

Assessing the Utility of NIBRS Data

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FBI, Criminal Justice Information Services Division,
UCR/NIBRS Groups

Goals

Provide back ground on FBI's National Incident-Based Reporting System (NIBRS)

Demonstrate utility of having NIBRS data in a relational data base (Oracle 12c)

Examine NIBRS data issues: nonresponse bias and extent of item missing data

Briefly discuss ongoing work

NIBRS Data Structure

- Group A offenses (46 crimes)
 - data on arrest, offense, offender, victim, property
 - data on incident (administrative)
 - 56 data elements in 6 main segments
- Group B offenses (11 crimes) – social crimes (victimless)
 - arrest data

NIBRS Data Structure

- NIBRS Group A offenses – data in 6 major files or segments
- An incident can have multiple segments: victims, offenders, offenses, arrestees, property records
- Tied together by Agency Identifier (ORI) and incident number
- 13 Segment files 6 group A, 1 group B, 3 Windows files, 3 Batch Files

NIBRS Relational Database

- 59 Tables – 13 Segments + Codebook
- Enforces referential integrity – important when uploading new data
- Provides SQL query capability and processing capabilities (indices, partitioning, etc.)
- Extract required data and relationships
- Viewing and reporting tools

Sizes of NIBRS Segments

John Jay NIBRS Relational Database

Segment Type	Record Counts			Columns (fields)
	(in millions, first 7 rows)			
	'95-'05	'95-'08	'95-'14	
1.Administrative	29.1	44.1	74.6	17
2.Offense	31.9	48.4	82.3	26
3.Property	33.3	50.7	87.6	25
4.Victim	31.7	48.2	82.3	55
5.Offender	32.9	50.0	85.0	12
6.Arrestee	8.0	12.4	22.2	21
7.Group B Arrest	9.9	14.6	24.9	19
8.Window Exceptional Clearance	11,502	16,611	35,085	27
9.Window Recovered Property	7,086	11,074	17,998	35
10.Window Arrestee	156,791	179,559	23.5	32

Records per Segment in NIBRS

	2014	2010	2005	2000	1995
Administrative	4,986,370	5,060,854	4,614,054	2,841,523	837,014
Offense	5,574,049	5,610,977	5,079,639	3,098,037	906,509
Offender	5,701,941	5,845,297	5,235,653	3,205,276	937,035
Victim	5,587,973	5,636,428	5,067,759	3,075,362	889,743
Property	6,119,863	6,011,620	5,338,234	3,214,981	951,574
Arrestee	1,667,262	1,606,460	1,334,625	769,630	227,090
Group B Arrest	1,590,574	1,753,973	1,457,435	1,006,424	318,524
LEAs Reporting	6258	5662	4862	3365	1255

LEAs Reporting at Least One Incident			
Year	Number of LEAs	Year	Number of LEAs
1995	1255	2006	4841
1996	1487	2007	4935
1997	1738	2008	5184
1998	2249	2009	5595
1999	2852	2010	5662
2000	3365	2011	5874
2001	3611	2012	6086
2002	3809	2013	6129
2003	4287	2014	6258
2004	4525		
2005	4682		

Oracle Enterprise Manager - Table View - Mozilla Firefox

Oracle Enterprise Manager - Table View

http://localhost:localdomain:1521/em/console/database/schema/table?name=NIBRS&name=ADMINISTRATIVE&event=view&cancelURL=/em/col

Most Visited Red Hat Red Hat Magazine Red Hat Network Red Hat Support

Actions | Create Like

General

Name: ADMINISTRATIVE
 Schema: NIBRS
 Tablespace: USERS
 Organization: Standard (Heap Organized)

