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THE HEALTH STATUS OF WOMEN IN THE MILITARY: AN EPIDEMIOLOGIC STUDY OF ACTIVE-DUTY NAVY AND MARINE CORPS PERSONNEL, PART II

FINAL REPORT

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This report describes the assessment of Perceptions of Wellness and Readiness (POWR) among active-duty Navy and Marine Corps personnel. Supported by the Defense Women's Health Research Program, the purpose of this study was to obtain baseline prevalence and risk factor information on a representative sample of active-duty Navy and Marine Corps women and men worldwide and to provide relevant comparative data with civilian populations. The POWR Assessment consisted of three separate, but complementary components. The first and most comprehensive component was a large-scale survey in which respondents completed an in-depth self-report questionnaire that assessed six key issues, including reproductive health, medical history and nutritional status, mental health, lifestyle issues, occupational/environmental risks, and health services issues. This questionnaire study was based on a probability sample of approximately 10,000 active-duty Navy and Marine Corps personnel. The second component consisted of physical measurements taken on a subsample of approximately 1,200 respondents to the main survey. The third component was a telephone interview drawn from volunteers responding to the main survey. This report includes background about the study and discussions of the sampling design, the data collection instruments, data collection methods, sample weighting and estimation procedures, and preliminary results.

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1. INTRODUCTION AND BACKGROUND

This report describes the assessment of Perceptions of Wellness and Readiness (POWR) among active-duty Navy and Marine Corps personnel. It includes background about the study and discussions of the sampling design, the data collection instruments, data collection methods, sample weighting and estimation procedures, and preliminary results. Although the funded period of this study has concluded, analyses of the volume of data obtained from this effort are expected to continue throughout the next several years as continuation funding becomes available.

1.1 Overview and Objectives

The purpose of the proposed research was to conduct a worldwide survey of the health of active-duty Navy and Marine Corps women and men with a special focus on women's health care needs. The general objectives of this study were to obtain data in order to

- estimate the prevalence of a broad range of health variables overall and for demographic subgroups, such as those defined by sex, race/ethnicity, age, and paygrade;
- assess the prevalence of selected diseases and disease risk factors in Navy and Marine Corps women;
- provide comparisons between differing populations of interest in the Navy and Marine Corps (e.g., women vs. men, sea vs. shore, junior enlisted vs. senior enlisted, enlisted vs. officers, surface vs. aviation, continental United States [CONUS] vs. outside continental United States [OCONUS]);
- compare prevalence findings on women's health from the Navy and Marine Corps with civilian female populations;
- develop baseline information for future status and trends of Navy and Marine Corps women's risk factor and health information;
- identify appropriate female Navy and Marine Corps populations for specialized studies; and
- contribute to the understanding of disease etiology in female populations by collecting and analyzing risk factor information.

The following section provides additional background about the need for and significance of the POWR Assessment.

1.2 Background and Significance

The shift in the U.S. Military from a conscription-based to an all-volunteer force in 1973, along with increased social acceptance of women's involvement in traditionally male-dominated occupations, has created new opportunities for an increasing number of women in the Military. Consequently, the proportion of the military population who are women has been increasing. In the early 1980s, less than 10% of the Armed Forces were women (Bray et al., 1983; Burt, Biegel, Carnes, & Farley, 1980), but by 1995 that percentage was approximately 14% of the force for a total of nearly 200,000 women (Institute of Medicine [IOM], 1995). Women make up from 11% to 15% of active-duty Army, Navy, and Air Force personnel and about 4% of Marine Corps personnel (IOM, 1995).

Since 1948, with the passage of the Women's Armed Services Integration Act, women have served in the same units as men, rather than in special all-female units (Dienstfrey, 1988). Although women in the U.S. Military have traditionally tended to be in administrative support or health-related occupational specialties, such as nursing, all occupations in principle are open to women except those related to direct offensive ground combat (Hoiberg & White, 1993; Naylor & Walker, 1994; Stanley & Segal, 1988). In the recent war in the Persian Gulf, however, approximately 33,000 women served in combat-support roles, including airplane and helicopter pilots, construction and repair, and artillery direction (Becraft, 1992).

