# Forensic Evidence and Sexual Assault Update

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# Project Overview

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 arrest; and

3. To analyze the impact of forensic evidence in key segments of the sample.

# 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

# Sampling

- Sampling Procedures
  - Random sample of cases in which a Provider Sexual Crime Report (PSCR) was collected between 2008 and 2010.
    - Original sample pool = 2,731
  - Final N = 528
- Data sources
  - PSCR database
    - Massachusetts Executive Office of Public Safety and Security
  - Crime laboratory reports
    - Massachusetts State Police Crime Lab
    - Boston Police Crime Lab
  - Police reports

# Data Challenges

- Data linkage
- Data quality
  - Completeness
  - Accuracy
  - Timeliness
- NIBRS challenges
- Additional outreach to PDs followed

# Types of Data Collected

## PSCR DATABASE

- KIT Number
- 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

## CRIME LABORATORY DATA

- KIT Number, ORI, Incident Number
- 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

## Police Outcome Data

- ORI, Incident Number
- Unfounded
- Arrest made/arrest date
- Charged/charge date

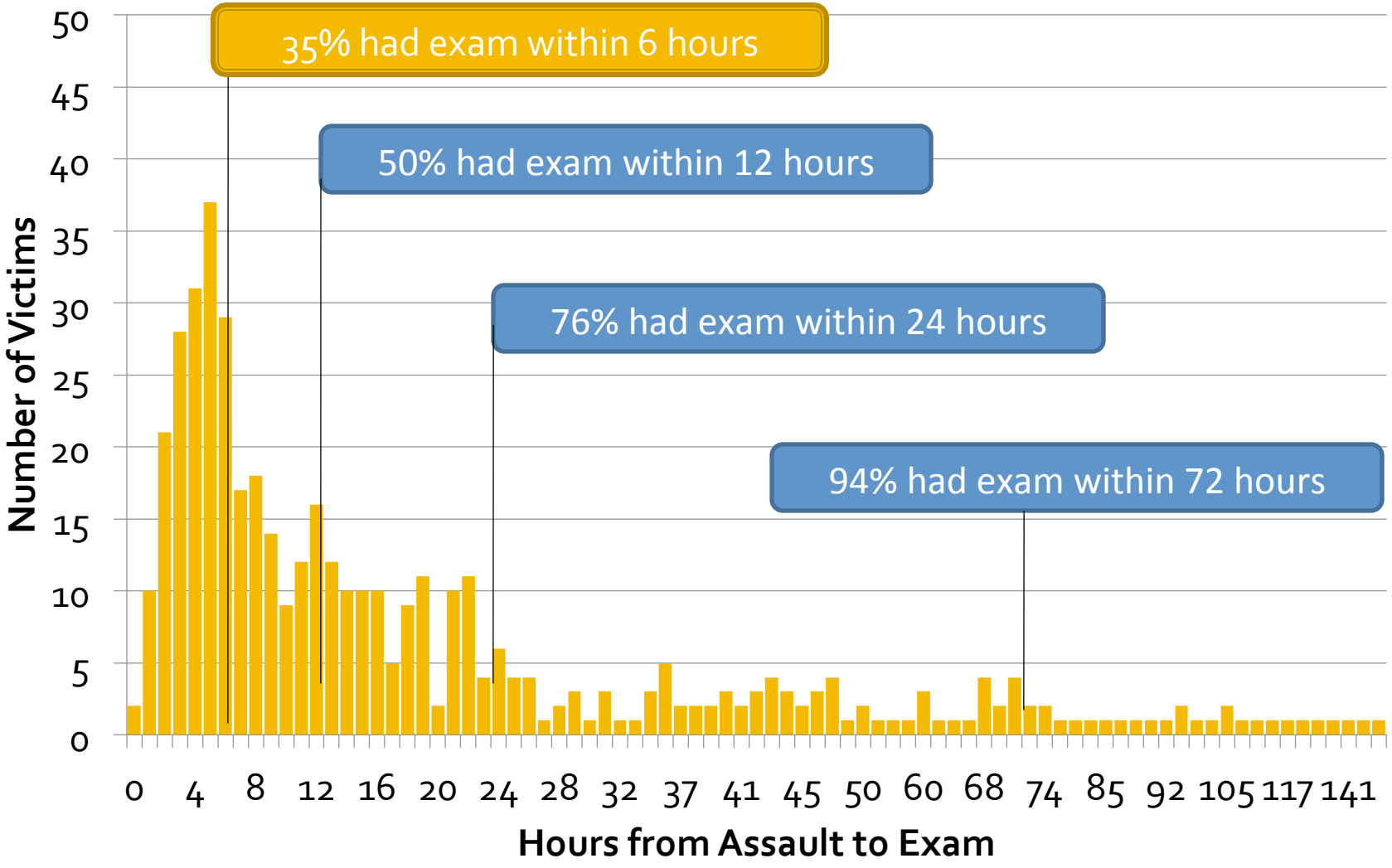
# Sample Characteristics

| Characteristic | %/Median |
|---|---|
| Victim Sex | 95.9% Female |
| Victim Age | 23 |
| Victim Under 18 | 4.9% |
| Victim Race-Ethnicity | White 68.6%<br>Hispanic 17.1%<br>Black 9.1% |
| Victim-Assailant Relationship | Known assailant 68.2% |

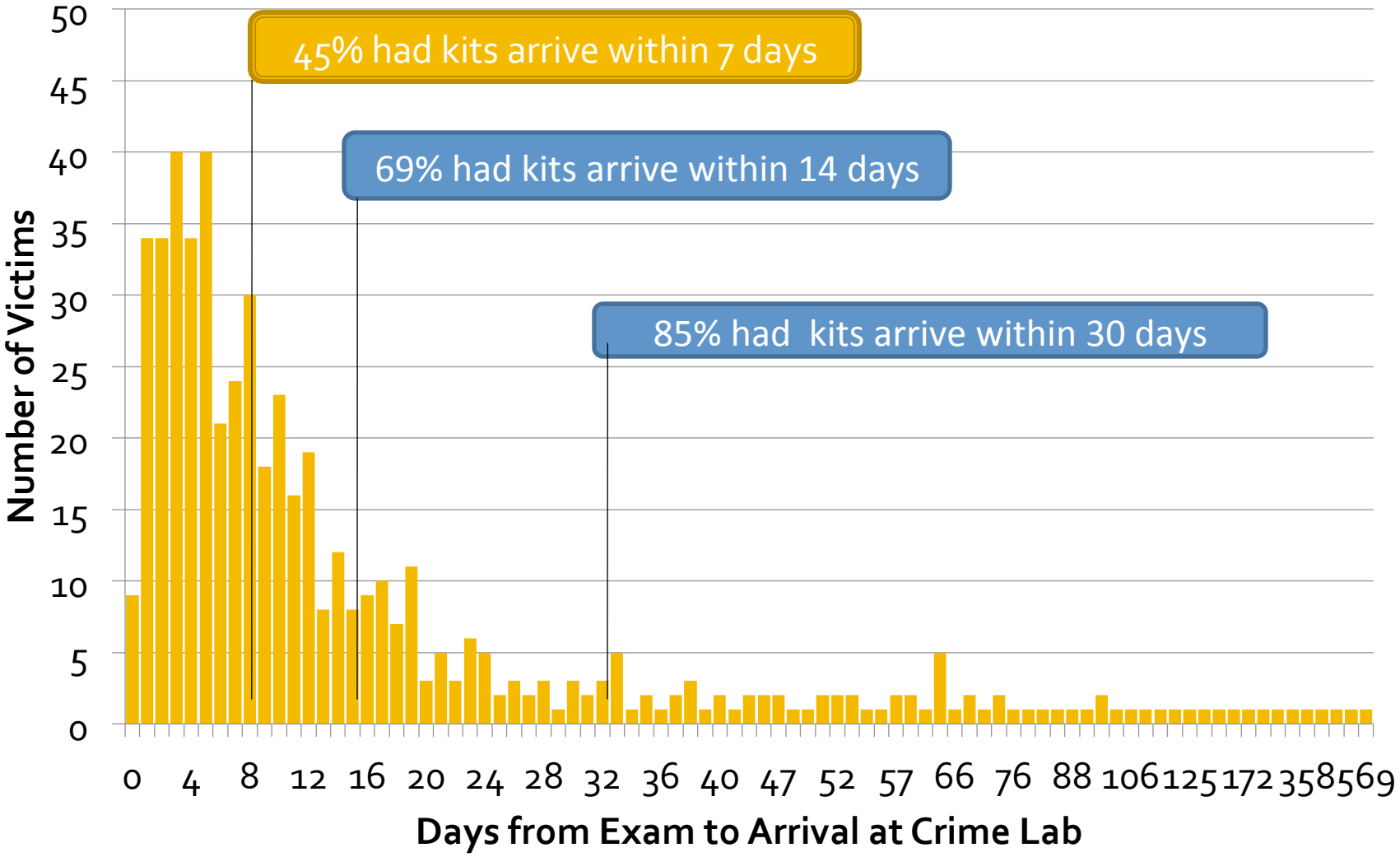
# Examination, Laboratory and Police Outcomes