Columns

Name	Data Type	Size	Scale	Not NULL	Default Value	Encrypted
SEG	CHAR	2		<input type="checkbox"/>		<input type="checkbox"/>
NIBRS_RELEASED	NUMBER	4		<input checked="" type="checkbox"/>		<input type="checkbox"/>
STATE_CODE	NUMBER	2		<input type="checkbox"/>		<input type="checkbox"/>
ORI	CHAR	9		<input checked="" type="checkbox"/>		<input type="checkbox"/>
INCIDENT	CHAR	12		<input checked="" type="checkbox"/>		<input type="checkbox"/>
INCIDENT_DATE	DATE			<input checked="" type="checkbox"/>		<input type="checkbox"/>
INCIDENT_DATE_HOUR	NUMBER	2		<input type="checkbox"/>	99	<input type="checkbox"/>
TOTAL_OFFENSE_SEGMENTS	NUMBER	2		<input type="checkbox"/>		<input type="checkbox"/>
TOTAL_VICTIM_SEGMENTS	NUMBER	3		<input type="checkbox"/>		<input type="checkbox"/>
TOTAL_OFFENDER_SEGMENTS	NUMBER	2		<input type="checkbox"/>		<input type="checkbox"/>
TOTAL_ARRESTEE_SEGMENTS	NUMBER	2		<input type="checkbox"/>		<input type="checkbox"/>
CITY_SUBMISSION	CHAR	4		<input type="checkbox"/>		<input type="checkbox"/>
CLEARED_EXCEPTIONALLY	CHAR	1		<input type="checkbox"/>		<input type="checkbox"/>
EXCEPTIONAL_CLEARANCE_DATE	DATE			<input type="checkbox"/>		<input type="checkbox"/>
NUMBER_OF_RECORDS_PFCORI	NUMBER	3		<input type="checkbox"/>		<input type="checkbox"/>
REPORT_DATE_INDICATOR	CHAR	1		<input type="checkbox"/>		<input type="checkbox"/>

Indicates a Primary Key column
 Indicates a Unique Key column
 Indicates a SecureFile LOB column

Constraints

Oracle Enterprise Manager - Table View - Mozilla Firefox

Oracle Enterprise Manager - Table View

Actions: Create Link

General

Name: OFFENSE
 Schema: NIBRS
 Tablespace: USERS
 Organization: Standard (Heap Organized)

Columns

Name	Data Type	Size	Scale	Not NULL	Default Value	Encrypted
SEG	CHAR	2		<input type="checkbox"/>		<input type="checkbox"/>
NIBRS_RELEASED	NUMBER	4		<input checked="" type="checkbox"/>		<input type="checkbox"/>
STATE_CODE	NUMBER	2		<input type="checkbox"/>		<input type="checkbox"/>
ORI	CHAR	9		<input checked="" type="checkbox"/>		<input type="checkbox"/>
INCIDENT	CHAR	12		<input checked="" type="checkbox"/>		<input type="checkbox"/>
INCIDENT_DATE	DATE			<input checked="" type="checkbox"/>		<input type="checkbox"/>
UCR_OFFENSE_CODE	CHAR	3		<input checked="" type="checkbox"/>	'NA'	<input type="checkbox"/>
OFFENSE_ATTEMPTED_COMPLETED	CHAR	1		<input type="checkbox"/>		<input type="checkbox"/>
OFFENDER_SUSPECTED_USING1	CHAR	1		<input type="checkbox"/>	'N'	<input type="checkbox"/>
OFFENDER_SUSPECTED_USING2	CHAR	1		<input type="checkbox"/>	'N'	<input type="checkbox"/>
OFFENDER_SUSPECTED_USING3	CHAR	1		<input type="checkbox"/>	'N'	<input type="checkbox"/>
LOCATION_TYPE	NUMBER	2		<input type="checkbox"/>	25	<input type="checkbox"/>
NUMBER_OF_PREMISES_ENTERED	NUMBER	2		<input type="checkbox"/>		<input type="checkbox"/>
METHOD_OF_ENTRY	CHAR	1		<input type="checkbox"/>	'U'	<input type="checkbox"/>
TYPE_CRIMINAL_ACTIVITY1	CHAR	1		<input type="checkbox"/>		<input type="checkbox"/>
TYPE_CRIMINAL_ACTIVITY2	CHAR	1		<input type="checkbox"/>		<input type="checkbox"/>
TYPE_CRIMINAL_ACTIVITY3	CHAR	1		<input type="checkbox"/>		<input type="checkbox"/>
TYPE_WEAPON_FORCE_INVOLVED1	CHAR	3		<input type="checkbox"/>	'99'	<input type="checkbox"/>
TYPE_WEAPON_FORCE_INVOLVED2	CHAR	3		<input type="checkbox"/>	'99'	<input type="checkbox"/>
TYPE_WEAPON_FORCE_INVOLVED3	CHAR	3		<input type="checkbox"/>	'99'	<input type="checkbox"/>
BIAS_MOTIVATION	NUMBER	2		<input type="checkbox"/>	'99'	<input type="checkbox"/>
NUMBER_OF_RECORDS_PERORI	NUMBER	3		<input type="checkbox"/>		<input type="checkbox"/>