In addition to safety concerns for women who might be near direct combat operations, concerns have been raised about the potential impact of military service upon women's health, such as the risk of stress-related health problems associated with minority status in a predominantly male environment, the risk of reproductive hazards associated with exposure to hazardous materials, or the risk of injury if women are in more physically demanding occupational specialties as opposed to administrative or medical specialties. Similarly, concern has also been raised about the potential impact of women's health problems upon overall military readiness (Hoiberg & White, 1993). Thus, research on the health status and health behaviors of military women can play an important role in helping to ensure their full participation in all aspects of military service and to guarantee them safety and well-being.

Partly in reflection of the large proportion of males in the Military, however, much prior research on the health of military personnel has either involved all-male samples within individual Services (e.g., Abood & Conway, 1991; Hurtado & Conway, 1993; McCarthy, Griffith, Prusaczyk, Goforth, & Vailas, 1992; Pleas, 1991), or it has included both military women and men but has generally not provided gender-specific estimates (e.g., Conway & Cronan, 1992; Woodruff & Conway, 1992). Prior health-related studies that have been conducted among military women, such as the 1989 DoD Women's Health Survey (Mahoney & Wright, 1990), the 1992 Navy Personnel Research and Development Center (NPRDC) survey of pregnancy among enlisted women, and Hoiberg and White's (1993) study of hospitalizations among Navy women, have tended **to focus on a narrow aspect of military women's health issues (e.g., pregnancy, hospitalizations) or have not allowed estimation of baseline disease prevalence rates.**

In addition, military population surveys do not offer the same degree of detailed epidemiological data on health status and health behaviors as are available for the civilian population through such studies as the National Health and Nutrition Examination Survey (NHANES) (National Center for Health Statistics [NCHS], 1981, 1985, 1992), the National Health Interview Survey (NHIS) (NCHS, 1994), the Behavioral Risk Factor Surveillance System (BRFSS) (Siegel, Frazier, Margolis, Brackbill, & Smith, 1993) and the Epidemiological Catchment Area (ECA) study (Robins & Regier, 1991). Although three recent DoD-wide surveys provided population-based health data on active-duty members (Bray et al., 1995; Lurie et al., 1993; Mahoney & Wright, 1990), none of them allows extensive estimation of baseline disease prevalence rates.

Further, because of the increasing proportion of military women, and the expansion of their military role, the nature and distribution of health care problems in the Navy and Marine Corps are likely to change. Accordingly, the health care system will need to adapt to effectively meet these needs. The development of baseline data to monitor changes in health status and health care delivery needs within the DoD and the Naval Service is of critical importance to the maintenance of military readiness.

To help address these various needs, the POWR Assessment provides key baseline data for six general issue areas within the Naval Service: (a) reproductive health, (b) medical history and nutritional status, (c) mental health, (d) lifestyle issues, (e) occupational/environmental risks and stressors, and (f) use of health services.

1.2.1 Reproductive Health

Reproductive issues are of major concern not only for policy purposes (e.g., manning ships and combat positions), but also for specialized health care. The majority of active-duty women are at the peak of their reproductive years. During a 1992 Navy Personnel Research and Development Center (NPRDC) survey of pregnancy among enlisted Navy women, a disproportionately high rate of miscarriages within lower paygrades was reported. Nearly 3,500 enlisted Navy women were randomly selected, based on their Social Security number, to complete this questionnaire. Findings indicated that the proportion of miscarriages among enlisted women (assuming any unintentional loss of the fetus throughout the entire pregnancy) for E3 and below ($\underline{N}$ = 478) was about 35%. The proportion of miscarriages for E4 to E6 ($\underline{N}$ = 907) was about 20%, while the proportion of miscarriages for E7 to E9 ($\underline{N}$ = 695) was approximately 5%.

A subsequent NHRC study (Calderon & Hilton, 1994) reported that active-duty enlisted Navy women had an ectopic pregnancy rate nearly twice that of civilians. Because baseline information on known risk factors (e.g., lifestyle, reproductive history, and history of sexually transmitted diseases) for adverse reproductive outcomes was not available, it was impossible to make adequate inferences about the high rate of ectopic pregnancies in enlisted Navy women.

