

B. Collections of Information Employing Statistical Methods

1. Respondent Universe

National Sample

The potential universe for the NCVS national sample is all persons 12 years of age or older in the more than 110 million housing units across the United States and persons 12 or over living in group quarters situations (except crews of vessels, military in barracks, and the institutional population).¹

Interviewers are able to obtain interviews with about 84 percent of the persons in 90 percent of the occupied housing units in sample in any given month. This is an ongoing survey that is in the field 12 months of the year.

The national sample consists of approximately 63,300 designated addresses located in 329 stratified PSUs throughout the United States. The sample consists of six parts, each of which is designated for interview in a given month and again at 6-month intervals. Beginning in 2005, new sample addresses were introduced based upon the 2000 Decennial Census of Population and Housing. These sample addresses were selected using the Ernst method (1986)² for maximizing overlap in sample selection. In 2016, new sample address will be introduced based upon the 2010 Decennial Census of Population and Housing. The 2016 sample will be selected using the Ohlsson method (1999),³ which requires that first-stages samples be selected independently but gives increased flexibility for moving towards producing state-level estimates.

The NCVS uses a rotating sample. The interviewing schedule is provided in Appendix A and the rotation chart is available in the attached forms (NCVS-551). The sample consists of six groups for each month of enumeration. Each of these groups stays in the sample for an initial interview and six subsequent interviews. During the course of a 6-month period, a full sample of six rotation groups will be interviewed (one-sixth each month). In addition, one rotation group enters the sample for its first interview each month.

Each interview period the interviewer completes or updates the household composition component of the NCVS interview and asks the crime screen

¹ The NCVS samples housing units, which refers to the physical structure occupying one household. The term 'household' is used to refer to any persons occupying a particular housing unit as their primary residence, whether related or not. If the initial household members leave the housing unit and are replaced, the new persons occupying the unit become the in-sample household.

² Ernst, L.R. (1986). Maximizing the Overlap Between Surveys When Information is Incomplete. *European Journal of Operational Research*, 27, 192-200.

³ Ohlsson, E. (1999). Comparison of PRN Techniques for Small Sample Size PPS Sample Coordination. Institute of Actuarial Mathematics and Mathematical Statistics, Stockholm University, No. 210.

questions for each household member 12 years old or older. The interviewer then completes a crime incident report for each reported crime incident identified in the crime screener. Each household member provides the information by self-response. Proxy respondents are allowable under very limited circumstances and represent less than 3% of all interviews. All forms and materials used to collect the NCVS are attached and are identified in Appendix B.

The first contact with a household is by personal visit and subsequent contacts may be by telephone. For the second through seventh visits, interviews are done by telephone whenever possible. Approximately 54 percent of the interviews conducted each month are by telephone. If members of a household move out and are replaced during the time that the housing unit is in sample, the new occupants are considered a replacement household and begin the interview process where the old household left off. For instance, if household members move out and are replaced after their third interview, the replacement household is interviewed for the fourth through seventh interviews. Each month, replacement households account for approximately 7% of the NCVS sample.

State Samples

Beginning in 2013, BJS plans to conduct a pilot test in which it will boost the existing national sample in seven of the largest states in order to generate state-level violent and property crime victimization estimates. This effort is part of BJS' effort to develop a credible subnational program for the NCVS that produces victimization estimates at the state or lower-levels of geography. (See Part A, Needs and Uses, for more information about BJS' plans for producing subnational estimates in the NCVS.) Building upon research conducted through the NCVS redesign efforts, BJS has learned that by building on existing sample in the largest states it could generate direct, state-level 3-year rolling estimates for lower costs than was originally estimated. The redesign research revealed that boosting the sample in the seven largest states, while maintaining the current national sample and consistency of national estimates, would only require about a six percent increase in total sample.

This boost in sample in the largest states will not only result in reliable 3-year state-level victimization estimates, it will also allow BJS to identify potential issues that could arise from the process of boosting state samples. Assuming the initial seven state boost is feasible and produces state-level victimization estimates with the expected level of precision, the seven states with direct estimates could ultimately be expanded on to include additional states, as well as metropolitan and other local areas within the states, when the new sample and sampling design is introduced in 2016.

