

POSSIBLE IMPROVEMENTS TO THE NATIONAL CRIME VICTIMIZATION SURVEY USING THE AMERICAN COMMUNITY SURVEY

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Introduction

A major redesign of the National Crime Victimization Survey (NCVS) was completed in 1993. The redesigned methods have had a profound impact on the measurement of crime in the United States. Compared to the "old" (NCS) methods, the "new" (NCVS) methods elicit about 50 percent more crimes of violence, 25 percent more crimes of theft, and 20 percent more burglaries. These numbers do not represent an increase in the occurrence of these crimes. Rather they represent an increase in the reporting of these crimes to interviewers due to the revised screening questions that do a better job of cuing respondents of crimes committed against them. These are dramatic improvements in the measurement of crime.

In recent years however, increased demands have been placed on the NCVS. These requests include the addition of questions measuring victimizations of disabled persons, victimizations motivated by hate, victimizations of persons residing on Indian reservations, as well as questions concerning police use of force and school crime. At the same time, there has been increasing concern regarding respondent burden, survey costs, and survey nonresponse rates. Limitations in the current design affect how well the survey is able to meet these new challenges. Moreover, many of these mandates for additional information are not accompanied by additional funding.

A focus group was held in July 1998 to discuss how best to meet these new initiatives. Participants included staff from the Bureau of Justice Statistics (BJS), the Census Bureau, and leading researchers from the academic community. Several alternative methodologies were discussed, including the use of the Census Bureau's American Community Survey (ACS).

The purpose of this paper is to provide the historical context for the NCVS, discuss the limitations which exist in the current design, and suggest possible methodological improvements available through the ACS.

National Crime Victimization Survey (NCVS) - Background

The National Crime Victimization Survey (NCVS) is one of two Justice Department measures of crime in the United States. A pioneering effort when it began in 1972, the survey was intended to complement what is known about crime from the Federal Bureau of Investigation's (FBI) annual compilation of information reported to law enforcement agencies known as the Uniform Crime Reports (UCR). The survey satisfies two broad goals: 1) to launch a time series tracing changes in both the incidence of crime and in the association of various descriptive attributes with criminal victimization, and 2) to create a vehicle that would allow the study of particular research questions related to criminal victimization (e.g., relationship of victims to offenders, the cost of crime, and the vulnerability of various types of individuals to victimization.) The mission of the survey has remained unchanged since its inception in 1972.

NCVS - Scope:

The NCVS is a household-based survey that collects data on the amount and types of crime in the United States. It measures the incidence of personal crimes of violence (e.g., rape, robbery, aggravated assault, and simple assault), personal crimes of theft, and property crimes (e.g., burglary and motor vehicle theft). Other types of crimes, such as murder, kidnaping, commercial robbery, drug abuse, prostitution, fraud, commercial burglary, and arson, are not in scope to this survey.

Specific information is collected on each incident reported. This information is used both in the crime classification

process and for analytical purposes. These incident attributes include: the date, time, and place of occurrence; whether the crime was completed or only attempted; whether there was a weapon present; whether the crime was reported to police; any injury or property loss suffered by the victim, and; the number of offenders and their characteristics, including their relationship to the victim.

Also, for analytic purposes, basic geographic and demographic information about each household is collected. The household information includes: region, locality of residence (e.g., urban, suburban, and rural), household income, and household composition and size. Personal demographic information on each respondent is collected for the same reason. The person-level information includes: age, race, sex, ethnicity, education, and marital status.

NCVS - Current Sample Design:

A stratified multi-stage cluster sample was used to select the housing units in the NCVS. Ninety-three large population areas were in sample with certainty and are called self-representing (SR) areas. Most SR areas have multiple interviewers assigned. Of the remaining areas, 110 nonself-representing (NSR) areas were randomly selected with probability proportional to population size. Most NSR areas have a single interviewer assigned.

Within the selected areas, the sample consists of all persons, aged 12 and older, in approximately 60,000 housing units. The reference period is 6 months, and the sample is interviewed at 6-month intervals. For purposes of equalizing interviewer workloads, the sample is divided into six rotating panels. The six panels each consist of one-sixth of the total sample (approximately 10,000 housing units). One panel is designated for sample each month.

