NCS-X and NIBRS – Data Strategies for the Future of Crime Reporting

SEARCH Symposium
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Goal – improve national statistics on reported crime by developing national estimates based on detailed crime incident data

- Take a sample-based approach to increasing the number of agencies reporting data to FBI’s National Incident-Based Reporting System (NIBRS)

- Provide funding and technical assistance to state UCR programs and local law enforcement agencies to facilitate the NIBRS transition

- Support industry efforts to assist customer agencies in implementing NIBRS and state-specific variations of incident-based reporting

- Generate national estimates of reported crime data based on NIBRS
NCS-X NIBRS Estimation Project (NNEP)

- NNEP is the culmination of the NCS-X recruitment efforts and implementation support
- BJS, in collaboration with the FBI, will establish a process to create national-level crime estimates following the January 2021 NIBRS transition deadline
- NNEP is designing the methodology needed to:
  - Evaluate data quality
  - Impute for missing data (as necessary)
  - Produce national estimates
NCS-X Estimation Project Objectives

Primary Objectives

• Determine set of key NIBRS indicators for which accurate and reliable estimates can be produced
• Use the NCS-X sample to produce national estimates based on NIBRS data
• Develop population-served estimates which can be split by key demographic characteristics such as age, sex, and race

Secondary Objectives

• Use NCS-X sample to produce subnational estimates (prioritizing state-level estimates)
• Develop population-served estimates for agencies traditionally classified as zero-population agencies (when possible and appropriate)
National Indicators – Prioritization Roadmap

**Incident Level**
- **Violent Crime**
  - By Specific Crime
  - Weapon ▶ injury ▶ victim–offender relationship ▶ clearance ▶ agency characteristics
- **Property Crime**
  - By Specific Crime
  - Property loss ▶ clearance ▶ agency characteristics
- **Society Crime**
  - By Offense Category

**Victim Level**
- **Individuals/LEOs**
  - Victim demographics ▶ relationship to offender ▶ weapon ▶ injury ▶ gang involvement
- **Non-person Victims**
  - By Specific Type of Property Crime

**Arrestee Level**
- **Arrest Type**
  - By Specific Crime Type
- **Arrestee Characteristics**
  - By Specific Crime Type
  - Age ▶ sex ▶ race ▶ Hispanic origin ▶ juvenile disposition ▶ armed

**Offense Level**
- **Violent Crime**
  - By Specific Crime
  - Weapon ▶ injury ▶ victim–offender relationship ▶ clearance ▶ agency characteristics
- **Hate Crime**
  - By Group A Offense (Bias Motivation)
- **Property Crime**
  - By Specific Crime
  - Property loss ▶ clearance
- **Society Crime**
  - By Offense Category
Intermediate Approach Weighting/Estimation Approach

Weighting by State

- Weighting by state if coverage ratio exceeds 80%
- For remaining states, produce top-down weights
- Over time, will achieve a 50-state design which will allow for simultaneous estimates at the national and state levels
### Data Quality Review/Adjustment

<table>
<thead>
<tr>
<th><strong>Missing Values</strong></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>• True missing</td>
<td></td>
</tr>
<tr>
<td>• NIBRS business rules programmed</td>
<td></td>
</tr>
<tr>
<td>• Cases are missing when business rules indicate there should be a value</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Unknown Values</strong></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>• Unknown values can be a valid response</td>
<td></td>
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<tr>
<td>• However, sometimes are used in rates which are not realistic or plausible</td>
<td></td>
</tr>
<tr>
<td>• Or, unknown can be an undesirable response option for estimation</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Partial Reporters</strong></th>
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</thead>
<tbody>
<tr>
<td>• Situation where an agency reports incidents for more than 0 but less than 12 months</td>
<td></td>
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<tr>
<td>• Administrative data can identify the months where no reported incidents were provided by an agency</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Outliers</strong></th>
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<tbody>
<tr>
<td>• Situation where an agency underreports the number of incidents in a month</td>
<td></td>
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<tr>
<td>• Statistical methods identify months where the number of incidents are underreported</td>
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</tbody>
</table>
Summary of Future Steps for Imputation