More specifically, the pilot boost in the seven states is designed to achieve several purposes. First, it will provide BJS with more precise cost data related to survey administration that can then be used in determining the costs of its plans for a larger subnational program based upon a combination of direct and model-

based estimates. The boosted sample in the seven states will come from areas that are outside of the current PSUs, and collecting data from the boosted sample may incur additional field costs, such as those associated with hiring and training new FRs, travel costs, and other field costs. BJS currently does not have good estimates of these costs, but once these estimates are generated at the state level, they can then be used to generate estimates of the costs associated with sampling for large cities after 2016. Second, and related, to determining if there are any efficiencies to be gained over time through the pilot boost, BJS intends to conduct the pilot study for three years for three reasons: (1) the three-year period was used in designing the amount of sample required to generate violent and property crime estimates with coefficients of variation of less than 10%; (2) a one-year pilot would not provide sufficient time to assess whether the allocation of cases among FRs can be done in ways that can achieve cost efficiencies; and (3) the current cost estimates for additional sample in the seven states is sufficiently modest to allow BJS to run the test for three years.

The state-level victimization estimates to be produced from the pilot boost will also have utility for BJS in describing changes in victimization rates. Because the seven states account for about one-third of the U.S. resident population, the crime rates in these states can be used to help decompose changes in national-level crime rates. Second, used in conjunction with the subnational work on MSAs and generic area estimates (described in Part A), BJS will be able to describe changes in crime rates arising from the largest states, 40 of the largest MSAs, and various types of generic areas. Third, the state-level victimization estimates are useful to states governments in allocating funds for victim services. Apart from state police, state funding for crime policy is limited to passing through a portion of Justice Assistance Grants to local jurisdictions and funding for programs such as victim services or domestic violence programs. State-level victimization estimates provide a basis for assessing need and program allocation decisions. Finally, the state pilot boost effort does not preclude BJS from making local or city-level estimates in the future. Rather, BJS through annual sampling and the stratification plans for the 2016 sample design, BJS can select cities or MSA areas for boosts, contingent upon funding, and produce estimates for large cities as well. In deciding to boost in seven states now, rather than a limited number of cities, BJS chose an option that will yield important cost data about survey operations that it can use in making future decisions about its subnational estimate program as well as generate estimates having utility in their own right.

The three-year, rolling average estimates meeting the 10% coefficient of variation of standard is consistent with other federal subnational estimate programs estimates. For example, the American Community Survey (ACS) generates estimates based one-year, three-year, or five-year rolling averages, depending on the size of the area. The design of the pilot boost with its goal of three-year rolling average estimates was based on assumptions about national-level crime rates applied to the states. The state pilot boost will allow BJS to test these assumptions and identify possible gains in efficiency that could be applied to a

larger set of states or could allow for fewer years of data to generate reliable estimates for a given cost.

The 2013 sample boost would require a modification of NCVS burden hours and this modification will be submitted to OMB at a later point but prior to initiating the boost. The exact sample sizes will be determined in consultation with the Census Bureau, as information about the sample sizes and field implementation plan are deliverables that Census is to provide to BJS later this year. Given the exact sample sizes, BJS will include with the a sampling plan from Census that details the methodology used to generate three- year rolling average state estimates with coefficients of variation of 10% or less.

2. **Statistical Methodology**

The NCVS is primarily designed to calculate national estimates of crime victimization for the target population - the noninstitutional resident population aged 12 years and older. Beginning in 2014, however, the survey will also be used to calculate state-level estimates of criminal victimization for the four to seven largest states in the country. For both the national and state-level estimates, the frame used to reach the target population is the list of addresses of all living quarters in the U.S. compiled from the 2000 decennial census. Starting in 2016, the national and state sampling frames will be adjusted to reflect the 2010 decennial census.

Sample selection for the NCVS has three stages: the selection of primary sampling units or areas known as PSUs, the selection of address units in sample PSUs, and the determination of housing units and persons to be included in the sample. Each of these three stages is discussed in detail in the section “Sampling.”