Furthermore, each panel has seven rotations. Six of those rotations correspond to the six tabulated interviews per household. The first interview is not tabulated. It places a "boundary" on the subsequent interviews used for estimation. (Bounding prevents the reporting of the same incidents in consecutive reference periods by eliminating incidents which were reported in the previous interview.) Since the initial interview has no such bound, it is not used in the crime rate estimates. A new rotation group enters the sample every 6 months, replacing a group retired from the sample after being in sample for 3 years.

National Crime Victimization Survey - Limitations in the Current Design

The "new" NCVS methods have clearly improved the collection and reporting of crime victimization data. However, there are still several areas where improvements are possible. This section provides a brief overview of those areas.

Current Use of Paper and Pencil Interview (PAPI) Does Not Capitalize on Automation:

Data collection with the current design is conducted in a paper and pencil environment for 70 percent of the sampled households in the first enumeration and in subsequent enumerations where a telephone interview is infeasible. This type of system is inflexible in reacting quickly to content changes. Moreover, the majority of the alternate methodologies under consideration are only viable in an automated environment, specifically with computer-assisted personal interviewing (CAPI). This includes completing an incident report for only a sample of respondents who experience high-incident offenses and including questions for "newly evolving" topics on a rotational basis (e.g. in years N, N+2, etc.) There are also cost advantages to a fully automated data collection system in terms of eliminating printing, keying and coding costs associated with maintaining a PAPI system.

Limited Use of Warm Contact Centralized CATI:

Centralized computer-assisted telephone interviewing (CATI) involves conducting telephone interviews from a centralized facility using a computerized questionnaire, instead of from field interviewers' homes using the paper questionnaire. NCVS PSUs are classified into one of three tiers of CATI usage: maximum CATI, half CATI, and no CATI. The determination is based on the ability of the field staff to efficiently manage the reduced workload in the PSU. Use of CATI is restricted in half CATI and no CATI PSUs because of these constraints. Currently, about 30% of the sample is interviewed via CATI.

The victimization rates in households interviewed via CATI have been consistently higher than those interviewed via

paper and pencil methods. The hypothesis is that CATI instruments are highly structured and leave little opportunity for field staff to interpret or alter the questions. Consequently, the use of CATI reduces response bias. Extrapolating from the 1994 and 1995 data, personal crimes and property crimes in maximum CATI PSUs were estimated to have increased by thirty to forty percent and twenty to thirty percent, respectively. Further expansion in CATI usage will most likely increase crime rates further. If automated instruments in fact contribute to increased victimization rates, we can also hypothesize that the use of CAPI will also increase victimization rates, although decentralized interviewing may mitigate the effect.

Respondent Burden/Questionnaire Improvements:

One of the primary concerns expressed by the BJS at the focus group was the increase in respondent burden. The current NCVS interview is quite lengthy. The screen questionnaire contains 50 items and the incident report contains 163. (Only 19 items on the incident report are necessary to classify a type of crime). Most of the remaining items were added to measure specific trends in criminal victimization or to address the research needs of outside organizations. These items were not removed from the questionnaire when the political importance subsided or the research completed.

We have proposed making significant changes to the content of the data collection instruments; specifically to the incident report which was not revised as part of the redesign. These changes were tested as part of the Baltimore City project. We are hoping to implement a revised instrument in the future.

The American Community Survey - Background

The American Community Survey (ACS) is a monthly household survey. The survey, as part of the Continuous Measurement System, is a new approach for collecting accurate timely information needed for critical government functions. This new approach will provide more accurate and up-to-date profiles of America's communities every year, not just every 10 years.

The ACS will provide estimates of housing, social, and economic characteristics for the U.S. population. The content is the same as the Decennial census long form with an emphasis on producing small area estimates throughout the decade. The intention of the survey is to provide decennial data from the long form questionnaire by the year 2010.

ACS Sample Design:

The ACS is a systematic sample of the U.S. population; there is no stratification or clustering of the sample which is spread evenly across the country. The sample is considered to be a "rolling" sample since it is in all areas every month and in different housing units every interview. At full implementation, in the year 2003 and beyond, the sample size will be 3 percent of the U.S. population per year.

The sample is selected from the Master Address File (MAF). The MAF was initially constructed by a computer match of the U.S. Postal Service's Delivery Sequence File (DSF), the 1990 Census Address Control File (ACF), and the Topologically Integrated Geographic Encoding and Referencing (TIGER) files. The MAF is currently updated approximately every 6 months based on revisions to the DSF.

