Forensic Evidence in Sexual Assault Cases - Preliminary Findings

Megan Alderden, Ph.D., Saint Xavier University
Theodore P. Cross, Ph.D., University of Illinois at Urbana-Champaign
Alexander Wagner, M.A. Fisher College
Daniel Bibel, Massachusetts State Police
Marjorie Bernadeau, Boston Police Department
Lisa Sampson, M.S.W, Massachusetts Executive Office of Public Safety and Security
Saijun Zhang, Ph.D., University of Illinois at Urbana-Champaign
Kaitlin Lounsbury, M.A., University of New Hampshire
Brittany Peters, M.S. Massachusetts Executive Office of Public Safety and Security

This research is funded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice (2011-WG-BX-0005). The opinions, findings, and conclusions or recommendations expressed in this presentation are those of the author(s) and do not necessarily reflect those of the Department of Justice.
Project Overview

- **Project goals:**
  1. To provide a detailed description of forensic evidence in sexual assault cases, including its timing relative to criminal justice outcomes;
  2. To examine the relationship of forensic evidence to criminal justice outcomes; and
  3. To analyze the impact of forensic evidence in key segments of the sample: cases with child victims, cases with stranger assailants, and cases with SANEs conducting the examination.
Research Questions

- **Goal 1:** To provide a detailed description of forensic evidence in sexual assault cases, including its timing relative to criminal justice outcomes.

  1. What are the characteristics of sexual assault examinations and do these differ by examiner type?
  2. What is the injury identification rate and does this vary by victim, assault, and examiner?
  3. What is the forensic evidence rate and does this vary by victim, assault, and examiner?
  4. What is the timing related to the availability of forensic evidence?
Sexual Assault Case Outcomes: Case Processing

- 40% are reported to the police\(^1\)
- 40% result in arrest\(^2\)
- 50% result in felony charges\(^2\)
- 33% result in conviction of original felony charge\(^3\)

**Convictability impacts attrition**

---

1. Rennison, 2002
2. Chandler & Torney, 1981; LaFree, 1980
Sexual Assault Case Outcomes: Types of Evidence

• Sexual assault victims have a unique place in the criminal justice system: witnesses and crime scenes

• Evidence in sexual assault cases
  ○ Physical evidence – Photographs of injuries, property, clothing.
  ○ Forensic evidence – fingerprints, hair, bodily fluids, fibers.

• Improvements in evidence collection
  ○ Examination techniques to improve injury identification
  ○ Analytical techniques to improve DNA extraction
  ○ Sexual Assault Nurse Examiners (SANE) programs to improve data collection
Sample

- **Sampling Procedures**
  - Random sample of cases in which a Provider Sexual Crime Report (PSCR) was collected between 2008 and 2010.
    - Cases involving persons 12 years of age or older.
    - Cases in which a forensic examination occurred in Massachusetts.
    - Original sample pool = 2,731
  - Final N = 587; 21.5% of the original sampling pool

- **Data sources**
  - Provider Sexual Crime Report (PSCR)
    - Massachusetts Executive Office of Public Safety and Security
  - Crime laboratory reports
    - Massachusetts State Crime Lab
    - Boston Police Crime Lab
## Data Collection

### Crime Laboratory Data
- Injury type, frequency, location*
- Type of examinations completed*
- Type of evidence collected (physical, forensic)*
- Date/time of evidence kit collected
- Date/time kit arrival to lab
- Date/time of report of lab results
- Laboratory results

*Reflects information obtained from the forensic examination forms available at the crime lab

### PSCR Database
- Victim age, sex, race/ethnicity
- Location of assault (city and surroundings)
- Location/Date/time of exam
- Exam provider (SANE/non SANE)
- Number of assailants
- Assailant-victim relationship
- Weapon type
- Description of assault
- Reported to police
- Completion of evidence kit/toxicology
Victim Characteristics

<table>
<thead>
<tr>
<th>Gender</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>4.1%</td>
</tr>
<tr>
<td>Female</td>
<td>95.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>69.6%</td>
</tr>
<tr>
<td>Black</td>
<td>9.0%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>16.1%</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>5.1%</td>
</tr>
<tr>
<td>Other</td>
<td>3.6%</td>
</tr>
</tbody>
</table>
Victim Characteristics

- Mean: 26 years, SD: 11 years
- Median: 23 years
- 67.8% of victims were 15 to 30 years of age
Assault Characteristics

Threat/Force

- Verbal Threats: 26.7%
- Physical Force: 43.8%
- Weapon Used: 18.4%
- Restraints Used: 11.9%

Penetration / Sex Act

- Vagina: 89.1% *
- Anal: 18.7%
- Oral: 39.1%
- Act by Vic on Assailant: 28.5%

* Females only
Exam Characteristics

- SANE, 69.0%
- Non-SANE, 31.0%
13.6% had at least one photograph of non-genital injuries taken