Indicates a Primary Key column

Tablespace: USERS
 Organization: Standard (Heap Organized)

Columns

Name	Data Type	Size	Scale
SEG	CHAR	2	
NIBRS_RELEASED	NUMBER	4	
STATE_CODE	NUMBER	2	
ORI	CHAR	9	
INCIDENT	CHAR	12	
INCIDENT_DATE	DATE		
VICTIM_SEQUENCE_NUMBER	NUMBER	3	
UCR_OFFENSE_CODE1	CHAR	3	
UCR_OFFENSE_CODE2	CHAR	3	
UCR_OFFENSE_CODE3	CHAR	3	
UCR_OFFENSE_CODE4	CHAR	3	
UCR_OFFENSE_CODE5	CHAR	3	
UCR_OFFENSE_CODE6	CHAR	3	
UCR_OFFENSE_CODE7	CHAR	3	
UCR_OFFENSE_CODE8	CHAR	3	
UCR_OFFENSE_CODE9	CHAR	3	
UCR_OFFENSE_CODE10	CHAR	3	
TYPE_OF_VICTIM	CHAR	1	
AGE_OF_VICTIM	CHAR	2	
SEX_OF_VICTIM	CHAR	1	
RACE_OF_VICTIM	CHAR	1	
ETHNICITY_OF_VICTIM	CHAR	1	

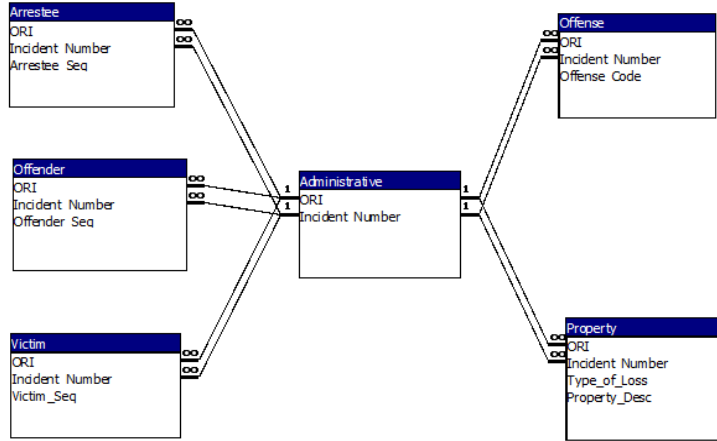
Oracle Enterprise Manager - Table View - Mozilla Firefox

INJURY1	CHAR	1		
INJURY2	CHAR	1		
INJURY3	CHAR	1		
INJURY4	CHAR	1		
INJURY5	CHAR	1		
OFFENDER_NUMBER_RELATED1	NUMBER	2		
RELATIONSHIP_VICTIMOFFENDER1	CHAR	2		
OFFENDER_NUMBER_RELATED2	NUMBER	2		
RELATIONSHIP_VICTIMOFFENDER2	CHAR	2		
OFFENDER_NUMBER_RELATED3	NUMBER	2		
RELATIONSHIP_VICTIMOFFENDER3	CHAR	2		
OFFENDER_NUMBER_RELATED4	NUMBER	2		
RELATIONSHIP_VICTIMOFFENDER4	CHAR	2		
OFFENDER_NUMBER_RELATED5	NUMBER	2		
RELATIONSHIP_VICTIMOFFENDER5	CHAR	2		
OFFENDER_NUMBER_RELATED6	NUMBER	2		
RELATIONSHIP_VICTIMOFFENDER6	CHAR	2		
OFFENDER_NUMBER_RELATED7	NUMBER	2		
RELATIONSHIP_VICTIMOFFENDER7	CHAR	2		
OFFENDER_NUMBER_RELATED8	NUMBER	2		
RELATIONSHIP_VICTIMOFFENDER8	CHAR	2		
OFFENDER_NUMBER_RELATED9	NUMBER	2		
RELATIONSHIP_VICTIMOFFENDER9	CHAR	2		
OFFENDER_NUMBER_RELATED10	NUMBER	2		

