

OMB SUPPORTING STATEMENT
INCREASING THE SUPPLY OF MILITARY NURSES

A. JUSTIFICATION

1. Need for Information

The 2008 and 2009 National Defense Authorization Acts included provisions for strengthening the supply of military nurses. The 2008 NDAA authorized the establishment of a military nursing school and the conferees further directed DoD to undertake a study "to determine whether a program to provide incentives to retired military nurse corps officers to serve as faculty at civilian nursing schools, sometimes referred to as 'Retired Troops to Nurse Teachers' could help to alleviate the current and projected nursing shortage in the military services." The 2009 NDAA authorized a pilot of a Retired Troops to Nurse Teachers (TNT) program.

Both NDAA provisions are designed to address the national shortage of registered nurses that has existed for at least a decade by adding to the number of graduates from U.S. nursing schools. A military nursing school would directly boost the number of nurses entering military service each year. In contrast, a TNT program could enhance the supply of military nurses if the additional teachers allowed civilian nursing schools to increase their enrollments, and exposure to ex-military nurse teachers led more graduating nurses to choose a military career.

The RAND study team has been commissioned by DoD to provide the specific information requested in the 2008 NDAA conference report and assess the potential value of a TNT program in increasing the supply of nurses to the medical departments, given other initiatives under way. The study will also inform decision about a TNT pilot (2009 NDAA). Specific study questions include:

1. How many retired military nurses might participate in a TNT program?
 - a. How many have had teaching experience already and how many have an interest in teaching part-time or full-time?
 - b. What advantages and disadvantages do they see in a second career in teaching?
 - c. How does interest in teaching vary with the salary offered?
 - d. How does the potential pool of participants vary with other program characteristics?
2. Would a TNT program expand the number of graduating nurses who enter military service?

- a. Do nursing students who have had a teacher with military experience show more awareness of and interest in military service?
- b. What other factors affect student nurses' potential interest in military service?

To answer these questions, RAND will collect primary data through a series of military and civilian surveys. A survey of civilian nursing students nearing graduation will provide information about the factors that influence graduating nurses to join the military, to include a range of financial and educational incentives as well as exposure to former (or reserve) military nurse faculty. A second survey of military nurses nearing retirement or recently retired will provide information about their interest in teaching and likely participation in a TNT program. The military nurse survey is being submitted to DoD for approval.

2. How, by Whom, and for What Purpose Information Will Be Used

The purpose of this study is to respond to the 2008 National Defense Authorization Act (Conference Report) to evaluate the provision for a TNT program to encourage more retired military nurses to become nurse educators. It will also provide the DoD with information needed to evaluate whether conducting a pilot as currently designed is valuable and for designing the pilot if it is implemented.

This study gives impetus for a one-time and voluntary data collection effort that yields timely and objective information that can be used to help inform DoD decision-makers about policies to sustain the critical need for military nurses. The study report will be forwarded to the Senate Armed Services Committee and the House Armed Services Committee and distributed widely within the Military Health System, including the Office of the Assistant Secretary of Defense for Health Affairs and the Air Force, Army, and Navy Medical Departments.

3. Forms of information collection

- i. The primary data collection effort will be conducted through internet surveys. Current civilian nursing school students who are in the last year of accredited Bachelor of Science in Nursing (BSN) degree programs, and are eligible to enter the military upon graduation will be asked to participate in an internet survey. The schools that will participate in the sample will be randomly selected, but the graduating students from these schools will be a census survey.

4. Efforts to Avoid Duplication

We know of no other external organization that has or is planning to conduct a similar survey that provides the information needed for this study. The required information is not available from the Department of Defense's administrative data systems.

5. Small Business Impact

We do not believe that any of the participating nursing schools would be considered a small business, so do not anticipate any impact on any small businesses.

6. Consequences of Not Collecting Information

Without primary data collection, it will not be possible to meet the objectives of the Congressional study request or provide information needed to evaluate the TNT concept.

