination and photography of the anal canal and lower rectum;
- *colposcope*: a lighted speculum with a special lens that can magnify an area, designed to examine and, in some cases, photograph the tissues within the cervix and vagina, as well as the external genitalia;
- *medscope*: a video colposcope that is smaller than a regular colposcope and has a wider depth of field;
- *no-crimed/unfounded*: an incident that is not recorded as a crime;
- *sexual assault examiner*: a professional (e.g., doctor, police surgeon, forensic examiner, nurse or forensic nurse examiner) who conducts a medical forensic examination;
- *toluidine blue*: a nuclear staining solution used to detect genital and peri-anal injuries;
- *Wood's lamp*: an instrument that shines ultraviolet light from a black light source for purposes of illuminating trace materials (e.g., blood, semen and saliva) on skin by causing visible fluorescence.

5. Method

An extensive investigation was undertaken to locate literature relevant to the uses and impacts of medico-legal evidence in sexual assault cases worldwide. This included searching a number of sources using key words such as *sexual violence*, *sexual assault*, *rape*, *medico-legal evidence*, *forensic evidence* and *legal outcomes*. The sources drawn upon were:

electronic databases Psycinfo, Sociofile, Sociological Abstracts, Social Science Abstracts, Web of Science, Legal Trac, Criminal Justice Abstracts, National Criminal Justice Reference Service Abstracts, CINAHL and Medline, and the Internet, using the search engine Google.

Also searched were the web sites of:

- international, intergovernmental organizations (e.g., Pan American Health Organization, United Nations Development Fund for Women, United Nations International Children's Fund, World Bank and World Health Organization);
- governments (e.g., Australian Crime and Misconduct Commission, Australian Institute of Criminology, Department of Justice Canada, Law Commission of India, United Kingdom Home Office, United States Centers for Disease Control and Prevention and United States Justice Department);
- nongovernmental organizations/civil society organizations (e.g., Amnesty International, Center for Reproductive Rights, Doctors Without Borders, End Violence Against Women International, Fiji Women's Crisis Centre, Global Forum for Health Research, Human Rights in China, Human Rights Watch, International Planned Parenthood Federation, IPAS, Rape Crisis England, Sikh Women, Vera Institute of Justice, Women's Centre for Change Penang, Women's Human Rights NET and Women in Law & Development in Africa);
- research centres (e.g., Centre for Enquiry into Health and Allied Themes (India), Center for Research on Violence Against Women (United States), Child and Woman Abuse Studies Unit (England), Innocenti Research Centre (Italy), International Center for Research on Women (United States), Key Centre for Women's Health in Society (Australia) and Victorian Institute of Forensic Medicine (Australia)).

Knowledgeable academics, policy-makers and service providers were consulted for leads on published and unpublished materials in:

— Australia
— China (Province of Taiwan)
— Costa Rica
— Denmark
— Germany
— India
— Israel
— Mexico
— New Zealand
— Nigeria
— Norway
— Senegal
— South Africa
— Switzerland
— the United Kingdom
— the United States.

Some of these individuals then contacted their colleagues in other parts of their own, as well as in other, countries:

— Austria
— Bolivia
— Brazil
— Egypt
— France
— Jordan
— Mozambique
— Nicaragua
— the Philippines.

Finally, a notice requesting information was posted on two list-serves, the:

- Sexual Violence Research Initiative (twice);
- African Networks for Health Research and Development (Afro-nets).

Relevant literature reviewed included books, journal articles, news articles, research reports, annual reports, discussion papers and monographs. Other works were identified from the references cited in these publications. Where materials were not written or available in English, they were translated (e.g., from Chinese, French, German, Norwegian, Portuguese and Swedish).

SECTION TWO

Context

The context of sexual assault has a bearing not only on its prevalence, but also on the institutional responses to it. This section introduces the concept of rape myths, the magnitude of the problem of sexual assault, and the historical legal and medical responses to victims.

1. Rape myths

Virtually all societies in the industrialized and developing worlds are characterized by male dominance and systemic and individualized practices of gender inequality. The resulting power imbalance sets the conditions for violence against women. In this context, the widespread experiences of, and problematic institutional responses to, sexual assault have been generated and fuelled by a ubiquitous rape discourse. Across cultures, there exist a number of pervasive and remarkably negative beliefs that constitute the historical schema of rape mythology. Overriding this taxonomy of assumptions is the general suspicion of women's claims of rape (*12–14*) and an inclination to "downplay perpetrators' responsibility and criminality while shifting blame towards the victim," based on her behaviour and personal characteristics (*15*, p.788, see also *14*, *16*). Examples of these common prejudicial, stereotypical and false notions about rapes, raped women and rapists (*17*), as captured in a study of 478 Supreme Court decisions on rape in the Philippines, are:

- Rape happens only to young, pretty or desirable women.
- Rape is a crime of lust or passion.
- Men can have sex freely with women deemed to be of loose morals because these women have nothing to lose.
- Rape is committed by maniacs or perverts.
- Rape happens only in poorly-lit or secluded places.
- Sexy clothes incite men to rape.
- When a woman's "chastity" is threatened, she violently resists, attempts to escape or screams for help.
- Women seeking to avenge slights or to extort money often fabricate rape charges (*18*, p.14, see also *19–27*).

It is also widely held that a "real" rape involves a stranger, physical force and physical injury (*11*, *20*, *21*, *23*, *27*, *28*).

When these erroneous notions of rape exist within a culture and are largely unchallenged, they "serve to deny and justify male sexual aggression against women" (*29*, p.133). Depending on the extent to which they are formally and informally embraced within institutions that respond to rape, a woman may find little or no support following victimization. Moreover, by individualizing and pathologizing women and men and trivializing sexual assault, rape myths "can function to obscure the need for social change" (*24*, p.142).

2. Magnitude of the problem

Although underreported, sexual assault is known to be a problem that affects the lives of millions of women worldwide (*6*, *30–43*), regardless of age, race, appearance, marital status, sexual orientation, ability, and socioeconomic and health status (*44*). Women may be sexually assaulted by multiple assailants (*45–50*) or experience gang rape (*27*, *30*, *35*, *51–56*). Many of the perpetrators are men they know, a substantial proportion of whom are their current or previous intimate partners (*39*, *47*, *48*, *50*, *52*, *57–67*). Frequently, these and other perpetrators reoffend (*68–73*). Rape may be used as a weapon of war or genocide (*51*, *54*, *74–80*) and has been documented in refugee camps, prisons and police stations (*74*, *75*, *81–87*).

The negative short- and long-term physical, psychological and social sequelae of sexual assault can be considerable (*88–90*). They may include ano-genital and extra-genital injuries (*6*, *39*, *45*, *48*, *49*, *62*, *64–66*, *91–99*); sexually transmitted infections, including human immunodeficiency virus (HIV), unwanted pregnancy, and unsafe abortion (*6*, *38*, *39*, *77*, *81*, *100–115*); depression, anxiety, phobias, post-traumatic stress disorder, sleep disturbances, and suicidal ideation and attempts; as well as substance abuse problems, eating disorders, and difficulties at work and school (*39*, *52*, *102*, *108*, *114–133*). Sexually assaulted women are more likely to perceive their general health as poorer (*37*, *39*, *134*) and to access medical care (*131*, *133*, *135*). Their social well-being can be affected as some families, friends and intimate partners may experience significant stress post-assault (*30*, *136–138*). They may be rejected by those close to them, ostracized by their communities (*52*, *110*, *139–141*, *142* cited in *2*) and, in extreme cases, murdered by the perpetrator (*143*, *144* cited in *100*) or by others (*2*, *145–147*).

3. Historical responses to victims

Despite its pervasiveness and the wide-ranging and often devastating impacts of sexual assault on victims across the world, the responses of criminal justice systems have been problematic. In industrialized countries, sexually assaulted women's claims of victimization were often met with disbelief and disregarded by police and prosecutors, resulting in extensive practices of cases being no-crimed/unfounded and charges being not laid/filed or withdrawn (*148–159*). Not surprisingly, conviction rates for sexual assault were low (*148*, *149*, *151*, *153*, *154*, *160–164*). Moreover, perceptions of being treated poorly within these settings led many victims not to report their assault or to screen themselves out of law enforcement and legal proceedings at the early stages (*149*, *151*, *153*, *155*, *165–172*). Where cases did move forward, the collection of medico-legal evidence, often demanded in the law or policy for corroborative purposes, was frequently inconsistent, severely limited in quality and scope, or not undertaken (*94*, *173–175*). Specially trained sexual assault examiners were seldom available (*175–180*) and victim waiting-times for examinations could be detrimentally long (*148*, *175*, *177*, *179*, *181*), resulting in the loss or degradation of evidence (*178*, *182*). At times, those who did conduct examinations were described by victims as being insensitive and unsympathetic (*148*, *175*, *176*, *179*, *183*, *184* cited in *176*). Police officers were sometimes negligent in handling medico-legal evidence (*148*, *185*) and, for those cases that did reach the courts, the findings presented and testified to were sometimes misinterpreted and misused (*186*).

SECTION THREE

Medico-legal services

As a result of the high rates of attrition in the criminal justice processing of cases and the absence or poor quality of assembled medico-legal evidence, in many parts of the industrialized world and increasingly throughout developing regions, services have been established to improve medico-legal responses to sexual assault (see Box 3.1). This section summarizes how medico-legal evidence is currently used worldwide. It begins with a description of its purpose and definition and then outlines the types of settings, staff, and protocols and procedures involved in its collection and processing, as these vary and are unevenly developed and implemented across and within regions.

▼ BOX 3.1

Collection and processing of medico-legal evidence in Manila, the Philippines (*217*)

The Philippine's National Bureau of Investigation (NBI) is a government agency that investigates crimes such as sexual assault. Its staff includes investigators, doctors, chemists, fingerprint technicians, photographers, stenographers and clerks. When a woman is sexually assaulted in Manila, she may go directly to NBI headquarters or be referred by another agency. Once an initial report is given to the Complaints and Recording Division, she is generally sent to Investigative Services, Violence against Women and Children Division, where her statement is taken, as well as statements from any witnesses to the event. Technical Services may also see her. Here, within the Medico-legal Division, she may undergo a medical forensic examination by a specially trained doctor. Biological samples are then collected, injuries documented and a neuropsychiatric report prepared. Irrespective of whether any evidence is gathered, her injuries will be treated and, if she requires any further, more specialized medical treatment, a referral to a hospital will be made. Once collected, the medico-legal evidence is forwarded to the Forensic Chemistry Division of Technical Services where, for instance, tests for drugs and alcohol can be run and the presence of bloodstains, semen and seminal stains, can be determined. The information gathered by both services can then be forwarded to the Department of Justice. Finally, the woman is referred to the Focal Point for Gender Concern, where a case-study is completed by a social worker and referrals to other services that may be needed, such as shelters and counselling, are coordinated.

1. Purpose of medico-legal evidence

Medico-legal evidence is collected from a victim's body in order to corroborate her account of a sexual assault for a court of law (*180*, *187*). In any legal action pursued in relation to her case, this evidence is typically used to aid the investigation and prosecution of the accused (*28*, *182*, *188*). In this regard, "[t]he objective of forensic evidence is to prove or exclude a physical connection between individuals and objects or places" (*28*, p.57, see also *189*). More specifically, the medico-legal evidence taken from a sexually assaulted woman may be used in determining the occurrence of recent sexual activity (*179*, *180*, *182*, *187*, *190–194*), identifying the assailant (*19*, *146*, *179*, *180*, *182*, *187*, *190–193*, *195*, *196*), establishing the use of force (*146*, *179*, *180*, *182*, *187*, *191*, *192*, *197*) or resistance (*193*, *197*, *198*), and indicating an inability to consent due to the influence of alcohol and drugs or an otherwise diminished mental capacity (*146*, *182*, *187*, *193*) (see Table 3.1).

2. Definition of medico-legal evidence

Medico-legal evidence refers to documented extra- and ano-genital injuries (*197*, *199–204*) and emotional state (*19*, *182*, *186*, *193*, *202*, *205*), as well as to those "samples and specimens that are taken [from the victim's body or clothing] solely for legal purposes" (*187*, p.347). Such evidence includes saliva, seminal fluid (*180*, *182*, *186*, *187*, *192*, *197*, *202*), head hair, pubic hair (*180*, *182*, *187*, *192*, *202*), blood, urine (*174*, *180*, *182*, *187*, *192*, *200*, *202*), fibre, debris and soil (*28*, *180*, *182*, *187*, *199*) (see Table 3.1).

3. Collection of medico-legal evidence

In some countries (e.g., Canada and the United States), a sexual assault victim seeking legal recourse is not obliged to submit to a medical forensic examination (*182*, *190*, *202*). In others (e.g., Bangladesh, Belarus, the Russian Federation and the Ukraine), undergoing an examination is mandatory (*197*, *206*). In Cameroon, although "expert medico-legal opinion [is] not mentioned in penal law … [i]t is … recommended that a medical certificate be produced" (*198*, p.33).

TABLE 3.1

Uses of medico-legal evidence from sexual assault victims[a]

TYPE	COLLECTION	PURPOSE
Hair	Head and pubic hair combed or cut to examine for assailant's semen, saliva and hair, and fibres and debris (*19*, *182*, *193*, *199–201*, *204*, *205*, *289*, *300*)	May identify assailant (*187*, *191*, *193*, *205*, *300*). May link victim to crime scene (*28*, *182*). May link assailant to victim (*182*, *268*, *300*)
Blood	Blood drawn for drug (*28*) and alcohol analysis (*19*, *187*, *193*, *200–202*, *205*, *214*, *245*)	May indicate inability to consent (*146*, *182*, *187*, *193*, *205*)
Urine	Urine taken for drug (28) and alcohol analysis (*19*, *187*, *194*, *200*, *202*, *205*, *214*, *245*)	May indicate inability to consent (*146*, *182*, *187*)
Semen and saliva	Skin swabbed for assailant's semen and saliva (*19*, *28*, *182*, *193*, *199–201*, *204*) Mouth, vagina and anus swabbed for assailant's semen (*28*, *182*, *193*, *199–201*, *204*, *205*, *289*, *300*)	May identify assailant (*146*, *179*, *182*, *187*, *190*, *191*, *193*, *205*, *294*, *300*, *301*). May indicate recent sexual contact (*179*, *180*, *182*, *187*, *190*, *191*, *193*, *205*, *300*). May indicate penetration (*190*, *193*, *216*, *300*)
Extra-genital injury	Marks documented on the body such as bruises, lacerations and bite marks (*193*, *201–205*, *245*); photographs may be taken (*182*, *187*, *199*, *200*, *300*)	May indicate use of force (*146*, *187*, *191–193*, *205*, *300*). May indicate resistance (*198*). May indicate circumstances of assault (*203*)
Ano-genital injury	Injuries documented to areas such as the labia, clitoris, hymen, perineum and rectum (*193*, *199–205*, *245*); photographs may be taken (*182*, *289*)	May indicate use of force (*146*, *191*, *192*, *205*, *300*). May indicate penetration (*146*, *193*, *198*, *302*)
Emotional presentation	Emotional state observed and documented (*182*, *186*, *193*, *202*, *205*)	May indicate recent victimization (*198*)
Clothing	Clothing worn at the time of the assault collected and examined for tears, assailant's semen, saliva, blood and hair, and fibres and soil (*19*, *182*, *187*, *193*, *199*, *201*, *204*, *205*, *214*, *289*, *300*)	May indicate use of force (*146*, *179*, *182*, *187*, *192*, *220*, *268*, *300*). May identify assailant (*179*, *182*, *187*, *193*, *294*). May link victim to crime scene (*28*, *179*, *182*, *268*). May link assailant to victim (*182*, *268*)
Foreign debris	Foreign debris collected from pubic hair, under fingernails, vagina, rectum and clothing (*182*, *199*, *205*)	May link victim to crime scene (*28*, *182*). May identify the crime scene (*205*)
Fingernail scrapings	Fingernail scrapings collected for traces of assailant's skin, blood and hair, and fibres (*19*, *28*, *182*, *193*, *199*, *204*)	May identify assailant (*187*, *192*, *193*, *204*). May indicate resistance (*193*, *198*). May link assailant to victim (*28*, *182*)

[a] If a suspect(s) is apprehended, evidence may also be collected from his body and clothes.

In certain areas, a sexually assaulted woman may go to a facility for a medical forensic examination of her own volition or upon referral by the police. For example, in parts of France and Germany, she may approach a forensic institute directly (*207*, *208*), whereas in areas of Egypt and Iraq, she must be referred by the police or another government body (*209*, *210*). Within regions of eastern Europe, Kenya, Lesotho and South Africa, often a victim must first present to a police station in order to have the assault documented, complete a report and/or obtain a medical form or sexual assault kit that she is then to take to the facility where evidence is collected (*197*, *211–213*). In some areas of Central America, Austria, Belgium, the Philippines and the Russian Federation, law enforcement, the prosecution or a judge must request or authorize the examination (*214–218*). In Belize, the police must attend the examination as observers of the process (*219*) and, in some jurisdictions (e.g., parts of Central America and the United States), a victim may have a support person (e.g., friend, family member or rape crisis counsellor) present (*175*, *182*, *204*, *220–222*).

a. Settings

Medical forensic examinations are commonly carried out in hospitals, forensic institutes and police stations. Less typical settings include community-based agencies, such as those found in parts of Australia and Nicaragua (*223*), wherein a range of services, including immediate medical care, crisis counselling, longer-term counselling and court support, may also be available.

i. Hospitals

Specialized hospital-based services known variously as sexual assault centres, sexual assault referral centres, centres of excellence and one-stop crisis centres are found in many countries (e.g., parts of Australia, Canada, Denmark, Germany, Iceland, Jordan, Malaysia, Norway, South Africa, Sweden, Switzerland, Thailand, the United Kingdom and the United States) (*2*, *60*, *179*, *194*, *223–230*). Typically located in cities rather than smaller villages or remote or rural areas (*179*, *195*, *224*, *229*, *231*), these facilities generally provide around-the-clock collection of medico-legal evidence, medical care (which sometimes includes HIV counselling, testing and post-exposure prophylaxis), as well as psychological support and referrals to other services (*179*, *194*, *199*, *223*, *224*, *226*, *228*, *230*, *232–235*). In parts of certain countries (e.g., Austria, Belgium, Belize, Canada, South Africa and the United States), a victim of sexual assault may be examined in a hospital that does not house a specialized centre (*214*, *215*, *218*, *221*, *236–239*). While the services such hospitals offer may vary from jurisdiction to jurisdiction and facility to facility, under ideal circumstances, medico-legal evidence is systematically collected and the physical and psychological needs of victims addressed (e.g., *215*, *221*, *240*, *241*, *242*).

ii. Forensic institutes

Forensic institutes have been established in the cities of some countries (e.g., Australia, Austria, Egypt, Germany, Iraq, Portugal and Switzerland) (*207*, *209*, *210*, *214*, *243–246*). These institutes are often open 24 hours a day to provide medical forensic examinations. In parts of Europe, they regularly analyse and store specimens, interpret findings, and offer expert consultation (*243*, *246*). Additional services such as pregnancy testing, provision of emergency contraception, treatment of sexually transmitted infections, psychological support and referrals to other agencies may also be available (*245*, *246*).

iii. Police stations

In the United Kingdom, there are many smaller communities and rural areas where medical forensic examinations are conducted in police stations. Most of these stations have a special suite where the sexually assaulted woman is examined by a physician (*231*, *247*) in order to gather medico-legal evidence and determine whether she should be referred to a hospital for medical care (*247*).

b. Staff

The staff who conduct medical forensic examinations include doctors, police surgeons, forensic examiners, nurses and forensic nurse examiners. In some areas, consideration is given to the sex of the sexual assault examiner. For example, in South India, "only women doctors are allowed to handle these cases" (*248*, p.5), whereas in Belize, as in many other jurisdictions, a sexually assaulted woman cannot specifically request a female examiner (*219*).

i. Doctors

In many regions, emergency department physicians, gynaecologist–obstetricians, and/or family and general practitioners carry out medical forensic examinations, usually in hospitals, and may subsequently testify to their findings in court (*249*). In certain areas of countries such as Belgium, Belize, Egypt, India, South Africa and the United States, they perform these examinations without having received forensic instruction (*193*, *210*, *215*, *218*, *221*, *236*, *242*, *250*, *251*) which, in other jurisdictions (e.g., parts of Australia, Bangladesh, Brazil, New Zealand and the Philippines) (*217*, *252–256*), can range from minimal to extensive. For instance, in some parts of Canada, physicians receive a three-hour orientation describing the protocols and procedures for the collection of medico-legal evidence (*179*), whereas in Rwanda, the local chapter of the Forum of Activists Against Torture has trained more than 40 medical doctors over four days in how to communicate with rape victims, conduct rape examinations and understand the laws on sexual violence (*51*).

ii. Police surgeons

Police surgeons, who are doctors retained by law enforcement agencies to conduct medical forensic examinations in cases of sexual assault, can be found in countries such as India, Uganda and the United Kingdom (*193*, *198*, *231*). They may be general practitioners or family physicians, or practice forensic medicine as a specialty (231, 257). Typically, they carry out their examinations in police stations (*231*, *247*). In Uganda, only police surgeons are "authorised to classify the harm [resulting from sexual assault] and fill in the required police form" (*198*, p.35).

iii. Forensic examiners

In some regions (e.g., parts of Europe, Costa Rica and Egypt), forensic or medico-legal examiners conduct examinations of victims of sexual assault (*197*, *210*, *215*, *246*). These specialized physicians are generally found in major centres where forensic institutes are located (*197*, *210*, *215*). Trained both to collect and interpret the evidence, they typically carry out their examinations in these institutes or hospitals (*21*, *243*, *246*). In Costa Rica, "aside from their university specialization, [doctors of forensic medicine] are offered in-service training and are permanently supervised during their 3 years of post-graduate work. To be accredited, they must perform forensic examinations under the continuous presence of an assigned tutor" (*215*, p.47). In Belgium, the Minister of Health has created a designation of "specialist in forensic medicine" (*218*, p.212). In 2002, guidelines were produced for the training required to obtain this title. They included completion of a five-year postgraduate programme with a residency in pathology and training in a centre for forensic medicine. However, to date, these guidelines have not been consistently implemented and many victims of sexual assault continue to be examined by family physicians or gynaecologists at local hospitals (*218*).

iv. Nurses

In some jurisdictions, nurses may conduct medical forensic examinations (*182*). For instance, in Belize they are authorized to "perform forensic examinations after passing a course and fulfilling other administrative prerequisites" (*215*, p.44). In other parts of Central America and in countries such as Canada, nurses may assist physicians or certified sexual assault nurse examiners in carrying out the examinations (*179*, *215*, *258*). Here, the extent of their training can vary from area to area.