**Partial Reporters**
- identify months with missing crimes
- estimate the number of missing crimes for a particular month/LEA
- use hot deck or cold deck methods to impute missing crimes

**Missing Items**
- select useful predictors in imputing the key imputed items
- perform multilevel multiple imputation

**Validate Imputation Results**
- review the distribution of individual imputed variable
- review the weighted estimates of key indicators
- compare the weighted estimates with external data

**Assessment for Upcoming Years**
- monitor the frequencies of partial reporting and missing items during the transition time period
- assess the impact of imputation on final estimates
<table>
<thead>
<tr>
<th>Estimated Timeframe</th>
<th>Key Milestone</th>
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<tbody>
<tr>
<td>Fall 2020</td>
<td>Produce final set of estimation methodology protocols for producing national estimates</td>
</tr>
<tr>
<td>Winter 2021</td>
<td>Finalize data quality methodology associated with producing national estimates</td>
</tr>
<tr>
<td>Spring-Fall 2021</td>
<td>Initial version of estimation prototype developed (based on data through 2020)</td>
</tr>
<tr>
<td>Winter 2021</td>
<td>Finalize the estimation methodology for producing state-level estimates (for state estimation where feasible)</td>
</tr>
<tr>
<td>Spring 2022</td>
<td>Finalize the data quality methodology associated with producing state-level estimates</td>
</tr>
<tr>
<td>Spring/Summer 2022</td>
<td>Evaluate and address any quality issues specific to actual 2021 data submissions from newly transitioned agencies</td>
</tr>
<tr>
<td>Summer/Fall 2022</td>
<td>Finalize revisions to the estimation prototype and produce reports and estimates for key indicators (based on 2021 submission data)</td>
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</tbody>
</table>
Analytic Dissemination Plan

- Technical assistance products, print reports, and other transition support documents
  - *Multiple Offense Incidents in the National Incident-Based Reporting System* – providing information about the effect of removing the Hierarchy Rule on crime statistics
  - *Will NIBRS Reporting Increase Crime Statistics?*
  - Talking About NIBRS
  - Press Release – Transitioning to NIBRS
  - *Research in Brief: Leveraging NIBRS to Better Understand Sexual Violence*

- Estimation methodology technical reports
  - Data quality analysis – Key indicators
  - Population estimation procedures

- Interactive statistical report platform
  - Interactive capabilities for users to select criteria and explore data

- NCS-X Data Dashboard – under development
  - System for users to analyze and visualize data and create and download custom data files
This report presents statistics on sexual assault victimizations that were reported to NIBRS in 2015 by law enforcement agencies in 15 states. The National Incident-Based Reporting System (NIBRS) captures detailed information on four types of violent sexual assaults recorded by law enforcement: rape, sodomy, sexual assault with an object, and fondling. This report contains interactive charts that compare the demographic characteristics of sexual assaults to victims of other serious violent crimes, estimates of sexual victimization rates by victim demographic characteristics, and statistics on police clearance and arrest outcomes for sexual assaults. Data for this report were submitted by state and local law enforcement agencies from 15 states certified by the FBI to report all of their 2015 crime data to NIBRS. Those 15 NIBRS-certified states are highlighted in the map below.
What can NIBRS tell us about sexual assault?

In 2015 in Virginia—

- **24%** of all violent victimizations involved a sexual assault; the percentage was higher for females (21%) than for males (4%).
- **There were 62.6 sexual assault victimizations per 100,000 persons; the rate was 5 times higher for juveniles (169.7) than for adults (30.9).**
- The average age of sexual assault victims was **13 years** for males and **20 years** for females.
- **94%** of sexual assault victimizations were committed by someone the victim knew.

Contents:

- Part 1: Violent Victimization That Involved a Sexual Assault
- Part 2: Characteristics of Sexual Assault Victims and Incidents
- Part 3: Rates of Sexual Assault Victimization, by Victim Demographics
- Part 4: Clearance and Arrest
Nearly one-quarter of all violent victimizations recorded by law enforcement in Virginia involved a sexual assault offense of rape, sexual assault with an object, sodomy, or fondling.