7. Special Circumstances

There are no special circumstances involved in this data collection effort.

8. Applicability to 5 CFR 1320.8(d)

A 60-day Federal Register notice published November 4, 2009, page 57152. No comments were received.

The RAND Corporation is conducting this survey under contract to the Department of Defense. RAND has reviewed the existing data sources (including surveys) and determined that none provide the information needed for this study. RAND has also consulted with administrators at nine nursing schools throughout the country as well as senior nursing staff in the Office of the Surgeon General in each military service and the Uniformed Service University of the Health Sciences. The American Association of Colleges of Nursing and National League for Nursing provided information used in developing the sample design for the survey.

9. Remuneration to Respondents

Providing a case incentive to respondents has been shown to increase response rates and decrease the potential for non-response bias without compromising data quality.¹ Some studies have found that incentives increase data quality as well. The research suggests that non-

¹ See Boulianne, Shelley. "Incentives." *Encyclopedia of Survey Research Methods*. 2008. SAGE Publications. 19 Jan. 2009. http://sage-ereference.com/survey/Article_n218.html for a summary of the research on survey incentives

contingent (provided ahead of time whether or not the person completes the survey), cash incentives are the most effective in raising response rates for mailed surveys. For the student nurse survey, it will not be feasible to provide a fully non-contingent incentive in advance because the study team will not be recruiting respondents directly. We will offer online access to a \$15 incentive (gift card for online purchase) when students begin taking the survey. To determine the incentive, we took into account the hourly wages of full-time workers ages 20-24 and the starting salaries of new graduates in nursing. The Current Population Survey for the third quarter of 2008 reported median weekly earnings of \$458 for young workers working full-time, or an hourly wage of about \$12.

10. Confidentiality

The information collected will be protected to the extent permitted by law and the project has a Data Safeguarding Plan, approved by the RAND Institutional Review Board (IRB) for securing all data and information collected. All information will be aggregated with those of other respondents before it is reported to DoD.

11. Questions of a Sensitive Nature

The student survey does not contain sensitive questions. However, a screener for the student survey includes sensitive information combined with non-sensitive information and requires some explanation. Student respondents will be screened before they begin the internet survey to determine whether they would be eligible to serve in the military. Some eligibility criteria are sensitive—e.g., whether the student has ever been arrested for a criminal offense or drug charge, or received a less than honorable discharge from the military. Instead of asking respondents about each of these eligibility criteria individually, the screener asks a single question about all eligibility criteria, including a number of non-sensitive criteria. Students who reply that, for any of the indicated reasons, they would not be eligible for military service are thanked and dropped from the survey. No information will be retained for the respondents who are dropped.

12. Hour Burden Estimate

Table 1 shows the estimated annualized burden hours for the respondents' time to participate in this information collection. We conducted 9 pre-test surveys with nursing students to determine the hour burden for the survey. We will survey students from 34 schools, expecting 51.3 completed surveys per school on average, for a total of 1744 expected completes. The nursing student questionnaire is expected to require on average 20 minutes to complete, resulting in a total burden of 581.3 hours.

Table 1. Estimated annualized burden hours

Form Name	Number of respondents	Number of responses per respondent	Hours per response	Total burden hours
Nursing student questionnaire	1,744	1	0.33	581.3

Table 2 shows the estimated annualized cost burden for the student nurses, which is estimated to be \$6,976.60.

Table 2. Estimated annualized cost burden

Form Name	Number of respondents	Total burden hours	Average hourly wage rate	Total cost burden
Nursing student questionnaire	1,744	581.3	\$12.00 ²	\$6,976.60

² Based on median hourly wages of full-time workers ages 20-24, as reported in the Current Population Survey for the third quarter of 2008.

13. Total Annual Cost to Respondents or Recordkeepers

Capital and maintenance costs include the purchase of equipment, computers or computer software or services, or storage facilities for records, as a result of complying with this data collection. Respondents will not be asked to maintain records and there are no direct costs to respondents other than their time to participate in the study.

