B. Collection of Information Employing Statistical Methods

1. Universe and Respondent Selection

Universe. There are two target populations of interest for the National Inmate Survey 4 – Prisons (NIS-4P): (1) all adult prison inmates held in confinement facilities, and (2) all prison inmates 16 years old or older[1] held in adult confinement facilities[2]. The first target population will be used for the facility-level estimates and the national estimates when comparing to prior NIS studies, which did not include prisoners under 18 in their estimates. The second target population will be used for an alternative national estimate which will include all inmates 16 years of age or older. Inmates held in community-based facilities[3] are not eligible for the NIS-4P because of the amount of time they spend unsupervised. The target population for the NIS-4P will remain unchanged relative to prior NIS studies.

The sampling frame for the first three iterations of the NIS used the 2005 Census of State and Federal Adult Correctional Facilities as the basis for defining the prison frame. The 2005 Census was the most recent Census conducted at the time of each prior NIS iteration. Because of the amount of time between the Census and the start of NIS-2 and NIS-3, prior to the sample selection for the NIS-2 and NIS-3, the Census frame was supplemented with updated information from websites maintained by each state's department of corrections (DOC) and the Federal Bureau of Prisons (BOP). The supplemental updates focused on identifying new facilities and removing closed facilities. Population counts were not updated because they could not be updated for all facilities.

The sampling frame for both target populations in NIS-4P began with the 2016 Survey of Prison Inmates (SPI) frame. RTI constructed the roster of facilities using the frame from the 2016 SPI and looking at websites from departments of corrections (DOCs). Then RTI asked each state's DOC and the Bureau of Prisons (BOP) to confirm/update the list of facilities as confinement facilities and provide inmate counts by gender for each facility in September and October 2018. The types of changes made to the frame include

- Adjusting the population size of a facility to account for a planned change in population.
- Removing facilities that are planned to close.
- Adding new facilities that are known to be operating prior to selecting the sample.

[1] There are a small number of juvenile inmates younger than 16 held in adult facilities. These inmates are considered ineligible for the NIS-4P.

[2] Confinement facilities are facilities where less than 50% of the inmates are regularly permitted to leave unaccompanied.

[3] Community-based facilities are facilities where 50% or more of the inmates are regularly permitted to leave unaccompanied.

The final frame includes 1,341 facilities and 1.35 million inmates. Table B1 presents the facility and inmate population counts by jurisdiction and sex housed.[4]

Table B1. Number of facilities and population counts by jurisdiction and sex housed

	Facilities		Population	
	Male	Female	Male	Female
Federal	182	20	158,065	9,951
State	1,023	116	1,098,801	84,097
Total	**1,205**	**136**	**1,256,866**	**94,048**

Sample design. The NIS-4P sample will be a two-stage sample selection process to allow for both national- and facility-level estimates. The Prison Rape Elimination Act of 2003 (PREA) mandates that at least 10% of facilities in the country and at least one prison per state must be sampled. To meet these goals, the prisons will be sampled probability proportional to size (PPS) with some adjustments to ensure at least one prison per state is selected. Inmates will be selected via simple random sample within selected facilities.

Given cost constraints and the overarching analytic objectives, the design will implement the following design assumptions:

- A first-stage facility sample size large enough to obtain 238 participating facilities[5]
- Juvenile inmates will be selected with the same probability of selection as adults (i.e., juveniles will not be oversampled)
- Female inmates will be oversampled at a rate of 5, which will be incorporated into the size measure used in the first-stage of selection

In the first stage, facilities will be stratified by primary gender held and jurisdiction (i.e., federal or state). The size measure of a facility includes an oversampling factor for female inmates. In the second stage of sampling, a simple random sample of inmates will be selected where the number of inmates selected is a function of the facility size to ensure the ability to make facility-level estimates.

