SUPPORTING STATEMENT

B.   STATISTICAL METHODS

1.   Universe and Respondent Selection

The *Officer Safety in Correctional Facilities Survey* is the first data collections of their kind about correctional officers. Little is known about the basic elements and profile of body armor usage in correctional facilities. Outside the work of BJS in conducting a census of all Federal and state prisons, no example of other nationally representative samples of COs could be found. The data collected in this survey will help to identify key barriers to the use of body armor in the prison environment and ways to overcome them from a user perspective.

In order to select a representative sample of the population of interest while taking into account its special nature, a stratified two stage cluster sample will be selected. The project team recognizes the complexity of obtaining a nationally representative sample of COs. NORC has extensive experience in surveying criminal justice agencies and in drawing nationally representative samples and has the technical skills to assure the rigor of the proposed approach, will have the necessary statistical power and precision. At the first stage, a cluster sample of correctional facilities will be selected across different facility groupings. At the second stage, a stratified random sample of officers within facilities will be randomly selected.

In the first stage, a nationally representative sample of 153 correctional facilities will be selected as primary sampling units.   This sampling will be based on a three way stratification approach to balance the sample between the following groups:

1. Type of facility: Federal and State
2. Security level: Maximum, Medium, and Minimum
3. Region: Northeast, Midwest, South, and West

The facility sampling frame will be divided into groups based on the above variables. The allocation of the sample across strata will take into account that the number Federal facilities is relatively small compared to State facilities. Although Federal facilities represent approximately 6% of the facilities compared to 94% for state facilities, the proportion of Federal facilities in the sample will be set to 20% (31 facilities) in order to assure adequate representation of federal facilities for analytical purposes[1] while the State facilities in the sample will be set to 80% (122 facilities). Meanwhile for the security level of the facility, the sample will be allocated proportional to the number of facilities within each of these groups. Finally, in order to guarantee a nationwide coverage of the sample, the sample allocation by region would be also proportional to number of facilities within each region.

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[1] Sampling weights will be used to adjust the sample estimates to reflect the proportions within the population.

In the second stage, a random sample of 1,683 correctional officers will be drawn as secondary sampling units stratified by gender. A sample of 10-12 correctional officers per facility will be sampled whenever possible to assure adequate representation of the facility and a minimum sample size for variance calculation. Therefore, the officer sampling frame will be divided into two groups based on gender and the sample will be selected based on proportional allocation.

Facilities will also be asked to provide a list of correctional officer staff within their facility so that this information may be used to select respondent officers for the officer level phase of the study. The initial request will ask for name, gender, and rank of all full-time officers, a badge or employee ID, shift information, work telephone number and address. NORC will work with each facility to determine the level of officer contact information that is allowed to be provided. Some facilities may provide name and contact information, others may provide badge number only, and others may provide another type of listing. From the provided list, a stratified random sample of approximately 10-12 officers will be selected from each facility for the officer survey.

Some facilities will not be able to send a list of officer names or badge numbers. When this happens, NORC will work with the facility so that the facility may order officers in numeric order. NORC can then randomly select numbers within the range of officers on the list. A liaison within the facility would then be asked to distribute surveys to those officers. NORC could also work with facility staff so that facility staff randomly selects officers. Easily accessible software, such as Microsoft Excel, has randomization features. NORC can prepare a template for facilities to use.

Arrangements will be made on a facility by facility basis for the state departments of correction. State departments of correction may also require internal review or additional IRB review according to their procedures or guidelines. For Federal facilities within the Bureau of Prisons (BOP), NORC will work with central administration to determine the officer selection process. NORC consulted the Human Subjects Protection Officer (HSPO) in the Office of Research and Evaluation (ORE) in BOP who reviewed the proposed data collection with NORC. It was the sense of the HSPO that the data collection was touching on a critical topic of direct interest to the BOP administration and the officers. The proposed data collection was also deemed to be feasible since ORE at BOP regularly does surveys with BOP correctional officers and obtains reasonably high participation rates. It was indicated that the surveys they conduct are mostly online. Upon clearance from OMB, the *Officer Safety in Correctional Facilities Survey* would need to be reviewed by the BOP Institutional Review Board (IRB) and Labor Management Relations (LMR), the correctional officer union. To minimize the amount of resources allocated to this review, the BOP would prefer to do their review after the OMB approval is provided. It is anticipated that both the IRB and LMR at BOP will provide feedback and would likely approve the collection of the information.