14. Annualized Cost to Federal Government

The Agency is supporting the conduct of this survey and analysis of survey data as part of a federally funded research and development contract with the RAND Corporation (award number W74V8H-06-C-0002). The estimated cost for the one-time survey component is \$89,968. The estimated cost of data collection includes \$ labor costs, fringe expenses, overhead per the contract, and other direct costs. There is no capital acquisition associated with this effort.

15. Changes from OMB Form 83-I

This is a new information collection.

16. Outside Publication

Data collected will be analyzed to produce descriptive statistics, examine the variability of responses to questions, and conduct correlations, cross tabulations of responses, regression analysis or other statistical analysis. The results of the survey will be used by RAND to assemble a report to Congress in response to the 2009 NDAA.

17. Expiration Date

We do not seek this exemption. The expiration date of the OMB approval will be displayed at the bottom of all correspondence (email invitations and reminders), and will also be displayed at the start of the web survey.

18. Certification Statement

No exceptions. As required, the following information (including the ICR No. assigned) will be prominently displayed in the printed information provided to respondents to the internet survey:

- Response time for this collection is estimated to average 20 minutes, including time to review instructions, gather information, and complete and review the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Washington Headquarters Services, Executive Services Directorate, Information Management Division, 1155 Defense Pentagon, Washington, DC 20301-1155 (0720-TBD. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

B. COLLECTION OF INFORMATION EMPLOYING STATISTICAL METHODS

1. Respondent Universe and Sampling Methods

The respondent universe consists of Bachelor of Nursing (BSN) students who will receive their degrees from nationally accredited institutions in the U.S. not more than one year after the survey is fielded. Furthermore, these students must be eligible for active duty service in the U.S. military.

We will employ a two-stage sampling scheme, where nursing schools are the primary sampling units (PSUs) and nursing students are the secondary sampling units (SSUs). There are two national accrediting bodies for nursing baccalaureate programs: the Commission on Collegiate Nursing Education and the National League for Nursing Accrediting Commission. The sampling frame is a database of nursing schools in the 50 states and the District of Columbia that have nationally accredited BSN programs for which all stratifying variables are available. The four stratification variables include

- i. Geographical region as defined by the U.S. Census: Midwest, Northeast, South, or West
- ii. Sector: public or private
- iii. Research or non-research institution (based on the 2005 Carnegie Classification found in the Integrated Postsecondary Education Data System (IPEDS) of the National Center for Education Statistics (NCES))
- iv. Whether the school is located within 40 miles of a Military Treatment Facility (MTF).

Additionally, proprietary schools (i.e. private, for-profit schools such as the University of Phoenix) will form a separate stratum due to their unique characteristics. The resulting 33 school strata are shown in Table 3 below. The database contains 685 nursing schools with a mean of 90 BSN graduates per school per year, and an estimated total of 63,714 new BSN recipients annually.

From this database we will draw a stratified simple random sample (SRS) of 34 nursing schools, replacing non-respondent schools with random draws such that the final sample will total exactly 34 schools. By using proportionate stratification, we allocated the sample of 34 schools to the 33 strata as shown below in Table 3.