Survey estimates are derived from a stratified, multi-stage cluster sample. The PSUs composing the first stage of the sample are formed from counties or groups of adjacent counties based upon data from the decennial census. The larger PSUs are included in the sample automatically and are considered to be self-representing (SR) since all of them are selected with certainty. The remaining PSUs, called non self-representing (NSR), because only a subset of them are selected, are combined into strata by grouping PSUs with similar geographic and demographic characteristics, as collected in the decennial census from which the sample is drawn. For the NCVS, administrative crime data drawn from the FBI’s Uniform Crime Reporting Program are also used to stratify the PSUs.

SAMPLING

Stage 1. Defining and Selection of PSUs:

Defining PSUs - Formation of PSUs begins with listing counties and

independent cities in the target area. For the NCVS, the target area is the entire country. The counties are either grouped with one or more contiguous counties to form PSUs or are PSUs all by themselves. The groupings are based on certain characteristics such as total land area, current and projected population counts, large metropolitan areas, and potential natural barriers such as rivers and mountains. The resulting county groupings are called PSUs.

After the PSUs are formed, the large PSUs and those in large urban areas are designated SR. The smaller PSUs are designated NSR. Determining which PSUs are considered small and which are large depends on the survey's SR population cutoff. An SR PSU must be large enough in population to support at least one field representative with a full workload of approximately 32 cases. For the NCVS, all PSUs with population over 223,176 were labeled SR.

Stratifying PSUs - The NSR PSUs are grouped with similar NSR PSUs within census divisions (New England, Mid Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, Pacific) to form strata. Each SR PSU forms its own stratum. The data used for grouping the PSUs consist of decennial census demographic data and administrative crime data. As was stated earlier, NSR PSUs are grouped to be as similar or homogeneous as possible. Just as the SR PSUs must be large enough to support a full workload so must each NSR strata be of that size. The most efficient stratification scheme is determined by minimizing the between PSU variance and the within PSU variance.

Selecting PSUs - The SR PSUs are automatically selected for sample or "selected with certainty." One NSR PSU is selected from each grouped stratum. The NSR PSUs are sampled with probability proportional to the population size using a linear programming algorithm. Beginning with collection year 2006, the NCVS design consists of 183 SR PSUs and 146 NSR PSUs.

Stage 2. Preparing Frames and Sampling Within PSUs

Frame Determination - To ensure adequate coverage for the target population, the Census Bureau defines and selects sample from four address lists called frames: the unit frame, the area frame, the group quarters frame, and the new construction or permit frame. Each address in the country is assigned to one and only one of these frames. Which frame an address is assigned to depends on four factors: 1) what type of living quarters are at the address, 2) when the living quarters were built, 3) where the living quarters were built, and 4) how completely the street address was listed. The main distinction between the frames are the procedures used to obtain the sample addresses.

Two types of living quarters are defined in the decennial census. The first type is a housing unit. A housing unit (HU) is a group of rooms or a single room occupied as separate living quarters or intended for occupancy as separate living

quarters. A housing unit may be occupied by a family or one person, as well as by two or more unrelated persons who share the living quarters. Before the 2000 decennial census, separate living quarters were defined as a space in which the occupants live and eat separately from all the other persons on the property and have direct access to their living quarters from the outside or through a common hall or lobby as found in apartment buildings. Beginning with the 2000 decennial census, the criteria for separate living quarters are that the occupants must live separately from any other individuals in the building and have direct access from outside the building or through a common hall or entry. Eating separately is no longer a criterion.

The second type of living quarters is group quarters (GQ). Group quarters are living quarters where residents share common facilities or receive formally authorized care. About 3 percent of the population counted in the 2000 census resided in group quarters. Of those, less than half resided in non-institutionalized group quarters. About 97 percent of the population counted in the 2000 census lived in housing units.

Within-PSU Sampling - All the Census Bureau's continuing demographic surveys, such as the NCVS, are sampled together shortly after the most recent decennial census. This takes advantage of newly available census data that shows population growth and demographic changes, as well as updated unit address lists. Roughly a decade's worth of sample is selected at that time. Selection of samples is done one survey at a time (sequentially) and one frame at a time (independently). Each survey determines how the unit addresses within the frame should be sorted prior to sampling. For the NCVS, each frame is sorted by geographic variables. A systematic sampling procedure is used to select housing units from each frame. For the unit and the GQ frames, actual unit addresses are selected and reserved for the NCVS. In the area frame, a specified number of living quarters in a specific geographic location are promised to the NCVS and after the address listing operation in that geographic area, the specific unit addresses are assigned. Similarly in the permit frames, empty placeholders are selected for the NCVS within the PSU. Then over time as new permits are issued, the placeholders are replaced with actual newly built housing units/addresses.