First-stage design. A sample of 246 facilities will be drawn using the PPS sequential sampling method, also known as the Chromy method. This method samples units sequentially proportional to their size and has a feature that the probability of any two

[4] For the NIS-4P, a facility is identified as either a male facility or a female facility based on the composition of the inmate population. The assignment for NIS-4P is based on whichever sex comprises the majority of inmates housed (i.e., if the percentage of inmates housed is 50% or greater male than the facility is designated a male facility whereas if more than 50% of the inmates are female than the facility is designated a female facility). For prior iterations of the NIS, the sex of the facility was defined as female if all inmates housed at the facility were female and male if the populations housed was mixed or all male.

[5] To obtain 238 participating prisons, the first-stage sample size will be adjusted to account for nonresponse and expected in eligibility. Based on historical experience, all prisons have participated and 3% of facilities were ineligible. Therefore, an adjusted starting sample size of 246 facilities will be selected to obtain the desired 238 participating prisons.

facilities being selected is greater than 1. This feature allows for an unbiased variance estimator unlike a systematic sampling algorithm. Facilities will be stratified by

- Facility Type: state or federal
- Sex housed: male or female

Females will be oversampled by a factor of 5. An oversampling rate of 5 for females will balance the precision of the estimates for females with the estimates for males and the sample sizes for all types of facilities.

The size measure of each facility is defined as

$$S_i = N_{m,i} + 5\,N_{f,i}$$

where $N_{m,i}$ is the number of males in facility i and $N_{f,i}$ is the number of females in facility i.

To ensure the PPS design is selected without replacement and all states have at least one facility selected, the allocation procedure will be iterative. An initial allocation will be made to the four strata based on the facility size measure, that is

$$m_h = 246\,\frac{\sum_h S_i}{\sum S_i}$$

where h is the stratum indicator. The allocation of the sample using the above size measure and sample size is shown in Table B2.

Table B2: Sampling Frame Summary and Sample Allocation

Strata	Facility Type	Sex Housed	Facilities on Frame	Inmates on Frame	Sampled Facilities
1	**State**	Male	1,023	1,098,801	157
2		Female	116	84,097	59
3	**Federal**	Male	182	158,065	23
4		Female	20	9,951	7
	Total		**1,341**	**1,350,914**	**246**

Each facility must be selected at most once. Some facilities on the frame are very large and, without adjustments to the sampling method, would get selected more than once into the sample. A facility's expected number of hits or the number of times it is expected to get sampled is defined as

$$E(n_{i,h}) = m_h \frac{S_i}{\sum_{i \in h} S_i}$$

where m_h is the sample size for stratum h and S_i is the size of facility i.

Using the Chromy method of PPS, the number of times each unit is sampled is either $E(n_{i,h})$ or $E(n_{i,h})+1$. Thus, if a facility has an expected sample size greater than 1, it will be selected with certainty since its number of hits will be greater than or equal to 1. Any facility with $E(N_{i,h})$ greater than or equal to 1 is set aside into a certainty stratum. This must be done iteratively since after setting aside facilities to the certainty stratum, the population of the other strata is changed and thus the expected hits are updated. Additionally, m_h would be updated after setting aside facilities to be $m_h - k_h$ where k_h is the number of certainty facilities identified in stratum h. The process is repeated until no facility has an expected number of hits greater than or equal to 1.

Some state prisons in the certainty stratum were pulled out to ensure no facility had an expected number of hits greater than 1. State-jurisdiction male prisons had 1 certainty facility pulled, and state-jurisdiction female prisons had 25 certainty facilities pulled.

One constraint of the NIS-4P design is that each state have at least one facility selected[6]. If a state does not have an expected size of at least 1 then the state becomes its own stratum where one facility in that state will be selected. Similar to setting aside certainty facilities, this process is iterative and is continued until no states have an expected number of hits of less than 1. The majority of inmates and facilities are in the state, male stratum so this process is only implemented in that stratum. The expected number of hits for a state is defined as:

$$E(n_{state_i,h}) = (m_h - k_h)\frac{\sum_{i \in State_i} S_i}{\sum_{i \in h} S_i}$$

where h is the state, male stratum and $m_h - k_h$ begins at 162, after removing any certainty facilities identified in the previous step. After setting aside small states into each of their own stratum, the expected number of facilities in states is updated until every facility has an expected number of hits of at least 1.