Table 3. Number of Nursing Schools in Sample Frame by Stratum

Stratum	Frequency	Percent	Stratum	Frequency	Percent
Proprietary	11	1.61	South, private, non-research, no MTF	56	8.18
Midwest, private, non-research, no MTF ³	104	15.18	South, private, non-research, MTF	25	3.65
Midwest, private, non-research, MTF	15	2.19	South, public, non-research, no MTF	72	10.51
Midwest, public, non-research, no MTF	41	5.99	South, public, non-research, MTF	32	4.67
Midwest, public, non-research, MTF	5	0.73	South, private, research, no MTF	8	1.17
Midwest, private, research, no MTF	5	0.73	South, private, research, MTF	8	1.17
Midwest, private, research, MTF	1	0.15	South, public, research, no MTF	29	4.23
Midwest, public, research, no MTF	27	3.94	South, public, research, MTF	12	1.75
Midwest, public, research, MTF	4	0.58	West, private, non-research, no MTF	13	1.90
Northeast, private, non-research, no MTF	54	7.88	West, private, non-research, MTF	9	1.31
Northeast, private, non-research, MTF	21	3.07	West, public, non-research, no MTF	23	3.36
Northeast, public, non-research, no MTF	27	3.94	West, public, non-research, MTF	12	1.75
Northeast, public, non-research, MTF	17	2.48	West, private, research, no MTF	5	0.73
Northeast, private, research, no MTF	8	1.17	West, private, research, MTF	1	0.15
Northeast, private, research, MTF	8	1.17	West, public, research, no MTF	8	1.17
Northeast, public, research, no MTF	8	1.17	West, public, research, MTF	10	1.46
Northeast, public, research, MTF	6	0.88	Total	685	100.00

³ Where MTF denotes a Military Treatment Facility within 40 miles of the nursing school's location

Table 3. Number of Nursing Schools in Sample by Stratum

Stratum	Frequency	Percent	Stratum	Frequency	Percent
Proprietary	2	5.88	South, private, non-research, no MTF	2	5.88
Midwest, private, non-research, no MTF	5	14.71	South, private, non-research, MTF	1	2.94
Midwest, private, non-research, MTF	2	5.88	South, public, non-research, no MTF	3	8.82
Midwest, public, non-research, no MTF	2	5.88	South, public, non-research, MTF	2	5.88
Midwest, public, non-research, MTF	0	0.00	South, private, research, no MTF	0	0.00
Midwest, private, research, no MTF	0	0.00	South, private, research, MTF	0	0.00
Midwest, private, research, MTF	0	0.00	South, public, research, no MTF	1	2.94
Midwest, public, research, no MTF	2	5.88	South, public, research, MTF	2	5.88
Midwest, public, research, MTF	0	0.00	West, private, non-research, no MTF	2	5.88
Northeast, private, non-research, no MTF	3	8.82	West, private, non-research, MTF	0	0.00
Northeast, private, non-research, MTF	1	2.94	West, public, non-research, no MTF	1	2.94
Northeast, public, non-research, no MTF	1	2.94	West, public, non-research, MTF	1	2.94
Northeast, public, non-research, MTF	0	0.00	West, private, research, no MTF	0	0.00
Northeast, private, research, no MTF	0	0.00	West, private, research, MTF	0	0.00
Northeast, private, research, MTF	0	0.00	West, public, research, no MTF	0	0.00
Northeast, public, research, no MTF	0	0.00	West, public, research, MTF	0	0.00
Northeast, public, research, MTF	1	2.94	Total	34	100.00

From the 34 sampled schools, we will invite all bachelor's degree students who will graduate within one year of the survey fielding period to complete our internet survey. With a mean of 90 graduating students per school in the sample frame, we expect to contact 3,060

students. We anticipate a 60% student response rate. In a recent survey of post-high school students, Edelen et al.⁴ achieved a 57% response rate using the mailing addresses of the participants' parents and paying an incentive at a lower hourly rate than \$15 for 15 minutes. We expect to achieve a higher response rate due to our use of more current contact information (e-mail addresses maintained by nursing schools), the shorter survey completion time and higher hourly rate of our incentive, and the survey cover letters from the deans of the nursing schools encouraging students to participate (described in section B(3) below).

Of those students who attempt to complete the survey, we estimate that 95% will pass the screener question for eligibility for active duty in the U.S. military. We expect the main reason for screenouts to be non-U.S. citizenship rather than dependents, age, criminal record, etc., 2007 Current Population Survey March Supplement data estimated that 94% of college or university students in the United States were U.S. citizens. This estimate includes community college students and graduate students, who may be more likely to be non-U.S. citizens, and does not take field of study into account. An estimated 96% of bachelor's degrees in science, engineering, and health were awarded to U.S. citizens in 2001-2002.⁵ Accounting for a 60% response rate and 95% screening pass rate, the expected number of completed student surveys is 1,744.