The effect of expanded combat and ship experience and other occupational (chemical, radiological, and biological) exposures associated with specified duties is of major concern. A review of the literature suggests that environmental toxins and lifestyle habits may affect the ability of both a mother and a father to

produce a viable embryo or fetus. Maternal factors affecting the length of pregnancy include exposure to organic solvents (Lindbohm, Taskinen, Sallmen, & Hemminki, 1990), electromagnetic radiation (Stewart, 1991), lead exposure (Lindbohm, Sallmen, Anttila, Taskinen, & Hemminki, 1991), alcohol consumption (Windham, Fenster, & Swan, 1992), passive smoke (Windham, Shanna, & Fenster, 1992), contaminated tap water (Hertz-Picciotto, Swan, Neutra, & Samuels, 1989), heavy lifting (Ahlborg, Bodin, & Hogstedt, 1990), and heavy caffeine consumption (Fenster, Eskenazi, Windham, & Swan, 1991).

According to the Naval Environmental Health Center (Crawl, 1990), a number of reproductive health hazards are found at both ship and shore commands. Cadmium, mercury, benzene, glycol ethers, perchloroethylene, polychlorinated biphenyls, and vinyl chloride should be considered priority materials for shipboard and shore minimization action. Chloroprene (rubber manufacturing), carbon disulfide, ethylene oxide, ethylene thiourea, ethylene dibromide, halogenated anesthetic gases, and nitrous oxide are substances that most likely would be found at shore facilities.

The POWR study provides information on the participants' reproductive history and existing gynecological and obstetrical (OB/GYN) conditions. In addition, perceptions, attitudes, and health care use patterns regarding existing utilization of OB/GYN facilities and services were surveyed.

1.2.2 Medical History and Nutritional Status

National health surveys (NHANES and NHIS) have served as important parts of the Nation's health monitoring systems. These surveys have established the normative distributions for certain population parameters, such as height, weight, blood pressure, and nutrition. In addition, these surveys have ascertained the prevalence of certain chronic diseases, as well as the prevalence of risk factors for given conditions. This information is essential to identify health care needs and to facilitate health care planning. Currently, there is no baseline information on underlying conditions typically seen in an acute care setting for military personnel. In addition, there is no baseline information on which to base statements regarding average height and weight for women in the Military; that is, despite gender differences in anthropometry, a single equation to predict body surface, used in estimating thermal physiologic responses, is currently applied to both male and female populations (Hodgdon, Fitzgerald, & Vogel, 1990). Also, many machines and vehicles are designed based on physical parameters standardized against the average male.

The physical measurements obtained in this survey, among other advantages, will permit a validation of existing body surface formulae or a generation of new body surface formulae for females. The POWR questionnaire provides information on height, weight, vision problems, tuberculosis, gastrointestinal problems, anemia, diabetes, respiratory conditions, hearing and speech impediments, liver and gallbladder conditions, kidney and bladder disease, allergies, hypertension, cardiovascular conditions, chronic back and joint pain (arthritis), and a variety of acute and chronic diseases.

Nutritional status has been a major component of national surveys and was included in POWR as a way of ascertaining the nutritional status of Navy and Marine Corps personnel. Although it is known that

women in the Military have higher nutritional knowledge scores than men (Trent, 1992), it has also been established that women in general have different nutritional needs than men, such as for more iron, more calcium, and fewer calories, and that naval female personnel, in particular, may require supplemental iron to meet the recommended dietary amount (Departments of the Army, the Navy, and the Air Force, 1985). Data from the POWR study will permit an evaluation of active-duty women's nutritional status relative to that of their male counterparts. Also, because the common predictors of economic status and availability should be relatively stable in the Military, this survey will be able to examine the effect of lifestyle and cultural conditions on nutritional status.