SANE nurses took significantly more photographs
Exam Characteristics

- Toxicology Kit: 28.4%
- Foreign material: 46.5%
- Clothing taken: 72.2%
- Underwear during assault: 58.4%
- Underwear after assault: 42.3%
- Head hair combing: 89.3%
- Pubic hair combing: 62.4%
Exam Characteristics

- Clothing taken*: 68.4% (SANE) vs. 81.1% (Non-SANE)
- Head hair combing**: 85.6% (SANE) vs. 97.0% (Non-SANE)
- Pubic hair combing***: 79.8% (SANE) vs. 53.5% (Non-SANE)
- Additional swabs***: 74.6% (SANE) vs. 45.2% (Non-SANE)

* p = ≤ .05; ** p = ≤ .01; *** p = ≤ .001
Injury Identification – Non-Genital Injuries

53.0% victims had non-genital injuries
Median=4 injuries

Black and Hispanic significantly less likely than whites to have any injuries noted (37.0% and 43.8% versus 56.6%)
41.1% of victims had genital injuries*

SANE examiners identified significantly more genital injuries than non-SANE

*Includes: Swelling, redness, abrasion, or tearing to any genital structure
Injury Identification – Female Genital Injuries

Injury to Specific Female Genital Structures

- Labia majora: 8.1%
- Perineum: 7.6%
- Clitoris: 5.9%
- Labia minora: 7.1%
- Periurethral tissue: 16.0%
- Urethral meatus: 7.1%
- Periurethral tissue (vestibule): 11.1%
- Hymen: 18.3%
- Posterior fourchette: 14.0%
- Fossa navicularis: 20.1%
- Vagina: 19.5%
- Cervix: 0%
Injury Identification – Genital Injuries

<table>
<thead>
<tr>
<th>Tissue</th>
<th>SANE</th>
<th>Non-SANE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labia minora+</td>
<td>18.4%</td>
<td>9.9%</td>
</tr>
<tr>
<td>Periurethral tissue (vestibule)*</td>
<td>13.3%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Posterior fourchette*</td>
<td>21.8%</td>
<td>10.3%</td>
</tr>
<tr>
<td>Fossa navicularis**</td>
<td>17.1%</td>
<td>4.9%</td>
</tr>
</tbody>
</table>

\[ p = .051; * p \leq .05; **p \leq .01. \]
Availability of Forensic Evidence

- Blood: 27.6%
- Saliva: 34.7%
- Semen: 59.3%
- Other biological: 39.5%
- Biological evidence (all): 86.9%
Availability of Forensic Evidence

Cases w/ Biological Evidence

DNA profile: 40.9%
Match to suspect: 37.9%
Match to other case: 8.3%
Match to convict: 17.5%

Cases with DNA Profile

Cases with DNA Profile
Availability of Forensic Evidence

- Non-stranger:
  - No DNA Profile: 61.1%
  - Yes - DNA Profile: 38.9%

- Stranger:
  - No DNA Profile: 43.4%
  - Yes - DNA Profile: 56.6%

$p = .004$
Time from Exam to Police Report

Median: 63 days
25.8% within 33 days
75.2% within 105 days
90.4% within 162 days
Time from Exam to Arrival at Lab

- Median: 8 days
- 28.9% arrived within 4 days
- 75.7% arrived within 18 days
- 90.0% arrived within 45 days
Time from Arrival at Lab to Report to Police

Median: 44.5 days
25.6% - reported to police within 21 days
75.1% - reported to police within 87 days
90.2% - reported to police within 131 days
Discussion

- Examination Completeness
  - SANE nurses photographed more often and were significantly more likely to complete additional swabs during the exam.
  - Non-SANE medical personnel were more likely to include hair and pubic hairs combings and include clothing.

- Injuries
  - Non-Genital Injuries—53.0% of cases
    - No differences by examiner type, but differences by race/ethnicity.

  - Genital Injuries—41.1% of cases
    - SANE nurses were significantly more likely to identify genital injuries overall.
    - SANE nurses were significantly more likely to identify injuries on several specific female genital structures.
Discussion

- **Forensic Evidence**
  - 86.9% of cases had biological evidence

  - 40.9% of cases with biological evidence had DNA profile generated
    - DNA matched the suspect in 27.9% of these cases (7.6% of total sample with data available)

  - Cases involving strangers were more likely to have a DNA profile generated by the crime labs.

  - Short time periods between examination, arrival at the lab, and reporting back to the police appear to be the norm.
Next Steps

1. Continuing to exam the evidence collected in these sexual assault cases.

2. Examining the relationship of forensic evidence to criminal justice outcomes.
   - Linking the forensic and medical examination data to the Massachusetts NIBRS data and Boston Police data

3. Examining the effect of forensic evidence in key segments of the sample: cases with child victims, cases with stranger assailants, and cases with SANEs conducting the examination.
Contact Information

Theodore P. Cross, Ph.D.
University of Illinois at Urbana-Champaign
tpcross@illinois.edu