Universe

The universe for this study will consist of all currently operating state and federal correctional facilities in the U.S. that are intended for adults, but sometimes hold juveniles. Using the Bureau of Justice Statistics definition of eligible facilities, facilities will be included in the enumeration if they hold inmates primarily for state or federal authorities; are physically, functionally, and administratively separate from other facilities; and are operational at the time of data collection. The study will include the following types of adult correctional facilities:

- Prisons and prison farms;
- Reception, diagnostic, and classification centers;
- Facilities primarily for parole violators and other persons returned to custody;
- Road camps;
- Forestry and conservation camps;
- Facilities for youthful offenders except in California;
- Vocational training facilities;
- Drug and alcohol treatment facilities; and
- State operated local detention facilities in Alaska, Connecticut, Delaware, Hawaii, Rhode Island, and Vermont.

The following types of facilities will be excluded from the sampling frame:

- Institutions primarily for juveniles;
- Facilities that do not house primarily state or federal inmates;
- City, county, or regional jails;
- Private facilities that do not house primarily state or federal inmates;
- Facilities for the military;
- The U.S. Marshals Service (USMS);
- The U.S. Immigration and Customs Enforcement (ICE);
- The Bureau of Indian Affairs (BIA); and
- Correctional hospital wards not operated by correctional authorities.

Sample of Facilities and Officers

NORC will work on reducing both sampling and non-sampling error. In order to reduce non-sampling error, the first step is to reduce any frame related error by updating the 2005 Census data. This update will take place by compiling a list of state and Federal correctional facilities using the 2005 Census of State and Federal Correctional Facilities and the 2012 National Directory of Law Enforcement Administrators, Correctional Institutions and Related Agencies. The sampling design consists of a multistage stratified cluster design. At the first stage facilities as clusters will be selected within each stratum. In the second stage, officers within the sampled facilities will be selected using gender as the stratification variable. As discussed above, the facility sample will be drawn using a stratified random sample of three strata (facility type, security level, and region). The frame of officers will be compiled within the sampled facilities only. Using

the list of COs provided by each facility responding to the facility-level survey, we will draw a random sample of 10-12 officers per facility, stratified by gender.

In order to determine the number of facilities and officers to include in the sample, multiple steps will be taken. The following assumptions will be made in order to calculate the requisite sample size: the rate of change in the number of correctional facilities and inmates is constant over time; the odds of an officer wearing a body armor is equal to the odds of an officer not wearing a body armor (i.e., fifty-fifty chance to wear a body armor, thus the variance for the proportion S^2 is equal to 0.25); 90% confidence level; margin of error (e) of 7% at the facility level and of 5% at the officer level; and an 85% response rate at the facility level and 80% response rate at the officer level.

To validate sample size, a power analysis was conducted to assess the power achieved using the calculated sample sizes. Our univariate survey results will be tabulated as percentages with confidence intervals. In order to estimate these proportions, to within ±7% with 90 percent confidence, 130 completed surveys are needed at the facility-level and 1,089 completed surveys from COs. Assuming a conservative figure of 85% response rate at the facility level and a very conservative 65% response rate at the officer level, it will be necessary to contact 153 facilities to achieve the desired sample size of 130 and 1,683 officers to achieve the desired sample size of 1,089. The calculations are summarized in Tables 5 and 6.

Table 5. Sample size calculation at the facility level.

Confidence	Margin of Error	Proportion for Variance	n_0	n (adjusted for finite population)	n* (adjusted for 85% response rate)
90%	7%	0.5	139	130	153

Table 6. Sample size calculation at the officer level.

Confidence	Margin of Error	Proportion for Variance	N	n* (adjusted for 65% response rate)
90%	5%	0.5	1089	1683

The sampling design at the facility level use the following strata:

- Type of facility: Federal and State
- Security level: Maximum, Medium, and Minimum
- Region: Northeast, Midwest, South, and West

Within each facility, the gender of the officers will be used as a stratification variable then proportional allocation will be used for identifying the allocation within each stratum. Table 7 shows the distribution of facilities by security level within each region.

Table 7. Distribution of facilities by security level within each region.

	Facilities	Correctional Officers	Security Level Facilities		
		Total	Maximum	Medium	Minimum
Northeast	25	261	7	5	13
Midwest	32	332	11	6	15
South	67	585	22	10	35
West	29	183	7	5	17

Out-of-scope Facilities

Although NORC will clean the sampling frame to exclude ineligible facilities prior to drawing the sample, it is possible that in the course of data collection a selected facility may be deemed ineligible due to the attributes of the facility (i.e., a juvenile facility, county jail, etc.) or because it is no longer operating. In this case, it may be necessary to select more than 153 facilities to achieve the desired sample size and statistical power.