2. Procedures for the Collection of Information

a) Statistical methodology for stratification and sample selection

As described above in item B(1), we will use proportionate stratification to draw a stratified simple random sample (SRS) of 34 nursing schools (PSUs). We will ask each of the sampled schools to contact by email all nursing baccalaureate students who will receive their degrees within one year of the survey fielding period.

⁴ Edelen, Maria Orlando, Daniel F. McCaffrey, Phyllis L. Ellickson, Joan S. Tucker, and David J. Klein, "Creating a Developmentally Sensitive Measure of Adolescent Alcohol Misuse: An Application of Item Response Theory," *Substance Use & Misuse*, Vol. 44, No. 6 (May 2009), pp.835-847.

⁵ National Science Foundation, Division of Science Resources Statistics, *Characteristics of Recent Science and Engineering Graduates: 2003*, NSF 06-329, Project Officer John Tsapogas, Arlington, Va. 2006. As of August 20, 2009: <http://www.nsf.gov/statistics/nsf06329/>

b) *Estimation procedure*

The primary survey outcome of interest is the difference in the proportion of students expressing positive military enlistment propensity with and without an incentive package. After describing a typical career path for a military nurse officer and the current recruiting incentives and compensation package, we will ask students the following question:

- Given these characteristics [of a military nursing career], how likely are you to consider joining the military?
 - Very likely
 - Somewhat likely
 - Neither likely nor unlikely
 - Somewhat unlikely
 - Very unlikely.

We will consider those who respond ‘Very likely’ or ‘Somewhat likely’ to have positive enlistment propensity given current incentives and compensation. Then we will ask students how likely they are to consider joining the military in the presence of various enhanced recruiting incentives, such as signing bonuses, loan repayment programs, etc. (for full question text, please see items 20-22 on the attached survey instrument).

We will use the following method to estimate the potential effect of the enhanced recruiting incentives

Let $p_0 =$ *observed proportion of students with positive enlistment propensity in absence of added incentive*

and $(1 - p_0) =$ *observed proportion of students with negative enlistment propensity in absence of added incentive*

Let $p_1 =$ *increase in the proportion of students with positive enlistment propensity in the presence of an added incentive*

Thus $p_0 + p_1 =$ *observed proportion of students with positive enlistment propensity in presence of added incentive*

and $p = \frac{p_1}{(1 - p_0)}$ = *proportion of students with negative propensity in absence of incentive who change to positive propensity when incentive is added*

We can perform a one-sample statistical hypothesis test of proportion for the quantity

$$p = \frac{p_1}{(1 - p_0)} .$$

Due to our use of proportionate stratification, weights are not necessary to address the sampling design. For a discussion of our procedure for calculating weights to address nonresponse bias for the student survey, please see item B(3) below.

c) *Degree of accuracy*

Based on Defense Manpower Data Center officer accession reports, Department of Defense research on youth enlistment propensity,⁶ and Department of Education figures on the number of bachelor's degrees awarded yearly to men and women⁷, we expect 5-20% of respondents to express positive enlistment propensity in the absence of any incentive package. For this range, the number of schools required to attain 80% power to reject the null hypothesis $H_0 : p = 0.01$ in favor of the alternative hypothesis $H_a : p \neq 0.01$ in a 0.05 level test is given in Table 4 below, for different values of the intra-class correlation coefficient (ICC) and the true increase in enlistment propensity p_1 . The table varies the ICC, which allows for the possibility that students from the same school may have correlated responses, and the "true" increase in enlistment propensity that we will be able to detect. Table 4 shows that, if we observe an ICC of 0.02 and an increase of 2.5% in positive enlistment propensity in the presence of the recruiting incentive package (e.g. an increase from 10% positive propensity without the incentive to 12.5% positive propensity with the incentive), the expected sample size of 1,744 students will give us more than 80% power to declare that the proportion of students changing from negative to positive propensity due to the incentive differs significantly from 0.01.