Extensive research is underway as part of the 2000 sample redesign to evaluate the accuracy of the MAF. For areas that are "inside the blue line" (areas where post office deliveries are made to a specific address) the MAF is considered to be relatively accurate. For areas that are "outside the blue line" (rural areas with no post office delivery system in place), there are significant problems because the necessary information is nonexistent.

ACS Data Collection and Estimation:

The survey is conducted using a tri-modal data collection operation. The three modes are: self-response through mail-out/mail-back methodology, CATI, and CAPI. The self-response procedure includes the use of several mailing pieces: a prenotice letter, the ACS questionnaire, and a reminder card. A replacement questionnaire is mailed to addresses in the sample if the original questionnaire is not completed and returned to the processing office within the prescribed amount of time. For sample addresses that do not respond by mail, follow-up is conducted through CATI, CAPI, or both.

The CATI follow-up is conducted approximately six weeks after the original questionnaires are mailed. An attempt is made to conduct telephone interviews for all households that do not respond by mail.

The final data collection phase consists of CAPI. Following the CATI operation, a one in three subsample is selected from addresses which remain unvisited. These addresses will be visited by Census Bureau Field Representatives who will conduct personal interviews. Based on the available information, the response rate for the mail phase is approximately 60 percent. An additional 10 percent is gained through the CATI/CAPI nonresponse follow-up phases.

Each year, the ACS will provide estimates of housing, social, and economic characteristics for all states, as well as for all cities, counties, metropolitan areas, and population groups of 65,000 persons or more. For smaller areas, it will take five years to collect data for the same number of households as sampled in the decennial census. These multi-year estimates of characteristics will be updated each year for every governmental unit, for components of the population, and for census tracts and block groups once the survey is in full operation (2003 and beyond).

Potential Improvements Using the ACS

The ACS has the potential to benefit the NCVS in the following areas, the extent of which will be determined based on future research. The first two benefits described below could accrue to all surveys conducted by the Census Bureau. The third and fourth benefits assume that individual surveys will be allowed, at some future point, to add a limited number of content specific questions to the ACS.

1. Improve the Efficiency of the Field Staff:

Since Field Representatives working on the ACS would also be assigned to recurring surveys (such as the NCVS), we could increase the use of CATI in half-CATI and no-CATI PSUs. Currently, CATI is not being used to its fullest potential in these PSUs since it would result in inefficient workloads. There would also be a cost saving for the NCVS in that some field costs could be shared and increasing the use of CATI decreases the overall cost per case.

2. Improve the Accuracy of Weighted Estimates:

The NCVS will also experience a modest gain in variance estimation as a result of the weighting procedure, specifically the first- and second-stage ratio adjustments. This is because the ACS is being updated on a continual basis. Again, these benefits could accrue to all current Census Bureau surveys.

First-stage adjustment factors: The purpose of the first-stage estimation procedure is to reduce the contribution of the variance arising from the sampling of primary sampling units (PSUs) and is applied only to the nonself-representing (NSR) PSUs. The cells for this adjustment are primarily region crossed by other standard demographic characteristics such as MSA status, race, and Hispanic origin, which are currently extrapolated from decennial census counts. The ACS would provide updated estimates of these characteristics throughout the decade. To have great potential value to the NCVS, the demographic characteristics used in the cells need to be highly correlated to the incidence of crime. (Currently, we are restricted to the Census long form items. NCVS can expect larger gains if crime specific questions are added at a later date.)

Second-stage ratio adjustment factors: The purpose of the second-stage ratio adjustment factor is to bring sample estimates in line with known population figures from the Census. Currently, these are derived through an inflation/deflation method based on census counts. Given that the decennial census is done on 10-year cycles, the ACS would provide more accurate controls throughout the decade specifically at lower levels of geography (state and sub-state levels). The advantages would be even greater for surveys with a state-based design as opposed to a national-based design. Again, survey estimation would be restricted to adjustment cells that are based on items currently on or derived from the long form.

