B. Collections of information employing statistical methods

1. Description of universe

Universe. The universe for the study is the population of current U.S. military retirees (target population), where the sampling frame—comprised of all military retirees with email addresses on file with the Defense Manpower Data Center (DMDC) from its the latest update to the Defense Enrollment Eligibility Reporting System (DEERS). Each record within the sampling frame will be stratified by the following four variables considered important in the exploration and development of compensation options for Military Compensation and Retirement Modernization Commission (MCRMC): 1) current age group (three groups: <55 years, 55–64 years, >65 years), 2) rank group before retirement (two groups: officer, enlisted), 3) duty status before retirement (two groups: active duty, guard or reserve), and 4) current family status (four groups: single with children, single without children, married with children, married without children).

The complete cross classification of these variables results in 48 strata for the sampling frame. As of February 2014, the target population was made up of about 2.1 million military retirees. Because the mode of data collection will be a web survey where the military retirees will be notified through email to participate in the survey, the sampling frame will be limited to the approximate 1.0 million retirees with email addresses on file with DMDC. Tables B.1 and B.2 present the number of cases and their distribution/percentages in the target population and in the sampling frame limited to those with email addresses (about one-half of the target population) broken down by sampling strata. A preliminary examination on the distribution of retirees in the sampling frame versus that in the target population showed that there are small differences in some sampling strata, as shown in Tables B.1 for frequency and B.2 for percentage. Such differences will be corrected later through the use of a post-stratification weighting technique.

Please see Tables B.1 and B.2.

Response rate. Experience has shown that the population of military personnel, including reserve personnel and retirees, is a difficult one to survey. The response rate for surveying this population varies depending on the survey topics and the modes of data collection.[1] For planning purposes, MCRMC is using a 25 percent response rate (survey completion rate) of the retiree sampling frame contacted. This rate is based on last year's customer satisfaction survey conducted by the Defense Finance and Accounting Services (DFAS). While it is likely that survey response rates will vary across the 48 strata in the

[1] In a pilot survey on civilian health insurance conducted by RAND (2007), 59.7 percent of the sampled military retirees responded to the telephone survey (advance notification letters followed by CATI). Similarly, in a study on the views of the American public and U.S. foreign affairs experts on China policies conducted by the Pew Research Center (2012), only 25 percent of sampled military retirees responded; this survey relied on a combination of web and telephone surveys (mailed advance letters, emails, and phone follow-ups). The quarterly Health Care Survey of DOD Beneficiaries, sponsored by TRICARE Management Activity, has response rates of around 13.5 percent to its web surveys (mailed advance letters with the URL and password for the surveys).

sampling frame, there are no response data available from other surveys to use as a basis for making these estimates at the stratum level.[2]

2. Statistical Methodology

Sample selection. As previously noted, the sampling frame consists of all military retirees with email addresses on file with DMDC. While statistical methods governing sample selection becomes moot in this context, the design of the sampling frame from an analysis and reporting standpoint remains an important step. As described in Section B.1, we will implement a stratification of the sampling frame based on age group (current), rank group (before retirement), duty status (before retirement), and current family status resulting in 48 strata. The size of the target population relative to the resulting completed surveys for each of the 48 strata will require that we statistically weight each completed survey record. The statistical methods used to weight the completed survey records are discussed elsewhere in this section.

In addition to the variables used to stratify the sampling frame, we may use three other variables for analysis and reporting purposes: 1) service branch upon retirement (Army, Navy, Marine Corps, Air Force, and Coast Guard); 2) gender (male, female); and 3) current retirement type (disability retired, and non-disability retired).

Estimation, precision, and sample size. The reporting domain for estimation and data analysis will be individual sampling stratum/cell. In most cases the MCRMC survey asks the respondent to indicate the extent to which they agree with a statement based on a sliding scale scored from 0 to 100. As a result, the sample size for each sampling stratum is determined based on a consistent precision requirement across each of the 48 sampling cells equal to a margin of error of five score points in the 95 percent two-sided confidence interval. To be able to calculate the sample size for each sampling stratum, we utilized information on the estimates of population variances for a subset of key survey items from a past survey collecting similar information. Because this survey was based on a relatively small sample in many cases, we were not able to produce reliable population variance estimates at the stratum level for all strata, and in such cases, we used the average of the population variance across the strata overall or for a broader subgroup to compute the stratum sample size requirements.

Note that because we intend to survey all military retirees with email addresses on file with DMDC (a sampling frame of approximately one million records), it is likely that we will achieve sufficient counts of completed surveys in each of the 48 strata to satisfy the established criteria for statistical precision (five score points margin of error in the 95 percent two-sided confidence interval).

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[2] DMDC maintains extensive data on survey response rates by subgroups for the active and selected reserves, but has no experience surveying military retirees. DFAS does conduct customer satisfaction surveys to include military retirees, but does not retain any data on response rates for subgroups. For last year's customer satisfaction survey, DFAS estimated a 22.6 percent response rate for those military retirees contacted by email. Because of the nature of the content in its survey, MCRMC increased the average response rate slightly to 25 percent for military retirees.