There are 15 small states that are put into their own strata. The states are AK, DE, HI, ME, MT, ND, NE, NH, NM, RI, SD, UT, VT, WV, and WY. Using the sequential PPS selection algorithm, states with an expected number of hits between 1 and 2 have a small chance of not having any facilities selected. After selecting a sample, we will confirm that each state has a facility in the sample.

[6] Saguaro Correctional Center is a facility in Eloy, AZ that holds inmates for Hawaii exclusively so is counted as a Hawaii facility. Eagle Pass Correctional Facility is a facility in Eagle Pass, TX that holds inmates for Idaho exclusively so is counted as an Idaho facility.

After removing all certainty facilities and setting aside small states, the sampling allocation includes 20 strata with the 4 original strata, 1 certainty strata, and 15 small state strata. The allocation is presented in Table B3.

Table B3: NIS-4P Sample Allocation

Strata	Strata Description	Facilities on Frame	Sampled Facilities
0	Certainty	26	26
1	State, male	932	141
2	State, female	91	34
3	Federal, male	182	23
4	Federal, female	20	7
5	Small state: AK	12	1
6	Small state: DE	3	1
7	Small state: HI	8	1
8	Small state: ME	3	1
9	Small state: MT	8	1
10	Small state: ND	3	1
11	Small state: NE	9	1
12	Small state: NH	2	1
13	Small state: NM	9	1
14	Small state: RI	5	1
15	Small state: SD	3	1
16	Small state: UT	2	1
17	Small state: VT	6	1
18	Small state: WV	13	1
19	Small state: WY	4	1
	Total	**1,341**	**246**

The order of the units on the list prior to sampling affects the composition of the sample. If the frame is sorted by variables of interest, these variables will be balanced in the sample. For example, if we sort by whether facilities are public and private, the sample is expected to have the number of facilities which are public and private proportional to their size and thus have a sample reflecting the composition of the population. This process of sorting a frame by relevant variables prior to drawing a systematic or sequential sample is known as implicit stratification.

The NIS-4P frame will be sorted by operator type (public or private), state, and measure of size, within each stratum, prior to sampling.

Second-stage selection. The within-facility sample size will be calculated in a manner similar to prior rounds of NIS. The only change will be in some of the sample size assumptions which are altered to better achieve the analytic goals of NIS-4P. The sample size will be a function of the facility population and the assumptions we make to ensure precise within-facility estimates.

The following assumptions are made:

- $V=(0.0175)^2=0.00030625$ – this provides a standard error of 0.0175 which allows for a confidence interval half width of approximately 0.035.
- $p=0.04$ – this is the assumed prevalence rate and the rate estimated in NIS-3
- $DEFF=1.90$ – this is the assumed design effect within the facility due to non-response adjustment and post-stratification
- $RR=0.65$ – this is the assumed response rate and reflects the NIS-3 response rate results
- $QRR=0.95$ – this is the questionnaire randomization rate. 95% of inmates who begin the survey will be assigned to the victimization survey, while 5% will be assigned to the alternative survey

For NIS-4P, all eligible inmates age 16 years old or older will be selected via a simple random sample. This differs from NIS-3 where juvenile inmates were explicitly stratified and sampled at a higher rate than adult inmates. NIS-4P will use this revised strategy because the number of juvenile inmates held in adult facilities has greatly decreased over the past 10 years. Using the stated assumptions, the sample size is calculated as follows:

1. Calculate n_0 the initial sample size as if a simple random sample from an infinite population as $n_0=\frac{p(1-p)}{V}$.
2. Calculate n_1 which accounts for unequal weighting due to nonresponse and poststratification as $n_1=n_0\times DEFF$.
3. Calculate n_2 which accounts for the finite population correction (fpc) factor as $n_2=\frac{n_1}{1+n_1/N}$ where N is the number of inmates on the roster that are eligible and 16 years of age or older.
4. Calculate n which accounts for the questionnaire randomization and response rate and rounds the number up to the nearest whole number as $n=\text{ceil}\left(\frac{n_2}{RR\times QRR}\right)$.
5. We cannot sample more inmates than are on the roster so if $n>N$ then set $n=N$.