In Ontario, Canada, for instance, some sexual assault centres offer nurses a two-day orientation programme that includes readings, simulations, a one-day training session on pelvic examinations and a buddy system for administering the first four sexual assault kits. At another centre, nurses are simply given the examination protocol and the manual of programme policies and procedures to review (*179*).

v. Forensic nurse examiners

In some countries, nurses have been intensively trained as forensic nurse examiners (e.g., parts of Canada, China (Province of Taiwan), India, Puerto Rico, South Africa, the United Kingdom, the United States and Zimbabwe) (*179*, *181*, *182*, *250*, *259–263*). Also known as sexual assault nurse examiners, these nurses generally work in hospital settings or, less commonly, at community-based sexual assault centres (*179*, *181*, *223*, *250*, *264*). Their specialized training qualifies them to conduct medical forensic examinations and often to give court testimony regarding the findings (*178*, *179*, *181*, *182*, *250*, *265*). They may also attend to the immediate health care needs of a victim, with little or no physician involvement (*179*, *250*).

c. Protocols

In certain parts of the world, there are no specific policies or procedures in place to guide the collection of medico-legal evidence in cases of sexual assault (*212*). For instance, in Belize, a review of medical forensic services found no standardized protocol for responding to victims (*215*, *221*). In other jurisdictions, protocols have been developed but not widely implemented (e.g., *214*, *266*). In India, for example, although a model protocol has been created by a voluntary organization active in health research, and employed by the New Delhi police and a large public hospital in Mumbai, it has not yet been "'officially sanctioned' for use in any state or at the national level" (A. Pitre, personal communication, 19 and 24 September 2006:267) (see Box 3.2). A review of practices in South Africa also revealed that "there was a short poorly-disseminated national protocol for the care and management of rape survivors which some provinces had adapted. However, more than half ... of the providers reported that there was no protocol for the care of rape survivors where they worked" (*242*, p.497). Subsequent to this review, a new policy was developed through an extensive consultative process.

In some regions of countries such as Canada, protocols for gathering forensic evidence after a sexual assault are thoroughly institutionalized (*45*, *179*, *202*). Commonly, such protocols include "history-taking, physical examination, laboratory investigations, medical care and collection of forensic evidence" (*202*, p.69). Some involve the use of sexual assault kits (also known as rape kits, crime kits, rape examination kits, forensic kits, sexual assault forensic evidence kits, sexual assault evidence kits, sexual assault care kits, sexual aggression kits and sexual assault investigation kits), which contain the materials needed to document and gather evidence (*174*, *193*, *202*, *218*, *230*, *239*, *245*, *268–273*).

d. Medical forensic examination

The medical forensic examination is conducted to collect available medico-legal evidence for potential use in court. In order to preserve such evidence, the examination is often carried out within 72 hours of a sexual assault (*28*, *94*, *180*, *190*, *192*, *274–276*). Recent guidelines in the American state of North Dakota have suggested that due to "advances in technology in the detection of evidence and DNA" this time frame can be extended to 96 hours (*220*, p.10). The limit for collecting physical evidence of a sexual assault in the Russian Federation has been set at five days (*216*), whereas in South Africa, no limit has been specified (R. Jewkes, personal communication, 28 August 2006:*277*). In most regions, all relevant samples are collected from the victim during this examination. How-

ever, in areas of Kenya, if deemed necessary to the investigation, she may be instructed to go to the laboratory to give urine and blood (*266*).

While in some jurisdictions the examination provided may be minimal (e.g., *27*), in others, a more comprehensive, "detailed and meticulous external and internal examination to document injuries and [gather biological] ... evidence" is undertaken or recommended (*180*, p.6). The latter examination typically comprises a number of key components, including acquiring consent, taking the medical and sexual assault histories, documenting medico-legal findings, and carrying out treatment guidelines (*278*).

▼ BOX 3.2

Sexual assault care and forensic evidence (SAFE) kit protocol in India (*193*, *284*)

This model protocol, which is intended to guide medical and sexual assault history-taking, the forensic and general examinations and laboratory examinations, consists of six forms:

1. Consent form

Asks for patient's permission to medically examine and treat the effects of the sexual assault and carry out a medico-legal examination that may involve inspecting her mouth, breasts, vagina, anus and rectum, removing her clothing, and collecting her scalp hair, pubic hair and blood, as well as saliva, semen, bloodstains and foreign materials from her body. Also asks for her permission to disclose the results of the medico-legal examination to the police. It advises her that she is free to revoke consent at any time during the examination or to decline any portion of it.

2. Medical history form

Gathers information regarding the patient (e.g., name, address and age) as well as any relevant medical or surgical history, including date of last menstrual period and contraception use.

3. Sexual assault history form

Elicits information about the location, date and time of the assault, the number of assailants involved, and their names if known. Requests details regarding the type of assault (e.g., vaginal, anal and oral penetration), the use of condoms or lubricants, as well as weapons or objects. Documents any vaginal discharge or bleeding and any activities engaged in by the victim since the assault (e.g., whether she has removed clothes, bathed, douched, urinated and defecated).

4. Forensic evidence form

Itemizes clothing, specimens and samples taken (e.g., oral swabs, vulval swabs, vaginal swabs, bloodstains, seminal stains, head and pubic hair, nail scrapings or clippings, blood, and foreign material). Documents the quantity of each specimen or sample, or if not collected, lists the reasons why.

5. General examination form

Documents on body diagrams the physical injuries sustained. Describes injuries according to their type, size, shape, colour, borders and age. Directs examiner to include opinion of the cause of injury (e.g., sharp object, cloth or rope). Also documents the emotional state of the patient (e.g., distressed, agitated, shocked, hopeless and controlled).

6. Discharge/summary slip

Notes testing done, treatment given, and follow-up for possible sexually transmitted infections and pregnancy. Records injuries and their related treatment and follow-up, psychological assessment and counselling provided, and referrals made to other services.

Note: This model protocol has been submitted for consideration for institutional use to the Maharashtra State Government and Greater Mumbai Municipal Corporation by the Centre for Enquiry Into Health and Allied Themes (CEHAT). In developing the SAFE Kit, the first of its kind in India, CEHAT drew on those used in Ontario, Canada, KwaZulu-Natal, South Africa and Illinois, the United States, as well as inputs from local forensic doctors, gynaecologists, public health experts and women activists (A. Pitre, personal communication, 19 and 21 September 2006:*298*; *299*).

i. Consent

Written consent is generally required from the victim of sexual assault prior to a medical forensic examination (*19*, *182*, *193*, *194*, *201*, *202*, *204*, *214*, *220*, *276*, *279–282*). She may be advised that she can stop the examination at any point (*182*, *193*, *201*, *202*, *204*, *280*). Often, she is also asked to consent to the release of evidence to relevant law enforcement- and court-related services (*19*, *182*, *193*, *214*, *220*, *279*, *280*). As one exception, in Egypt, consent can be implied when the victim reports to the police and agrees to undergo an examination after being advised of what it entails (*210*).

ii. Medical history

A medical history is commonly taken to assess the victim's state of health and identify any pre-existing health problems that might be relevant to her care (e.g., current use of medications, date of last menstrual cycle, present or past pregnancies and immunization against tetanus) (*19*, *182*, *193*, *199*, *201*, *202*, *204*, *268*, *276*, *279–281*, *283*). The information taken as part of this history may or may not be forwarded to the police (*19*, *182*, *193*, *202*, *222*).

iii. Sexual assault history

The victim is usually asked to recount the relevant details of the sexual assault, including the date, time and location, as well as any details about the assailant(s) (*182*, *193*, *201*, *202*, *204*, *268*, *270*, *276*, *279*, *283*). This account of the assault can be used to guide the medical forensic examination (*182*, *202*, *204*, *280*). The victim is also asked to describe what activities she may have engaged in since the assault (e.g., whether she has bathed, douched, urinated, defecated and changed her clothes) (*182*, *204*, *268*, *279*, *280*, *283*, *284*).

iv. Medico-legal findings

The clothing worn by the victim at the time of the sexual assault is often collected if available (*193*, *205*, *230*, *272*, *280*, *283*, *285*). It is then secured in a bag, together with any trace evidence found on it (*182*, *193*, *200*, *201*, *204*, *280*, *286*). The woman's hair may be combed or cut to capture any foreign hairs or materials (*82*, *193*, *200*, *201*, *204*, *205*, *230*, *286*). She may also be asked to provide a urine or blood sample to test for drugs and alcohol (*19*, *182*, *193*, *194*, *200*, *201*, *202*, *230*, *286*, *287*).

A physical examination follows, in which both extra-genital and genital injuries or marks such as abrasions, lacerations, swellings, bites and scratches are documented (*193*, *203*, *204*, *268*, *270*, *272*, *273*, *280*, *286*, *287*). A speculum, colposcope, anoscope and a staining agent like toluidine blue dye may be used to further detect injuries to the ano-genital areas (*193*, *200*, *201*, *204*, *220*, *272*, *280*). Photographs of injuries may be taken and included as evidence for court (*182*, *199*, *200*, *279*, *288*, *289*). The skin is examined for secretions such as semen and saliva (*182*, *193*, *199–201*, *204*, *280*, *285*), and body cavities are swabbed for seminal fluid (*182*, *193*, *199–201*, *204*, *217*, *280*, *285*, *286*). These secretions may be highlighted using a Wood's lamp (*180*, *199*, *204*, *222*). A victim's emotional state may be observed and recorded (e.g., whether she is crying or appears depressed, calm or composed) (*182*, *193*, *281*, *283*, *286*). In some areas, for instance, parts of eastern Europe, Cambodia and the West Bank and Gaza Strip, a particular focus of the examination is on checking for evidence of "defloration" (i.e., a ruptured hymen) (*30*, *145*, *197*, *290*).

v. Treatment guidelines

The victim is frequently offered prophylaxis for pregnancy, hepatitis B and, in some instances, HIV, as well as treatment for other sexually transmitted infections (*182*, *199*, *204*, *212*, *232*, *268*, *270*, *278*, *279*, *287*). She may also be given information on counselling and available social services (*202*, *230*, *270*, *279*) and asked to return for follow-up care (*179*, *193*, *278*, *280*, *287*).

4. Processing of medico-legal evidence

Key to the effective processing of medico-legal evidence is the establishment of a secure chain of custody to prevent it from being compromised before analysis and possible court use (*18*, *19*, *182*, *192*, *199*, *204*, *239*, *280*, *282*, *283*, *291–293*). Following collection, specimens may be air-dried, sealed in separate containers to avoid cross-contamination and labelled, signed and dated by the person who gathered them (*182*, *200*, *204*, *210*, *214*, *283*, *292*). In some jurisdictions (e.g., parts of Australia, Canada, Denmark, the United Kingdom and the United States), the evidence is secured in a sexual assault kit and may be stored or frozen while the victim decides whether she will pursue recourse in the legal system (*179*, *182*, *200*, *223*, *230*, *269*, *287*).

a. Police

Typically, the evidence is handed over to a law enforcement official (e.g., parts of Belgium, Canada, Egypt, India, South Africa and the United States) who may either take it directly to a forensic laboratory or store it at the police station until it is to be analysed (*179*, *193*, *199*, *204*, *210*, *218*, *220*, *239*, *249*, *268*, *275*, *294*). In Canada, in some locations, the police have the power to select and forward for analysis specific items of evidence based on their judgement and the needs of their investigation (*174*).

b. Forensic laboratories

Once submitted to a forensic laboratory, the medico-legal evidence is to be analysed and a report produced (*180*, *190*, *197*, *215*, *295*). Tests for drugs and alcohol may be run and foreign matter examined for particular characteristics (*187*, *217*). Other analyses commonly involve identifying the specimen (e.g., as semen) and its source (e.g., the assailant) (*190*). Increasingly DNA-testing techniques are being used (*190*).

c. Courts

In some jurisdictions (e.g., parts of Latin America and Canada), the laboratory findings and documented injuries, together with those who are sanctioned to testify to them, may then be introduced in court (*202*, *293*, *296*). In the United States, forensic analysts are sometimes called to comment on or further interpret their results and may be cross-examined on their conclusions (*297*). In South Africa, any health care worker who has examined and collected evidence from a victim may testify to it in court (*198*). Across Argentina, Chile, Colombia, Mexico and Peru, physicians who are government employees or who work in state-run facilities are preferred to other health professionals as experts by the legal system. Whether explicitly stated in law or not, judges place more value on their testimony than that of a private physician (*293*). In parts of sub-Saharan Africa, a prosecutor or an investigating police officer may present the report on the medico-legal examination. Here, the sexual assault examiner is only called upon if there are issues requiring clarification or findings are contested by the defence (*198*). Because of the time commitment required and fear of retaliation, the examining physician in Belize often prepares a statement for the courts rather than testifying in person (*219*).

SECTION FOUR

Impacts of medico-legal evidence on legal outcomes

The objective of establishing systematized medico-legal services for sexual assault in the form of specialized facilities and examiners, as well as detailed protocols, has been to help victims to better negotiate criminal justice systems and to ensure that those who assault them are convicted. Despite continual reports of the widespread attrition of sexual assault cases across jurisdictions (*160*, *195*, *303–307*), it is generally believed that medico-legal evidence is crucial to their successful prosecution (*28*, *95*, *189*, *198*, *213*, *251*, *270*, *292*, *300*, *308–311*). In fact, Temkin has written that the outcomes of rape investigations and trials "[are] likely to depend on it" (*176*, p.821). To date, however, there has been no systematic collation or scrutiny of globally available evidence to support this contention.

This section draws together what is known about the impact of medico-legal evidence on the legal resolution of sexual assault cases from research that has tracked such cases through criminal justice systems. First, studies undertaken specifically to evaluate the association with legal outcome of distinct types of medico-legal evidence are presented. Second, studies intended to evaluate the relationship with legal outcome of other factors, but which included either injury to the victim or physical or forensic evidence as variables in their designs, are reported. Third, studies that have constructed medico-legal evidence as a single "yes, no" variable and examined its impact on legal outcome, are described. In all three sections, the rates at which medico-legal findings were documented are also noted. The key results from the different types of studies reviewed are summarized, and the non-medico-legal factors associated with legal outcome, as determined in them, are highlighted. Finally, the limitations of the studies are discussed, followed by a description of promising research projects in progress.

As a note of caution, one must be aware when comparing findings across the studies reviewed that often different sources of information were used (e.g., hospital, police, prosecution and court records) (e.g., *94*, *312*, *313*), different outcomes at different levels of criminal justice systems examined (e.g., *156*, *314–316*) and different analytical procedures employed (e.g., *94*, *240*, *317*). A few studies also included sexually assaulted men and/or children in their designs (e.g., *45*, *95*, *156*, *306*, *318*, *319*, see also *320*). Moreover, the measures of medico-legal evidence tended to vary from study to study (e.g., *45*, *94*, *213*, *321–323*). For example, although Penttilä and Karhumen's description of severe injuries includes "numerous and superficial bruises, abrasions, lacerations, and swellings" (*319*, p.726), the descriptions of Tintinalli and Hoelzer, McGregor et al. and Rambow et al. do not (*45*, *317*, *321*). Likewise, the tools and techniques used to document and analyse evidence were sometimes dissimilar (e.g., *45*, *95*, *321*, *324*).

1. Medico-legal evidence by type

a. Studies undertaken specifically to examine association with legal outcome

Table 4.1 highlights studies undertaken to examine the relationship to legal outcome of particular types of medico-legal evidence in sexual assault cases. These 13 retrospective reviews, conducted in Canada, Denmark, Finland, Norway and the United States, drew on cases of sexual assault reported to hospitals and their related police and/or prosecution files. The evidence examined included the

documentation of general body injury, ano-genital trauma, sperm, semen and saliva, and emotional presentation. For comparative purposes, and to ensure that the rates of medico-legal findings and legal outcomes presented are not inflated, only those studies that reported their results based on the total number of cases reported to the police, or could be recalculated so that they are, are synthesized.

i. Rates of medico-legal findings

- *General physical injury*

All but one of the 13 studies reviewed examined injury to the victim, which included abrasions, contusions, lacerations, bumps, bruises, swellings, cuts, scrapes, ligature marks, bites, burns, fractures, internal injuries, internal bleeding, intracranial injury and/or injuries requiring surgery or hospitalization (*316*). Across the 10 studies that reported rates that were or could be based on all cases reported to the police, documented injury ranged from 32% in Detroit (*321*) to 90% in Helsinki (*319*) (average, 65%) (the exceptions were *95* and *240*). Among those studies that examined the degree of physical trauma sustained by victims, the rates of minor injury (e.g., redness, tenderness, bruises and scratches) ranged from 24% in Vancouver (*45*) to 72% in Helsinki (*319*). Severe injury (e.g., trauma requiring operative repair, surgery and/or hospitalization) ranged from 2% in Minneapolis (*317*) to 24% in Copenhagen (*161*). Moderate injury (e.g., genital abrasions, lacerations requiring treatment such as suturing) averaged 58% across two studies in Vancouver (*45*, *318*). Du Mont et al. examined the extent of injury in terms of the number of body areas affected and found that in Toronto/Vancouver, 36% of the victims had sustained injuries to three or more sites (e.g., on the head/neck/face, limbs and trunk) (*286*). This figure was substantially lower in Lindsay's study of sexual assaults in San Diego, where the proportion of victims with injury to three or more sites was reported at 16% (*324*).

- *Ano-genital injury*

Ano-genital trauma, which typically included swellings, redness, tenderness, lacerations, contusions, abrasions, tears, bruises and/or bleeding of the vulva, introitus, hymen, vagina, cervix or anus was examined in all but one study (*161*). Across the nine studies that reported rates that were or could be based on all cases reported to the police, the presence of such injuries varied widely, ranging from 9% in Minneapolis (*317*) to 67% in San Diego (*324*) (average, 30%) (the exceptions were *95*, *240*, *321*). In San Diego, anoscopes and colposcopes were routinely employed to aid in the visualization and documentation of trauma.

- *Biological samples*

All but one study examined biological samples (*240*). Eleven reported rates that were or could be based on all cases reported to the police (the exception is *95*). Sperm or semen was detected in as few as 1% of these cases from Klamath and Lake County (*316*), where most victims underwent a medical forensic examination more than 72 hours after the sexual assault, and as many as 59% in Minneapolis (*317*) (average, 24%). Seminal and/or saliva stains were evident in two Canadian studies: the proportions were 13% (in a victim's pubic hair) and 16% (on a victim's skin) in Toronto (*94*) and 21% (in a victim's pubic hair and/or on her skin) in Toronto/Vancouver (*286*). The presence of male secretions was reported in only one study, as 70% in Minneapolis (*317*). Acid phosphatase was examined in three studies (*317*, *319*, *321*), but in only two of them were rates based on all cases reported to the police: 58% and 60% in Helsinki and Minneapolis, respectively (*317*, *319*).

TABLE 4.1

Relationship to legal outcome of medico-legal evidence by type as reported in studies undertaken specifically to examine this association

STUDY	SAMPLE, SETTING, AND METHOD	MEDICO-LEGAL FINDINGS				LEGAL OUTCOME	RELATIONSHIP OF MEDICO-LEGAL EVIDENCE TO LEGAL OUTCOME	LIMITATIONS
		GENERAL INJURY	ANO-GENITAL INJURY (METHOD)	BIOLOGICAL SAMPLES (METHOD)	EMOTIONAL PRESENTATION			
Helweg-Larsen 1985 (*161*) **Denmark**	74 female adolescent and adult victims of sexual assault seen at the Institute of Forensic Medicine in Copenhagen in 1975 and 1980, retrospective review of medico-legal reports, legal outcome data obtained from files of the Copenhagen Police Headquarters	Injury (50/74, 68%): minor (32/74, 43%) and severe (18/74, 24%) Injuries ranged from bruises and scratches, to wounds and facial fractures	NR	Semen (39/74, 53%) (NR)	NR	Pending (21/74, 28%), charge withdrawn (27/74, 36%), charge filed (15/74, 20%), false statement/complaint withdrawn (7/74, 9%), unknown (4/74, 5%), sentenced (13/74, 18%), sentence length (range 8 months to 2 years)	"A correlation between the judicial outcome and the results of the medico-legal examination was not found in all cases. ... No given correlation ... found between severity of penalty and the grade of violence concluded by the medico-legal examination" (pp.145, 151)	Retrospective review. Single jurisdiction. Small sample size. Attrition of cases. Descriptive statistics. Data more than 30 years old.
Tintinalli & Hoelzer 1985 (*321*) **United States**	372 randomly selected female adolescent and adult victims of sexual assault examined at the Rape Crisis Center (RCC) and Emergency Department (ED) of the Detroit Receiving Hospital and University Health Center between July and December 1980, retrospective review of RCC and ED medical records, legal outcome data obtained from files of the Detroit Police Sex Crimes Unit	Injury (119/372, 32%), total number of injuries (148)[a]: mild (121/148, 82%), moderate (26/148, 18%) and severe (1/148, 1%) Minor injuries included bruises, scratches, abrasions and erythemas. Moderate injuries included lacerations requiring suturing, large haematomas, and extremity and facial fractures not requiring hospitalization. Severe injuries included major fractures and trauma requiring operative repair.	Vaginal or perineal injury (28/148, 19%)[b] (gross, direct visualization)	Sperm (115/372, 31%) (visualization by direct microscopy of saline suspension of contents of posterior vaginal fornix), acid phosphatase activity from victim's clothing or artefacts (30% of cases in which warrant was signed) (detected in police laboratory)	NR	Lost to follow-up/did not wish to prosecute (300/372, 81%), warrant issued (68/372, 18%), warrant denied (4/372, 1%), guilty verdict (47/372, 13%), charge dismissed (14/372, 4%), acquittal (6/372, 2%), awaiting trial (1/372, 0.3%)	"No correlation between the presence of sperm or trauma on ED examination, results of the police laboratory examination [for positive acid phosphatase activity], and issuance of warrants or guilty verdicts" (p.453)	Retrospective review. Single jurisdiction. Attrition of cases. Bivariate statistics. Data more than 25 years old.