1.2.3 Mental Health

In the Navy, mental disorders are the second leading cause for hospitalization among both enlisted men (after injuries) and enlisted women (after pregnancy-related conditions) (Hoiberg, 1980). Although psychiatric incidence rates are high for both sexes, some studies have suggested that women may have much higher rates than men. For example, a study of sex differences in sick call diagnoses aboard U.S. Navy ships found significantly higher rates of personality disorder, stress, and adjustment reactions, and other symptoms and syndromes (e.g., eating and sleep disorders) among women (Nice & Hilton, 1990). Two- to four-fold differences in psychiatric hospitalization rates (excluding alcoholism) were found for women in earlier cohort studies (Hoiberg, 1980; Schuckit & Gunderson, 1974). Also, women soldiers deployed during the Persian Gulf War were almost twice as likely as men to be diagnosed with psychiatric disorders (Hines, 1993). Some investigators have suggested that women may have more disorders because women find military life more difficult and stressful than men do. However, these higher rates may reflect women's greater propensity to use health services. Further, most studies have not controlled for known demographic, psychosocial, or Service-related differences between the sexes in the assessment of their disorder rates. In view of the increased proportion of women in the Military and their greater exposure to stressful situations, such as nontraditional occupations, deployment, and combat that may increase the risk of mental disorder or distress, the Military must be prepared to plan for the delivery of increased mental health services and must identify high-risk groups to target mental health promotion efforts.

POWR provides the epidemiological data needed to address these issues by determining the prevalence of the most commonly diagnosed mental disorders in women—depression, personality disorders, eating disorders, anxiety disorders, and posttraumatic stress disorder (PTSD)—as well as the prevalence of psychiatric distress symptomatology. This study also examines possible risk factors associated with these rates, such as life events, coping skills, quality of life, perceived stress, personality, interpersonal relations, and social support.

1.2.4 Lifestyle Issues

There is increasing awareness in the medical and psychological communities that men and women differ in their risks for a variety of illnesses and in their appropriation of health-related behaviors. Women's health risk and behavior issues are particularly salient in the U.S. Navy and Marine Corps, where women's roles are expanding to embrace all occupational specialties, including those associated with deployment and combat, thereby exposing women to new physical and psychological demands and potential health hazards. Further, it is unknown to what extent poor health behaviors (e.g., smoking and caffeine use) may potentiate the effects of stress in women or to what extent their co-occurrence in an operational environment may add psychological and biological burdens (Anderson, Kiecolt-Glazer, & Glaser, 1994). To evaluate the effect of an expanded role for women, a clear understanding of health, lifestyle, and fitness variables must be ascertained to serve as a basis for subsequent evaluations.

The POWR study examines an array of health- and fitness-related variables in women, including exercise and dietary habits, sleep patterns, cigarette smoking, aerobic fitness, muscle strength, general health habits and attitudes, and perceived health status. These variables will be evaluated as potential risk factors for specific diseases and used in comparative analyses with males.

1.2.5 Occupational/Environmental Risks

The integration of women into nontraditional ratings raises a number of questions concerning the impact of such jobs on women's health, the mechanisms employed by women to cope with new occupational demands, and the requirements for Navy medicine to provide care to women engaged in the full spectrum of occupational sites and situations. This study provides data to examine the differences in health and occupational stress among Navy women assigned to both traditional and nontraditional jobs, and to compare women's health and fitness status, as well as their job satisfaction, perceived job stress (including sexual harassment and discrimination), and job performance, to that of their male counterparts.

Further, most of the research on the effects of occupational and environmental stress in the workplace has been on males; few studies have examined potential gender differentials. Certainly, an important source of occupational stress in the Military is exposure to combat and sustained operations. Although many epidemiological studies have examined the effects of warfare exposure to active-duty male members, no epidemiological studies have been conducted on the effects of combat or deployment stress in active-duty women. Therefore, an important aspect of this study will be an examination of the physical and psychological correlates of occupational and combat stress.