Creating Cells for Weighting and Imputation

The sample will be weighted such that it is representative of the national population of all correctional officers. The sampling design is a two-stage stratified cluster sample from well-defined sampling frames and strata, and the computation of case weights is straightforward based on the inverse of probabilities of selection. When data collection is complete, weights will be adjusted to compensate for nonresponse. Cells for weighting will be created by crossing the number of facilities within each stratum within the population and the sample to create the sampling weights, then non-response weights will be calculated based on the number of facilities willing to collaborate within the sample relative to those sampled within the population. Sampling and nonresponse weights will be constructed similarly at the officer level, using gender as the stratification variable. Thus, unit non-response will be handled through non-response weight adjustments while item non-response will be handled using imputation techniques discussed further in Section B.3.

2.   Procedures for Collecting Information

Data collection will involve a series of mailings, non-response follow-ups, and retrieval of missing and inconsistent items. NORC is skilled at using the "classic" non-response conversion techniques. There is a delicate balance between strongly encouraging non-respondents to complete a survey and over-pressuring them. NORC staff recognizes that most correctional agencies are supportive of research but are burdened with competing demands on limited time resources. NORC staff members have a great deal of experience in tactfully persuading non-respondents to complete surveys. NORC's approach to data collection and non-response follow-up is based on previous project experience and recommendations made by Dillman and colleagues .

Although Dillman et al. recommend that researchers implement five distinct contacts that combine U.S. postal service first-class mailings with a special, final contact made by

telephone, they also recognize that additional contacts may be required to collect data from organizations such as correctional facilities. NORC staff will use the standard five contacts in the order recommended by Dillman et al. (i.e., pre-notification letter, initial survey mailing, thank-you/reminder postcard, replacement survey, and telephone calls) to recruit the Stage 1 sample of facilities, but will supplement those contacts with extra follow-ups as needed to achieve the desired response rates (Attachments 5 through 18). Also, after the enrollment of a facility into our sample, NORC staff will request that the warden or chief executive of each facility assign an individual to help assure completion of the facility-level survey and the individual-level CO surveys. For hard copies, sealed envelopes will ensure the confidentiality of CO responses. For web-based respondents, password protection and encryption will be employed.

More specifically, the facility-level survey will be conducted initially by mail, although respondents will have the option of completing the survey by phone if they choose. Respondents to this survey may be the facility warden, administrator, or supervisor, and the facility officials may decide whom they want to complete the survey. Initially the facility will be sent a paper copy of the questionnaire by mail with a postage-paid return envelope included. If respondents fail to complete the questionnaire, NORC interviewers will follow up by telephone to prompt the respondent to complete the paper questionnaire or complete the survey by telephone.

As part of the facility-level data collection, each facility will send to NORC a list of all currently employed COs. From the pilot phase, correctional administrators demonstrated that this could be accomplished and is therefore a reasonable expectation. From this roster, NORC will randomly select 10-12 officers. For the Stage 2 sampling of COs, NORC will request contact information from the facility for each randomly selected participant and where that information is provided a similar five-point contact approach will be used as outlined above. However, it is anticipated that many of the facilities will decide not to provide such contact information and will prefer that NORC work through an assigned liaison. In such cases, NORC will contact the liaison on multiple occasions to assure that the individual COs complete the survey. Officers will initially be sent a paper questionnaire with a postage-paid return envelope and at the same time will be given the option of completing the questionnaire on the web. If the officer fails to complete the paper or web version of the questionnaire, NORC interviewers will follow up by phone, either with the individual officer or with the liaison, to prompt them to complete the questionnaire by mail or by web, or to complete it by phone.

NORC will rely on experienced reviewers and coders to ensure that hardcopy surveys are free of errors prior to data entry. Interviewers will be trained to follow editing rules. Cases completed during Stage 1 that cannot be edited via the editing specifications or that provide missing or inconsistent data will be marked for telephone follow-up. Telephone retrieval for Stage 2 cases will be done with the participating CO if contact information is available for the CO. Otherwise, NORC will work through a facility liaison to contact the participating CO to address confidentially any problems with the survey. Once the follow-up is complete, the case will be data entered.