STUDY	SAMPLE, SETTING, AND METHOD	MEDICO-LEGAL FINDINGS				LEGAL OUTCOME	RELATIONSHIP OF MEDICO-LEGAL EVIDENCE TO LEGAL OUTCOME	LIMITATIONS
		GENERAL INJURY	ANO-GENITAL INJURY (METHOD)	BIOLOGICAL SAMPLES (METHOD)	EMOTIONAL PRESENTATION			
Penttilä & Karhumen 1990 (*319*) **Finland**	249 female child, adolescent and adult victims of sexual assault examined at the Department of Forensic Medicine at the University of Helsinki from 1978 to 1984, retrospective review of medico-legal reports, judicial outcome data obtained from files of the Criminal Police of Helsinki for 1978–1981 only (*n* = 150)	Injury (224/249, 90%): minor (180/249, 72%), severe (44/249, 18%) Severe injuries included numerous and/or extensive superficial bruises, abrasions, lacerations and swellings, and fractures of facial bones. Minor injuries included all other injuries.	Sexual organ injury (45/249, 18%), including fresh tear of hymen (10/249, 4%) (gross, direct visualization)	Sperm/semen (115/249, 46%) (visualization by direct microscopy using picroindigo-carmine nuclear fast red staining of vaginal samples), human prostate specific acid phosphatase (37/249, 15%)[c] (chemical determination), non-specific acid phosphatase (144/249, 58%) (chemical determination), sperm/semen samples not analysed (19/249, 8%), human prostate specific acid phosphatase not analysed or not determined (172/249, 69%), non-specific acid phosphatase not analysed (50/249, 20%)	NR	Imprisonment (52/150, 35%), fine (1/150, 1%), pending (27/150, 18%), charge withdrawn (47/150, 31%), no proof of crime (14/150, 9%), false statement (2/150, 1%), case to child inspector (2/150, 1%)	"There was little correlation between judicial outcome and severity of injuries and/or the presence of spermatozoa in vaginal samples. …[I]n cases leading to imprisonment there were significantly more victims with severe injuries than in the other categories. However, in various categories the distribution of cases with a positive or negative result for spermatozoa was similar" (pp.725, 729)	Retrospective review. Single jurisdiction. Descriptive statistics. Data more than 25 years old.

Rambow, Adkinson, Frost & Peterson 1992 (*317*) **United States**	182 female adolescent and adult victims of sexual assault examined at Hennepin County Medical Center in Minneapolis in 1983, retrospective review of medical records, legal outcome data obtained from police files and legal files of Hennepin County Attorney's office	Injury (91/182, 50%): minor ("vast majority"), severe (4/182, 2%) Minor injuries included abrasions, minor contusions and lacerations. Severe injuries required surgery or hospitalization and included skull fracture with severe head injury.	Vaginal or perineal injury (17/182, 9%) (gross, direct visualization) Included small lacerations, contusions and abrasions	Male secretions (127/182, 70%): sperm (108/182, 59%) (visualization by direct microscopy), acid phosphatase (110/182, 60%) (thymophthalein monophosphate method), samples not analysed (10/182, 5%)	NR	Charge filed (53/182, 29%), victim uncooperative/declined to prosecute (55/182, 30%), assailant not identified (42/182, 23%), lack of evidence/indeterminant consent (28/182, 15%), unfounded (3/182, 2%), charge dismissed (1/182, 0.5%), conviction (18/182, 10%)	"[E]vidence of trauma was significantly associated with successful prosecution [P <. 0.01]. ... [P]resence of sperm or acid phosphatase was not significantly associated with successful prosecution" (p.729)	Retrospective review. Attrition of cases. Bivariate statistics. Data more than 20 years old.
Schei, Muus & Moen 1995 (*341*) **Norway**	109 child, adolescent and adult victims of sexual assault examined at the Department of Obstetrics and Gynaecology at the University Hospital of Trondheim from 1989 to 1992, retrospective review of medical charts, legal outcome data obtained from computerized files of the Trondheim Police Department[d]	Body injury (42/109, 39%) Included surface and open wounds, contusions, and possible internal bleeding	Genital injury (15/109, 14%) (gross, direct visualization) Included tears, wounds and swellings	Sperm, live or dead (19/109, 17%) (visualization by direct microscopy)	NR	Suspect not apprehended (12/109, 11%), lack of evidence (30/109, 28%), suspect cleared (5/109, 5%), investigation open (12/109, 11%), other 6/109, 6%), conviction (32/109, 29%), unknown (12/109, 11%)	"Adjusted for lapse of time between the event and the examination and the victim's age, the only factor that ... showed a statistically significant association with conviction was the report of severe violence" (p.30)	Retrospective review. Single jurisdiction. Small sample size. Attrition of cases. Data more than 15 years old.
Lindsay 1998 (*324*) **United States**	697 female adolescent and adult victims of sexual assault, 650 of whom were examined at Children's Hospital or Villa View Community Hospital, respectively, in San Diego from 1994 to 1996, retrospective review of medical records, legal outcome data obtained from police logs of the San Diego Police Department Sex Crimes Unit	Body injury, non-genital (342/697, 49%), multiple sites body injury: none (300/697, 43%), 1 site (135/697, 19%), 2 sites (94/697, 13%), 3 sites (62/697, 9%), 4 sites (36/697, 5%), 5 or more sites (15/697, 2%), injuries on head/neck/face (182/697, 26%), unknown (55/697, 8%)[e] Included bruises, abrasions, swellings, lacerations, cuts, wounds, bite marks, haematomas, burns and fractures	Ano-genital injury (466/697, 67%), multiple ano-genital injuries (250/697, 36%), genital injury (444/697, 64%) (anoscopy, colposcopy, gross, direct visualization and/or toluidine blue dye), unknown (55/697, 8%)[e] Included tears, lacerations, bleeding ecchymoses, bruises, abrasions, redness, erythemas and swellings	Sperm (66/697, 9%) (visualization by direct microscopy), unknown (55/697, 8%)[e]	NR	Unfounded (49/697, 7%), victim declined to prosecute (95/697, 14%), inactive (263/697, 38%), rejected by prosecutor (146/697, 21%), charge filed (130/687, 19%), pending (14/697, 2%)	In 195 cases with examinations of adults[f] reviewed by the District Attorney's office, "evidence of injury to the head, neck, or face region [odds ratio (OR): 2.6, 95% confidence intervals (CI): 1.3, 5.3] or more than one site of ano-genital injury [OR: 2.6, 95% CI: 1.1, 6.4] ... are significantly associated with suspect charging" (p.189)	Retrospective review. Single jurisdiction. Attrition of cases. Data more than 10 years old.

STUDY	SAMPLE, SETTING, AND METHOD	MEDICO-LEGAL FINDINGS				LEGAL OUTCOME	RELATIONSHIP OF MEDICO-LEGAL EVIDENCE TO LEGAL OUTCOME	LIMITATIONS
		GENERAL INJURY	ANO-GENITAL INJURY (METHOD)	BIOLOGICAL SAMPLES (METHOD)	EMOTIONAL PRESENTATION			
McGregor, Le, Marion & Wiebe 1999 (*318*) **Canada**	95 female and male adolescent and adult victims of sexual assault examined at the British Columbia Women's Sexual Assault Service at Vancouver General Hospital in Vancouver in 1992, retrospective review of medical charts and medico-legal records, legal outcome data obtained from the Vancouver Police Department	Injury (85/95, 89%), clinical injury extent score: mild (26/95, 27%), moderate (56/95, 59%), severe (3/95, 3%) Mild injuries included redness, tenderness and those with no expected impact on physical function. Moderate injuries included those expected to have some impact on function, lacerations, bruises, abrasions of genitalia and injuries requiring treatment such as suturing. Severe injuries included head injury with concussion, evidence of attempted strangulation, fractures and contusions of internal organs.	Genital injury (including anal and rectal areas), excluding tenderness (23/95, 24%), including tenderness (31/95, 33%), tenderness only (8/95, 8%) (gross, direct visualization) Included redness, tenderness, lacerations, bruises and abrasions	Sperm: motile (6/95, 6%), non-motile (7/95, 7%) (visualization by direct microscopy)	NR	Inactive (28/95, 29%), victim declined to prosecute (13/95, 14%), charge laid (31/95, 33%), conviction (11/95, 12%): for sexual assault (10/95, 11%), for common assault (1/95, 1%), sentence length (range 21 days to 5 years, 1 case life imprisonment)	"[P]resence of genital injury (excluding tenderness) ... and ... sperm ...were not significantly associated with the laying of charges. ... The presence of moderate or severe injury was significantly associated with the laying of charges [OR: 3.33, 95% CI: 1.06, 10.42]" (p.1567)	Retrospective review. Single jurisdiction. Small sample size. Attrition of cases. Data more than 10 years old.
Du Mont & Parnis 2000 (*94*) **Canada**	187 female adolescent and adult victims of sexual assault examined at the Sexual Assault Care Centre at Women's College Hospital in Toronto in 1994, retrospective review of hospital charts, legal outcome data obtained from files of the local police service and Crown attorney's office	Injury, excluding tenderness and pain (120/187, 64%): bruises, bites and/or burns (108/187, 58%), lacerations, abrasions and/or bumps (68/187, 36%), fractures (3/187, 2%), internal injuries (1/187, 0.5%), injuries requiring hospitalization (3/187, 2%)	Ano-genital injury (51/187, 27%) (gross, direct visualization) Included bruises, lacerations and abrasions	Non-motile sperm (13/187, 7%) (visualization by direct microscopy), seminal/saliva stains on skin (30/187, 16%), seminal/saliva stains in pubic hair (25/187, 13%)	Expressed (65/187, 35%), controlled (74/187, 40%), mixed (14/187, 7%) Expressed presentation included crying and showing anger. Controlled presentation included appearing calm and detached.	Unsolved (51/187, 27%), unfounded, cleared otherwise or victim declined to prosecute (35/187, 19%), charge laid (87/187, 47%), unknown (14/187, 7%)	"[T]he collection of sperm, semen and/or saliva and the documentation of clinically observed injuries did not predict an arrest and charge" (p.784)[9]	Retrospective review. Single jurisdiction. Attrition of cases. Data more than 10 years old.

Du Mont, McGregor, Myhr & Miller 2000[h] **(*286*)** **Canada**	236 female adolescent and adult victims of sexual assault examined at the Sexual Assault Care Centre at Women's College Hospital in Toronto in 1994 (n = 145) or the British Columbia Women's Sexual Assault Service at Vancouver General Hospital in Vancouver in 1992 (n = 91), retrospective review of hospital charts and medico-legal records, legal outcome data obtained from files of the Metro Toronto Police Service and Vancouver Police Department	Injury (187/236, 79%), extent of injury, including injuries on perineum and anus: none (49/236, 21%), 1 or 2 sites (102/236, 43%), 3 or more sites (85/236, 36%) Included bruises, bites, burns, cuts, scrapes, bumps, internal injuries and fractures	Genital injury (70/236, 30%) (gross, direct visualization) Included redness, bruises, tears, abrasions and/or bleeding of vulva, introitus, hymen, vagina, cervix and anus	Sperm, motile or non-motile (24/236, 10%) (visualization by direct microscopy), seminal/saliva stains (50/236, 21%)	NR	Inactive (67/236, 28%), unfounded, cleared otherwise or victim declined to prosecute (61/236, 26%), charge laid (108/236, 46%), acquittal, charge withdrawn, dismissed or stayed (68/236, 29%), conviction: sex and non-sex offences (37/236, 16%), pending (3/236, 1%)	"Neither the documentation of physical injury nor the collection of sperm and semen and/or saliva was related to the laying of charges or securing of convictions" (p.220)	Retrospective review. Attrition of cases. Data more than 10 years old.
Gray-Eurom, Seaberg & Wears 2002 (*95*) **United States**	801 female and male adolescent and adult victims of sexual assault seen at the Adult and Adolescent Sexual Assault Program in Duval County, Florida, from October 1993 to September 1995, retrospective review of interview and examination records, legal outcome data obtained from computerized law enforcement files, state attorney's legal files and courtroom proceedings	Trauma (202/355, 57%)[i] Included abrasions, contusions, lacerations, ligature marks, burns and bite marks	Genital trauma (123/355, 35%)[i] (gross, direct visualization) Included cervical erosions, superficial lacerations to the vaginal opening and orifice, swellings, abrasions, and erythemas	Sperm (110/355, 31%)[i] (visualization by direct microscopy)	NR	Suspect not identified (446/801, 56%), suspect identified (355/801, 44%), arrest (271/801, 34%), no arrest (84/801, 10%), dropped (153/801, 19%), proceeded with prosecution (118/801, 15%), sealed/pending (27/801, 3%), acquittal (2/801, 0.2%), conviction (89/801, 11%)	"[T]he presence of trauma ... [was] significantly associated with successful prosecution [OR: 1.93, 95% CI: 1.08, 3.43]" (p.39)	Retrospective review. Attrition of cases. Data more than 10 years old.

STUDY	SAMPLE, SETTING, AND METHOD	MEDICO-LEGAL FINDINGS				LEGAL OUTCOME	RELATIONSHIP OF MEDICO-LEGAL EVIDENCE TO LEGAL OUTCOME	LIMITATIONS
		GENERAL INJURY	ANO-GENITAL INJURY (METHOD)	BIOLOGICAL SAMPLES (METHOD)	EMOTIONAL PRESENTATION			
McGregor, Du Mont & Myhr 2002 (45) **Canada**	462 female and male victims of sexual assault examined at the British Columbia Women's Sexual Assault Service (SAS) at Vancouver General Hospital in Vancouver from 1993 to 1997, retrospective review of SAS administrative database and medico-legal reports, legal outcome data obtained from files of the Vancouver Police Department and courts	Injury (406/462, 88%), extra- genital injury: bruising (301/462, 65%), lacerations (86/462, 19%), fractures (7/462, 2%), clinical injury extent score: mild (110/462, 24%), moderate (265/462, 57%), severe (31/462, 7%), none (56/462, 12%) Mild injuries included redness, tenderness and those with no expected impact on physical function. Moderate injuries included those expected to have some impact on function, lacerations, bruises, abrasions of genitalia and injuries requiring treatment such as suturing. Severe injuries included head injury with concussion, evidence of attempted strangulation, fractures and contusions of internal organs.	Genital injury (193/462, 42%) (gross, direct visualization, colposcopy in 8% of cases) Included bruises, abrasions and lacerations of anal and genital regions	Sperm/semen (100/462, 22%) (determined by forensic tests), biological samples (262/462, 57%) (analysed in forensic laboratory), biological samples (327/462, 71%) (collected by sexual assault examiner), biological samples not analysed (65/462, 14%)	Emotive, (205/462, 44%), controlled (220/462, 48%) Emotive presentation included appearing anxious, shaking and crying. Controlled presentation included appearing calm, detached and rational.	Suspect not identified (182/462, 39%), charge not recommended (110/462, 24%), charge recommended (170/462, 37%), charge not filed (19/462, 4%), charge filed (151/462, 33%), no conviction (99/462, 21%), pending (1/462, 0.2%), conviction (51/462, 11%): guilty as charged (33/462, 7%), guilty of lesser charge (18/462, 4%), custodial sentence (40/462, 9%), non-custodial sentence (11/462, 2%)	"The medical-legal variables significantly associated with an increased odds of charge filing were documentation on the police file of receipt of forensic samples collected by the SAS examiner (OR 3.45; 95% CI 1.82 to 6.56) and a clinical injury extent score of mild, moderate, and severe (OR 2.85, 95% CI 1.09 to 7.45; OR 4.00, 95% CI 1.63 to 9.84; and OR 12.29, 95% CI 3.04 to 49.65, respectively). ... [T]he only variable found to be associated with conviction was a clinical injury extent score of severe (OR 6.51; 95% CI 1.31 to 32.32) ... [F]ail[ed] to demonstrate a significant association between sperm-semen positivity and conviction. ... [L]ack of association of genital injury alone with either charge filing or conviction" (pp.644–645)	Retrospective review. Single jurisdiction. Attrition of cases. Data more than 10 years old.

Wiley, Sugar, Fine & Eckert 2003 (*240*) **United States**	888 female adolescent and adult victims of sexual assault examined in an urban emergency department in Washington State between January 1997 and September 1999, retrospective review of medical records, legal outcome data obtained from the prosecutor's office	General trauma (192/396, 48%)[i] Included bruises, abrasions, lacerations, and radiologically defined intracranial injuries and bone fractures	Ano-genital trauma (64/396, 16%)[i] (gross, direct visualization) Included bruises, abrasions and lacerations	NR	NR	Charge not filed (756/888, 85%), charge filed (132/888, 15%), acquittal (7/888, 1%), charge dismissed (11/888, 1%), declined to prosecute (1/888, 0.1%), conviction (113/888, 13%): guilty verdict (20/888, 2%), guilty plea (93/888, 10%)	"Anogenital trauma was significantly associated with legal outcome [charges filed] (OR: 1.9, 95% CI: 1.1, 3.3)..., whereas general body trauma was not" (p.1640)	Retrospective review. Single jurisdiction. Attrition. Bivariate statistics. Data more than 5 years old.
Cahill 2004 (*316*) **United States**	72 female adolescent victims of sexual assault examined at Klamath-Lake Cares Center in 2001 and 2002, retrospective review of medical charts, legal outcome data obtained from the Oregon Judicial Information Network	NR	Genital injury (28/72, 39%): acute (4/72, 6%), non-acute injuries (24/72, 33%) Acute injuries included abrasions, lacerations and bruises on labia, perihymenal tissue and posterior fourchette, and hymenal laceration. Non-acute injuries included healed hymenal transection and hymenal notch nearly to vaginal floor.	Sperm (1/72, 1%)[k] (NR)	NR	Suspect not identified (2/72, 3%), suspect not apprehended (1/72, 1%), no decision for prosecution (38/72, 53%), tried in court (24/72, 33%), acquittal (1/72, 1%), conviction (23/72, 32%): for sexual offence (19/72, 26%), for non-sexual offence (4/72, 6%), unknown (7/72, 10%)	"A chi-square test of independence exploring the relationship between physical findings [acute hymenal lacerations, acute abrasions, lacerations or bruising to labia, perihymenal tissue, and posterior fourchette, healed hymenal transection, hymenal notch nearly to vaginal floor, prior rape, + pregnancy test, anogenital human papilloma virus (HPV)] and legal outcome (trial versus no trial) failed to demonstrate statistical significance" (pp.38–39)	Retrospective review. Single jurisdiction. Small sample size. Attrition of cases. Bivariate statistics. Data more than 5 years old.

Note: Percentages are based on the total sample size of study unless otherwise indicated. NR is an abbreviation for not reported.

[a] Total number of injuries is based on count of injuries by anatomical area per victim.

[b] Rate of vaginal or perineal injury is based on total number of injuries sustained by a victim.

[c] Determined only for 99 cases from 1982 to 1984.

[d] B. Schei, personal communication, 4 April 2006 (*346*).

[e] Although a total of 697 victims underwent a medical evidentiary examination, 47 of these examinations were performed at facilities from which the author was unable to gain access to records. The records for an additional 8 cases seen either at Children's Hospital or Villa View Community Hospital could not be located.

[f] In the sample of 97 cases of sexual assault on an adolescent reviewed by the District Attorney's office, the presence of a medical forensic examination was not related to charge filing. Therefore, the association of specific types of evidence to suspect charging was not examined.

[g] Although not reported, the presence of ano-genital injuries and documented emotional presentation were also analysed and found not significantly associated with charge-laying.

[h] This study draws on data presented in Du Mont and Parnis (*94*) and McGregor et al. (*318*).

[i] Data were presented for only 355 cases for which the police had identified suspects.

[j] Data were presented for only 132 cases for which charges were filed and 264 controls.

[k] Eighty-six per cent of victims underwent a physical examination more than 72 hours post-sexual assault.