Most sexual assaults—84%—were against a female victim, while males were the majority—61%—of victims of non-sexual violent crimes, such as robbery, aggravated assault, kidnapping, and homicide.

In 2015, sexual assaults against females made up a sizeable portion—about 21%—of all violent victimizations recorded by Virginia law enforcement agencies.
What can NIBRS tell us about sexual assault?

Family members committed over two-thirds (69%) of all sexual assaults against young children under age 5 and over half (53%) of those against children ages 5 to 13. Most sexual assaults against victims age 14 or older were committed by friends and acquaintances.
BJS Efforts to Develop an Online NIBRS Data Analysis Platform

- **NCS-X Data Dashboard – under development**
  - Online data analytics platform for users to analyze and visualize data.
  - Built via Tableau.
  - Create and download custom data files.
  - Access victimization and crime incident rates for specific population groups.
  - Future goal: To provide public health and socioeconomic data for NIBRS reporters in an effort to contextualizes levels and trends in crime and victimization.
NCS-X : NIBRS Data Access & Analysis

This tool allows users analyze to National Incident Based Reporting System (NIBRS) data. It also provides a convenient way to organize and download NIBRS data based on the selections users make on this website.
Reporting States, 2018
Major Reporting Agencies, 2018

Filter Summary: Data Year (2018), Reporting State (All), Reporting County (All), Reporting MSA (All), Crime Type (All), Offense Category (All), Offense (All), Victim Type (All), Victim Age (All), Victim Sex (All), Offender Age (All), Offender Sex (All), Relationship Status (All), Population (Cities 250,000 people or over)

Bureau of Justice Statistics, based on data from the Federal Bureau of Investigation, National Incident-Based Reporting System. Data last refresh date: 8/17/2020 3:51:58 PM.
Reporting Counties, Virginia (All), 2018

Filter Summary: Data Year (2018), State (Virginia), Reporting County (All), Reporting MSA (All), Crime Type (All), Offense Category (All), Offense (All), Victim Types (All), Victim Age (All), Victim Race (All), Victim Sex (All), Offender Age (All), Offender Race (All), Offender Sex (All), Relationship Status (All)
# Incidents, Data Year and Victim Age by Offense Category and Relationship Status