3. Improve the Accuracy of Sub-State Crime Rates:

Statistical modeling based on estimates derived from the ACS and the current NCVS could provide a means for

obtaining reliable MSA-level estimates. These models are based on the concept of synthetic estimation which involved "borrowing strength" from other estimates to reduce the variance (specifically the mean square error). Use of modeling requires the addition of a limited number of crime-specific questions to the content of the ACS. These questions, in conjunction with other information, would be used to derive a "crude" crime rate that might be a useful predictor of the current NCVS rate. These rates could be incorporated in the following generic small area estimation model:

$$y_0 = Y_0 + e_i \quad Y_0 = x_0 + u_i$$

where: where:

y_0 = the direct estimate x_0 = regression variables

Y_0 = the "true" estimate u_i = model error

e_i = sampling error $\sim iud N(0, v_0)$

The quality of the estimates depends largely on the validity of the model used.

4. Screen for Specific Populations or Events:

One of the alternative methodologies discussed at the NCVS focus group was the use of the ACS as a screening device. The BJS has expressed interest in the following three areas: 1) use the ACS to screen for crime victims in general, 2) use the ACS to screen for rare populations and/or events, and 3) use the ACS to screen for non-telephone household.

Currently, there is no prior knowledge concerning a person's victimization status before the initial NCVS interview. This results in a screening interview being conducted with respondents who have not experienced a crime incident during the reference period. It would be beneficial to identify and target individuals with one or more reported crime incidents. This could be accomplished by adding a limited number of crime-specific question(s) to the content of the ACS for screening purposes, for example: "Have you been a victim of a crime within the last 6 months?" and "What type of crime?" Those persons who respond affirmatively to the screener question(s) provide a restricted frame

(comprised of those persons who recognize themselves as being a victim of a crime) to select sample respondents to be administered either the entire NCVS instrument or some abbreviated version as determined by the sponsoring agency.

Table 1 provides the sample sizes that are necessary to achieve various coefficients of variation (CVs) for two major crime categories, crimes of violence and burglary. (Note: the design effect for crimes of violence is 4.0 and for burglary is 2.0. The percent characteristic is .04 for both crimes of violence and burglary.)

Table 1: CVs for Crimes of Violence and Burglary

Sample Size Necessary for:	Coefficient of Variation							
	.05	.06	.07	.08	.09	.10	.15	.20
Crimes of Violence - person	38,400	26,667	19,592	15,000	11,852	9,600	4,267	2,400
Burglary - households	19,200	13,333	9,796	7,500	5,926	4,800	2,133	1,200

Recent political events have prompted the Congress to mandate the collection of crime-related data on specific populations and/or topics of interest, for example, crimes against the developmentally disabled, victims of hate crimes, victims of crime who reside on Indian reservations, and supplements measuring police use of force and school crime. One of the measurement difficulties encountered is the rare nature of these populations or events.

For example, in 1996 the BJS conducted a pilot test of the Police Public Contact Supplement (PPCS) which is designed to measure the incidence of face-to-face interactions with the police that resulted in the police use of force. The PPCS was administered in the outgoing rotation of the NCVS over a six month period and collected data on 1,308

respondents who reported a face-to-face contact with the police. Of these, only 14 respondents reported a police threat or use of force. Small sample sizes, such as those experienced by the PPCS, greatly restrict the usability of the data in terms of the estimates constructed and comparisons that can be made. Because of the size of the sample, the ACS could be used to screen for these types of incidents and ultimately increase the sample size achieved. For example, questions such as : "Did you have a face-to-face contact with the police within the last 12-months?" and "At any time during this contact, did the police officer use or threaten to use physical force against you?" could be administered to screen for these types of populations or events. This option assumes that content-specific questions could be added to the ACS on a time-limited basis.

Table 2 provides the sample sizes that are necessary to achieve various CVs for incidents involving a police use of force. (Note: the design effect for assault is 4.3 and the percent characteristic is .011.)

Table 2: CVs for Incidents Involving Use of Force by the Police

Sample Size Necessary for:	Coefficient of Variation							
	.05	.06	.07	.08	.09	.10	.15	.20
Incidents of Force by Police	144,933	100,648	73,946	56,615	44,733	36,233	16,104	9,058

One possible methodological change discussed at the NCVS focus group meeting was the implementation of a random-digit dialing (RDD) sampling frame for the NCVS or its supplements. One of the main problems associated with RDD surveys is the coverage bias of excluding the nontelephone universe. This bias will be particularly problematic for the NCVS since characteristics associated with the nontelephone universe (e.g., income, race, tenure) are also characteristics which are correlated with crime victimizations. This bias could be substantially reduced by using the ACS to identify nontelephone households. Once identified, an area sample of these units could be included. Therefore, the bias associated with excluding nontelephone households could be reduced.