1.2.6 Health Services Issues

It is well-documented that women utilize health care resources more frequently than do men (Briscoe, 1987; Nathanson, 1975; Verbrugge, 1985). In the United States, women in the reproductive age group use physician services at almost 1½ times the rate of men in that group, excluding services associated with pregnancy. Several studies on military populations have indicated that military women utilize health care resources more frequently than military men do. Navy enlisted women have considerably higher rates of

hospitalization than enlisted men, with pregnancy-related conditions accounting for nearly one-third of women's hospitalizations (Hoiberg, 1980). Navy shipboard women were also found to use health care resources at a significantly higher rate than men, with a female-to-male visit ratio of 1.44 for all visits and 1.21 when all sex-specific diagnoses were excluded (Nice & Hilton, 1994). A study of the health status of women in the Army demonstrated that Army women used health care resources more frequently than Army men did (Misner, Bell, & O'Brien, 1987).

In terms of satisfaction with care, a 1989 DoD Women's Health Survey found that the majority of women were satisfied or very satisfied with the quality of medical services for both the last non-OB/GYN visit and the last OB/GYN visit. Nonetheless, there was some dissatisfaction reported with specific aspects of medical treatment (e.g., time waited, priority shown, and time to receive test results) (Mahoney & Wright, 1990). There were also differences across the Services, with women in the Air Force reporting better access to medical services and higher satisfaction with those services than did women in the other Services.

Identifying factors associated with military women's health care utilization, satisfaction, and access will help target areas for improvement in health care delivery to military women. For example, investigators have reported various psychological, social, physical, and behavioral factors associated with sex differences in health care utilization. Differences in health care utilization among men and women have been attributed to greater apparent morbidity among women than men (Rodin & Ickovics, 1990), the effects of employment (both positive and negative models) among women, and factors in the Health Belief Model. Such factors include predisposing variables (i.e., attitudes, beliefs, and knowledge regarding health care and treatment), enabling factors (i.e., conditions that facilitate or inhibit the use of health care resources), and need variables (i.e., subjective and objective evaluations of health status) (Janz & Becker, 1984).

The information obtained in the POWR Assessment contains data to evaluate women's health status in the Navy and Marine Corps. It provides baseline information for future comparisons, as the demographic profile of the Military changes over the next few years and as women move into traditionally male-dominated occupations. These data also provide key information pertinent to Navy and Marine Corps policies ranging from health care utilization to women's health issues.

1.3 POWR Assessment Components and Research Team Responsibilities

The POWR Assessment consisted of three separate, but complementary components. The first and most comprehensive component was a large-scale survey in which respondents completed an in-depth self-report questionnaire that assessed the six key issues described above. This questionnaire study was based on a probability sample of approximately 10,000 active-duty Navy and Marine Corps personnel. The second component consisted of physical measurements taken on a subsample of approximately 1,000 respondents to the main survey. The third component was a telephone interview drawn from volunteers responding to the main survey. For simplicity, these three components are referred to as the questionnaire study, the body measurement study, and the telephone study, respectively. Each is described in more detail in the following chapters.

Researchers from Naval Health Research Center (NHRC) and Research Triangle Institute (RTI) collaborated to conduct the POWR Assessment. NHRC had lead responsibility for instrument development for all three components and for data collection for the body measurement study and telephone study. RTI had responsibility for sample design, data collection, sample weighting, and data file and codebook preparation for the questionnaire study. RTI also provided sampling support for the body measurement study. NHRC had responsibility for data editing for the questionnaire study.

2. SAMPLING DESIGN

2.1 Overview and Modifications of the Sampling Design

The POWR Assessment consisted of three components: a questionnaire study yielding approximately 10,000 respondents, a body measurement study yielding measurements on approximately 1,000 persons, and a telephone study. This section briefly describes these components and the key modifications to the design after its inception.

2.1.1 Questionnaire Study

The main portion of the POWR Assessment was a questionnaire administered to a probability sample of active-duty shore-based Navy and Marine Corps personnel. The questionnaire was administered to sampled personnel in group sessions in three Navy and two Marine Corps locations. Sampled personnel in the remaining sites were surveyed by mail.