⁶ Bergman, Shawn M., Ricardo S. Carvalho, Scott R. Turner, Sean M. Marsh, Andrea B. Zucker, and Matt Boehmer, *Department of Defense Youth Poll Wave 14—December 2007: Overview Report*, Arlington, Va.: Department of Defense, Defense Human Resources Activity, Joint Advertising, Market Research and Studies, July 2008. As of August 20, 2009: http://www.jamrs.org/reports/Youth_Poll_14.pdf

⁷ National Center for Education Statistics, U.S. Department of Education Institute of Education Sciences, *Digest of Education Statistics: 2007*, NCES 2008-022, March 2008. As of August 20, 2009: http://nces.ed.gov/programs/digest/d07/tables_1.asp

Table 4. Schools (Complete Surveys) Needed to Achieve 80% Power to Reject a Level 0.05 Test of $H_0 : p = 0.01$, for Baseline Positive Enlistment Propensity of 2-5 Percent

True Increase in Enlistment Propensity	Intra-Cluster Correlation				
	0.005	0.01	0.02	0.05	0.1
2.0%	38 (1,921)	45 (2,308)	61 (3,080)	106 (5,396)	181 (9,256)
2.5%	21 (1,062)	25 (1,275)	34 (1,702)	59 (2,982)	100 (5,115)
3.0%	14 (713)	17 (856)	23 (1,143)	40 (2,002)	67 (3,434)
5.0%	6 (291)	7 (349)	10 (466)	16 (816)	28 (1,400)

d) Unusual problems requiring specialized sampling procedures

We have not encountered unusual sampling problems and thus do not require specialized or unconventional sampling procedures.

e) Use of periodic (less frequent than annual) data collection cycles

We will only collect data once from each survey respondent during the survey fielding period. No longitudinal or periodic data collection will occur.

3. Methods to Maximize Response Rates and to Deal with Non-Response

To maximize the survey response rate at the student (SSU) level, as described in section A, we will pay a \$15 incentive to each student completing the survey in the form of an online gift card. Additionally, the Dean of each selected nursing school will initially contact students nearing completion of the BSN degree via e-mail, inviting them to participate in the survey. Students will then receive up to two follow-up e-mails from the Dean of the school reminding them to complete the online questionnaire. We asked each of the nursing school administrators who participated in the pretest of the school interview protocol about their willingness to solicit their students' participation in the student survey. All the school administrators with whom we spoke would have been willing to follow the procedure outlined here.

We will use school-level non-response weights (the inverse of the proportion of students responding to the survey within each school). We will also know for each school what fraction of the students entering the survey website report that they would be eligible for military service as a

nurse. Since we will not have this information for non-respondents, we cannot adjust for any bias in response by this characteristic.

We do not expect high item-level non-response since we are not asking sensitive questions. We will multiply impute missing data using the Markov Chain-Monte Carlo (MCMC) method, with the number of imputations determined by the level of item missingness. Thus our quantitative findings will take into account the uncertainty in the data due to item non-response.

4. Tests of Procedures or Methods

Survey piloting consisted of a two hour focus group where we performed cognitive testing of the instrument and elicited feedback on how readily the survey questions are understood. Four BSN students nearing graduation participated, receiving \$50 each.

5. Individuals Consulted on Statistical Aspects of the Design

The survey will be conducted by the RAND Corporation as part of its National Defense Research Institution, a federally funded research and development center for the Office of the Secretary of Defense, the Joint Staff, the Unified Combatant Commands, and the defense agencies. The Senior Statistician at RAND who consulted on the statistical design of this data collection is Marc N. Elliott, PhD (310-393-0411, ext. 7931).