Addresses selected for a survey are removed from the frames, leaving an unbiased or clean universe behind for the next survey that is subsequently sampled. By leaving a clean universe for the next survey, duplication of addresses between surveys is avoided. This is done to help preserve response rates by insuring no unit falls into more than one survey sample.

Stage 3: Sample Within Sample Addresses

The last stage of sampling is done during initial contact of the sample address during the data collection phase. For the NCVS, if the address is a residence

and the occupants agree to participate, there are procedures to identify all persons who live at the resident address.⁴ A household roster is completed to detail the name and other demographic information for all persons living at the resident address regardless of their age or relationship to one another. Based on the household roster, every person aged 12 or older who lives at the resident address is then interviewed. If a household member under age 12 turns 12 while the household is in sample, that person is then eligible to be interviewed as well. If someone moves out (in) during the interviewing cycle, they are removed from (added to) the roster.

Stage 4: Independent Sample State Boost

Beginning in 2013, BJS plans to boost the existing national sample in seven of the largest states- California, Texas, Florida, New York, Illinois, Pennsylvania, and Ohio in order to generate state-level violent and property crime victimization estimates in those states. The boosted sample will be drawn from the Census Master Address File and will be maintained independently from the core NCVS sample so as to not impact national victimization estimates.

BJS will submit a request for a change in burden hours associated with the boost based on increases in sample sizes. Determinations regarding the necessary number and location of sample cases will be made based on simulations being conducted by the Census Bureau and Westat. The change request submitted to OMB prior to the boost will include a sampling plan from Census that details the methodology used to generate two- or three- year rolling average state estimates at an acceptable level of precision (coefficients of variation of 10% or less).

DATA COLLECTION

Each housing unit selected for the NCVS remains in the sample for three years, with each of seven interviews taking place at 6-month intervals. Respondents are asked to report crime experiences occurring in the six months preceding the month of interview. The NCVS-1 screener survey is asked of all respondents age 12 years old or older and used to ascertain whether the respondent has experienced a personal crime victimization during the prior six months and is then eligible to be administered the NCVS-2 crime incident report. The NCVS-1 collects the basic information needed to determine whether the respondent experienced a victimization within the scope of the survey (rape or other sexual assault, robbery, assault, personal larceny, burglary, motor vehicle theft, or other household theft). When a respondent reports an eligible personal victimization, the NCVS-2 is then administered to collect detailed information about each crime incident that the respondent reported. In each household, one respondent is

⁴ The criteria for separate living quarters are that the occupants must live separately from any other individuals in the building and have direct access from outside the building or through a common hall or entry. If these criteria are not met, the location is considered one housing unit and all persons living in the housing unit are household members.

designated as the head of the household and that head of the household reports about all household property crimes on behalf of the entire household.

3. Maximizing Response Rates

Several steps are taken to encourage response and maximize response rates:

- An advance introductory letter is mailed to sampled households from the Director of the Census Bureau explaining the authority for and purposes of the survey to the household before the interviewer's visit or call. All introductory letters in English and non-English languages are attached (NCVS 572 letter series).
- Field representatives carry cards and portfolios identifying them as Census Bureau employees.
- The Census Bureau trains the interviewers to obtain respondent cooperation and instructs them to make repeated attempts to contact respondents and complete all interviews. The interviewer obtains demographic characteristics of noninterview persons and the race of noninterview households for use in the adjustment for nonresponse.
- Potential respondents are assured that their answers will be held in confidence and used only for statistical purposes.
- Senior field representatives and may be called in to convert refusals.