Issue to be Considered

Inasmuch as the ACS has the potential to improve the current methodology of the NCVS, there are implications that must be considered. First, the improvement in the efficiency of the current NCVS design assumes that the ACS field staff will work on continuing surveys as well. The efficiency is achieved by spreading out both the survey cost and the workload to a consistent field staff. Currently, the ACS field staff is not being assigned work from continuing surveys. This is based on discussions with each of the Regional Offices as part of the 2000 sample redesign research and may be due to the differences in the type of field work required. For example, field staff for continuing surveys have consistent survey workloads (usually 15-30 cases per month) and interview in the same areas. The field work for the ACS, since it is predominantly a mail-out/mail-back survey, is more sparse and tends to be located in different areas each month.

Several questions must be addressed before deciding the role of modeling for the NCVS. First, how important are MSA-level crime estimates? The BJS is currently considering an increase in the sample size for the largest MSAs in order to obtain reliable violent crime estimates. Second, are good predictor variables available? This is where crime-specific questions on the ACS would provide a benefit. Third, will data users question the validity of crime rates that are based on a statistical model.

There are also several issues associated with using the ACS as a screening device. A short set of crime-specific screener questions will necessarily rely on the respondent's perception to determine whether or not their particular incident constitutes a crime. We feel that the resulting data will be heavily concentrated with more salient types of crimes and exclude those which are more perception based. For example, respondents may not consider domestic violence a crime. Certain topics, such as hate crimes and crimes against the disabled, involve concepts that respondents have difficulty grasping. This will make accurately identifying these types of incidents difficult in a mail-out/mail back environment, particularly if surveys are limited to one or two content-specific questions. One

of the BJS' current initiatives is to identify and target crime victims who reside on Indian reservations. The ACS has experienced great difficulty interviewing on Indian reservations or tribal lands where residents have been instructed by

tribal leaders not to answer Census Bureau surveys.

Before any screening device is implemented, extensive cognitive research will be required to develop an instrument which elicits the appropriate responses based on a limited number of crime specific questions. Furthermore, the accuracy of the frame will need to be validated. One approach would be to contact a subset of persons who responded affirmatively to the screener to make sure that they had, in fact, been a victim of crime. The same holds true for those persons who indicated they were not been victimized.

One final consideration is the preservation of the NCVS time series. One of the major benefits of the current NCVS design is the ability to detect small changes in the crime rates from year-to-year. This is important in gauging trends in criminal victimization. In order to preserve the time series, any screening device would need to be restricted to current NCVS PSUs which would reduce the benefits achieved from using the ACS.

Policy Implications of Adding Content Specific Questions

At the present time, the Census Bureau has not yet developed a marketing strategy for the ACS but plans to do so over the course of the next two years. The goal is to have the policy in place prior to January 2001. In developing this policy, the Census Bureau will work in conjunction with other federal agencies and the Office of Management and Budget (OMB) to develop consistent procedures for evaluating each survey's request to add content-specific items. The preliminary plans assume that agencies will begin making proposals for items to the 2004 ACS in early 2001. Issues that the Census Bureau must consider in establishing this policy are: 1) how to balance the priorities of the need to screen for rare populations, collect data mandated by law, and obtain sub-state estimates; 2) how to embed a voluntary supplement into the mandatory ACS; and 3) the operational feasibility of multiple supplements to the ACS.

Conclusion

The redesigned NCVS has been a major success in reducing measurement error of victimization estimates. However, as new demands are placed on the survey, we must consider ways to meet these challenges in a cost-efficient and timely manner. One possibility is to use the American Community Survey. Because of its continuous nature, the ACS has the potential for improving current NCVS methodology by providing more accurate and up-to-date national, state, and sub-state population controls, provide a vehicle for modeling small area estimates, and creating a sampling frame based on a prespecified screening device.

However, several fundamental questions must be addressed before proceeding with this option. Most importantly, what is the likelihood of adding crime specific questions to the content of the ACS? Second, what will the procedure be to add content specific questions? Finally, given the current budget climate, is it cost effective to use the ACS as a screening device?

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