An illustration of the sample size for an array of facility sizes is included in Table B4. In facilities with fewer than 183 inmates, a census will be taken. Furthermore, the response rate assumption will be modified if information from the logistics process indicates a higher than normal ineligibility rate.

Table B4: Number of inmates selected by facility size

Eligible inmates on roster (N)	Sample size (n)
50	50
200	177
500	262
750	293
1,000	312
1,500	333
2,000	345
3,000	358

Sampling weights. The sampling weights are defined as the inverse of the probability of selection. The probability of selection is calculated as

$$p_i = m_h' \frac{S_i}{\sum_h S_i}$$

where m_h' is the number of sampled facilities in the strata as shown in Table B3 and S_i is the size measure of the facility. The facilities in the certainty stratum are not sampled and are all included so $p_i = 1$ for each of those facilities.

Then the sampling weight is defined as

$$w_i = \frac{1}{p_i} = \frac{\sum_h S_i}{m_h' S_i}$$

for all facilities except those in the certainty stratum where w_i=1.

Expected power to detect change from prior NIS studies. To detect change across NIS waves, a reduction of 0.5, 1.0, 1.5, 2.0, and 2.5% in the national rate was considered in simulations. In other words, if the NIS-3 rate was 3.2%, a 0.5% decrease would result in an NIS-4P rate of 2.7%. Table Table B5 displays the power to detect a difference by victimization type and gender. As expected, a change in the male rate is easier to detect with the larger sample size. Furthermore, a rate change of 1.0% is required to get at least 80% power for all three estimate types.

Table B5: Power to detect change between NIS-3 and NIS-4P

Type of Victimization		Decrease (%)				
	Gender	**0.5**	**1.0**	**1.5**	**2.0**	**2.5**
Total	**Male**	29.1%	100.0%	100.0%	100.0%	100.0%
	Female	2.2	80.9	99.7	99.9	100.0
Inmate-on-inmate	**Male**	97.4	100.0	100.0	100.0	100.0
	Female	55.5	100.0	100.0	100.0	100.0

Type of Victimization		Decrease (%)				
	Gender	**0.5**	**1.0**	**1.5**	**2.0**	**2.5**
Staff sexual misconduct	**Male**	61.2	100.0	100.0	100.0	100.0
	Female	23.4	96.5	100.0	100.0	100.0

2. Procedures for Information Collection

With adaptions when necessary, the NIS-4P data collection procedures are modeled after the approach that was used to conduct three waves of NIS, for which over 250,000 inmates were interviewed in more than 1,200 correctional facilities. The experience of BJS and RTI conducting three rounds of NIS have provided a wealth of knowledge regarding how to work effectively with a variety of prisons to schedule and conduct data collection. Lessons learned include the need to identify private interviewing space at each facility, provide information on the interviewers that allows the facility to conduct background checks on the team in advance of data collection, and determine how best to manage the flow of inmates to and from the interviewing location. Although no two prisons are exactly the same, we believe these plans and our experience interacting with and collecting data within a variety of prisons in NIS will result in a successful administration that minimizes burden on facilities and inmates while maximizing response and data quality.

Procedures for collecting the data include the following:

Obtaining Approval from RTI's IRB. RTI's IRB approved the NIS-4P questionnaire, consent form, and protocols for implementation on 01/14/2019. Continuing approval was provided on 12/04/2020. Approval documents are attached to this package. RTI's IRB is reviewing revised instruments on 03/17/2021 and relevant approval documents will be forwarded to OMB once received.

Obtaining Approval from Jurisdictions. BJS received OMB approval through a generic clearance on 3/13/2020 to begin outreach to the 50 state DOCs and BOP for research approval.. Letters will be sent to each commissioner of the 50 state DOCs and BOP to notify them that facilities in their jurisdiction are included in the NIS-4P. The letter will ask for the commissioners' approval to conduct the study and explain that the RTI Logistics Manager will be in touch to discuss arrangements, beginning with the establishment of a liaison from the DOC/BOP. Once a DOC/BOP contact is established, the Logistics Manager will contact that person to determine the jurisdiction's required research approval process.