As part of their job, interviewers are instructed to keep noninterviews to a minimum. Maintaining a low nonresponse rate involves the interviewer's ability to enlist cooperation from all kinds of people and to contact households when people are most likely to be home. As part of their initial training, interviewers are exposed to ways in which they can persuade respondents to participate as well as strategies to use to avoid refusals. Furthermore, the office staff makes every effort to help interviewers reduce their noninterviews by suggesting ways to obtain an interview, and by making sure that sample units reported as noninterviews are in fact noninterviews. Also, survey procedures permit sending a letter to a reluctant respondent as soon as a new refusal is reported by the interviewer to encourage their participation and to reiterate the importance of the survey and their response.

In addition to the above procedures used to ensure high participation rates, beginning in September of 2011 interviewers were required to complete a two-day refresher training course designed to reinforce standards for the accurate and uniform collection of data. Following the refresher training, the Census Bureau implemented additional performance measures for interviewers based on

data quality standards. The enhanced guidelines include standards pertaining to the appropriate amount of time for the administration of the NCVS-1 and NCVS-2; item non-response and “don’t know” responses; the collection of contact history information; the time of day and month the interview was conducted; and the overall response rates. The Census Bureau continually monitors interviewers to assess whether performance and response rate standards are being met. The Census Bureau also instructs and monitors each Regional Office on taking appropriate corrective actions to assist and discipline field representatives who are not meeting the performance standards.

In 2011, the household response rate for the NCVS was 90 percent and the individual response rate was 84 percent. Nonresponse at the household level is known as a Type A non-interview and is computed based on the total number of households in which no household members completed an interview, divided by the total number of households in sample, minus Type B and C non-interviews (designated when housing units are vacant, demolished, under construction, or no longer existing as a housing unit for some other reason). The individual response rate is based on the annual number of interviewed persons divided by the total number of eligible respondents in responding households (households not classified as a Type A, Type B or Type C non-interview).

Annually, the Census Bureau conducts complete analyses of nonresponse, including nonresponse and response rates, respondent and nonrespondent distribution estimates, and nonresponse bias estimates for various subgroups. Should the analyses reveal evidence of nonresponse bias, BJS will work with the Census Bureau to assess the impact to estimates and ways to adjust the weights accordingly.

Based on the 2011 response rates and assuming a violent crime rate of about 15 crimes per 1,000 persons and a property crime rate of about 120 crimes per 1,000 household, we expect to be able to detect an annual difference of less than 10% in victimization rates at a 95% confidence level.

4. Test of Procedures or Methods

Since July 1993, changes to the survey content, such as the inclusion of questions on hate crime, disability, computer crime, identity theft, and stalking, were either cognitively tested or an expert review of the survey questions was conducted to ensure the wording and sequence of the question items were appropriate.

Additionally, the Census Bureau and BJS have engaged in extensive monitoring and testing of the potential impact of the 2011 sample reinstatement, as well as changes to the organization of the Census Bureau, on victimization estimates. The Census Bureau, in conjunction with BJS, has developed a series of statistical models that allow for the examination of actual versus anticipated household and personal victimization rates, controlling for other factors that may have an impact

on crime rates. The models allow BJS to infer whether changes in victimization rates are real or are a product of methodological changes and need to be adjusted accordingly.

The conversion of the NCVS to a fully automated survey also entailed various testing of the survey instrument and control systems. In late 2005, testing of the NCVS CATI/CAPI survey began and continued through the first half of 2006. Testing included a *full instrument test* of all parts of the instrument including the systematic checking of instrument output; multiple *systems tests* of all control systems that are used for production; a *hothouse* in which interviewers come in from the field and review the instrument with input; a *dress rehearsal* (test) of all production systems but using test data and conducted by real interviewers who may interview live respondents taken from the NCVS reserve sample or do mock interviews; a *verifications test* to ensure that all changes/problems reported in Systems Test are corrected.

Other changes over the history of the survey that were approved by OMB are detailed in Appendix C.

5. Consultation Information

The Victimization Statistics Unit at BJS takes responsibility for the overall design and management of the activities described in this submission, including developing study protocols, sampling procedures, and questionnaires and overseeing the conduct of the studies and analysis of the data by contractors. BJS is also working with staff at the Census Bureau to coordinate research activities with ongoing NCVS operations. BJS, Census Bureau, and current contractor contacts include:

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