Relationship Table - 27 Rows

NA	Not applicable	SE	Victim was Spouse
CS	Victim was Common-Law Spouse	PA	Victim was Parent
SB	Victim was Sibling	CH	Victim was Child
GP	Victim was Grandparent	GC	Victim was Grandchild
IL	Victim was In-Law	SP	Victim was Stepparent
SC	Victim was Stepchild	SS	Victim was Stepsibling
OF	Victim was Other Family Member	VO	Victim was Offender
AQ	Victim was Acquaintance	FR	Victim was Friend
NE	Victim was Neighbor	BE	Victim was Babysitter
BG	Victim was Boyfriend/Girlfriend	CF	Victim was Child of Boyfriend / Girlfriend
HR	Homosexual Relationship	XS	Victim was Ex-Spouse
EE	Victim was Employee	ER	Victim was Employer
OK	Victim was Otherwise Known	RU	Relationship Unknown
ST	Victim was Stranger		

Entity Relationship (6 main segments)



NIBRS Incidents with Multiple Segments (1995-2014)								
Segment	One		Two		Three		Four	
Arrestee	15,642,547	85.91%	2,007,327	11.02%	386,543	2.12%	112,768	0.62%
Offender	66,566,279	90.16%	5,431,359	7.36%	1,207,932	1.64%	398,409	0.54%
Offense	66,895,039	90.61%	6,344,465	8.59%	535,986	0.73%	48,723	0.07%
Victim	68,100,575	92.24%	4,711,182	6.38%	678,083	0.92%	186,663	0.25%

Victim/Offender Join

ORI Code	Incident Number	Offender Sequence No.	Offender Age	Victim Sequence No.	Victim Age	Incident Date	
1	CO0030400	CI0BRFRH-2 N	1	23	1	33	09-Nov-00
2	DE0020300	LT01KETVVO N	0	00	1	39	16-DEC-02
3	DE0020600	LI01KVBRTU N	1	11	1	09	06-OCT-02
4	DE0020600	LI01KVBRTU N	1	11	2	08	06-OCT-02
5	DE0020600	LI01KVBRTU N	2	10	1	09	06-OCT-02
6	DE0020600	LI01KVBRTU N	2	10	2	08	06-OCT-02
7	DE0020600	LI01KVBRTU N	3	10	1	09	06-OCT-02
8	DE0020600	LI01KVBRTU N	3	10	2	08	06-OCT-02
9	DE0020600	LI01KVBRTU N	4	12	1	09	06-OCT-02
10	DE0020600	LI01KVBRTU N	4	12	2	08	06-OCT-02
11	IA0820200	7Z1C7REMQ-F	1	40	1	41	24-JAN-02

**NIBRS Released Year vs. Incident Year
(1995 – 2014 data sets)**

NIBRS Release Year	Incidents where Released year is not the same as Incident year	Percentage of incidents where released year not the same as incident year	Total Release year Records
2014	67,010	1.34%	4,986,370
2013	72,288	1.43%	5,070,862
2012	68,357	1.30%	5,261,649
2011	63,905	1.26%	5,084,696
2010	61,940	1.22%	5,060,854
2009	60,658	1.20%	5,052,752
2008	56,882	1.13%	5,016,841
2007	58,303	1.17%	5,003,962
2006	59,110	1.20%	4,906,781
2005	52,351	1.13%	4,614,054
2004	46,690	1.14%	4,083,571
2003	39,856	1.10%	3,637,432
2002	36,941	1.07%	3,455,589
2001	200	0.01%	3,232,281
2000	22,407	0.79%	2,841,523
1999	20,484	0.95%	2,157,326
1998	102	0.01%	1,822,675
1997	56	0.00%	1,426,978
1996	81	0.01%	1,064,763
1995	168	0.02%	837,014