3. Statistical Reliability

Method to maximize response rate. MRCMC is taking extensive steps to publicize its survey prior to launch. For example, we conducted an interview in the May 13, 2014 editions of the Army and Navy Times, informing their subscribers, which includes retirees, of the survey.[3] We will also advertise the survey through Military and Veterans Service Organizations, such as the Military Officers Association of American and the Veterans of Foreign Wars, since they have existing and effective distribution to retirees. In addition, we will conduct a media roundtable at the end of May in conjunction with the release of the Commission's interim report and include the survey roll-out in the course of the discussion. Finally, reminder emails will be sent after one week to survey non-respondents, then every two weeks thereafter throughout the 6-8 week duration of the survey.

Dealing with non-response. When the response rate falls below the cut-off rate of 80 percent, the rate required by OMB, we will perform a nonresponse bias analysis. The goals of this analysis are to evaluate whether there is a potential nonresponse bias when survey estimation is computed based on respondents only (without any nonresponse adjustment), and to assess variables appropriate for nonresponse adjustment procedures. In the nonresponse bias analyses, we will look at the following:

- Response rates by sampling frame characteristics; for example, differences between the response rates by the age group may indicate a potential nonresponse bias because sample composition may no longer be similar to the original (full) sample with regard to age group.

- Distribution of sampling frame characteristics of the full sample compared to the distribution of characteristics of respondents only; for example, a significant difference in the proportion of active duty retirees in the full sample from that in the respondents only may also be an indication of nonresponse bias.

- Distribution of sampling frame characteristics of the full sample compared to the distribution of characteristics of respondents only after applying the nonresponse weight adjustments and the post-stratification that follows; this, in turn, will demonstrate that the potential for nonresponse bias observed above has been eliminated to the extent possible by the adjustment process. We will also examine the degree to which the nonresponse and post-stratification adjustments affect the survey estimates.

For these analyses, we will utilize the sampling frame and other auxiliary variables available for both respondents and non-respondents; for example, we will use both sampling stratification and sorting variables.

[3] Please see http://www.armytimes.com/article/20140513/BENEFITS/305130045/Panel-prepares-launch-pay-benefits-survey

Weighting. Sampled retirees in this study will be selected based on a sampling design that implemented stratification and oversampling of certain groups, resulting in unequal probabilities of selection and subsequent differential sampling weights across samples. For this reason, the data analysis should be weighted. The basic sampling weights can be used in the analysis when all samples respond to the survey so that analyses with these weights will provide design-unbiased estimates. When survey non-response exists, such as in this study, analyses based on respondents using only the basic sampling weights may no longer produce unbiased estimates. Using the nonresponse bias analyses discussed above, we will determine whether and how to best adjust the weights for nonresponse. The nonresponse adjusted weight is designed to account for differences in the propensity to respond to a survey, as well as potential differences in survey outcomes between respondents and non-respondents. Data analyses then can be conducted using the nonresponse adjusted weights.

The method for nonresponse adjustment depends on the response mechanism underlying the study population. Commonly, when a response mechanism is assumed to be missing at random, nonresponse adjustments typically are implemented independently within weighting classes/cells, under the assumption that the probability of response is homogeneous among units in the same class, and the survey variable(s) is homogeneous within the class. The weighting cells then will usually be constructed based on characteristics directly or indirectly related to survey variables. It is reasonable that the same variables used during the sampling stage can be used to construct weighting cells. To calculate the nonresponse adjusted weights, within each cell, the basic sampling weight will be multiplied with the inverse of response rate used as the nonresponse adjustment factor within the cell.

Post-stratification. To address possible coverage bias due to unavailability of email addresses from all retirees so that samples are drawn only from retirees with email addresses, we will perform post-stratification. Post-stratification is a ratio adjustment technique that forms a mutually exclusive set of post strata (or post-stratification cells) and adjusts the weights within each post stratum so that weighted counts equal control totals, where in this case the control totals used will be the number of retirees in the target population including those without email address. These control totals are important because the post-stratification, as a ratio-based adjustment, will force the weighted distribution to reflect these population of retirees overall and will reduce the variability of survey estimates. As a result, once the nonresponse adjustments and the post-stratification are completed, the distribution of the nonresponse adjusted respondent data will match the population profile as obtained from the target population database to reduce the potential for nonresponse bias in the final study results.

4. Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.

In addition to internal testing within MCRMC staff, we assembled a small group (5-9) of retired military volunteers to beta test the survey interface. Testing evaluated the functionality of the software, intuitiveness of the interface and understanding of the question items. These volunteers performed this activity in a report environment (home or work) unprompted by any monitor or facilitator.

Each volunteer received an email invitation to participate and was then directed to a website to exercise the survey interface and a second website to capture feedback on the system.

For each tester, we tracked:

- The time taken to advance through each screen; and,
- The total time taken to complete the application.

The testers were asked to answer the following questions with specific feedback:

CONTENT

- Were the questions easy to understand?
  - If not, which question(s) was/were confusing? Why?
- Did you use the rollovers or help text?
  - If so, did you find them clear and helpful?

DESIGN

- Was the design (layout and images) of the survey engaging?
- Did the pages, images, and text load at an appropriate speed?
- Did you have trouble with any aspect of the experience?

GENERAL

- We are trying to understand how retirees value different aspects of their retirement pay and benefits. Do you believe that the questions we've asked are reasonable and relevant to this goal?
- How do you feel about the length of the survey?
- Do you have any other feedback for us?

With this feedback, MCRMC is working with the contractor to make the necessary adjustments.

5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

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