| Result | % |
|---|---|
| Non-genital injuries | 53.0% |
| Genital injuries | 35.6% |
| Kits tested | 77.6% |
| Biological evidence | 84.2% of kits tested |
| DNA profile | 28.3% of kits tested |
| DNA match to suspect | 8.6% of kits tested |
| DNA match to CODIS-another case | 2.0% of kits tested |
| DNA match to CODIS-convicted offender | 4.7% of kits tested |
| Founding | 64.6% |
| Arrest | 42.2% |

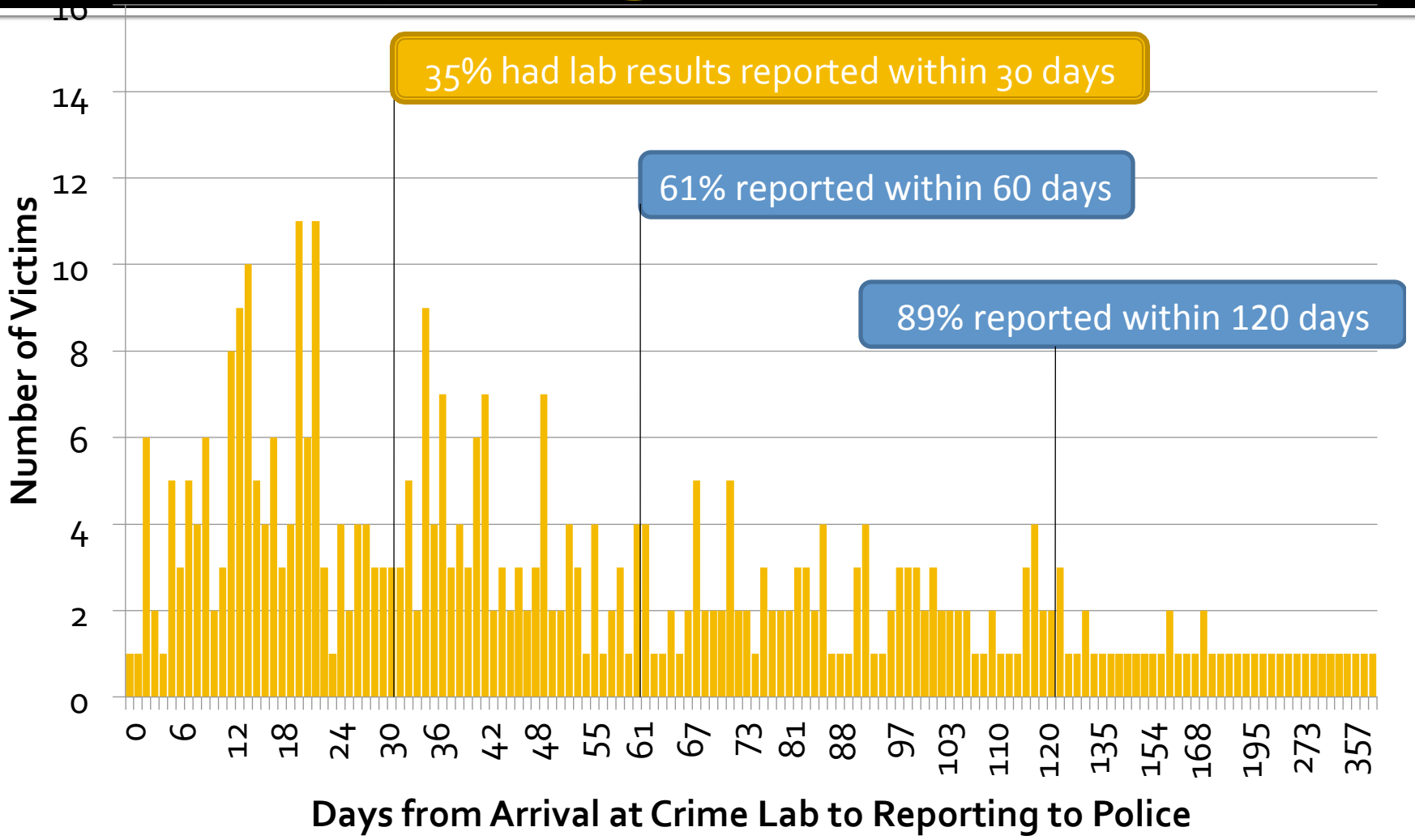
# Timing of Evidence: Assault to Exam



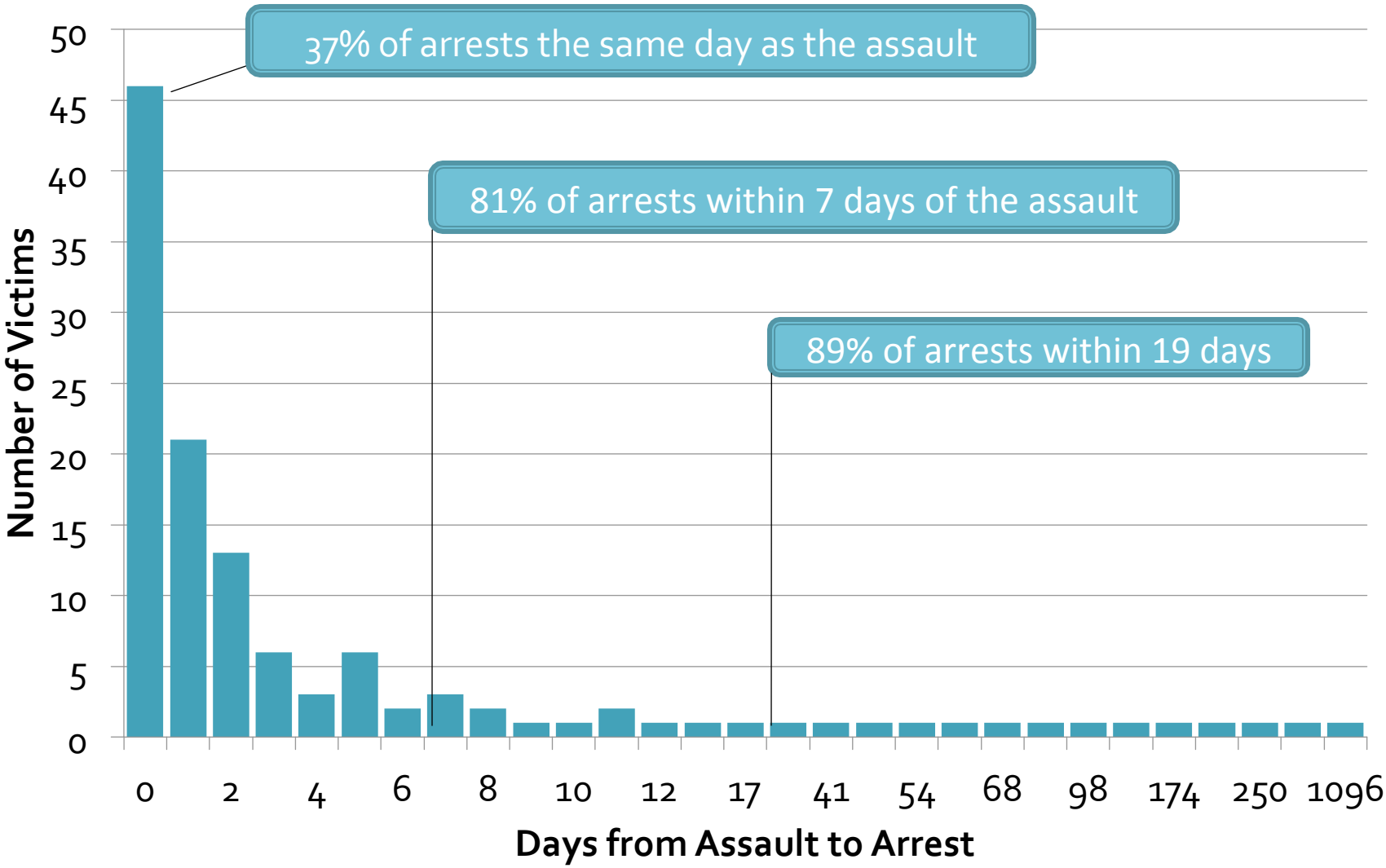
# Timing of Evidence: Exam to Lab



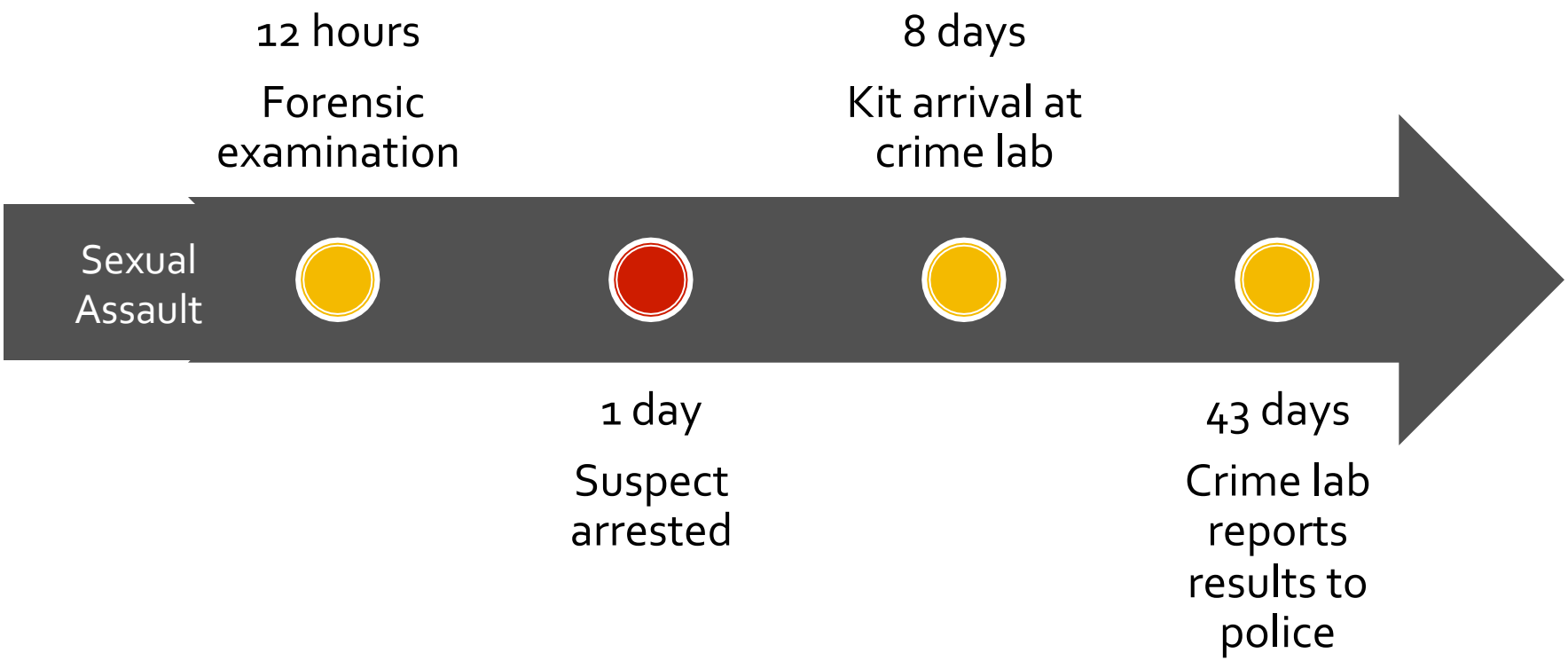
# Timing of Evidence: Lab to Reporting Results to Police



# Time between Assault and Arrest



# Timing of Arrest to Forensic Evidence




Based on median times.