<table>
<thead>
<tr>
<th>Data Year</th>
<th>Victim Age</th>
<th>2017</th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1-4</td>
<td>Age 1-4</td>
<td>751.0</td>
<td>74.0</td>
<td>687.0</td>
<td>297.0</td>
<td>51.0</td>
<td>2.0</td>
<td>36.0</td>
<td>42.0</td>
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<tr>
<td></td>
<td>5-14</td>
<td>Age 5-14</td>
<td>Age 15-17</td>
<td>Age 18-24</td>
<td>Age 25-34</td>
<td>Age 35-64</td>
<td>Age 65 and Older</td>
<td>21.0</td>
<td>1.0</td>
<td>5.0</td>
<td>19.0</td>
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<tr>
<td></td>
<td>15-17</td>
<td>476.0</td>
<td>44.0</td>
<td>175.0</td>
<td>156.0</td>
<td>15.0</td>
<td>138.0</td>
<td>89.0</td>
<td>2.0</td>
<td>63.0</td>
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<tr>
<td></td>
<td>18-24</td>
<td>482.0</td>
<td>92.0</td>
<td>72.0</td>
<td>102.0</td>
<td>63.0</td>
<td>133.0</td>
<td>55.0</td>
<td>35.0</td>
<td>7.0</td>
<td>30.0</td>
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<tr>
<td></td>
<td>25-34</td>
<td>273.0</td>
<td>126.0</td>
<td>39.0</td>
<td>112.0</td>
<td>78.0</td>
<td>134.0</td>
<td>67.0</td>
<td>36.0</td>
<td>8.0</td>
<td>45.0</td>
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<tr>
<td></td>
<td>35-64</td>
<td>254.0</td>
<td>125.0</td>
<td>36.0</td>
<td>102.0</td>
<td>63.0</td>
<td>133.0</td>
<td>55.0</td>
<td>60.0</td>
<td>12.0</td>
<td>48.0</td>
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<tr>
<td></td>
<td>65 and Older</td>
<td>21.0</td>
<td>1.0</td>
<td>5.0</td>
<td>19.0</td>
<td>5.0</td>
<td>35.0</td>
<td>20.0</td>
<td>12.0</td>
<td>8.0</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td>2018</td>
<td>Age 1-4</td>
<td>78.0</td>
<td>1.0</td>
<td>184.0</td>
<td>35.0</td>
<td>2.0</td>
<td>5.0</td>
<td>20.0</td>
<td>12.0</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>5-14</td>
<td>Age 5-14</td>
<td>Age 15-17</td>
<td>Age 18-24</td>
<td>Age 25-34</td>
<td>Age 35-64</td>
<td>Age 65 and Older</td>
<td>24.0</td>
<td>6.0</td>
<td>4.0</td>
<td>15.0</td>
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<tr>
<td></td>
<td>15-17</td>
<td>475.0</td>
<td>56.0</td>
<td>180.0</td>
<td>120.0</td>
<td>20.0</td>
<td>27.0</td>
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<td>15.0</td>
<td>20.0</td>
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<td></td>
<td>18-24</td>
<td>552.0</td>
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<td>75.0</td>
<td>169.0</td>
<td>80.0</td>
<td>65.0</td>
<td>20.0</td>
<td>12.0</td>
<td>8.0</td>
<td>45.0</td>
</tr>
<tr>
<td></td>
<td>25-34</td>
<td>331.0</td>
<td>121.0</td>
<td>49.0</td>
<td>114.0</td>
<td>65.0</td>
<td>134.0</td>
<td>67.0</td>
<td>36.0</td>
<td>8.0</td>
<td>45.0</td>
</tr>
<tr>
<td></td>
<td>35-64</td>
<td>282.0</td>
<td>144.0</td>
<td>34.0</td>
<td>129.0</td>
<td>66.0</td>
<td>134.0</td>
<td>67.0</td>
<td>36.0</td>
<td>8.0</td>
<td>45.0</td>
</tr>
<tr>
<td></td>
<td>65 and Older</td>
<td>24.0</td>
<td>6.0</td>
<td>4.0</td>
<td>15.0</td>
<td>2.0</td>
<td>5.0</td>
<td>35.0</td>
<td>20.0</td>
<td>12.0</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Filter Summary: Data Year (2017 & 2018), Reporting State (Virginia), Reporting County (All), MSA (All), Crime Type (All), Offense Category ( & Sex Offenses), Offense (All), Victim Type (All), Victim Age (Age 1-4, Age 5-14, Age 15-17, Age 18-24 and 4 more), Victim Race (All), Victim Sex (All), Offender Age (All), Offender Race (All), Offender Sex (All), Relationship Status (Friend or Acquaintance Relationship, Intimate Partner, Other Family and 2 more)
## Incidents, State and Offense Category by Data Year and Victim Sex

<table>
<thead>
<tr>
<th>State</th>
<th>Offense Category</th>
<th>Female</th>
<th>Male</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montana</td>
<td>Assault Offenses</td>
<td>5,245</td>
<td>4,579</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>Sex Offenses</td>
<td>1,172</td>
<td>163</td>
<td>17</td>
</tr>
<tr>
<td>North Dakota</td>
<td>Assault Offenses</td>
<td>4,638</td>
<td>3,734</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Sex Offenses</td>
<td>844</td>
<td>101</td>
<td>4</td>
</tr>
<tr>
<td>Virginia</td>
<td>Assault Offenses</td>
<td>30,778</td>
<td>38,059</td>
<td>386</td>
</tr>
<tr>
<td></td>
<td>Sex Offenses</td>
<td>5,127</td>
<td>785</td>
<td>15</td>
</tr>
</tbody>
</table>

Filter Summary: Data Year (2018), Reporting State (Montana, North Dakota, Virginia), Reporting County (All), MSA (All), Crime Type (All), Offense Category (Assault Offenses & Sex Offenses), Offense (All), Victim Type (All), Victim Age (All), Victim Race (All), Victim Sex (All), Offender Age (All), Offender Race (All), Offender Sex (All), Relationship Status (All)