- *Emotional presentation*

Only two studies investigated the emotional presentation of victims as documented during medical forensic examination (*45*, *94*). Those in Toronto and Vancouver were described as emotively affected, which included having appeared angry, anxious or upset, in 35% and 44%, respectively, of all cases reported to the police (average 40%), and described as emotively controlled, which included having appeared calm, rational or detached, in 40% and 48%, respectively, of all cases reported to the police (average 44%).

ii. Rates of legal outcome

All 13 studies reported rates of legal outcome that were or could be based on all cases reported to the police. In a single study in Detroit, warrants were issued in 18% of cases (*321*). The rates at which charges were laid/filed was noted in eight studies and ranged from 15% in Washington State (*240*) to 47% in Toronto (*94*) (average 30%). The rates of successful prosecution or conviction across nine studies ranged from 10% in Minneapolis (*317*) to 32% in Klamath and Lake County (*316*) (average 16%).

iii. Relationship to legal outcome of medico-legal evidence

- *General physical injury*

In all, 6 of 12 (50%) studies reviewed that included a victim injury variable found a significant association with legal outcome (*45*, *95*, *317–319*, *324*). Rambow et al. (*317*) and Gray-Eurom et al. (*95*) reported that the occurrence of general physical injury was related to successful prosecution in Minneapolis and Duval County, Florida, respectively. Lindsay observed that in San Diego evidence of injury to the head, neck and/or face specifically was associated with charges being filed (*324*). McGregor et al. found that the presence of moderate and/or severe injury was related to prosecutors' decisions to lay charges in Vancouver (*318*). In a later study in the same jurisdiction, mild, moderate and severe injuries were associated with the filing of charges; severe injury, however, was associated only with conviction (*45*). In Penttilä and Karhumen's study of sexual assault cases in Copenhagen, severe injuries were also noted to affect the likelihood of imprisonment (*319*).

- *Ano-genital injury*

Just 2 of 12 (17%) studies, both conducted in the United States, found a significant association between ano-genital trauma and legal outcome. Wiley et al. (*240*) reported a relationship between the occurrence of ano-genital trauma and the filing of charges, and Lindsay (*324*) between the presence of more than one site of such injuries and the filing of charges.

- *Biological samples*

Only 1 of 12 (8%) studies that examined biological samples reported a significant association with legal outcome. The documentation in police files of the receipt of forensic samples collected by sexual assault examiners was related to the filing of charges in Vancouver, although there was no significant relationship between conviction and those samples that were analysed and tested positive for sperm or semen (*45*). In fact, none of the studies reviewed reported an association between legal outcome and sperm/semen, sperm/semen/saliva, semen/saliva and acid phosphatase.

- *Emotional presentation*

Neither (0%) of the two studies that examined the emotional state of the victim at the time of medical forensic examination found a significant association with legal outcome (*45*, *94*).

b. Studies not undertaken specifically to examine association with legal outcome

In addition to those studies designed specifically to measure the impacts of medico-legal evidence on the outcomes of sexual assault cases, as seen in the Annex, a larger body of literature exists that is more broadly focused on a variety of factors related to the progression of sexual assault cases through criminal justice systems. Many of these studies, mostly retrospective reviews of police and/or court files, have included the documentation of injury to victims in their research designs. Some of these studies have also considered the impact on legal outcome of what has been termed forensic or physical evidence, which encompasses various types of biological and non-biological samples collected from a victim's body or crime scene. For comparative purposes, and to ensure that the rates of medico-legal findings and legal outcomes presented are not inflated, only studies that reported their results based on the total number of cases reported to the police, or could be recalculated so that they are, are summarized.

i. Rates of medico-legal findings

- *General physical injury*

In all, 27 of 31 studies reviewed examined injury to the victim (the exceptions were *164*, *315*, *323*, *325*). Where defined, this variable included bruises, abrasions, cuts, broken bones, stab wounds, gunshots, internal injuries and burns (e.g., *322*, *326*, *327*). Only 14 studies provided rates for the presence of injuries, and only four of these were or could be based on all cases reported to the police (*152*, *160*, *303*, *328*, see also *163*). Rates ranged from 29% in one study in Toronto (*328*) to 71% in another (*303*) (average, 52%), although the latter research included self-reported tenderness and pain in its definition of injury. Lea et al. (*160*) in England and LaFree (*152*, see also *163*) in Indianapolis also reported rates of minor injury at 33% and 66%, and rates of major or severe injury at 2% and 4%, respectively.

- *Ano-genital injury*

Only 2 of 31 studies reviewed examined genital injury, defined as "vaginal trauma" in one and "injury to sex organs" in the other (*155*, *329*). Neither study provided rates for the occurrence of such injuries.

- *Biological and non-biological samples*

Fourteen of 31 studies reviewed examined some kind of composite forensic or physical evidence variable that included samples such as sperm, semen, seminal stains, saliva, hair, clothing and bedding (*151*, *164*, *303*, *306*, *313*, *315*, *322*, *323*, *325–327*, *330–332*, see also *320*, *333*, *334*). Of these studies, nine reported rates at which such types of evidence were available. In only one study were the findings based on all cases reported to the police (*303*). Du Mont and Myhr's examination of sexual assaults in Toronto revealed that forensic evidence, defined as seminal stains, saliva, or non-motile sperm on a victim's skin or in her pubic hair and/or the collection of blood, hair and fibres from the scene of the offence, was available in 82% of cases (*303*).

ii. Rates of legal outcome

All 31 studies examined rates of legal outcome, 14 of which provided rates that were or could be based on all cases reported to the police (*63*, *149*, *151–153*, *155*, *160*, *303*, *305*, *314*, *328*, *329*, *335*, *336*, see also *154*, *163*, *166*, *334*, *337*). Nine of these studies reported rates for cases that were no-crimed/unfounded, which ranged from 6% in Toronto (*303*) to 60% in Chicago (*329*) (average, 22%). Three studies documented the proportion of cases cleared by an arrest, which was 34% in Hawaii (*149*), 36% in Indianapolis (*152*, see also *163*) and 36% in Toronto (*328*) (average, 35%). Reported charge-laying/filing rates across eight studies ranged from 16% in Indianapolis and another American mid-western city (*152*, *314*) (see also *163*) to 47% in Toronto (*303*) (average, 28%). Nine studies reported

the rates at which suspects were convicted, these were: 7% and 13% in the United Kingdom (*63*, *305*), 11% in south-west England (*160*), 12% in Boston (*151*, see also *334*) and in an American mid-western city (*314*, *336*), 17% in Toronto (*303*), and 23% and 29% in Winnipeg (*153*, *335*). The overall average was 15%.

iii. Relationship to legal outcome of medico-legal evidence

- *General physical injury*

In all, 11 of 27 (41%) studies reviewed that included a victim injury variable found a significant association with legal outcome (*149*, *155*, *156*, *166*, *312*, *314*, *322*, *330*, *331*, *336*, *337*). Three of the studies reported an impact at the police level of processing (*166*), such as in the apprehension and interrogation of suspects (*314*), and the decision to forward cases for prosecution (*156*). Seven studies that examined prosecutorial outcomes found a relationship between the occurrence of injury to the victim and the decision to file charges and/or fully prosecute cases (*149*, *312*, *314*, *322*, *330*, *336*, *337*). Three studies that examined conviction found an association between the presence of physical injuries and guilty pleas and/or verdicts (*155*, *156*, *337*), although in Gunn and Linden's examination of sexual assault cases from Winnipeg this was true only for pre-rape-law reform cases (*337*). Briody found that "tangible evidence", which included the presence of injuries, was associated with conviction in Queensland, Australia (*331*). One study also reported a negative association between the presence of physical injuries and the decision to found (i.e., record as a crime) a case (*155*).

- *Ano-genital injury*

Both (100%) studies that examined the relationship of ano-genital trauma alone to legal outcome found a significant association. Kerstetter concluded that the presence of injuries to sex organs was related to founding cases in Chicago only when sexual assaults were perpetrated by acquaintances (*329*). McCahill et al. reported that in Philadelphia evidence of vaginal trauma led to conviction by jury trial (*155*).

- *Biological and non-biological samples*

In total, 7 of 14 (50%) studies that examined the relationship to legal outcome of forensic or physical evidence reported a significant finding (*164*, *306*, *315*, *323*, *326*, *330*, *331*, see also *320*). In studies drawing upon data from Detroit, Philadelphia/Kansas City and Miami/Kansas City, the police were more likely to refer cases for prosecution (*315*) and prosecutors to file charges and fully prosecute (*326*, *330*) if physical evidence was available. In two Australian studies, a positive relationship between presence of DNA (and in one of these studies other types of evidence as well) and conviction was found (*306*, *331*, see also *320*). Williams reported that among rape cases in the District of Columbia, the presence of "a medical test for sperm, torn clothing, etc." was related to conviction (*164*, p.35). Finally, Weninger found that in cases processed in Travis County, Texas, the availability of medical corroboration, which included sperm in a woman's vagina and seminal stains on her clothes, had the greatest impact on the probability of an indictment being returned, that is, of an assailant being accused formally of having committed a serious crime (*323*).

2. Medico-legal evidence as a whole

A handful of descriptive studies that have discussed the relationship to legal outcome of medico-legal evidence as a single "yes, no" variable were located. The two main and related findings arising from these studies are that medico-legal evidence appears to be of minimal importance to the courts (*205*, *213*, *338*) and that supportive medico-legal findings are not always necessary for a case to progress (*186*, *205*, *339*).

a. Blass (213): South Africa

Blass examined the criminal justice processing and legal outcomes of 226 sexual offences involving female and male children and adult women complainants from four regional courts located in the Kathorus region of Gauteng province in South Africa from January 2002 to June 2003. Drawing on court records, she found that 142 (63%) cases were removed from the roll or filtered out of the criminal justice system by the courts and/or prosecutors before the plea stage, leaving 84 (37%) cases that reached the trial level. Fifty-five (24%) cases resulted in a verdict of not guilty: 41 (18%) defendants were acquitted and 14 (6%) discharged. The prosecution withdrew a single (0.4%) case and 28 (12%) resulted in conviction. Twenty-seven (12%) convictions were for sexual offences: 13 (6%) had guilty verdicts and 14 (6%) had guilty pleas. The author found that 30 (13% of 226) of the cases that went to trial had no medico-legal report attached to them, although a crime kit may have been completed and physical evidence collected. Even among the 52 (23% of 226) cases that had a medico-legal report attached, "there was not one record showing that forensic evidence was led during ... trials" (p.77).

b. Drezett, Junqueira, Antonio, Campos, Leal and Iannetta (339): Brazil

Drezett et al. retrospectively reviewed the files of 87 sexually assaulted adolescent females seen at the Referral Center for Children and Adolescents in São Paolo, Brazil between 1996 and 2002. One of the goals of their study was to evaluate factors related to medical forensic examinations and legal outcomes. The authors found that 23 (26%) of the cases were still being processed in the criminal justice system. The prosecution did not present any information against the accused in 13 (15%) cases. Eleven (13%) cases were suspended and 5 (6%) dismissed. In 12 (14%) of the cases an assailant was acquitted, and in 3 (3%) the outcome was unknown. In 30 of the 32 (94%) cases for which a medical forensic examination had been completed, no physical evidence was found to confirm that a sexual offence had occurred. The authors noted that despite this, 20 (23%) cases resulted in conviction.

c. Feldberg (186): Canada

Feldberg examined the impact of medico-legal evidence on sexual assault trials in Ontario, Canada. She reviewed 61 cases of sexual assault involving complainants 14 years of age or older. These cases that had been heard between 1984 and 1990 were retrieved from Quicklaw, Ontario Judgments, Ontario Decisions – Criminal Convictions, the Weekly Criminal Bulletin and the Dominion Report Service Index and analysed for "how medical testimony about evidence of penetration, semen, and physical and/or emotional trauma affected judgments and sentencing" (p.96). The transcripts of trials and interviews were also reviewed. Feldberg found that medico-legal evidence had been presented in court for only 26 (43%) cases. Furthermore, only 12 (45%) of these 26 cases resulted in a finding of guilt. Her "crude analysis of preliminary data suggest[ed] that medical evidence [did] not contribute significantly to a guilty verdict. ... In 18 cases, where the physical evidence obtained through the medical exam proved ambiguous, the court nonetheless reached a verdict of guilty" (pp.98, 104).

d. Herbert and Wiebe (338): Canada

In a letter to the *Canadian Medical Association Journal*, Herbert and Wiebe described their "attempt" to document the usefulness of medico-legal evidence in determining the legal process pursued. They reviewed the medico-legal records of all 130 sexual assault victims examined in 1986 at what was then known as the Sexual Assault Assessment Service of University Hospital, Vancouver. They were able to obtain legal outcome data on charges laid, stays (i.e., suspensions) of proceedings, convic-

tions and sentencing from the Vancouver City Police Department and reasons for judgement from the court registry. Ninety-nine (76%) cases had been "dealt" with by the police. There were 25 (19%) cases in which charges had been laid and 8 (6%) in which proceedings had been stayed. Seventeen (13%) of the cases proceeded to trial and 10 (8%) resulted in conviction. Medico-legal evidence was called in only 13 (10%) of the cases. Judgements were written in five cases, although two of these could not be reviewed. Just one of the other three mentioned medico-legal evidence and the judge nevertheless dismissed the case. This occurred despite the fact that more than half of the victims assessed at the service since 1982 had sustained physical injuries.

e. Kee (205): Canada

Kee examined the court records for 452 sexual offence cases that had been prosecuted in six jurisdictions across the province of British Columbia between April 1994 and March 1995. Her purpose was to assess the impact of the introduction of medico-legal evidence in court on case outcomes. She found that 147 (33%) of the cases resulted in a conviction for a sexual offence and 83 (18%) in an acquittal. Medico-legal evidence was presented in 35 (15%) of the 230 cases that proceeded to trial or had a preliminary inquiry. Among these cases, the conviction rate was substantially lower (20%, 7/35) and acquittal rate substantially higher (43%, 15/35) than those reported for the entire sample.

3. Relationship to legal outcome of non-medico-legal factors

An important finding of this review is that factors other than the availability of medico-legal evidence have been found to be influential in shaping legal outcomes. In this regard, across the jurisdictions surveyed, much of the research suggests "a regressive class-morality continuum at work that has sharply disadvantaged those ... [victims] perceived to be at the wrong end" (*303*, p.1112). The composite profile of the victim least likely to see her assailant convicted is of an older (*94*, *95*, *155*, *156*, *303*, *305*, *312*, *322*, *337*), poorer woman (*155*, *318*), whose character or reputation is perceived negatively as she is deemed to have been sexually promiscuous, a sex worker, has a psychiatric history, drug abuse problem and/or a criminal record (*151*, *152*, *155*, *162*, *166*, *322*, *326*, *330*, *333*, *337*) (see also *163*, *334*). Moreover, it may also have been presumed that she precipitated the attack by having engaged in "risk-taking" behaviours such as walking alone late at night or hitchhiking (*155*, *313*, *322*, *325–327*, *330*, *333*), and/or had been drinking prior to the assault (*149*, *166*, *305*). Other factors in this profile include that she neither verbally and/or physically resisted the assailant (*94*, *303*, *313*, *315*, *325*, *327*, *336*) nor reported the assault promptly to the police (*151*, *152*, *162*, *312*, *325*, *327*, *328*, *330*, *340*, see also *163*, *334*). Some studies have indicated that being acquainted with the assailant was negatively associated with legal outcome (*63*, *149*, *156*, *164*, *314*, *323*, *327*), whereas others have found the opposite to be true (*45*, *94*, *240*, *286*, *303*, *305*, *318*, *322*, *328*, *337*).

The majority of findings in the studies reviewed also suggest that certain characteristics of offences are significantly associated with the criminal justice processing of sexual assaults. For instance, those cases involving suspects with prior charges and/or convictions (*149*, *162*, *312*, *315*, *326*, *336*, *340*, see also *163*), multiple or a greater number of charges (*312*, *313*, *325*, *340*), penetration (*152*, *286*, *314*, *328*, *337*, see also *163*), physical force or verbal coercion (*63*, *155*, *156*, *303*, *314*, *336*, *341*), and weapons (*95*, *149*, *152*, *155*, *305*, *322*, *324*, *328*, see also *163*) were more likely to progress. The corroborating testimonies of witnesses (*94*, *151*, *162*, *164*, *303*, *312*, *314*, *330*, *336*, *337*, *340*, *342*, see also *163*, *334*, *343*) were also significantly associated with positive legal outcomes.

4. Summary of key findings from the different types of studies reviewed

As seen in Table 4.2, across those studies that examined medico-legal evidence by type, a substantial proportion (10% to 71%) of victims did not sustain physical injuries. The proportion of victims

TABLE 4.2

Summary of rates of medico-legal findings

MEDICO-LEGAL FINDING	RATE IN PERCENT
General physical injuries	29–90
Minor	24–72
Moderate	57–59
Severe	2–24
Ano-genital injuries	9–67
Biological samples	
Sperm/semen	1–59
Seminal/saliva stains	13–21
Acid phosphatase	58–60
Male secretions	70
Biological/non-biological samples	82
Emotional presentation	
Expressed	35–44
Controlled	40–48

for whom there was no documented ano-genital trauma (33% to 91%) or sperm/semen present (41% to 99%) was greater. A slightly larger proportion of victims presented emotively controlled (40% to 48%) than expressed (35% to 44%).

Attrition in sexual assault cases examined was high. Forty-six per cent to 85% of cases did not progress as far as the charge laying/filing stage (e.g., cases were unsolved, unfounded or no-crimed, suspects were not apprehended, warrants were denied, or victims withdrew their complaint or refused to proceed). Among all cases reported to the police, fewer than half (15% to 47%) resulted in charges and less than a third (7% to 32%) in convictions.

As presented in Box 4.1, the data on the impact of available medico-legal evidence on the resolution of sexual assault cases is mixed. A positive relationship between legal outcomes such as charge-laying/filing and conviction and the occurrence of general injury to victims was found in fewer than

▼ BOX 4.1

Summary of relationship to legal outcome of medico-legal evidence by type

TYPE OF MEDICO-LEGAL EVIDENCE	RELATIONSHIP TO LEGAL OUTCOME
General physical injuries	44% of studies found a significant positive association with legal outcome (the apprehension and interrogation of a suspect; the decision to forward a case for prosecution, lay/file charges, fully prosecute; successful prosecution/ conviction; imprisonment)
Ano-genital injuries	29% of studies found a significant positive association with legal outcome (the decision to found a case, lay/file charges; conviction)
Biological/non-biological samples	31% of studies found a significant positive association with legal outcome (the decision to refer a case for prosecution, return an indictment, lay/file charges, fully prosecute; conviction)
Biological samples	8% of studies found a significant positive association with legal outcome (the decision to lay/file charges)
Sperm/semen Sperm/semen/saliva	No study found a significant positive association with legal outcome
Emotional presentation	No study found a significant positive association with legal outcome

half (17/39, 44%) of all pertinent studies. However, less than a third of the studies found that the presence of ano-genital trauma (4/14, 29%) and biological and/or non-biological samples (8/26, 31%) was related to legal outcome. Among those studies that examined biological samples alone, this proportion was 8% (1/12). No study found a relationship between legal outcome and the presence of sperm and/or semen and sperm, semen and/or saliva (0/12, 0%) specifically, nor the documented emotional state of the victim (0/2, 0%). Moreover, the authors of some descriptive studies commented, as noted earlier, that medico-legal evidence appears to be of minimal importance to the courts (*205*, *213*, *338*) and that positive medico-legal findings are not always necessary to secure a conviction (*186*, *205*, *339*).

Notably, in many studies, attrition in the processing of sexual assault cases in criminal justice systems was associated with a victim's age, socioeconomic status, reputation and/or behaviour prior to (e.g., drinking), during (e.g., lack of resistance) and following (e.g., promptness of report) an assault.

5. Limitations of the studies

The failure of the studies reviewed to systematically demonstrate a significant relationship between the documentation of medico-legal evidence and positive legal outcomes should be interpreted cautiously, as most of them have significant limitations, as discussed below.

a. Design

First, almost all the studies were retrospective reviews of medical and/or legal files. This fact may have had implications for the quality and scope of the data examined. The results may have been compromised by problems inherent in all official records, as the data collected may not have been complete or documented consistently for all cases. As well, the number of variables analysed may have been limited by the information available in the pertinent records and, as a result, other theoretically relevant factors that can have an impact on legal outcomes may not have been measured and adjusted for in analyses (e.g., witness accounts and the prior criminal record of the assailant). Second, the number of cases of sexual assault examined in most of these studies was relatively small. Even in larger studies, such as that conducted by McGregor et al., which started with 462 cases of sexual assault, fewer and fewer cases were retained at each successive stage of the criminal justice system (*45*). Consequently, many analyses may have lacked sufficient statistical power to detect significant associations between medico-legal findings and court outcomes. Third, medico-legal variables were measured quite crudely. For instance, in some studies, it was unknown whether biological samples identified as sperm and/or semen by an examiner using direct microscopy were confirmed as such in a forensic laboratory (e.g., *94*, *318*). Also, injury was most often analysed simply as a "yes, no" variable (e.g., *95*, *240*, *322*). As a result, possible associations with the extent of trauma sustained (e.g., minor versus severe injuries) may not have been detected. Fourth, because studies tended to focus their analyses on one or two legal outcomes (e.g., charging or conviction), a relationship between medico-legal evidence and other important investigative and prosecutorial outcomes (e.g., the police decision to found a case and a victim's decision to cooperate or prosecute) may have been missed, as may relevant associations through the pooling of data on females and males in some studies. Finally, these problems were sometimes compounded by the presentation of only descriptive and bivariate statistics, with no adjustment for confounders (e.g., *240*, *305*, *316*, *321*).

b. Generalizability

Almost all the studies reviewed were conducted in industrialized countries such as Australia, Canada, Denmark, Finland, Norway, the United Kingdom and the United States, in large urban centres, and all but a few examined sexual assaults reported in a single jurisdiction. Although such studies are informative, the specificities of local circumstances make it extremely difficult to generalize findings to other locations.