The original plans for the study called for the survey to include all active-duty Navy and Marine Corps personnel—afloat as well as shore-based. However, because a similar study of all afloat personnel was being conducted at the same time, the POWR study was restricted to ashore persons to avoid an undue burden to the afloat persons. The original design also called for all sampled persons to be surveyed in group sessions. Nonrespondents would be followed up by mail. The sample design and data collection protocols would be similar to those used for the 1995 DoD Survey of Health Related Behaviors Among Military Personnel (Bray et al., 1995). It was thought that group session administrations would result in higher response rates. The data collection strategy was changed to a combination of group sessions in a few selected sites, and multiple mailings in the remaining sites, because there was insufficient time to obtain command support needed to ensure a high turnout at the group sessions. Group sessions were conducted at a few selected West Coast and Pacific sites where support was obtained. At these sites, the questionnaire was administered in group sessions, and body measurements were taken for a subsample of persons attending the group sessions.

The sample design was similar to that used for the 1995 DoD Survey (Bray et al., 1995). A two-stage stratified design was used that included sampling of geographic locations and personnel from within those locations. Even though a large portion of the sample was surveyed by mail, clustering was used because the first two mailings to sampled persons were sent through the commanding officer (CO) in an

attempt to increase the response rates. By restricting the sample to a set number of locations, we also restricted the number of COs who needed to be contacted.

2.1.2 Body Measurement Study

At three Navy locations (corresponding to five first-stage units) and at two Marine Corps locations (corresponding to four first-stage units), a sample of persons reporting to the group sessions was selected to participate in the body measurement study. The sites were determined after the original sample had been selected and corresponded to one naval base outside the continental United States (OCONUS), two West Coast naval bases, and two West Coast Marine Corps bases. The hand-picked bases are major West Coast and OCONUS bases. Although a nonprobability procedure was used to select the bases to participate in the body measurement study, persons were selected in a random manner. The sample of persons can be used to make inferences for these bases. A sample large enough to yield body measurements for 600 Navy personnel (300 men and 300 women) and 400 Marines (200 men and 200 women) was selected.

2.1.3 Telephone Study

The telephone study was a volunteer survey from persons who completed the main POWR questionnaire. Sampled persons received a handout asking if they would like to be a part of the telephone survey. Persons who agreed to participate were then stratified based on their questionnaire responses to two psychiatric screening instuments. This sampling design was patterned after the two-stage approach for case identification and diagnosis described by Shrout et al (1985). Persons of greatest interest for the study were those who were most likely to have selected mental health diagnoses (such as major depression, generalized anxiety disorder, somatization, or alcohol abuse).

2.2 Design Parameters for the Questionnaire Study

The sample design for the POWR Assessment was a two-stage probability sample, with installations selected at the first stage and personnel assigned to selected installations chosen at the second stage. This approach allowed the sample to be restricted to a predetermined number of installations while preserving its inferential capability. In addition, stratification was used to further control the sample distribution with respect to organizational and demographic characteristics. The first-stage sampling frame for the Navy and Marine Corps for the 1995 DoD Survey of Health Related Behaviors Among Military Personnel was used as the basis for the first-stage frame for the 1995 POWR Assessment. The geographic distribution of the sample was controlled by stratifying by continental United States (CONUS) and outside the continental United States (OCONUS).

The total sample size for the survey consisted of approximately 25,863 Navy and Marine Corps personnel selected from 45 geographic locations worldwide. This sample size was based on precision requirements for and targeted sample sizes of approximately 10% of the women in each Service and an equal

number of men, response rates based on experience with similar methodology, and eligibility rates obtained in the 1995 DoD Survey of Health Related Behaviors Among Military Personnel.

The eligible population of survey participants was all active-duty shore-based personnel except recruits, cadets, persons absent without official leave (AWOL), and persons who had a permanent change of station (PCS) at the time of data collection.

The POWR Assessment had two specified precision requirements adopted from NHANES:

(a) A prevalence statistic of 10% should have a relative standard error (RSE) less than 30%.

(b) Differences of at least 10% in health or nutrition statistics between any two subdomains should be detected with a type I error of no more than 0.05 and a type II error of no more than 0.10.