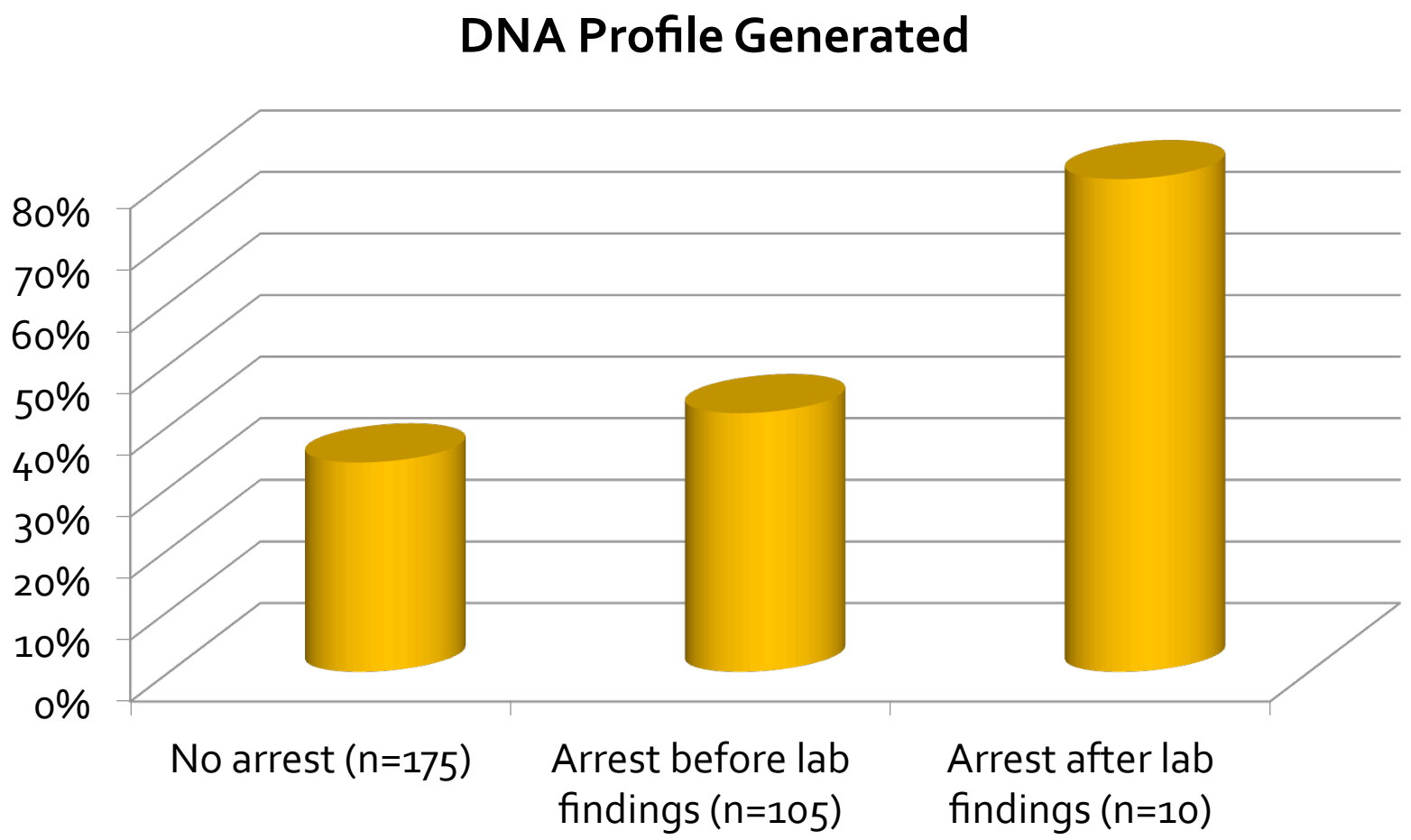
# Cases where Arrest Followed Forensic Results Reporting

- 8 cases had arrests following forensic result reporting to the police by the crime lab
  - 3 had arrests within 15 days of the report
- 3 cases had arrests within a day or two of the report
- These 11 cases accounted for 2.1% of the final sample (N=528) and 8.5% of arrests (n=130)

# Cases where Arrest Followed Forensic Results Reporting (n=11)

- 10 cases had biological evidence found
  - Body swabs typically were the source of biological evidence (7 of 11 cases)
  - 2 cases clothes contained biological evidence
  - 3 cases other evidence contained biological evidence (hair combings, condoms, fingernail scrapings)
- 9 cases had specimens that tested positive for semen
- 8 cases had a DNA profile generated—significantly more than other arrests
  - 5 cases the DNA profile was confirmed to match the suspect. 1 case the match results were pending.
  - 3 cases the DNA profile matched another case in CODIS
    - These involved 2 stranger cases and one acquaintance case
  - 2 cases the DNA profile matched a convicted offender in CODIS