6. Promising research in progress

Research that is beginning to address some of the limitations of the studies reviewed is currently under way in Denmark and South Africa.

a. Denmark

A six-year (November 1999 to December 2005) retrospective chart review of sexual assault cases seen by the Western Danish Sexual Assault Center is being conducted under the leadership of Ole Ingemann-Hansen. As part of a larger study on the epidemiology of rape and attempted rape in the region, a key objective of this work is to examine the relationship of medico-legal evidence to legal outcomes in cases reported to the police. The sample will consist of approximately 300 to 350 adolescent and adult women and men. Among the variables to be examined using multivariate statistics will be types of legal outcome (e.g., identification of a suspect, laying of a charge, filing of a charge, withdrawal of a charge and securing of a conviction), types of medico-legal evidence (e.g., presence of extra-genital injuries, genital injuries, and biological specimens such as sperm and semen), as well as other potentially explanatory factors (e.g., age of the victim, victim having undergone a medical forensic examination, time from the assault to police notification, age of the assailant, prior criminal history of the assailant, relationship of the assailant to the victim and assailant having undergone a medical forensic examination). The data are currently being collected and results are anticipated during 2007 (*230*; O. Ingemann-Hansen, personal communication, 16 October 2005:*344*).

b. South Africa

This project is led by the Centre for the Study of Violence and Reconciliation, Tshwaranang Legal Advocacy Centre and the Medical Research Council. Its objectives are to describe the processing of rape cases by the police and courts at selected police stations and courts in Gauteng province; illustrate the application of the rules of evidence and procedure in trials involving sexual offences; identify factors associated with withdrawals, convictions and acquittals; investigate the effectiveness of specialist sexual offence courts and determine which factors, if any, contribute to greater conviction rates; and develop indicators for monitoring the performance of police and court personnel in relation to sexual offences.

This retrospective review of rape dockets and court documents for rape and attempted rape cases in 2003 is based on a random sample of 70 police stations from Gauteng province that have been selected with probability proportional to size. In each police station, 30 rape dockets have been chosen using systematic sampling of all the closed rape dockets that are available. The total sample will include approximately 2100 rape dockets relating to crimes against women and men of all ages. A data collection sheet is being completed on each docket, which will include sociodemographic information about the victim and perpetrator and details of the rape (e.g., use of force and immediate responses of the victim), reporting to the police, the police investigation, and the progress of a case through the legal system. The medico-legal record is also being copied. It is anticipated that approximately 210 of the dockets will be for attempted rape and 1900 for completed rape. Of the latter, it is estimated that roughly 900 will have legal cases proceeding towards court and at least 150 will result in the conviction of the perpetrator. This is a large enough sample to allow the use of standard statistical approaches to explore factors associated with convictions, including the role of particular forms and the quality of medico-legal evidence, as well as factors associated with other types of legal outcomes. Also gathered will be a large amount of descriptive data on injuries and the quality of the collection and recording of medico-legal evidence. It is anticipated that the collection of data will be completed by the end of 2006 and a report of the findings made available by the end of 2007 (*345*).

SECTION FIVE

Sociocultural conditions of the use of medico-legal evidence

> ***"The medical findings from an examination performed fairly soon after a sexual assault may be extremely important forensically or may be almost totally irrelevant"*** (*347*, p.72).

Male dominance and gender inequality can foster false notions about rape and raped women which, in turn, may have a bearing upon the collection and processing of medico-legal evidence. While in many regions the presence of conflict, poverty and other pressing health priorities may influence the availability of adequate medico-legal services, commitment to the investment necessary for well-designed, effectively implemented and supported responses to sexually assaulted women may also be tied to prevailing rape-supportive attitudes. This section provides a detailed examination of the resources and operations, protocols and technologies, and professionals engaged in the production and use of medico-legal evidence to offer greater insight into how these forces may constitute barriers to the effectiveness of this evidence. It also presents initiatives that hold promise for optimizing the value of medico-legal evidence in relation to the criminal justice processing of sexual assault cases.

1. Contextual background

The social and legal structures of almost every region of the world are suffused with biases against women (*87*, *348*, *349*). Although policies and laws intended to minimize these biases have been adopted in many areas, women worldwide continue to experience injustice, discrimination and abuse (*146*, *348*, *350–354*). These are often compounded by racism and other forms of bias based on income, disability, sexual orientation or immigration status (*355*).

Gender biases commonly have an impact on understandings of sexuality and sexual violence (*13*, *23*, *293*). These, in turn, often translate to a general attitude of suspicion towards women's claims of rape (*13*, *14*, *16*, *20*, *21*, *25*, *63*, *197*, *211*, *356*, *357*), and an inclination to diminish the perpetrator's responsibility while blaming the victim on the basis of her character and behaviour (*14*, *15*, *358*). In both industrialized and developing regions, several negative and harmful reactions stemming from these beliefs may surface when a woman reports having been sexually assaulted to friends, family or the authorities. She may experience stigmatization (*4*, *46*, *145*, *293*, *351*, *359*), be "told by authorities – usually men – to stay silent" (*4*, p.37, see also *360*, *361*) and fear retribution from the assailant (*4*, *239*, *306*, *362*, *363*). In some circumstances, a rape may be interpreted as damaging to the reputation and honour of the victim's male relatives and family, which can have consequences that include accusations of adultery, banishment, forced marriage to the perpetrator, and femicide (*145*, *147*, *364*, *365*). In fact, "in some countries, there is frequently support for family members to do whatever is necessary – including murder – to alleviate the 'shame' associated with a rape or other sexual transgression" (*2*, p.160).

Gender-biases are also often evident in substantive and procedural laws related to sexual offences (*104*, *366*). In countries such as Côte d'Ivoire, Ethiopia, Ghana, Guatemala, Jordan, Lebanon, Malaysia and Mozambique, for instance, the law does not acknowledge that rape can occur within marriage (*141*, *350*, *353*, *367–371*). In many other places, including sub-Saharan Africa, Argentina,

Colombia, England, India, parts of the United States and Mexico City, rape is deemed to be a penetrative act, sometimes exclusively in terms of penile–vaginal penetration and, as such, distinguished from other forms of sexually violent offences (e.g., sexual assault, indecent assault, sexual outrage and molestation), which are typically characterized by less severe penalties (*190*, *198*, *293*, *359*, *372*, *373*). According to Kapur, in India, a victim's past sexual history may be used to discredit her complaint (*373*, see also *293*). In Cameroon and Slovenia, it must be proven that the victim resisted the assailant (*198*, *374*), as it must in Serbia, where it is also required that she show "resistance during [the] entire time the rape is being committed" (*197*, p.3). This need to demonstrate resistance is found in the laws of several American states, as is the requirement for independent corroboration of a complainant's testimony in certain sexual offences (*375*). In the Islamic Republic of Iran, in order to prove rape, a woman's story must be corroborated by four male or three male and two female witnesses (*352*), and in California, Illinois and South Carolina, if a victim does not report a spousal sexual assault promptly, she can lose the right to legal redress (*375*).

There are no (or no longer) formal rules regarding corroboration of a woman's testimony in cases of sexual assault in many areas of the world (e.g., parts of Latin America, Canada, Fiji, Ghana, Israel, South Africa, the United Kingdom, the United Republic of Tanzania, Zimbabwe and most parts of the United States) (*198*, *202*, *293*, *375–380*). However, the requirement of many legal systems to meet "a particular level of proof in order to prosecute", coupled with the widespread distrust of women, has led to the continued demand for authentication of a victim's claim (*20*, p.43). This may be in the form of fingerprints, accounts from witnesses, details from the victim's personal records and physical findings from her body indicating force, resistance and penetration (*190*, *306*, *376*, *381*). In Argentina, for example, while the courts formally specify that a victim need not be physically injured in order to prove rape, in practice, medical documentation of physical trauma is generally expected (*293*).

2. Resources and operations

> ***"Services are not available to the whole population .... This constitutes an important limitation both to the possibility of presenting a complaint, and to the possibility of gathering evidence, since there are no suitable institutions, personnel, resources or necessary equipment to collect ... forensic evidence and keep it safe"*** (*215*, p.66).

Across regions worldwide, negative beliefs and attitudes towards women can influence prevailing political will with respect to the allocation of resources to sexual assault services. An absence of such will can create logistical impediments to the effective collection and processing of medico-legal evidence. Victims may sometimes encounter situations characterized by a lack of well-trained staff, appropriate facilities, supplies and equipment, and interagency and intersectoral coordination. However, in some areas, there are established and emerging initiatives that hold promise for ameliorating such conditions.

a. Staff

The collection and processing of medico-legal evidence involves a number of professional groups, including those who administer medical forensic examinations, the police to whom the findings may be submitted and the forensic scientists who analyse and interpret them. The availability of these professionals and the nature of their training can have an impact on the collection, quality and use of medico-legal evidence.

i. Availability

In many parts of world, delivery of medico-legal services is hampered by a lack of tangible resources (*198*, *293*, *382*). Even in some regions of industrialized countries, where considerable numbers of

specially trained professionals can be found in health care settings, police facilities and forensic laboratories (*179*, *185*, *196*, *223*, *229*, *383*), many of the services within which they work are challenged by constrained funding capabilities (*179*, *190*, *223*, *295*, *303*, *384*, *385*). In hospitals in Canada and the United Kingdom, where physicians, nurses and nurse examiners may administer sexual assault kits on-call, acquiring and retaining staff to conduct examinations that may last several hours can be difficult, as they may be otherwise employed (*179*, *223*, *231*). In one region of Australia, a shortage of police officers resulting from "cuts" made since 2003 has been cited as contributing to low prosecution and conviction rates (*386*). In a survey conducted in 1998, it was found that more than half of prosecutor-respondents in Ontario, Canada were so overextended "they seldom had time to interview victims or to complete a sexual assault checklist required by the Ministry of the Attorney General" (*303*, p.1125, see also *293*). With regard to forensic analysts, even in jurisdictions where their practices are regularized, it has been reported that workloads have become excessive (*387*, *388*). One result has been sizeable backlogs of unanalysed findings as, for instance, in the United States, where it is estimated that more than 180 000 sexual assault kits have not yet been processed (*190*, *387–389*).

In certain areas of Central America, Ghana, India, Peru, Uganda and the United Kingdom, among others, there are few trained medico-legal professionals and those few can be difficult to access (*146*, *176*, *181*, *193*, *194*, *198*, *215*). Amnesty International has reported that in Timor-Leste, only one physician in Dili has been trained specially to collect evidence in rape cases, leaving victims in the districts to be seen by local doctors who have not received instruction in medical forensic examination techniques (*390*). As identified in a Human Rights Watch summary of medico-legal services in Brazil, Pakistan, Peru, the Russian Federation, South Africa and Turkey, the minimal state support for the employment and training of sexual assault examiners in some of these countries means that victims are unable to obtain timely medical forensic examinations (*146*), which can lead to the loss or degradation of evidence. Women in rural and remote areas (e.g., northern parts of Canada) may be forced to travel long distances to be seen by examiners (*179*), which in countries such as Uganda may be dangerous due to political instability (*198*). Moreover, because of shortages of examiners, in many places, victims may face long waits once they reach medical forensic examination sites (*215*, *231*, *356*). In Belize, as in Kenya (*211*, *266*), "[t]he low level of access to forensic examiners results in a waiting time that can stretch to several days ..., to the point where the wounds have healed and the evidence is lost" (*221*, p.32). Even in jurisdictions where services are more readily available, detrimental time lags may occur. In some emergency departments in Canada, the United Kingdom and the United States, for instance, victims can wait many hours before being seen (*194*, *237*, *391*, *392*). Compounding these obstacles, in parts of Central America, the Democratic Republic of the Congo and Egypt, for example, they must often arrange their own transport to facilities that provide medical forensic examinations, the cost of which can become another barrier to the collection of evidence, especially for poorer women (*4*, *210*, *215*).

Amidst these dilemmas exist more innovative and integrative services that have potential value for increasing the prompt examination of sexual assault victims and the viability of medico-legal evidence for use in the courts. For instance, the one-stop crisis centres in Bangladesh, Malaysia, South Africa and Thailand can bring together medical, law enforcement and legal professionals in a single facility (*393–399*) (see Box 5.1). In the United Kingdom, sexual assault referral centres have been credited with "hav[ing] the potential, alongside other improvements, to bring more offenders to justice on the basis of a better standard of forensic evidence" (*400*, p.39). In jurisdictions such as Argentina, Brazil, Colombia, Costa Rica, Ecuador, Nicaragua, Peru and Uruguay, specialized women's police stations, though controversial, have increased "the likelihood that women will receive forensic exams" (*382*, p.27).

▼ BOX 5.1

Thuthuzela Care Centres

In June 2000, the first Thuthuzela Care Centre was opened in Manenberg, Cape Flats, South Africa (*393*). Responding, in large part, to the alarmingly high rates of sexual assault (*478*, *479*) and correspondingly low rates of arrests and convictions (*480–482*), this centre was designed to house together the full range of professionals who traditionally care for victims and gather and process the related medico-legal evidence in an independent manner. To this end, it was staffed with health workers and with investigative and prosecutorial professionals who were designated to work exclusively on rape cases (*393*, *482*), and linked to several police stations and a specialized sexual offences court (*396*). The intention was that persons who had been raped would receive more "caring and dignified treatment, and more effective prosecution of their cases in the justice system" (*393*, see also *482*). It was believed that this "one-stop, integrated response" could ensure the proper handling of medico-legal evidence in more aggressive pursuit of the aim of bringing offenders to justice (*397*, see also *393*, *483*). While the model has not been evaluated systematically, it has been reported that it reduces the waiting time for medical forensic examinations and has "already improved the process of reporting and prosecuting rape and other sexual offences" (*397*, see also *484*, *485*). As of 2005, 12 Thuthuzela Care Centres had been established in the country and there were plans to create another six by the end of 2006 (*483*). Although the police have now been withdrawn from the South African centres and come only when called (R. Jewkes, personal communication, 29 November 2006:*486*), more recently, this approach has also been adopted in other parts of Africa, as well as in regions of Latin America and south-east Asia (*393*, *397*, *483*).

ii. Training

Within many medico-legal services, instruction in collecting and processing evidence has become increasingly specialized and refined (*250*, *401*, *402*). In Thailand, Grisurapong has reported that training initiatives for some hospital-based sexual assault examiners have enhanced their technical knowledge and improved services (*224*). Elsewhere, the field of forensic nursing has produced a new type of sexual assault practitioner known as the forensic nurse examiner (FNE) or sexual assault nurse examiner (SANE) who undergoes relatively extensive, specialized training (*181*). This typically qualifies them to offer health care related to the assault, as well as to collect and document medico-legal evidence (*403–405*). In parts of Canada and the United States, FNEs are "specially trained in forensic evidence collection, sexual assault trauma response, forensic techniques using specialized equipment, expert witness testimony, assessment of injuries, STD treatment, and pregnancy evaluation and treatment" (*406*, p.43, see also *407–409*). Some data suggest that this expertise has led to better-collected and more viable medico-legal evidence (*227*, *402*, *410–412*) (see Box 5.2). As a result, since their inception in the United States, FNE/SANE programmes have increasingly been

▼ BOX 5.2

Forensic nurse examiners

To date, it has been reported that forensic nurse examiners have:

- reduced waiting and assessment times for medical forensic examinations (*410*);
- increased the number of sexual assault kits completed (*227*);
- generated more accurate and complete sexual assault kits (*402*, *412*);
- improved the chain of evidence or custody (*402*, *412*);
- aided law enforcement officials in collecting information and laying/filing charges (*227*);
- enhanced the likelihood of prosecution and conviction (*227*).

developed and implemented in other areas (e.g., China (Province of Taiwan), India, Puerto Rico, South Africa and the United Kingdom) (*179*, *181*, *182*, *242*, *250*, *259*, *261*, *262*, *403*).

In contrast, in other areas of the United States and in certain regions of Guatemala, Pakistan, the Philippines, South Africa and the United Kingdom, among others, poorly trained sexual assault examiners, as well as law enforcement professionals and forensic analysts may reduce the efficacy of medico-legal evidence (*18*, *141*, *146*, *194*, *198*, *242*, *251*, *391*, *413–415*). In areas of Egypt and India, it has been observed that many physicians are inadequately prepared to collect and testify to this evidence (*193*, *210*, *416*). In one hospital in New York City, New York, sexual assault examiners were noted to have "los[t] key evidence, including underwear and vaginal swabs" (*392*, p.61). It has been found that in several eastern European countries, police have often been uninformed about their role in relation to medical forensic examinations (*197*). In Kenya, as in Jamaica (*55*), investigations have been documented as "poorly carried out" (*266*, p.57), and there have been instances of police instructing victims to wash themselves following a rape before medico-legal evidence has been collected (*211*). In South Africa, there have been reports of police officers providing victims with crime kits that have been used previously (*213*) and, in Pakistan, forensic analysts have been found to have mishandled specimens collected from victims, leading to the resulting findings being usually unreliable (*357*). Where prosecutors and judges have not been suitably trained to deal with cases of sexual violence, as has been described, for instance, in Rwanda (*51*), medico-legal evidence has not been interpreted and used properly (see also *27*, *30*, *91*). At the same time, however, with respect to law enforcement, it is encouraging to note that recent attempts have been made by the Rwandan National Police to sensitize officers to issues of sexual violence, including the need to prioritize such cases and expedite the process of collecting medico-legal evidence (*51*). Similarly, in 2002, it was noted that the Lesotho Police Service had begun training its officers "on the appropriate handling of rape cases" (*212*, p.71).

b. Facilities, supplies and equipment

The availability of suitable facilities with appropriate supplies and functional equipment can optimize the collection, integrity and use of medico-legal evidence. Yet, in many regions (e.g., parts of Central America and the United Kingdom), facilities for examining victims of sexual assault have been documented as inadequate (*215*, *231*). For example, an early study conducted in England by Temkin indicated that some examination rooms in London and Sussex were "beset with difficulties" (*176*, p.829). More recently, across the United Kingdom, Pillai and Paul identified similar problems with police victim examination suites (*231*). Forensic laboratories in parts of the United States have been found to be plagued by "serious inadequacies" (*417*, p.276) and, in a number of other areas (e.g., parts of Central America and India), facilities have been documented as being in short supply (*215*, *294*). For instance, in Egypt,

> [t]here are five chemical forensic laboratories distributed throughout the country, yet there is only one central medical forensic laboratory for the whole country ... and all specimens are transported to it, a matter that affects the speed of investigations and safety of evidence (*210*, p.8).

In addition, a shortage of studios capable of developing photographs of documented medico-legal evidence has been noted in Uganda (*198*).

An adequate supply of established protocols and the corresponding apparatus is necessary to ensure the collection of high-quality evidence. In some jurisdictions, sexual assault kits have been reported as often being unavailable for gathering and storing findings (*100*, *146*, *198*, *212*, *213*, *215*, *217*). A situation analysis of medico-legal services in Egypt highlighted the scarcity of kits within relevant agencies, a condition that prompted one study respondent to conjure the Egyptian proverb: a "'clever woman knits with a donkey's leg', i.e., they had to do the work with what they have at hand"

(*210*, p.55). In its review of medico-legal services in Brazil, Pakistan, Peru, the Russian Federation, South Africa and Turkey, Human Rights Watch documented cases where the swabs or gloves that should be used for collecting biological evidence were frequently unobtainable, the equipment non-sterile and the lighting insufficient (*146*). In one study in the Philippines, it was noted that most of the colposcopes were not in working order and basic supplies such as combs, tweezers, and paper sheets and bags for collecting and holding evidence were often in short supply (*217*). Facilities in parts of the United Kingdom have also been reported as being inadequately stocked (*194*). In South Africa, one of the reasons so few practitioners ever send a victim's clothes for forensic analysis has been a lack of spare clothing at the medical facilities where she is seen (*242*). Also in South Africa, "[o]nly 15.2% of facilities were found to have a lockable cupboard for storing evidence .... Thus completed kits were often left on a nurse's desk for collection by the police; ... in clear breach of requirements to protect the chain of evidence from possible tampering" (*242*, p.499). Difficulties in gaining access to refrigeration facilities for the storage of biological samples have been noted in Kenya (*211*). With respect to processing evidence, in parts of the United States some forensic laboratories have been reported to be poorly maintained (*417*) and unable "to analyze and process DNA samples in a timely fashion due to limited equipment resources ... [and] outdated information systems" (*418*).

On a more promising note, a recent World Health Organization initiative has led to the development of widely-accessible standardized medico-legal response guidelines for use in any setting, regardless of the status of available supplies and equipment (*28*) (see Box 5.3).

▼ BOX 5.3

World Health Organization guidelines for medico-legal care for victims of sexual violence (*28*)

As part of a broader effort addressing health sector responses to victims of sexual violence, the World Health Organization (WHO) convened a group of experts in 2001 to consult on the development of standard guidelines for the provision of consistent and high-quality medico-legal services worldwide. The impetus for this initiative came from the identified need for these responses to reflect more closely the health and welfare requirements of victims, as well as to effectively facilitate the collection of corroborative medico-legal evidence.