Even with a tightly formatted questionnaire and concise instructions, NORC understands that some respondents may inadvertently leave questionnaire items blank or give inconsistent information. To maximize the individual questionnaire item response rates, NORC will do the following:

- **Step 1:** The web survey will use automated checks or prompts to reduce missing or inconsistent items.
- **Step 2:** Completed questionnaires will initially be manually edited per approved specifications.
- **Step 3:** Questionnaires with remaining missing or inconsistent information will be selected for retrieval.
- **Step 4:** Facilities or COs will be contacted to confirm missing or inconsistent data.

To ensure high-quality data, NORC will employ a standard, integrated set of software tools that encompass the entire data processing and delivery mechanism, including receipt control, data entry, data quality review, and data delivery. All hard copy surveys will be entered directly into a database upon receipt. Web surveys are entered by the respondents and are checked for consistency within the web-based system. NORC will also review the frequencies from data entry after the first 10 percent of cases are entered, as well as frequencies from early Web survey responses. Any issues noted at that point will be investigated and resolved. The data will also be subjected to rigorous automated cleaning.

3.   Methods to Maximize Response

NORC staff recognize the importance of achieving a high response rate to ensure the usefulness and credibility of the proposed data collection. NORC is highly skilled in getting practitioners to complete agency and individual-level surveys (typically 90+ percent response rates) and has teamed with practitioner organizations, such as ACA, ASCA, and the Police Executive Research Forum (PERF), for this project to assist in this proposed collection of information and follow-on analysis. NORC will also draw on PERF's experience asking questions about body armor, the ACA's experience working with its over 20,000 members of correctional practitioners, and the ASCA's strong ties with correctional leaders.

The goal is an 85% response rate for the facility-level survey and 80% for the officer-level survey. Despite planned efforts to achieve a high response rate (e.g., training the data collection staff and working with the facilities to explain the purpose of the study), it is reasonable to expect that non-response will occur. To maximize response rates we will provide multiple response options to respondents, including the option to return the survey form via mail, fax or to complete it with a telephone interviewer as discussed in Section A.3. Correctional officers may complete their survey via the web. A follow up prompting strategy will be utilized. The follow-up plan is based off of best practices and is comprised of letters, e-mail, and telephone prompts. The web-based questionnaire will be programmed in an intuitive manner to facilitate ease of completion.

To assess non-response, completers and non-completers will be compared based on existing data on agency characteristics[2] and adjust for non-response bias.[3] First, the situation where the facilities and/or COs do not participate in the survey at all will be assessed. Heckman's two-step process to model the non-participation process will be employed. Analyses using unweighted and weighted estimates to determine the impact of alternative approaches will also be employed . Other areas to be explored include comparing respondents by response attempt wave to determine whether there is a bias in the data that is associated with the length of time to respond or how often the NORC team makes a request for a response. Second, the impact of employing various imputation-based procedures to fill in missing values for the surveys that are only partially completed will be compared. We will use Rubin's multiple imputation strategy to replace each missing value with a set of plausible values that represent the uncertainty about the correct value to impute.

4.   Testing of Procedures

Multiple rounds of review by NORC and NIJ staff and feedback from project partners (the American Correctional Association) has attempted to minimize the complexity and length of the survey in order to lower the burden on respondents. Only those items of direct relevance and deemed critical by the project team and partners were kept in the survey. The level of effort necessary to complete the survey was assessed during a pilot test of the facility and officer questionnaires in late 2012. Please see Attachment 4 which contains the Pilot Report.

Key elements of the pilot testing and the results are summarized here. A convenience sample was used for the pilot test based on recommendations from the ACA and supporters of the research project. Participants were asked to complete and return the appropriate survey, based on their position within the correctional facility, and to participate in a telephone debriefing. Eight participants completed the *Facility Survey* and eight correctional officers completed the *Correctional Officer Survey*.

The survey instruments were pretested with eight selected correctional administrators and eight selected correctional officers (six completed a debriefing). The pretest allowed NIJ and NORC to confirm correctional administrator's easy access to data requested. The correctional officer pretest allowed the project team to gauge the flow of survey questions and understanding of concepts asked. Feedback provided by pretest responders has been incorporated into the survey forms. Questions that were not easily answered by the pre-test responders were removed from the surveys. Questions reported to be ambiguous were clarified. Overall, the pretest has served to lessen the respondent data collection burden.

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2 For example, number of prisoners, number of officers, type of facility, level of security in facility, region of country, etc.

3 NORC will perform non-response analysis by using the 2011 NDLEA, Correctional Institutions and Related Agencies Directory (46th Edition) which will have data on every correctional facility in the U.S.

5.   <u>Contacts for Statistical Aspects and Data Collection</u>

Person to contact for information on statistical methodology, conducting the survey, and analyzing the data:

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