Spreadsheet Pivot Tables

Offender Counts (Offender suspected of using a computer)									
Aggregated by Offense, Age and Gender			Year						
Offense Description	Age Group	Gender	2000	2001	2002	2003	2004	2005	Grand Total
Embezzlement	11 – 20	F	11	7	5	8	8	14	53
		M	4	5	6	8	6	7	36
	20 – 30	F	17	18	19	22	20	29	125
		M	11	13	14	14	12	23	87
	31 – 40	F	9	9	18	20	13	31	100
		M	8	9	12	7	12	13	61
	41 – 50	F	5	7	7	6	8	21	54
		M	3	8	4	4	4	10	33
	51 – 60	F		2	4	1	1	4	12
		M		1	4		2	3	10
Wire Fraud	11 – 20	F	1	3	3	4	2	2	15
		M	9	9	9	13	13	12	65
	20 – 30	F	1	6	3	6	14	16	46
		M	7	12	18	22	27	22	108
	31 – 40	F		3	2	8	9	8	30
		M	4	8	11	12	13	21	69
	41 – 50	F	1	5	3	3	3	6	21
		M	4	2	2	8	4	5	25
	51 – 60	F		1	3	1	2	4	11
		M		2	2	2	1	1	6

BIAS due to Non Response

- Compare UCR and NIBRS reporting
- Examine Breakdown of Violent and Property Crimes in NIBRS and UCR
- Examine Larceny in NIBRS and UCR

NIBRS and UCR

NIBRS

- 33 states certified
- 38% report all crime in NIBRS
- 30% of US Population
- 29% of all crime
- 6528 LEAs Reporting

UCR

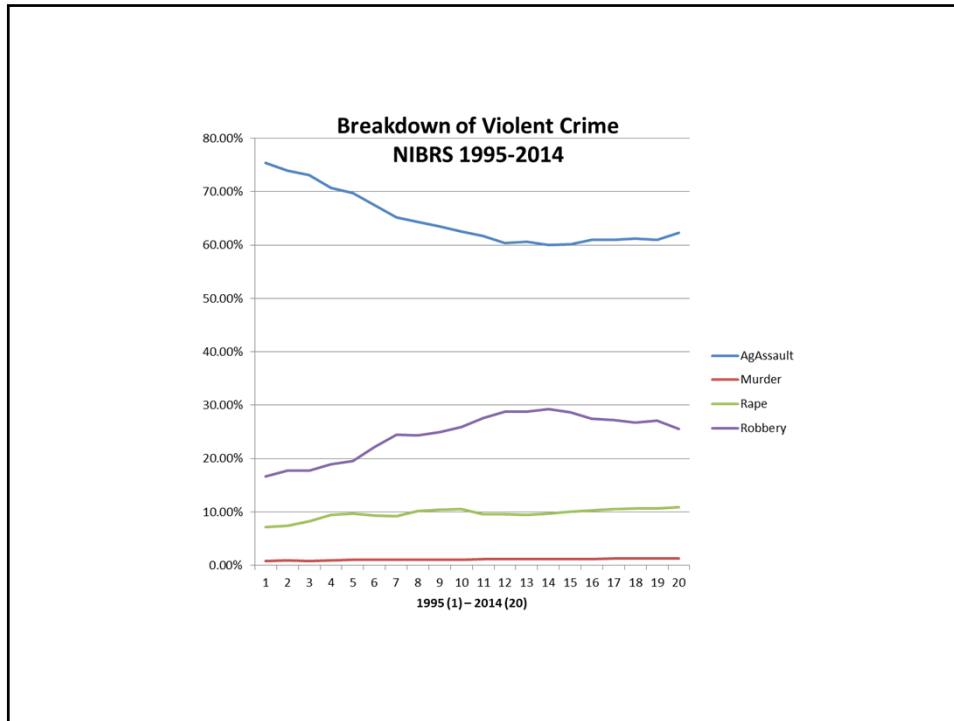
- 16,643 LEAs submitted data to UCR (18,439 total)
- Includes major municipalities
- Mainly summary data but with some incident data

LEAs Contributing Incidents to the NIBRS Administrative Segment

	1-10	10-100	100-1,000	1000-10,000	10,000-100,000	Over 100,00	Total
1995	111	385	585	170	9	0	1,255
2000	304	884	1,624	516	37	0	3,365
2005	475	1,222	2,144	775	64	2	4,682
2010	484	1,624	2,615	871	66	2	5,662
2014	532	1,929	2,858	874	65	0	6,258