In past NIS rounds, even though the DOC/BOP signed a study approval form, the Logistics Managers often experienced delays with the facility contacts. Many administrators wanted to verify the Commissioner's approval of the study processes before they agreed to work with RTI. For NIS-4P, RTI will request that each DOC/BOP Commissioner sign a research approval form. By signing the form, the Commissioner will grant RTI and BJS permission to conduct the study and approve study materials and processes for use within their jurisdictions. This approval form will expedite the logistics planning process and lessen the burden on facility administrators.

BJS will follow-up with each DOC/BOP with a second letter, notifying them which facilities in their jurisdiction have been sampled, as close to the beginning of survey administration as practicable.

Prison Recruitment. Depending on the jurisdiction and their preferences, sampled prisons may be notified of their selection via a letter from BJS. In other jurisdictions, the DOC contact may prefer to notify its facilities of their selection. The RTI Logistics Manager will then work directly with each sampled prison to solicit participation and a contact person will be identified at each prison. Working with this individual, the Logistics Manager will finalize details for data collection, including submission of background check forms for the interviewers, identifying appropriate space for interviewing, need for bilingual interviewers, format of the roster which will be used to draw the sample of inmates, number of days and hours of each day when interviewing can be conducted, specific rules regarding items that may be brought into the prison, and instructions for arriving at the facility. We anticipate that in most prisons interviewing will be completed within 1 week. All logistical details will be provided to facility contacts in a Facility Logistics Plan generated by the project website, NISweb.

Sampling of Inmates. Within one week prior to data collection at a facility, the facility will provide a roster of all inmates ages 16 and older who are currently incarcerated there. A random sample of inmates will be drawn from the roster.

Data Collection. A team of interviewers will visit the facility. They will ask correctional officers to bring each sampled inmate to a private interviewing area. The interviewer will read a consent form to the sampled inmate and ask a series of follow-up questions to ensure comprehension. If the inmate consents, the interviewer will begin administering a brief set of demographic questions that includes age, date of admission, and housing type. The interviewer will then give the inmate a brief tutorial on answering questions on the touch screen computer and allow the inmate to answer the more sensitive questions in complete privacy. In order to allow inmates with reading difficulties to participate, the inmate will wear a set of headphones and hear the questions being read as they appear on the screen. The inmate will enter their response by touching a button on the screen – no computer expertise is required. The computer program will randomly pick a series of questions to administer. Most inmates will get the series of questions about sexual assault and mental health/disability screeners. However, a portion of inmates will get a series of questions about other topics, including childhood experience, prison facility conditions, program and work assignments, visitors, and plans upon release. No one but the inmate will know which series of questions they were asked. At the end of the inmate section of the questionnaire, the inmate will turn the computer back to the interviewer and return to their housing unit. The interviewer will then finish the process by answering a set of debriefing questions about the interview.

In order to determine if there is any bias introduced from non-respondents, administrative record data will be collected for all sampled inmates. These data will allow researchers to

compare demographic characteristics of responding inmates with those who did not participate.

3. Methods to Maximize Response

Administration

Conducting the interview. Interviewers will use their knowledge of the study objectives and data collection procedures to gain cooperation from sampled inmates. Interviewers will establish a private setting where the laptop screen can be seen by only the individual sitting in front of it.

Interviewing hard-to-reach inmates. Some inmates will not be able to come to a common interviewing area to participate in the study. For inmates who are unable to leave their housing areas (e.g., in administrative segregation or a medical unit), we will use the abbreviated PAPI questionnaire. The On-Site Supervisor will work with the facility to identify a location where the PAPI questionnaire can be administered. No name will be recorded on the questionnaire, and at no time will the interviewer allow facility staff to handle completed questionnaires.

Dealing with distressed respondents. In past NIS rounds, very few respondents have become distressed to the point that professional intervention was required. However, we will have procedures in place including identification of a mental health contact person at each prison.