# % DNA Profile Generated by Arrest Groups



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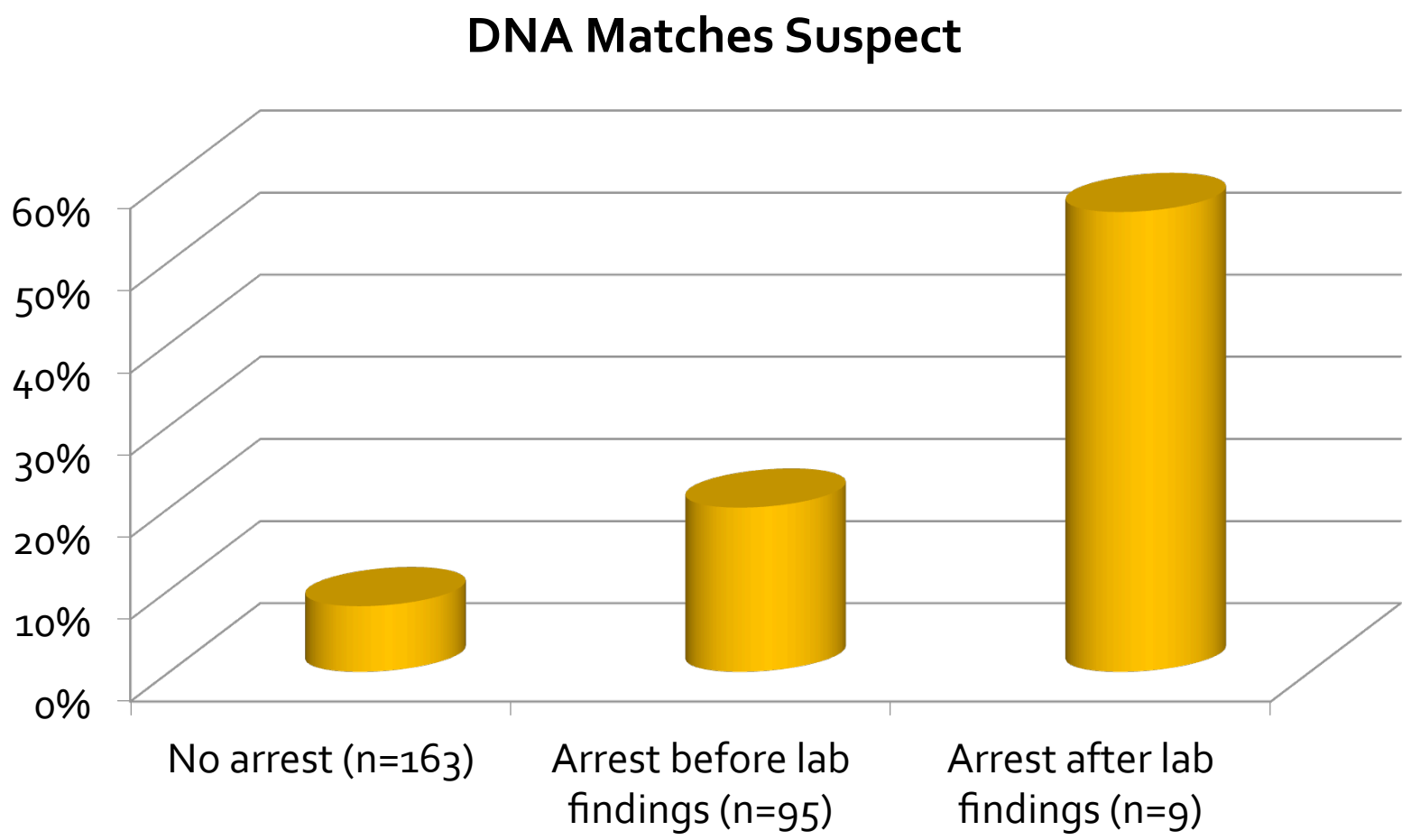
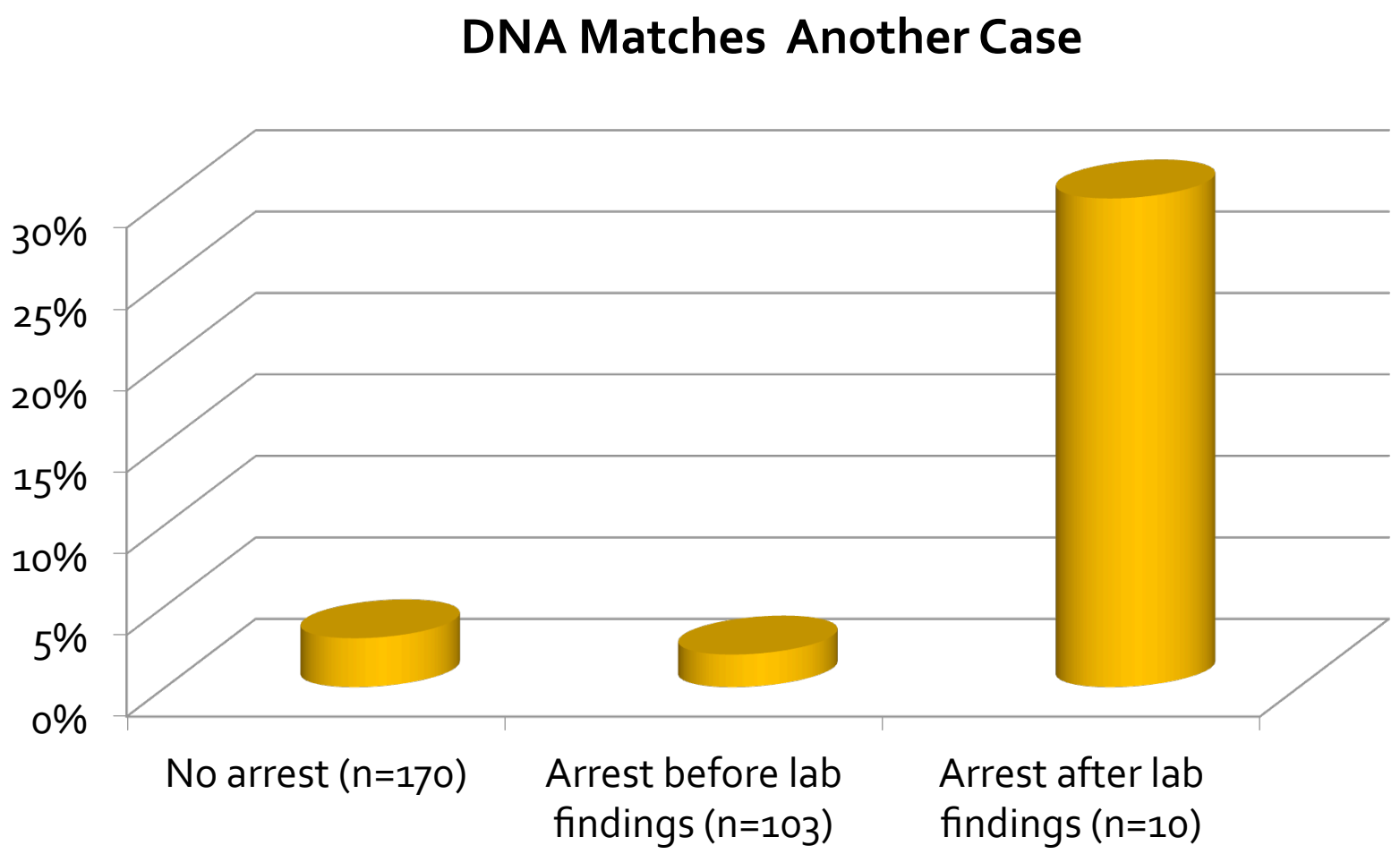