The document that resulted from the work of this group, *Guidelines for medico-legal care for victims of sexual violence*, covers a range of topics. They include practical aspects of care such as the need for appropriate facilities, equipment and training for health workers, as well as the consideration of important ethical issues. The guidelines also offer detailed descriptions of how to classify, collect and document medico-legal evidence, and how best to report on these findings. The recommendations and step-by-step instructions provided are unique in that they can be applied across a wide range of settings and adapted to specific regional resources, policies and procedures. Even in locations where resources are severely constrained, the guidelines offer strategies for optimizing facilities, for instance, in terms of accessibility, security and cleanliness.

Since their release in 2004, the guidelines have been widely disseminated. As of 2005, approximately 1600 printed copies had been distributed and even more downloaded from the Internet (*487*). They have been translated into Spanish, with Arabic, French and Portuguese versions to follow (*487*; C. Reis, personal communication, 17 August 2006:*488*). Field trials of the protocol began in 2004 in Jordan, Mozambique, Nicaragua and the Philippines (*487*, *489*). According to the Regional Advisor for Disability and Injury Prevention and Rehabilitation for WHO's Regional Office for Africa, the guidelines are increasingly being used in that region (*489*). In addition, the Council of Europe has recently passed an inter-ministerial resolution that recommends the adoption of the guidelines by governments and relevant organizations (*489*).

c. *Interagency and intersectoral coordination*

Effective coordination between post-sexual assault service sectors can help to facilitate the successful collection and processing of medico-legal evidence. The relevant professionals and agencies may have varying focuses, procedures, priorities, timelines and commitments (*295*) but must nevertheless work together in the interests of generating and preserving viable evidence. In some countries (e.g., parts of Denmark, Iceland, Malaysia and Norway), one-stop crisis centres and centres of excellence, despite some problems, have been relatively successful in establishing coordinated responses to sexual assault victims (*2*, *223*). Intersectoral collaboration has also been well-established in areas such as Ontario, Canada, where sexual assault care and treatment centres (SACTCs) have,

> fostered extensive community networks of local, district, and regional agencies working with victims/survivors of sexual violence [including] ... partnerships ... with and between the police, Crown attorneys, hospitals, child protection services, boards of education, shelters, rape crisis centres, multicultural agencies, sexual health clinics, military bases, and other victims/survivor services (*179*, p.24).

Du Mont and Parnis have noted that for these SACTCs,

> [r]ecognition of complementary services has ... [facilitated] a more integrated, coordinated, and efficient system of dealing with sexual violence ... [and has led to] ... better success in investigations [and in] court proceedings (*179*, p.25).

Similarly, in the United States, some "[p]olice departments have found that ... teams [involving law enforcement officers, prosecutors, medical practitioners, social workers, and rape victim advocates] benefit them in that they receive reliable, consistent medical examinations, which yield more accurate and relevant information than previously available" (*419*, pp.266–267). Even in settings with fewer resources, collaboration between systems has the potential to enhance the collection and processing of medico-legal evidence. A pan-African medico-legal workshop on sexual violence held in South Africa in 2002 is an encouraging example of the value of intersectoral and interdisciplinary knowledge-sharing that can build capacity in this area (*212*, *420*) (see Box 5.4).

There are some regions, including parts of the United States, however, where effective collaborative networks have not been established (*406*). The Human Rights Watch review of responses to sexual assault in Brazil, Pakistan, Peru, the Russian Federation, South Africa and Turkey found "very little coordination between law enforcement agencies, the criminal justice system and the health sector in most [of these] countries" (*146*, p.6), as is also the case in parts of the Philippines (*18*) and Egypt (*210*). This is true of regions in India as well where, Kapur has commented, "the police, medi-

▼ BOX 5.4

Medico-legal workshop on the care, treatment and forensic medical examination of rape survivors in Southern and East Africa

In August 2002, Amnesty International, the South African-based Independent Medico-legal Unit and the United Kingdom Community Fund co-sponsored a multination, intersectoral and interdisciplinary workshop in KwaZulu-Natal, South Africa focused on building capacity in justice and health care responses to rape victims. Participants from 10 African countries represented expertise in health care, psychology, forensic pathology, law enforcement, human rights, law and service delivery for victims of sexual violence (*212*, *420*). The workshop facilitated an exchange of experiences and the skills believed necessary for good practices in the "effective forensic medical examination of rape survivors and the collection and preservation of evidence [as well as for the] improve[d] ... efficiency of the police and the criminal justice system in the investigation and prosecution of crimes of sexual violence" (*212*, p.3). Many of those in attendance reported that they had "learnt something of value to take back with them to ... address local problems" (*212*, p.166).

cal health intervenor, lawyer, and trial court all function irrespective of one another" (*373*, p.44, see also *416*). In Kenya, where law enforcement and forensic services are housed in different ministries, "most samples never get to the government chemist and feedback to the district police station for action is literally non-existent" (*421*).

3. Protocols and technologies

> ***"In a society where hard facts and scientific truths are revered, the purpose of the [sexual assault] kit is to provide corroboration in the form of meticulous scientific evidence. As such, it attempts to produce 'hard' physical evidence that will withstand scrutiny better than more subjective emotional/psychological measures"*** (*186*, p.110).

Increasingly, standardized protocols designed to facilitate the reliable collection of valid and potentially valuable medico-legal evidence are being developed and implemented across the world. However, it should be recognized that they are created within cultures that are permeated, to varying degrees, by rape myths, and that their associated technologies may be technically limited. In some circumstances, these factors can compromise the ability to generate evidence that might otherwise lead to a positive legal outcome.

a. Tools

According to Green and Panacek, one of the most important developments in caring for victims of sexual assault has been the formation and refinement of standardized protocols (*188*) (see Box 5.3). These tools and the sexual assault kits that often accompany them provide examiners with precise instructions, documentation forms and implements that allow for the collection of evidence in a consistent manner (*174*, *193*, *202*, *214*, *218*, *245*, *273*) (see Box 3.2). It is widely held that their use "can increase the likelihood that evidence collected will aid in criminal case investigation, resulting in perpetrators being held accountable and further sexual violence [being] prevented" (*182*, p.3).

The evidence generated through such tools, however, frequently fails to reflect the full range of victims' experiences of sexual assault. For instance, the emphasis on the documentation of physical trauma as proof of violation (*187*, *193*, *202*, *204*, *268*) can be problematic given that many victims may sustain no physical injuries beyond the harm inherent in sexual assault (e.g., *91*, *95*, *240*, *317*, *321*, *324*, *341*). Likewise, in some jurisdictions, a woman's emotional state, documented at the time of the medical forensic examination, can be used as evidence of having been sexually assaulted (*45*, *186*, *193*, *205*, *381*, *422*). If emotively expressed (e.g., the victim is crying, upset, shaking and/or angry), she can be assumed to have experienced a recent trauma (*198*, *302*, *423*). However, there is some research to suggest that similar numbers of victims present emotively controlled, that is, appear calm, detached and/or rational (*45*, *57*, *94*).

Biological findings, especially sperm and semen, are often regarded as pivotal evidence in the legal processing of sexual assault cases (*187*, *189*, *190*, *308*, *424–426*), and detailed instructions and implements for their collection are included in most protocols and kits. In situations where a woman has been sexually assaulted by a stranger, sperm and semen may be used to identify the perpetrator (*146*, *180*, *187*, *190*, *193*). In this regard, however, their value may be limited, since a substantial proportion of victims are assaulted by someone known to them and, in these instances, consent is often the defence (*6*, *7*, *46*, *57*, *91*, *94*, *180*, *182*, *306*, *404*, *427–430*). These types of evidence may also be gathered as proof of penetration where forced intercourse is a requirement for the legal determination of rape (*190*, *197*, *198*, *293*). Even in jurisdictions where this is not the case, such evidence is often pursued (*186*, *187*), although sperm and semen can be lost or the quantity significantly diminished as a result of delays in examination (*182*, *187*, *286*, *347*, *391*); a victim having bathed, douched, urinated and/or defecated after being assaulted (*187*, *286*); and an assailant having used a condom,

ejaculated away from the body of a victim, not ejaculated (*182*, *268*, *347*), undergone a vasectomy (*182*, *186*, *187*, *286*) or penetrated the woman with an object rather than his penis (*182*).

Over the years, a considerable body of literature advocating the use of technologies to document the presence of biological specimens and micro-trauma has been established (*182*, *199*, *204*, *222*, *431–438*). For instance, it has been suggested that the Wood's lamp is a useful tool for fluorescing semen (*199*, *204*, *222*). However, an American study from 1999 found that physicians were "unable to distinguish between semen and other common products [e.g., ointments and creams] using ... [this tool]" (*434*, p.1342). The colposcope, in much the same manner, has been argued to be a valuable part of medico-legal practice (*66*, *216*, *220*, *250*, *324*, *439*, *440*). Observation with this tool has been found to increase the number and types of ano-genital injuries documented (e.g., *324*, *432*, *436*, *437*, *441*, *442*). It has been posited that it may help address the ambiguous nature of these sorts of findings by distinguishing between injuries incurred from "vigorous consensual intercourse" (*201*, p.360) and those sustained during non-consensual sexual contact involving penetration (*97*, *265*, *438*). However, studies conducted on the effectiveness of colposcopic technology for these purposes thus far have been criticized for problems in their design and method (*265*, *432*, *433*, *442*). In addition to these concerns, the question has been raised regarding claims for its increased use: if the documentation of gross visible genital trauma is often not associated with a positive legal outcome, then what value is there in documenting micro-injuries (*45*)? In its medico-legal care guidelines published in 2003, the World Health Organization did not recommend the use of Wood's lamps and noted that colposcopes are not an essential component of medical forensic examinations, a conclusion that may be especially pertinent to resource-poor settings where access to such equipment and the personnel trained to operate them may be unfeasible (*28*).

b. Tests

There is a growing body of research indicating the fallibility of some forensic tests used in cases of rape (e.g., tests that identify or characterize semen and other body fluids) (*187*, *417*, *443*, *444*), and the ambiguous results they can produce (*297*). In a comprehensive review of these tests, Ferris and Sandercock concluded that positive findings are highly time-dependent and that "many of the procedures ... do not generally have the level of sensitivity that is usually acceptable for medical tests and procedures" (*187*, p.344). For instance, they found that reported detection rates for sperm and seminal products were less than 40% and decreased over time. Since their review, efforts have continued to be made to improve upon these tests (*388*, *445–447*), although there are "still many deficiencies in current knowledge regarding optimum sampling techniques, persistence [of biological samples over time] and how the findings should be interpreted" (*424*, p.162).

4. Professional subcultures and practices

> ***"The court system presents its own set of hurdles for women seeking redress. Magistrates and judges often have discriminatory and sexist assumptions about women that prejudice the few cases that do reach the courts. State prosecutors have little or no training in handling cases of sexual and other violence against women and are largely ignorant as to the significance and interpretation of forensic medical evidence in such cases. Judges allow defense counsel free rein to introduce inflammatory evidence and to attack the victim's character and prior sexual history even when this is patently irrelevant"*** (*357*, p.4).

Many post-sexual assault services' professional subcultures lack relevant policies on the collection and use of medico-legal evidence and are often characterized by informal practices. Even within those that are circumscribed by well-established protocols and procedures, discretionary activities are evident. Whereas certain professionals are sensitive to gender-biases with respect to sexual

assault, in some instances, their actions and those of others may be informed by false beliefs about rape and rape victims. This, coupled with occurrences of poor and corrupt conduct, may have a negative impact on the evidentiary process. However, a number of recent initiatives aimed at addressing the problematic attitudes of professionals are encouraging with respect to potentially improving the efficacy of medico-legal evidence.

a. Sexual assault examiners

In some jurisdictions (e.g., parts of Belgium, Canada, India, Switzerland, the United Kingdom and the United States), sexual assault examiners have a dual and what has sometimes been described as a conflated or contradictory role, providing both health care and forensic services (*19*, *151*, *182*, *186–188*, *204*, *218*, *294*, *296*, *422*, *448–451*). This inherent duality can lead to tensions (*186*, *187*, *422*). In some service configurations, the collection of medico-legal evidence has traditionally been prioritized (*193*, *215*, *231*). In others, it appears that the mental and physical health of the victim takes precedence (*18*, *28*, *202*, *218*, *423*, *452*). For example, a study in Canada found that some sexual assault examiners regularly deviated from the standard directives for gathering evidence, often in the interest of protecting a victim from what they perceived to be either a traumatizing procedure or items that could potentially be used against her in court (e.g., having presented emotively controlled) (*202*, *422*). While these practices show respect for the principles of woman-centred care, their implications for the use of medico-legal evidence are not known.

Prakash, George and Panalal have noted, "health care is provided in a setting, which is a microcosm of society and it reflects, in an enhanced manner, the dominant prejudices and biases of society" (*453*, p.199). This manifestation is evident as well in post-sexual assault practices, where examiners have appeared discriminatory (*146*, *294*). For instance, in Sussex, England, it was found that some of them frequently disbelieved victims (*176*), as has also been noted in parts of Egypt (*210*) and Bangladesh (*206*). In Pakistan, a supervising doctor from the government forensic laboratory in Lahore told Human Rights Watch interviewers, "better forensic techniques [are] required to protect men from false accusations of rape" (*357*, p.49). There has been a tendency among some examiners, in these and other locations, to blame women for what they perceive to be their role in having precipitated the sexual assault through their appearance, mode of dress or actions (*176*, *210*, *357*). This can have implications for what evidence, if any, is collected. Commenting on such practices in India, Prasad noted,

> [i]n contrast to the specific guidelines in medicolegal protocol, ... physicians routinely comment on the age, virginity, and character of a woman to demonstrate that she is sexually experienced, old enough, or promiscuous enough to consent to sexual relations, thereby raising doubts about the commission of rape (*294*, p.492, see also *373*).

In the Canadian study of sexual assault examiners, it was found that there were circumstances in which some respondents stated that they would encourage particular victims to undergo a medical forensic examination. Such circumstances typically mirrored societal notions of a "real" rape (i.e., one or more stranger assailants, who serially rape with a weapon, and vaginally or anally penetrate and physically injure the victim) (*202*, see also *296*, *403*).

In extreme situations, the corrupt activities of some sexual assault examiners become barriers to the proper collection of medico-legal evidence. According to the Head of Clinical Forensic Medicine at an Australian institute:

> Patients, investigators and other parties may bring considerable pressure to bear on practitioners to provide an interpretation that would resolve an issue. These coercive forces may be direct and forceful, or subtle and insidious. They may be particularly strong where the practitioner has a formal relationship with the investigating authority (e.g., an employee of that authority), when a close relationship has developed between investigator and forensic practi-

> tioner (blurring the individual roles) or if there is some inducement for the practitioner to take a particular stance (*454*, p.189).

In India and in Bangladesh, for instance, accounts have been given of sexual assault examiners being paid to generate certain results and of representatives of the assailant pressuring doctors to alter their statements (*206*, *452*). D'Souza noted that in the case of a young girl from Gujarat, "the medical examination was conducted and recorded in such a way that the doctors shielded the policemen and issued false certificates" (*452*).

Counterpoint to some of these troublesome practices, in parts of China, Hong Kong Special Administrative Region, it has been noted that emergency department physicians generally have favourable attitudes towards rape victims (*455*). This has also been reported to be true of many forensic nurse examiners whose specialized training often includes being sensitized to rape myths and rape-supportive attitudes (*408*, *411*, *456*). And, in Bangladesh, the Woman Friendly Hospital Initiative has developed a programme of training for staff that is partially based on changing their attitudes and perceptions in relation to violence against women with the intention of enhancing the quality of their forensic practices (*206*, *252*) (see Box 5.5).

▼ BOX 5.5

Woman Friendly Hospital Initiative in Bangladesh (*206*, *490*)

As of 2002, the Bangladesh Woman Friendly Hospital Initiative had been launched in 30 of the country's hospital facilities. As a part of a larger project aimed at decreasing maternal mortality rates, the management of violence against women was identified as a priority in this project. Importantly, emphasis was placed on enhancing technical skills, as well as the attitudes and behaviours of hospital staff in order to offer respectful, equitable, timely, adequate and appropriate care to victims (*252*). It was believed that if they could be assured of such attention, women would be more likely to use these services for health care treatment and would have their injuries properly documented. It was also recognized that "the medical legal aspects of sexual violence needed to be developed more extensively and that the personnel ... who do the examinations ... needed to be trained specifically on this topic" (*252*, p.S48). To this end, a six-day special training workshop was developed, one day of which was focused on "exploring the attitudes, values and assumptions related to violence against women ... [and another] on sexual assault and the clinical and the forensic management of affected women" (*252*, p.S48).

b. Police

As "the gateway into the criminal justice system for rape victims, regardless of the legal system in question", the police represent a critical point in the post-sexual assault evidentiary process and, in this regard, can become a barrier to evidence being collected or processed (*451*, p.17). As Brown has noted,

> [i]t is virtually impossible for a woman who has been the victim of sexual or gender based violence to achieve redress through the criminal justice system unless she can first get the police to take her report of the crime. It is the act of filing an official police report that triggers any subsequent investigation, arrest and prosecution (*146*, p.7).

The decisions made by police that may hinder or halt the progression of rape cases can be shaped by erroneous notions of sexual assault and sexually assaulted women (*20*, *63*, *185*, *357*). As Human Rights Watch has observed, many women who report sexual assaults "encounter obstacles from the very beginning of the process" (*357*, p.53). For example, in Ethiopia, where "for the average police investigator rape means 'breaking the hymen'" (*198*, p.19), without medical proof of virginity prior

to being victimized, the complaint often will not be registered. According to Jordan, in New Zealand, a "dominant and destructive characteristic underpinning police participation in rape investigations arises from exaggerated beliefs in the prevalence of false rape allegations" (*25*, p.32, see also *20*, *160*). Similarly, in the United Kingdom, no-crime decisions can be based on the opinion that the complaint was malicious or false (*63*). Such attitudes have also been documented in Jamaica, Kenya, Pakistan and South Africa, where some victims have had a difficult time getting the police and prosecuting authorities to believe that they have been violated (*55*, *211*, *356*, *357*). As a measure of a victim's veracity, police officers in some parts of the United States may even administer a polygraph or computerized voice-stress test (*457*). In other jurisdictions, they may base their assessment of a woman's claim of sexual assault upon her willingness to undergo a potentially invasive and lengthy medical forensic examination (*186*, *422*, *458*). Kelly has noted, "we do know from the [United Kingdom] and other jurisdictions that refusal to have a forensic examination is often a factor in cases not being proceeded with" (*180*, p.12, see also *186*, *451, 458*).

Police responses to sexually assaulted women have also been documented as belligerent and corrupt. According to Human Rights Watch, some raped women in Pakistan have been intimidated and threatened by the police (*146*). Fedkovych has reported that across several eastern European countries, officers have sometimes been noted to humiliate sexually assaulted women, accuse them of having provoked the sexual assault and to force them to confront their assailants at police stations (*197*). Such behaviours have been documented in Kenya as well, where police have been known to embarrass, ridicule and verbally abuse women who seek their assistance (*211*). In certain regions of Brazil, Pakistan, Peru, the Russian Federation, South Africa and Turkey, women have been "repeatedly told by the police that they should not pursue pressing charges against the perpetrators. ... [because] they would bring about dishonor on themselves and their families", the consequences of which can instil enough fear in them to prevent them following through with their complaints (*146*, p.8). In Philadelphia, Pennsylvania, in 2004, it was discovered that "police investigators had downgraded or ignored hundreds of sex crimes" (*459*). Responding to these allegations, one retired officer stated his belief that "'half the girls that came in ... were lying'", labelling the sex-crime service there, "'The Lying Bitches Unit'" (cited in *459*). Equally insidious, in Pakistan, it has been noted,

> [t]he police commonly stall on registering complaints in order to create leverage to demand bribes from both the complainant and the accused in blatant moves to obstruct justice. ... [and there have also been documented] cases in which the police intimidated or pressured complainants to drop charges after accepting bribes from the accused (*357*, p.53).

Similarly, in Kenya, women wanting access to official forms required for medical forensic examinations have often had to bribe officers (*211*) and, in South Africa, "'lost files' are ... a common problem, ... a euphemism meaning that someone else had blocked the case or that the police were asking the survivor for a bribe for the case to proceed" (*378*, p.39, see also *460*).

In the face of instances of poor police practices, in some areas, sexual assault sensitivity-training is increasingly becoming a standard component of law enforcement preparation. This instruction is designed to help eliminate or mitigate the effects of negative attitudes towards rape victims on the progression of cases (*185*). To this end, for example, the National Center for Women and Policing in the United States has developed specialized police instruction curricula for investigation of acquaintance sexual assaults, highlighting different interviewing techniques "for those cases in which a consent defense – rather than identity – is raised" (*185*, p.265, see also *461*).

c. Forensic analysts

Forensic analysts or scientists are trained to receive, handle, analyse, report on and sometimes testify to medico-legal evidence. Forensic operations in many regions (e.g., parts of Australia, Canada and the United States) are well-established and professionalized (*295*, *417*, *422*). This fact reinforces

the perception that analysts can objectively "give a definitive answer to guilt or innocence" (*443*, p.157). However, their actual practices may be subjective, shaping what becomes available as medico-legal evidence in a given case, together with how it is analysed and interpreted, both in written reports and as testimony given in court (*174*, *297*, *417*, *422*, *424*, *443*). For instance, interviews with forensic scientists in one region of Canada revealed that personal characteristics of the victim made available on the history forms of sexual assault kits and from police reports sometimes influenced how they prioritized cases and what was to be analysed (*174*, *422*). Similarly, in the United States, it has been observed that forensic analysis "often depends too much on the personal qualities of each individual forensic scientist" and that their idiosyncrasies may determine the results they produce (*417*, p.256). Scientists "examining identical problems can express opposing views and reach different conclusions" (*462*, p.21, see also *463*). They will sometimes invoke ad hoc explanations of results based on their own subjective rulings rather than empirical testing and may make judgements based on ambiguous findings both in the laboratories and courts (*297*, *422*, *443*). Writing about analysts working in (often private) American forensic laboratories, Thompson further noted that their objectivity and neutrality might at times be compromised:

> Whether a test is interpreted as a damning incrimination or a complete exculpation may depend entirely on a subjective determination. The analysts making these determinations are not blind to the expected results of the test. They often are in direct contact with detectives and know all about the case (at least from the police perspective). Consequently, there is a danger that the analysts may intentionally or unintentionally be biased toward the police theory of the case when making subjective determinations (*297*, p.1123).