Although we are precluded from offering incentives to inmates, the Logistics Manager will seek approval from each facility to offer a light snack (e.g., Chips-Ahoy 100 calorie cookies) or metered envelope. If approved for a snack, inmates will be required to consume it prior to leaving the interviewing area, so it cannot be used as "currency" later. The interviewer will collect all trash and dispose of it according to facility procedures. While we know that some prisons will not allow the snacks, our experience conducting NIS-3 demonstrated that offering snacks led to a 6% increase in inmate participation.

Lastly, a Spanish version of the questionnaire will be available for Spanish-speaking respondents. Interviewer teams will consist of bilingual staff who have been RTI-certified as capable of conducting the interviews in Spanish. Only interviewers who have been certified will be allowed to conduct Spanish-language interviews. During discussions with their facility contact, the Logistics Manager will determine the percentage of Spanish speakers housed at the facility and bilingual interviewers will be added to the team appropriately.

Nonresponse Adjustments

Unit and item nonresponse. With almost any survey, some of the selected subjects will not respond to the survey request (i.e., unit nonresponse)[7] and some will not respond to particular questions (i.e., item nonresponse). Weighting will be used to adjust for unit nonresponse in NIS-4P. The weights created will allow for the analysis of the cross-

[7] Here, a "unit" is a particular inmate.

section sample of prisoners, including those in the self-representing jurisdictions. The non-response adjusted weights will be calculated within each facility using administrative data from the sampling rosters. The weights will be adjusted using the Generalized Exponential Model (GEM) in SUDAAN which adjusts weights using a propensity model and ensures weights for respondents sum to the weight of all eligible sampled inmates.

For unit nonresponse, we will assess whether responding inmates are different from nonresponding inmates. We will examine the disposition codes among nonrespondents to determine if a particular type of inmate had significantly higher levels of nonresponse (e.g., inmates in restricted housing). Then, using the inmate characteristics we receive on the facility roster (i.e., age, sex, race and ethnicity, date of admission, and sentence length), we will compare the distribution of respondents and nonrespondents by inmate characteristics. Cohen's effect sizes will be computed to assess the level of potential nonresponse bias. These assessments will be done at the national and facility levels.

For item nonresponse, imputation is preferred, as it preserves a single record per case, allowing for multivariable analysis. For NIS-4P, we will use a mixture of Weighted Sequential Hot-Deck and conditional stochastic imputation techniques. These approaches work well for large and diverse variable sets while providing a flexible toolset for controlling the underlying missingness mechanisms.

Post-Collection Outreach

After collection, a thank you letter, which was not a part of the generic clearance for outreach, will be sent to thank the BOP, DOCs, and facilities (see Attachment L).

4. Tests of Procedures or Methods

The interview and data collection procedures were tested in a pilot study conducted October 2019 among three prisons (two male and one female) with 72 inmates.

Timing data was obtained for both series of questions and showed an increase in burden to approximately 38 minutes per survey. Based on the test finding, we made cuts to both the sexual victimization instrument and the alternative instrument with the goal of bringing the interview length closer to 30 minutes (with 5 minutes allotted for consenting activities).

The New Mexico and Maryland DOCs completed the Facility Questionnaire for each of their facilities. A review of the submitted forms indicated there was complete reporting for all items. Field staff informally discussed the completion of the Facility Questionnaire with their DOC contacts. Neither contact indicated the questionnaire was excessively burdensome or difficult to complete. No changes were made in the content of the Facility Questionnaire other than to adjust the reference period used in some of the questions to make it appropriate for the main data collection.

5. Consultation Information

The Institutional Research and Special Projects Unit at BJS is responsible for the overall design and management of the activities described in this submission, including the fielding of the survey, data cleaning, and data analysis. BJS contacts include −

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During the development and design of the NIS-4P, RTI staff provided input and services to BJS, specifically in the areas of questionnaire design, statistical methodology, data collection, and analysis. RTI will continue to provide support and services throughout the course of SPI and will also manage and coordinate the collection of all data. Contacts at RTI include −

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