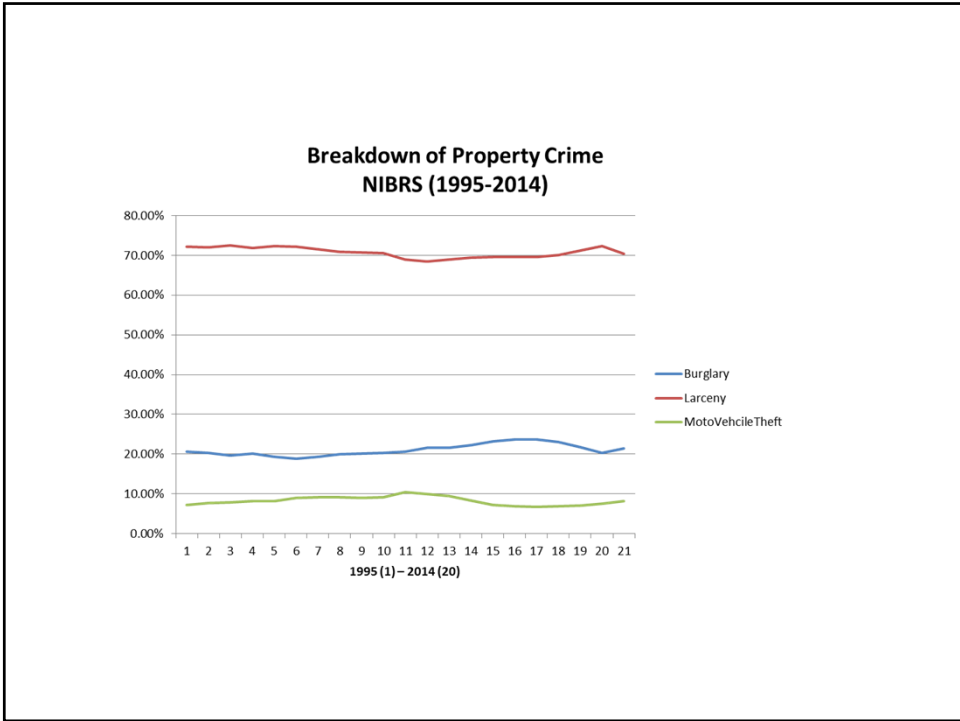
Breakdown of Violent Crimes UCR Data and NIBRS				
Crime Type	UCR (2014)	UCR (2015)	NIBRS Data (2014)	NIBRS Data (1995-2014)
Aggravated Assault	63.61%	63.8%	62.29%	62.86%
Murder/Nonnegligent Manslaughter	1.22%	1.3%	1.28%	1.15%
Rape (legacy definition)	7.21%	7.5%	10.91%	9.95%
Robbery	27.96%	27.3%	25.51%	26.03%

Increase in Violent Crimes UCR and NIBRS (2013-2014)						
Crime Type	UCR (2013)	NIBRS (2013)	UCR (2014)	NIBRS (2014)	UCR % change	NIBRS % change
murder	14,196	3,445	14,249	3,499	.37%	1.57%
rape	79,770	28,855	84,041	29,723	5.35%	3.01%
robbery	341,031	73,354	325,802	69,512	-4.47%	-5.24%
assault	724,149	165,395	741,291	169,728	2.37%	2.62%



Breakdown of Property Crimes UCR and NIBRS (2014)

Crime Type	UCR (2014)	UCR %	NIBRS (2014)	NIBRS %	NIBRS Data (1995-2014)	NIBRS Data %
Burglary	1,729,496	20.90%	486,554	20.24%	7,790,840	21.39%
Larceny	5,858,496	70.77%	1,736,384	72.24%	25,628,556	70.36%
Motor Vehicle Theft	689,527	8.33%	180,822	7.52%	3,003,125	8.25%



Comparison of Larceny Details UCR and NIBRS 2014 Data (offense counts)

Larceny Type	UCR Data		NIBRS Data	
	Counts	percentages	Counts	percentages
Pocket-picking	27,465	0.54%	6,884	0.40%
Purse-snatching	20,660	0.40%	5,653	.33%
shoplifting	1,097,444	21.47%	378,153	21.78%
From motor vehicles (except accessories)	1,172,876	22.95%	358,120	20.62%
Motor vehicle	359,490	7.03%	79,794	4.60%
accessories				
bicycles	184,575	3.61%	0	0%
From buildings	626,572	12.26%	225,598	12.98%
From coin-operated machines	11,728	.23%	3970	.23%
All others	1,610,734	31.51%	678,212	39.06%
Totals	5,111,544	100%	1,736,384	100%