More recently, Koppl has commented, "[f]orensic workers tend to identify with the police. ... [and] seek out evidence supporting the police theory" (*417*, p.261). In fact, such practices have led to the prosecution of some analysts in the United States "for misconduct involving the fabrication of incriminating DNA data" (*443*, p.91).

Although negative practices such as these occur, some initiatives that could strengthen the quality of the medico-legal work of forensic analysts have been proposed (e.g., *417*). For instance, a new Forensic Sciences Institute based on enhanced specialized post-graduate education and leading-edge research training for forensic science practitioners is expected to commence in Canada in 2007. The first undertaking of its kind in that country, instruction will cover advanced technical skills, best practices in scientific management, proper presentation of evidence in court, and studies on ethical and legal issues (*464*).

d. Legal personnel

Following the collection and analysis of findings, medico-legal evidence is potentially made available for use in the legal arena. Herein, focus on extra-legal considerations related to anti-woman and rape-myth centred attitudes of court personnel (*293*, *332*, *357*, *465*, *466*) may reduce the efficacy of the evidence. Spohn and colleagues found that in Dade County, Florida prosecutors sometimes based their charging decisions on assessments of a victim's credibility (*322*). In some Latin America countries, they may gather evidence of a victim's prior sexual activities (*293*). In Canada, it has been noted that defence attorneys frequently attempt to discredit a woman through the "maligning of her behaviour, her dress and her character – all in a sexualized context" (*466*, p.113). Similarly, observations of practices in some Indian courtrooms have labelled them as "fishing expedition[s] of women's characters" (*373*, p.22).

Some judges also appear to have these biases against women. In jurisdictions as diverse as Colombia, Fiji and the United States, they have been reported to reinforce sexist stereotypes in their statements (*293*, *467*, *468*) and, in Argentina, to blame the victim "for putting herself at risk" (*293*,

p.23). These practices have been evident in India (*469*) as well as in Canada (*16*) where, for example, in a case involving a 17-year-old sexual assault victim, the judge,

> commented on her clothing: 'the complainant did not present herself [to the accused] ... in a bonnet and crinolines' (*470* cited in *471*, p. 46); her past sexual history and her lifestyle: 'she was the mother of a six-month-old baby and ... along with her boyfriend, she shared an apartment with another couple' (*470* cited in *471*, p. 46); and the way in which she reacted to both the perpetrator and the assault: '[i]n a less litigious age, going too far in the boyfriend's car was better dealt with on site – a well-chosen expletive, a slap in the face or, if necessary, a well-directed knee' (*470* cited in *471*, p. 48). He also described ... [the defendant's] behaviour as an expression of 'romantic intentions ... far less criminal than hormonal' (*470* cited in *471*, pp. 47–48).

It has been found that when judges make summing-up statements to juries that contain such biases rooted in rape myths, it can have a negative effect on their decision-making (*472*). In order to address such prejudices, judges across some jurisdictions are being instructed on issues of gender-based violence (*473–475*). For instance, those in the United Kingdom who try serious sexual assault cases are "specially selected for their suitability ... [and must participate in] a rigorous 3 day course which takes place twice a year" and is intended to sensitize them to the negative experiences that sexual assault victims may have in the criminal justice system (*400*, p.123).

Within the courts, legal professionals also engage in various strategies that can undermine the potential effectiveness of medico-legal evidence (*466*). For example, defence lawyers may devalue those responsible for gathering and analysing the findings. In the United Kingdom, Temkin found that they discredited the testimonies of sexual assault examiners through accusations of their lack of experience, knowledge and impartiality and by suggesting inconsistencies between their notes and statements (*176*). In some circumstances, they had construed specific findings such as internal bruises and lacerations as having resulted from vigorous consensual intercourse (*176*). In several Latin American countries, Cambodia, Canada, India and the United Kingdom, among others, the absence of biological evidence or emotional or bodily trauma has been interpreted as the victim not having been raped (*27*, *30*, *91*, *186*, *293*, *373*, *423*, *476*). Furthermore, there is a risk that false negatives resulting from forensic tests used to investigate rape may be misconstrued in court as showing that no sexual assault has occurred (*187*). Finally, it should be noted that in some circumstances medico-legal evidence does not reach the trial stage, as cases may be plea-bargained or otherwise informally settled out of court (*30*, *198*, *379*, *477*).

SECTION SIX

Conclusions

This section summarizes the findings of this global review of scholarly and grey literature regarding the impacts and uses of medico-legal evidence in sexual assault cases. Based on these findings, salient knowledge gaps are highlighted and recommendations for future research presented.

1. Summary

The sexual assault of adolescents and adults is a common, widespread and insidious problem that has serious physical, psychological, emotional and social consequences. Anti-woman attitudes and rape myths have fuelled its prevalence and shaped the ways in which victims have been treated by health services, the police, the judiciary and in law. As a result, many have chosen not to report their victimization or have been filtered out of criminal justice systems, resulting in low charge-filing and conviction rates. Over time and across regions, medico-legal services have increasingly been established. The intention has been to provide suitable facilities, staff, protocols and technologies for collecting and processing viable medico-legal evidence to aid in the conviction of rapists. These services are delivered through a variety of models and are unevenly distributed within the industrialized and developing worlds. There has been little evaluation of such services with respect to the impact and uses of medico-legal evidence.

Of the few dozen studies reviewed that have examined medico-legal evidence in relation to the legal resolution of sexual assault cases, all but two were conducted in industrialized countries such as Australia, Canada, Denmark, Finland, Norway, the United Kingdom and the United States. The 13 studies undertaken specifically to examine the association between legal outcome and particular types of medico-legal evidence (e.g., genital and extra-genital injuries, seminal fluid, and emotional presentation) were carried out in countries representing only two regions (North America and Europe [Scandinavia]). Almost all have been urban-based, retrospective, and limited by the nature and level of consistency and completeness of information available in official records. Drawing comparisons across studies is difficult, as differently defined medico-legal evidence variables have been examined at various levels of criminal justice systems. Moreover, these variables have been drawn from diverse sources of information and analysed using different procedures. Complicating matters further, some research has included in its design a handful of children, and adolescent and adult men.

The findings summarized from these studies must be understood in the light of such limitations. Bearing this in mind, across cases reported to the police, supportive medico-legal evidence was available in only a limited number of sexual assault cases, many of which did not proceed beyond the police level of processing. A substantial proportion of victims did not sustain general physical injuries (10% to 71%) or ano-genital trauma (33% to 91%). The proportion of those for whom there was no documented sperm or semen present was greater (41% to 99%). Large numbers of cases were documented as unsolved, inactive, unfounded or no-crimed, the suspect was not apprehended, the warrant was denied, or the victim withdrew her complaint or refused to proceed, thereby rendering the potential impact of medico-legal evidence in the courts moot. Of all cases reported to the police, fewer than half (15% to 47%) resulted in charges and fewer than a third (7% to 32%) in convictions.

A variety of factors were found to be associated with the progression of cases through criminal justice systems. These often included the characteristics of the victim (e.g., whether her character or reputation were perceived as being negative) and her behaviours before (e.g., she engaged in "risk-taking" activities such as walking alone at night), during (e.g., she did not resist the assailant) and following an assault (e.g., she did not report the assault promptly to the police). With respect to medico-legal evidence, no study found a significant relationship between legal outcome and the detection of sperm or semen specifically, nor the documentation of the victim's emotional state. Collection of biological/non-biological samples and the occurrence of ano-genital trauma were related to the legal resolution of cases in fewer than a third of pertinent studies. The presence of general physical injuries was the strongest predictor of a positive legal outcome (significant in more than two-fifths of studies that tested this association). Suggestive of the use of force, this finding may not be surprising given that a substantial proportion of women are sexually assaulted by known assailants whose cases generally rest on a defence of consent. In regard to the apparent importance of injuries, it should be reiterated that many women who are sexually assaulted are not physically injured beyond the harm inherent in sexual assault. Moreover, some studies found that when women sustained moderate-to-severe injuries (e.g., injuries to head, neck or face, attempted strangulation, and fractures) having suffered such injuries was most strongly associated with charging and conviction. In these circumstances, however, the problem of sexual assault can be reduced to one of simple assault, eclipsing, to some extent, the gendered and sexualized power relations that lie behind it. Evidence of ano-genital trauma alone may not have been as valuable legal proof of an assailant's use of force, as these types of injuries are often difficult to distinguish from those incurred during consensual intercourse of a rough or vigorous nature.

The apparent limited impact of some forms of medico-legal evidence on the legal resolution of sexual assault cases may be partly due to the dearth of studies evaluating this association, as well as to the design limitations of those that have been conducted. At the same time, as presented in this research, there appears to be a notable relationship between legal outcome and the documentation of certain victim characteristics and behaviours. The effect of negative perceptions of women is further evidenced in the literature on how medico-legal evidence is used across regions. In this regard, sociocultural forces, in particular anti-woman and rape-supportive attitudes, foster the screening out of sexual assault cases from criminal justice systems and shape the existence, quality and impact of medico-legal evidence. These forces may influence the availability of well-trained staff, adequate facilities, supplies and equipment, the use of effective protocols and technologies, as well as the behaviours of the professionals responsible for collecting, processing, analysing and testifying to medico-legal evidence (see Box 6.1). Consequently, without eliminating cultural biases against women, there may be limited value in collecting such evidence. Given this knowledge, the emphasis on medical forensic examination in the sexual assault context must be carefully weighed and further evaluated.

It should be recognized, however, that in many regions constructive initiatives have emerged in attempts to address the limitations of existing research and enhance the collection and processing of medico-legal evidence to improve criminal justice outcomes for victims of sexual assault. In South Africa, a large, systematic and methodologically rigorous study exploring the relationship of particular types and the quality of medico-legal evidence on the outcomes of sexual assault cases is currently under way in Gauteng province. While many of the more recent service-oriented efforts have limitations and still require systematic evaluation, some that nonetheless appear to have potential value include the development and increasing establishment of forensic nurse examiner programmes and the creation and distribution of standardized medico-legal guidelines adaptable across settings with respect to varying resources, policies and procedures. Other more specific examples are an African cross-national medico-legal workshop held to foster intersectoral, interdisciplinary sharing of knowledge and skills; the development and replication of one-stop crisis centres

▼ BOX 6.1

Lessons learned

Sociocultural contexts characterized by male dominance, anti-woman biases and rape-supportive attitudes present a number of barriers to the effective use of medico-legal evidence. In these (and other) contexts, the

■ **collection of viable medico-legal evidence requires:**

- easily accessible, cost-free (to the victim) male and female sexual assault examiners who are well-trained and authorized to gather evidence properly and testify to it in court, and who are sensitized to the negative impacts of erroneous beliefs and attitudes regarding sexual assault and sexually assaulted women;
- suitable facilities distributed across urban and rural areas, available 24-hours a day, seven days a week, that house adequate supplies and equipment and that can secure its protection;
- collaborative networks and effective communications across the health care, law enforcement and legal sectors, and nongovernmental and community organizations such as rape crisis centres;
- well-constructed standardized protocols adaptable to local circumstances and suitable technologies that are readily available.

■ **processing of viable medico-legal evidence requires:**

- access to forensic facilities with adequate resources, staffed by properly trained analysts who can both process and testify to it without the interference of personal biases and demands from other post-sexual assault professionals;
- proactive involvement of police specially trained to maintain the chain of custody and to handle cases in a timely and sensitive manner, free from anti-woman, rape-supportive beliefs and attitudes, and corruption;
- prosecutors, defence attorneys, judges and other court staff sensitized to the detrimental impact that anti-woman biases and rape myths can have on its use in the courts.

such as the Thuthuzela Care Centres in South Africa, which were set up to house specialized medical, law enforcement and prosecutorial professionals and are linked, in some instances, to designated sexual offence courts; and a woman-friendly hospital initiative in Bangladesh that addresses the attitudes, values and assumptions of hospital staff working with victims of violence.

2. Knowledge gaps and research recommendations

Globally, there is a striking paucity of information and evaluative studies from which to assess the impact of medico-legal evidence on sexual assault cases. The design limitations of the research conducted are such that it is not possible to draw robust conclusions, nor generalize from the findings, particularly to low- and middle-income countries (see Box 6.2). To date, it has not been determined what the minimum amount of available medico-legal evidence is for aiding the courts, nor which components of the medical forensic examination (e.g., documentation of injury or collection of specimens) are most effective in specific circumstances (e.g., rapes by acquaintances). Moreover, it is unknown whether there are differences among subgroups of victims (e.g., children, adolescents and men) with respect to the impact of medico-legal evidence on legal outcomes. The many ways in which sociocultural factors may influence the use of medico-legal evidence have not been accounted for systematically and, although there is a general belief that improved training for sexual assault examiners, law enforcement officers and legal professionals can increase its efficacy, the results of existing initiatives have not been rigorously evaluated. Finally, from the perspectives of victims, the importance and relevance of the collection and processing of medico-legal evidence is neither clear nor self-evident.

▼ BOX 6.2

Key gaps in the literature

Impacts of medico-legal evidence:

- no international comparative research;
- research is limited to a few, mostly industrialized, nations;
- much of the research available is methodologically flawed.

Uses of medico-legal evidence:

- lack of available information from many areas;
- little is known about the effects of professional practices.

It is crucial that funds be made available to build research capacity in jurisdictions with limited resources. Knowledge of the efficacy of medico-legal evidence in sexual assault cases could then be advanced through projects designed to address existing gaps (see Box 6.3). For instance, to improve the understanding of its impact on legal outcomes, carefully planned international comparative studies, carried out in a cross-section of low-, middle- and high-income countries would be invaluable. Such studies should include adequate numbers of children, adolescents and adult women and men, be prospective, and uniformly designed and implemented. They should measure the different types of sexual victimization experienced and medico-legal evidence documented using standard classification systems (such as that presented in the World Health Organization's 2003 *Guidelines for medico-legal care for victims of sexual violence*), as well as determine variations in outcomes among different types of assaults and subgroups of individuals. Furthermore, the social conditions surrounding the collection and processing of medico-legal evidence, including the operational dimensions, protocols and professional practices that may act as barriers to its productive use, must be systematically examined by a variety of methods and in different settings. For instance, surveys of sexual assault professionals at various levels of criminal justice systems centred on how medico-legal evidence is used or discounted, as well as evaluative studies that measure the effects of their medico-legal training and policies, could shed greater light on the reasons for the high rates of attrition in sexual assault cases. In order to provide a fuller understanding of the value of medico-legal evidence for victims of sexual assault, their perspectives must also be examined. In capturing their opinions, interviews could explore the personal costs related to undergoing a medical forensic examination in relation to the outcomes of criminal justice proceedings.

As it has been established that rape myths pervade legal systems and factors related to rape-supportive attitudes (e.g., estimations of a victim's moral character) may influence the progression of sexual assault cases, attention might simultaneously be directed towards policy analyses of sexual assault laws. In particular, a critical examination could focus on the ways they may serve to disadvantage certain victims, regardless of the quantity and quality of available medico-legal evidence. It may also be important to galvanize advocate, policy and funding communities to support enhanced options for justice for victims of sexual assault. With the identification and evaluation of viable alternative legal measures, questions regarding the prioritization of resources across post-sexual assault services could then be addressed.

▼ BOX 6.3

Research recommendations

There is a need for ongoing research focusing on medico-legal evidence in relation to sexual assault. Questions to be addressed should include:

- What is the minimum amount of medico-legal evidence necessary to aid in the adjudication of a case?
- In which circumstances are particular types of medico-legal evidence most valuable?
- Are there differences between subgroups of individuals with respect to the relationship to legal outcome of medico-legal evidence?
- What are the direct influences of sociocultural factors on the operations of services, the development of protocols and the practices of sexual assault professionals?
- Does improved training of sexual assault personnel enhance the value of medico-legal evidence?
- Do medico-legal policies and protocols improve the efficacy of medico-legal evidence?
- What is the value and meaning of the medical forensic examination for sexual assault victims?

There is a need to further examine viable alternative measures for enhancing justice for victims of sexual assault. Questions to be addressed should include:

- How might such measures be prioritized in terms of resource allocation vis à vis existing criminal justice and medico-legal practices?

ANNEX

Relationship to legal outcome of medico-legal evidence by type as reported in studies not undertaken specifically to examine this association

Studies that have examined factors related to the processing of sexual assault cases in criminal justice systems, and have included some type of medico-legal evidence variable in their designs, are summarized in this Annex. They are listed chronologically from 1978 to 2005.

Holmstrom and Burgess (1978): United States

Holmstrom and Burgess examined the records of 109 sexually assaulted adults, adolescents and children who had been seen at the Rape Crisis Unit of Boston City Hospital and who had reported to the local police between July 1972 and July 1973. The main sources of data were observations of participants, interviews and some review of medical files. Their investigation revealed that few cases proceeded beyond the police level of processing, less than one-quarter (n = 24, 22%) "made it sufficiently far to be plea bargained or tried" (p.153). Eleven (10%) assailants were acquitted and 13 (12%) convicted when they either pled or were found guilty at trial. Bivariate analyses revealed that moderate-to-severe general injuries, including bruises and lacerations requiring consultation or treatment, were associated with conviction. However, clinical evidence of sexual intercourse (i.e., a positive test for sperm and/or moderate-to-severe genital injury) was not (*151*, see also *334*).

Weninger (1978): United States

Weninger reviewed the police and prosecution files for 201 cases of female sexual assault reported in Travis County, Texas, between 1970 and 1976. Using log linear analysis, he found that medical corroboration, that is, evidence collected through an examination in hospital and deemed positive (a pelvic examination that indicated intercourse had occurred, for instance, sperm present in the victim's vagina, or evidence that supported her testimony such as the presence of seminal stains on her clothing or bruising on her neck in cases of choking), had the greatest impact on the probability of an indictment being returned (i.e., of a formal accusation of a serious crime being made) (*323*).

McCahill, Meyer and Fischman (1979): United States

McCahill et al. (1979) reviewed the records of all women and children who reported a rape to the Philadelphia General Hospital and the local police between April 1973 and July 1974 (for child victims only, up to July 1975). Of the 1397 cases examined, police files could not be located for 199 (14%) and 218 (16%) were unfounded (i.e., not recorded as a crime). Using a technique similar to predictive attribute analysis, the authors found that, in a subsample of 709 cases for which there had also been a social work interview, contrary to expectations the presence of injuries, described as "demonstrable scratches", were associated with a case being unfounded (25% versus 14% founded). However, the presence of scratches increased the overall conviction rate (80% versus 56% not convicted) and evidence of vaginal trauma, the conviction rate by jury trial specifically (83% versus 33% not convicted by jury trial) (*155*).

LaFree (1980): United States

LaFree reviewed the prosecution and court records of 124 cases of forcible sexual assault on females that had been reported to the Indianapolis Police Department in 1970, 1973 and 1975 and adjudicated by the courts. He found that 96 (77%) of the 124 cases reviewed resulted in a conviction (guilty plea or guilty verdict). A total of 88 (71%) of the women had been injured, 7 (6%) so seriously that they required hospitalization. Analysing the data using ordinary least-squares multiple regression, LaFree found no significant relationship between injury and guilty pleas, verdicts or overall conviction (*162*, see also *163*).

Loh (1980): United States

Loh examined 445 cases of forcible and statutory rape of children, adolescents and adults. Data on assaults were obtained from the Seattle Police Department and King County, Washington Prosecuting Attorney's Office. Two hundred and eight of the assaults took place before (1972 to June 1975) and 237 after (July 1975 to 1977) the reform of Washington State's rape law. In 358 (80%) cases, a charge was initially filed, with 265 (60%) resulting in a guilty plea or verdict. One hundred and seventy-two (39%) victims suffered physical injuries, 121 (27%) required minor or first-aid attention, 50 (11%) required medical treatment and one died (0.2%). Although a bivariate association between injuries to the victim and decision to file charges both pre- and post-reform was found, this was lost in the subsequent stepwise multiple regression analyses (*342*, see also *343*).

Chandler and Torney (1981): United States

Chandler and Torney reviewed the police and prosecutorial records of 260 women who presented to a Sexual Abuse Treatment Program and the police in a large urban centre in Hawaii between October 1976 and September 1978. In all, 88 (34%) of the cases were cleared by arrest when 106 suspects were apprehended. Approximately half (n = 49, 46%) of these suspects were charged: 3 (3%) had their charges dismissed, 3 (3%) were acquitted, and 22 (42%) each pled or were found guilty of a felony (16 of these convictions were for the initial charge of rape). Four (4%) of the accused were still before the courts. Discriminant analysis revealed that cases in which the victim was injured were more likely to result in felony charges being filed (*149*).