# % DNA Matches Another Case in CODIS



# Evaluation of Factors Correlating with Unfounding and Arrest

- Multiple factors could help explain unfounding and arrest in sexual assault cases
- Statistical modeling (logistic regression) can identify which factors correlate with an outcome and to what degree
- We calculated logistic regression models for unfounding and arrest
- Caveat: correlation does not necessarily equal causation

# Results of statistical modeling

- Case Unfounding
  - Police officers were more likely to indicate a crime occurred if . . .
    - Penetration occurred ($p$ = .027, OR = 1.77)
    - Physical force was used ($p$ = .040, OR = 1.61)
- Arrest
  - Suspects were more likely to be arrested when . . .
    - The suspect was an acquaintance, date or relative as compared to a stranger ($p$ = .065, OR = 2.00)
    - The suspect was an intimate/ex-intimate partner as compared to a stranger ($p$ = .002, OR = 4.86)
    - Genital injuries were noted ($p$ = .045, OR = 1.95)
  - Suspects were less likely to be arrested when . . .
    - The forensic medical exam occurred after 24 hours of the assault ($p$ = .011, OR = .32)

# Summary of Findings

- Confirmation that forensic results rarely precede arrests (e.g., Johnson et al., 2012).
  - When forensic results do precede arrest, it does appear to be impactful
  - DNA profiles and matches are more prominent in these cases
- Probative forensic evidence may be a low frequency, high impact event
- NIBRS a potential resource for learning more

# Summary of Findings

- Factors related to unfounding
  - Absence of penetration
  - Absence of physical force
- Factors related to arrest
  - Known suspect
  - Genital injuries
  - Forensic medical exam within 24 hours of assault

# Value of research/police partnerships

- Analysis of crime laboratory and police data can help
  - Describe the nature of police work to a variety of audiences
  - Provide hard data showing cj professionals' contributions
  - Identify factors that could help improve training and education
- Resource to meet federal and state program evaluation requirements

# New study we are conducting on forensic evidence and prosecution

- How often and in what circumstances is forensic evidence *probative*?
- What impact does it have on prosecution?
- Abstracting data from Suffolk County DA files
- Interviews with assistant district attorneys about impact of forensic evidence in their cases