Item Missing Data

- NIBRS has 53 data elements most of which are mandatory
- Data elements such as demographics of victim and offenders, relationships victim/offender and others are of interest to researchers and policy makers
- Compare rates of missing data in NIBRS and other sources such as SHR
- Examine item missing data in murders

NIBRS Unknown Murder Victim Information							
	victims	Unknown age		Unknown race		Unknown gender	
1995	458	6	1.31%	6	1.31%	0	0.00%
1996	643	13	2.02%	7	1.09%	3	0.47%
1997	749	18	2.40%	10	1.34%	0	0.00%
1998	975	39	4.00%	21	2.15%	7	0.72%
1999	1230	34	2.7%	27	2.20%	6	0.49%
2000	1695	82	4.84%	52	3.07%	17	1.00%
2001	1958	85	4.34%	49	2.50%	15	0.77%
2002	2053	95	4.63%	53	2.58%	15	0.73%
2003	2132	65	3.05%	52	2.44%	7	0.33%
2004	2358	104	4.41%	58	2.46%	21	0.89%
2005	3320	122	3.67%	76	2.29%	13	0.39%
2006	3404	111	3.26%	66	1.94%	25	0.73%
2007	3420	97	2.84%	62	1.81%	16	0.47%
2008	3252	97	2.98%	93	2.86%	28	0.86%
2009	3457	79	2.29%	54	1.56%	8	0.23%
2010	3430	46	1.34%	49	1.43%	9	0.26%
2011	3544	47	1.33%	77	2.17%	13	0.37%
2012	3689	52	1.41%	62	1.68%	11	0.30%
2013	3551	57	1.61%	57	1.61%	14	0.39%
2014	3596	49	1.36%	73	2.03%	23	0.64%

NIBRS Unknown Offender Information ¹						
	Victims	Offender missing	unknown demographics	unknown age	unknown race	unknown gender
1995	458	4.37%	7.64%	6.99%	5.68%	4.80%
1996	643	7.93%	7.62%	7.00%	6.69%	5.29%
1997	749	10.41%	9.35%	8.14%	7.21%	6.28%
1998	975	7.08%	9.85%	8.82%	6.77%	5.23%
1999	1230	9.02%	9.27%	7.97%	7.64%	5.93%
2000	1695	9.44%	15.16%	14.40%	10.86%	9.79%
2001	1958	11.90%	11.64%	10.73%	8.27%	7.46%
2002	2053	10.23%	12.96%	11.69%	8.91%	7.60%
2003	2132	11.30%	12.24%	10.79%	9.29%	7.88%
2004	2358	10.69%	15.18%	13.02%	11.28%	9.16%
2005	3320	11.20%	19.94%	17.95%	14.46%	12.02%
2006	3404	11.72%	18.51%	16.69%	12.66%	11.05%
2007	3420	12.54%	15.26%	13.57%	9.30%	7.63%
2008	3252	13.47%	14.94%	12.67%	10.61%	8.30%
2009	3457	12.09%	15.33%	13.51%	9.98%	7.84%
2010	3430	13.29%	14.46%	13.27%	9.04%	7.49%
2011	3544	12.39%	15.77%	14.11%	10.38%	8.94%
2012	3689	13.53%	15.83%	14.10%	10.11%	8.65%
2013	3551	12.56%	14.81%	13.38%	9.63%	8.39%
2014	3596	11.43%	14.35%	12.26%	10.65%	8.79%

¹The unit of analysis is victims.

Ongoing Work

- Time series studies to examine NIBRS missing data, victim-offender relationships, circumstances, location and weapon used
- Extract data for specific studies and make it available in Excell Pivot Tables or Data Cubes
- Examine effects of police reporting practices on the data, e.g., inaccurate incident times
- Prepare for additional NIBRS reporting. DOJ, OJP, BJS and FBI program to create a nationally representative crime sample and NIBRS compliant operational systems increasing NIBRS reporting. (Mainly an IT effort)
- Make the relational database publicly available through use of the Oracle Data Pump utility

Thank You

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