LaFree (1981): United States

LaFree reviewed the files of 905 cases of forcible sexual assault on females reported to the Indianapolis Police Department in 1970, 1973 and 1975. He found that 324 (36%) cases were cleared by an arrest. In 148 (16%) of the cases, felony charges were filed. Six hundred and thirty-three (70%) victims had sustained physical injuries: 596 (66%) minor injuries that could be self-treated and 37 (4%) injuries requiring hospitalization. Ordinary least-squares multiple regression analysis revealed no relationship between documented physical injury and police decisions (*152*, see also *163*).

Williams (1981): United States

Williams examined 488 cases of rape in the District of Columbia forwarded for prosecution from 1973 to 1974. Using ordinary least-squares regression, she found that the cases most likely to result in conviction were those that involved corroborative evidence in the form of "a medical test for sperm, torn clothing, etc." (*164*, p.35).

Gunn and Minch (1985–1986, 1988): Canada

Gunn and Minch retrospectively reviewed the police and court files of 154 adult women who reported an attempted or completed rape to the Winnipeg Police Department in 1976 and 1977, and interviewed the prosecuting attorneys involved in those cases forwarded to the courts. Attrition was examined by case (n = 154) and total number of assailants (n = 211). Results revealed that 81 (53%) of the cases were filtered out of the system when they were classified as unfounded (n = 42, 27%), no suspect was apprehended (n = 22, 14%) or the victim refused to proceed (n = 17, 11%). Of the 211 suspects, 89 (42%) were charged and referred to prosecutors, 12 (6%) had their charges withdrawn, 10 (5%) pled guilty as a result of plea negotiations and 67 (32%) proceeded to trial. Eight (4%) defendants were acquitted, 8 (4%) had their charges dismissed, and 51 (24%) were found or pled guilty. Overall, less than one third (n = 61, 29%) of the assailants were convicted and less than 10% on the original sex-related charge. The completion of a medical examination and the presence of injuries were positively associated with a case being retained in the system, although the latter variable only at the police level of processing (*153*, *154*, see also *166*).

Nuttall (1989): Canada

Nuttall examined 2549 cases of sexual assault on adolescents and adults reported to the Metro Toronto Police Service between 1985 and 1987. Her review of police files revealed that 146 (6%) of the cases were unfounded and 1071 (42%) still being investigated. In more than 400 cases, the victim either refused (9%) or there was insufficient evidence to proceed (7%). Only 924 (36%) cases involving 1024 offenders were cleared by an arrest and charge. Of the 609 suspects who had been processed through the courts at the time the study was completed, 211 (35%) had their charges withdrawn (24%) or dismissed (10%), 38 (6%) were acquitted, and 360 (59%) were found (26%) or pled (33%) guilty. Although a final conviction rate could not be calculated owing to the large number of cases still before the courts, almost two thirds (64%) of the original 2549 cases had not progressed beyond the police level of processing. Physical injuries that ranged from bruises to severe wounds requiring hospitalization ranged from 29% (in 1985) to 34% (in 1987) of all reported cases. Injury was not associated with the likelihood of arrest and charge (*328*).

Kerstetter (1990): United States

Kerstetter reviewed the investigative files and criminal arrest histories for 1530 cases of sexual assault founded (i.e., recorded as a crime) by the Chicago Police Department in 1979. Both general injury to the complainant and injury to the complainant's sex organs were examined. Multivariate analyses revealed no association between either of the two injury variables and the decision to file a felony in cases of sexual assault either by a stranger or an acquaintance. Drawing on the same sources of data and injury related variables, Kerstetter examined a random sample of one quarter of the cases of sexual assault on females reported to the Chicago Police Department in 1981 (n = 671). Of these cases, 266 (40%) were classified as founded and in 128 (19%), a felony charge was filed (in 67 cases the suspect was a stranger, in 61 an acquaintance). Bivariate analyses revealed that evidence of injuries to sex organs was related only to the decision to found an acquaintance sexual assault case. There was no relationship found between either of the two injury variables and felony filing (*329*).

Gunn and Linden (1991, 1997): Canada

Gunn and Linden reviewed police, prosecution and court records for sexual offences reported to the police in Winnipeg before (1981–1982) and after (1984–1985) reform of the rape law in Canada. Approximately 50% of the total complaints were reviewed for the two time periods (n = 315 and n =

523, respectively). Of the total sample of 838 cases, 530 (63%) did not proceed beyond the police level of processing. These cases were unfounded (*n* = 192, 23%) or dropped when no suspect was apprehended (*n* = 144, 17%), the victim refused to proceed (*n* = 44, 5%), no charges were laid (*n* = 61, 7%) or they were referred to Youth Court (*n* = 89, 11%). Three hundred and eight (37%) of the cases were cleared by an arrest and charge. Prosecutors stayed (i.e., suspended) charges in 77 (9%) of the cases and the offender was acquitted in 39 (5%). Only 192 (23%) cases resulted in conviction when the perpetrator either pled guilty (*n* = 145, 17%) or was found guilty at trial (*n* = 47, 6%). Later, these authors used logistic regression and found that both before and after the law was reformed, cases involving injuries to the victim were more likely to be cleared by a charge. Pre-reform cases involving victims who had been injured were also more likely to result in a guilty plea or verdict (*335*, *337*).

Grace, Lloyd and Smith (1992): United Kingdom

Grace et al. investigated 335 cases of rape of female children, adolescents and adults that were crimed (i.e., recorded as a crime) within the first month of being reported to the police in England and Wales over a three-month period in 1985. Their examination of police and court files (which included medical examiners' statements about victims) revealed that a substantial proportion of cases were filtered out of the legal system when they were no-crimed (i.e., not recorded as a crime) after one month (*n* = 80, 24%) or undetected because the police could not identify an assailant (*n* = 32, 10%). The police subsequently took no further action in 45 (13%) of the cases and in 8 (2%), a suspect was cautioned. One hundred and seventy (51%) cases were prosecuted. In 34 (10%), a defendant was found not guilty or the case was dismissed. Convictions were secured in 136 (41%) of the cases (89 were for rape, completed or attempted, and 47 for a lesser offence). Sixty per cent of complainants had been physically injured. Of these, 46% suffered slight injury (e.g., bruises or scratches), 10% injury requiring treatment (e.g., lacerations requiring sutures) and 4% injury resulting in hospitalization. As determined by logistic regression analysis, victims who had been injured were more likely to have had their cases forwarded for prosecution. The extent of injury sustained was also related to cases ending in a conviction. In fact, "a conviction was twice as likely if a woman had sustained injury than if she had not" (*156*, p.26).

Spohn and Horney (1993): United States

Spohn and Horney examined the case files of randomly selected sexual assaults bound over for trial in Detroit Recorder's Court from 1970 to 1984. These files were accessed through the Sex Crimes Unit of the Detroit Police Department. The cases were stratified according to whether they occurred before the rape law reform period (prior to May 1975, *n* = 279) or following the rape law reform period (May 1975 onwards, *n* = 533) in Michigan. In the total sample of 812 cases, all charges were dismissed in 159 (20%). Charges were reduced in 267 (33%) of the cases and convictions rendered in 523 (64%). A total of 358 (44%) of the women were injured and in 540 (67%) of the cases, physical evidence, which included semen, fingerprints, bloodstains, hair and skin samples, was present. Logistic regression showed that neither injury nor physical evidence had an impact on the likelihood of charges being dismissed, charges being reduced or conviction (*313*).

Frazier, Candell, Arikian and Tofteland (1994): United States

Frazier et al. examined the filtering out of the legal system of cases of sexual assault on females reported to a mid-western metropolitan police department during 1991. They reviewed 674 case files and found that of the 281 rapes by strangers recorded, only 38 (14%) were cleared by a charge and 26 (9%) concluded in conviction. Of the 393 sexual assaults by acquaintances, 85 (22%) of the suspects were charged and 58 (15%) convicted of a crime. Overall (sexual assaults both by strang-

ers and acquaintances), only 123 (18%) cases were charged and 84 (12%) concluded in conviction. Using stepwise logistic regression, the authors found that for a victim assaulted by a man known to her, having gone to an emergency room for an evidentiary examination was key to a suspect being identified and questioned, as well as to charges being laid. Felony charges were also more likely to be filed in both cases of assault by a stranger and by an acquaintance if a woman was injured (*336*).

Frazier and Haney (1996): United States

Frazier and Haney examined 569 cases of sexual assault in a mid-western metropolitan area involving female victims 16 years of age or older that had been reported to the police in 1991. They reported that in 296 (52%) of the cases no suspect was identified. A total of 91 (16%) of the suspects were charged and 69 (12%) convicted, 54 pled guilty, 15 were found guilty at trial. Fifteen (3%) of the cases were dismissed. Stepwise logistic regression showed that if the victim was injured a suspect was more likely to be interrogated and charged (*314*).

Horney and Spohn (1996): United States

Horney and Spohn examined police files and court records of 662 cases of first- or third-degree criminal sexual contact entered into the daily complaint logs of the Detroit Police Department's Sex Crimes Unit in 1989. The cases included in their study were those that had been founded and involved a female complainant 16 years of age or older. The authors examined physical evidence of a crime (semen, fingerprints, bloodstains, hair and/or skin samples) in aggravated (involving an assault by a stranger, multiple assailants, use of a weapon and/or injuries to the victim) and simple rape cases. Logistic regression analyses revealed that the presence of physical evidence increased the likelihood of cases being referred to a prosecutor but not the identification of a suspect, full prosecution or conviction. Aggravation was negatively associated with the identification of a suspect and not related to any of the other three outcomes (*315*).

Spears and Spohn (1996): United States

Drawing on Horney and Spohn's (*315*) larger data bank of sexual offence cases that were entered into the daily complaint logs of the Detroit Police Department's Sex Crimes Unit in 1989, Spears and Spohn examined 321 offences committed on children, adolescents and adults that were referred to the Wayne County Prosecutor's Office for a charging decision. Prosecutors filed charges in 212 (66%) of the cases. Injuries to victims were present in 79 (25%) of the cases and physical evidence (semen, fingerprints, bloodstains, hair and/or skin samples) in 111 (35%). Logistic regression analyses found that neither the presence of injury nor physical evidence was related to charges being filed (*332*, see also *333*).

Spohn and Horney (1996): United States

Spohn and Horney examined the files of randomly selected cases of sexual assault bound over for trial in Detroit Recorder's Court from 1970 to 1984 by comparing simple with aggravated rape (involving the use of a gun or knife, injury to the victim, multiple assailants and/or an assault by a stranger). Sample size was 812 cases (279 in the period before the rape law reform and 533 in the period following the rape law reform). All charges were dismissed in 159 (20%) of the cases, defendants were found guilty at trial in 173 (21%) and convicted (plea or trial) in 523 (64%). Physical evidence of a crime was available in 540 (67%) of the cases. Using logistic regression analysis, the impact of degree of aggravation (0 to 3 or 4 factors) on legal outcome was examined while controlling for other potentially relevant predictor variables. The authors found that neither the number of aggravating circumstances of an offence nor the presence of physical evidence was related to charge dismissal or conviction (*325*).

Spohn and Spears (1996): United States

Spohn and Spears drew from the same sexual assault data collected by Spohn and Horney (*313*) to evaluate rape law reforms. One thousand one hundred and fifty-two cases of sexual assault on females were randomly selected from those bound over for trial in Detroit Recorder's Court from 1970 to 1984. Case files reviewed included police officers' reports, transcriptions of interviews with victims, suspects and witnesses, results of medical examinations and tests, and information about suspects' backgrounds and criminal histories. All charges were dismissed in 206 (18%) of the cases and convictions were secured in 757 (66%). Two of the factors examined in their logistic regression models were whether the victim had suffered physical injury, which included bruises, cuts, broken bones, stab wounds, gunshot wounds, internal injuries and burns (n = 487, 42%) and whether physical evidence, which included semen, fingerprints, bloodstains, hair and skin samples (n = 669, 58%), was available to corroborate a victim's account of the assault. Neither of these factors was found to predict the dismissal of charges nor conviction (*327*).

Kingsnorth, Lopez, Wentworth and Cummings (1998): United States

Kingsnorth et al. examined 365 cases of major sexual assault that had been forwarded to the District Attorney's Office by the Sacramento Police and County Sheriff's departments from 1992 to 1994. Data sources included law enforcement arrest and crime reports, information from the District Attorney's Office, probation officers' pre-sentencing reports, abstracts of judgements and sentencing, and perpetrators' arrest histories. Logistic regression showed that the presence of injury was not related to the decision to prosecute (versus dismissal or rejection), nor to go to trial (versus plea negotiation) (*340*).

Harris and Grace (1999): United Kingdom

Harris and Grace examined 483 cases of sexual assault drawn from the files of five police forces and the Crown Prosecution Service areas in the United Kingdom in 1996. Information was collected from the statements made by complainants and confirmed using statements from the police, witnesses and medical examiners. Of the total number of cases in the sample, 75% were crimed, 64% were detected (i.e., a suspect was identified) and the suspect was charged in 31%. In 23% of the cases, there was a decision to prosecute and 21% proceeded to court. A conviction (for all types of offences) was rendered in 13% of the cases (6% of cases of rape). Among crimed cases, some level of violence was recorded for 211 of the women. Of these, "nearly 100" sustained mild bruises, scratches or bite marks (p.19). Thirty-one women suffered severe bruising, including black eyes and lacerations. Four women suffered fractured or broken bones or cuts requiring stitches, and two of them were hospitalized. Thirty-four women suffered vaginal or anal cuts or hymenal tears. In multivariate analyses, injury was neither associated with the police rendering a case crimed (versus no-crimed), nor with their decision to take no further action (versus to proceed with a case) (*63*).

Kingsnorth, MacIntosh and Wentworth (1999): United States

Kingsnorth et al. tracked 467 sexual assaults involving victims 14 years of age or older through the Sacramento County court system. These assaults had been processed between 1992 and 1994 by the District Attorney's Office, Adult Sexual Assault Unit. Among the variables examined was the degree of physical injury to the victim, defined as either no injury, non-severe bruises, or severe bruises and lacerations. Using logistic regression analyses, the authors found that the degree of injury was related to the decision to prosecute a case. However, when sexual assaults by strangers and non-strangers were analysed separately, they found that the severity of injury increased the likelihood of prosecution only in cases of sexual assault by acquaintances or intimate partners. The degree of

injury was not related to the decision to go to trial either in the pooled or relationship-type segregated data sets (*312*).

Du Mont and Myhr (2000): Canada

Du Mont and Myhr retrospectively reviewed the hospital charts of 187 female adolescent and adult victims of sexual assault examined at the Sexual Assault Care Centre at Women's College Hospital in Toronto, Ontario in 1994. Legal outcome data were collected from the files of the local police service. Fourteen (7%) of the cases were unfounded. Charges were laid in 87 (47%) and a conviction secured in 31 (17%) of the cases. Injuries (including self-reported tenderness and pain), as described in official records by various professionals (including paramedics, emergency nurses, physicians, sexual assault examiners and police), occurred in 132 (71%) of the cases. In 153 (82%) of the cases, forensic evidence, defined as seminal stains, saliva or non-motile sperm on the victim's skin or in her pubic hair and/or the collection of blood, hair, fibres, etc., from the scene of the offence, was documented. In a multivariate model, however, the presence of forensic evidence was not significantly associated with charge-laying and its impact on conviction could not be evaluated as few cases without it advanced to the courts. Nor was the documentation of injuries related to charge-laying or conviction (*303*).

Spohn, Beichner and Davis-Frenzel (2001): United States

Spohn et al. gathered data from the police files of 140 cases of sexual battery cleared by an arrest in 1997 in Miami. Victims were female and aged 12 years or older. Charges were rejected by prosecutors in 58 (41%) of the cases and charges filed but later dismissed in 16 (11%). Defendants were not convicted in 2 (1%) of the cases and convicted by plea or trial in 64 (46%). Trauma such as bruises, cuts, burns and internal injuries had occurred in 41 (29%) of the cases and physical evidence, including semen, blood, bedding and hair, was available in 79 (56%). Logistic regression analyses revealed that cases in which victims had sustained injuries were more likely to be prosecuted. No relationship between the presence of physical evidence and the decision to prosecute was found (*322*).

Spohn and Holleran (2001): United States

Spohn and Holleran reviewed police and prosecution files for cases of sexual assault involving females aged 12 years or older resulting in arrest in Kansas City in 1996, 1997 and 1998 (n = 259) and in Philadelphia in 1997 (n = 267). Charges were filed in 279 (53%) of the total sample of 526 cases. Injury was documented in 135 (26%) of the cases and physical evidence in 305 (58%). Cases were categorized by the type of relationship between the victim and the assailant (i.e. as stranger, acquaintance or partner). They found that victims of sexual assault by partners were more likely than those assaulted by acquaintances and strangers to have sustained "collateral injuries" such as bruises, cuts, burns and internal injuries (p.688). In contrast, there was a greater presence of physical evidence defined as semen, blood, clothing, bedding and/or hair in cases of assault by strangers. Using logistic regression, the authors then examined the relationship of these and other variables to charge-filing in all cases. They found that only the availability of physical evidence to corroborate the victim's story was positively related to charge-filing (*326*).

Briody (2002): Australia

Briody examined the role that deoxyribonucleic acid (DNA) evidence plays in the processing of sexual assault cases in the criminal justice system in Australia. From the laboratory files of the Forensic Biology Section (FBS) of Queensland Health, he selected 102 sexual offence cases and matched them to 98 similar cases extracted from a computerized search of Queensland Police Service records.

These cases had occurred between July 1994 and October 1999. Evidentiary data other than the presence of DNA, as well as sociodemographic and sentencing information, were obtained from the Police Information Centre. None of the cases was initially centred on the issue of consent as the FBS "refuses to test evidence" where a suspect has admitted to intercourse with the complainant (p.162). The results of multivariate analyses revealed that DNA evidence was related to a jury finding of guilt. Tangible evidence (defined as signs of forced entry, injuries obvious to the police or medically documented, and/or bruises and torn clothing) was also found to be significantly associated with conviction. At a significance level of $P < 0.05$, DNA evidence did not facilitate cases reaching the courts or defendants pleading guilty (*331*).

Lea, Lanvers and Shaw (2003): England

Lea et al. analysed 379 cases of rape or attempted rape on female and male adolescents and adults reported to a constabulary in south-west England from January 1995 to December 2000. No further action was taken in 231 (61%) of the cases, 38 (10%) were still pending, 42 (11%) were no-crimed, and the victim refused to assist or retracted the allegation in 26 (7%). A total of 42 (11%) of the cases ended in conviction, only 19 (45%) of which were for rape. Beyond those sustained through the rape or attempted rape itself, no additional injuries were reported in 242 (64%) of the cases. Slight injuries were sustained in 125 (33%), moderate injuries in 4 (1%) and severe injuries in 8 (2%) of the cases. In multivariate logistic regression analysis, injury was not shown to predict legal outcome (*160*).

Lievore (2004, 2005): Australia

Lievore examined the prosecutorial decisions for 141 sexual offence cases involving adolescent and adult females and males in five jurisdictions in Australia. These cases were those referred to the Director of Public Prosecutions between July 1999 and June 2001. Her investigation revealed that 53 (38%) of the cases were withdrawn and 88 (62%) proceeded to trial. In total, 152 defendants were involved in these cases, 92 for whom outcomes were known: 26 (17%) were acquitted, 2 (1%) had their cases dismissed, 47 (31%) pled guilty and 17 (11%) were found guilty, for an overall conviction rate of 42%. A total of 76 (51%) of the 148 victims involved in these cases sustained physical injuries that ranged from superficial abrasions to the body and ano-genital bleeding, to life-threatening injuries requiring hospitalization. For 59 (39%) of the defendants, there was additional evidence available linking them to the attack and corroborating the victim's story. The most common type of evidence was DNA, but it also included fingerprints, eyewitness accounts, objects found at the defendant's home or crime scene, video footage of the defendant with the victim, statements made by the defendant to other people, and telephone records. Logistic regression analysis revealed that the presence of physical injury and additional evidence were not associated with the progression, versus withdrawal, of cases. However, the presence of additional evidence was related to guilty pleas or verdicts (*306*, see also *320*).

Beichner and Spohn (2005): United States

Beichner and Spohn examined 140 cases of sexual battery from Miami cleared by an arrest in 1997 and 259 cases from Kansas City cleared by an arrest in 1996, 1997 and 1998. Data were extracted from the case files maintained by the local sex crime units for cases involving female victims over the age of 12 years. Of a combined total of 399 cases, charges were filed in 231 (58%). Injury occurred in 120 (30%) of the cases and physical evidence was available in 221 (55%). Logistic regression analysis of the pooled data found that both the presence of injury to the victim and the availability of physical evidence was related to the decision to fully prosecute (*330*).

Kelly, Lovett and Regan (2005): United Kingdom

Kelly et al. prospectively tracked through the criminal justice system 2643 cases of sexual assault reported to the police from three Sexual Assault Referral Centres (SARC) and three comparison areas where no SARCs existed in the United Kingdom. The victims included both females (n = 2474) and males (n = 169). The period of data collection varied between the six sites and ranged from 17 to 27 months (between October 2000 and December 2002). Information on legal outcomes was missing for 399 (15%) of the 2643 cases. Five hundred and seventy-five (22%) cases were no-crimed, 882 (33%) were not detected, 787 (30%) were detected, and 467 (18%) were detected and proceeded. In 9 (0.3%) of the cases, a defendant was cautioned, the victim withdrew in 40 (2%), 59 (2%) were discontinued and 72 (3%) were pending trial. In 104 (4%) of the cases, a defendant was acquitted and in 183 (7%), a conviction was rendered. In one site, injuries were documented for two-thirds of the victims who underwent a medical forensic examination. However, across the jurisdictions examined, cross-tabulation (with no statistical testing) showed that injury had little impact on conviction (*305*).

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