Domains of interest for the study were those defined by

(a) Service (Navy, Marine Corps);
(b) gender (male, female);
(c) race (white, other); and
(d) paygrade (E1-E6, E7-E9, Officer).

Further, the targeted responding eligible sample sizes for the study were specified as approximately 10% of the number of women in each of the services and an equal number of men.

To satisfy precision requirement (a), equations were developed to describe the variable survey costs and sampling variances given the salient features of the design. These features, collectively termed "design effects," included estimates of the intracluster correlation among individuals in the same first-stage unit, the first- and second-stage stratum sizes, and the nonresponse subsampling fraction. Estimates of the data collection costs from previous surveys with similar designs were obtained, and the minimum cost allocations were obtained by solving the equations simultaneously (subject to the precision constraints).

The effective sample size needed to satisfy precision constraint (a) is 100 persons per domain. The effective sample size is the actual sample size divided by the design effect, where the design effect is the ratio of the variance under the sample design divided by the variance under a simple random sample design.

Allocations for a variety of domains and domain-level relative standard errors (RSEs) were made to obtain a sample allocation that satisfied both the approximate targeted sample size and the precision constraint that RSEs be less than 30%. In Table 2.1, the domains and the targeted RSEs considered in designing the survey are presented. The prevalence for each of the domains was assumed to be 10%. Domains were defined by first-, second-, and third-order interactions of Service, gender, paygrade, and race. RSEs that were less than 30% were targeted. Domains defined by the full cross of the factors were not considered in the design because they would have required a very large sample size. Navy

Table 2.1 Domains and Relative Standard Errors Used as the Basis for the Sampling Design

Reporting Domain	Number of Domains	Targeted Relative Standard Error
Navy and Marine Corps, Total	1	10%
Navy	1	8%
Marine Corps	1	10%
Gender (Male, Female)	2	15%
Paygrade (E1-E6, E7-E9, Officer)	3	10%
Race (White, Other)	2	25%
Navy: Gender	2	5%
Marine Corps: Gender	2	15%
Navy: Paygrade	3	15%
Marine Corps: Paygrade	3	30%
Navy: Race	2	10%
Marine Corps: Race	2	20%
Navy: Gender by Paygrade	6	20%
Marine Corps, Male: Paygrade	3	20%
Marine Corps, Female: Paygrade	3	30%
Navy: Gender by Race	4	10%
Marine Corps: Gender by Race	4	25%
Navy: Paygrade by Race	6	30%
Marine Corps, Paygrade by Race	6	30%

and Marine Corps women of the "other race" in the E7-E9 and Officer paygrades are very rare groups, and setting precision constraints for this domain made for an unacceptably large sample size. However, the resulting sample sizes should result in acceptable levels of precision for making estimates for most of the domains defined by the cross of gender, paygrade, and race. The resulting sample sizes are actually large enough for some of the domains that estimates will be more precise (i.e., have smaller RSEs) than indicated in Table 2.1. Details of the sample allocation are presented in Section 2.4.

The sample sizes per subgroup needed to satisfy precision constraint (b) are determined by the sizes of the two proportions being compared. With p_1=0.15 and p_2=0.05, an effective sample size of 183 per subgroup is needed; with p_1=0.20 and p_2=0.10, an effective sample size of 263 per subgroup is needed; and with p_1=0.30 and p_2=0.20, an effective sample size of 390 per subgroup is needed. In the sample sizes for our sample allocation, differences of 0.10 can be detected between most of the subgroups defined in Table 2.2 with at least 90% power for proportions in the 0.05 to 0.10 range. Exceptions include some of the comparisons involving Marine Corps females, where the power is generally at least 80%. Table 2.2 gives the expected power for detecting differences of 10% between some example domains under our proposed design.

Table 2.2 Power for Detecting Differences of 0.10 for Some Example Domains and Proportions (Level of Significance = 0.05)

Domains	p_1=0.30, p_2=0.20	p_1=0.15, p_2=0.05
Navy vs. Marine Corps	0.98	0.99
Navy Females vs. Marine Corps Females	0.98	0.99
Marine E1-E6 Females vs. Marine Officer Females	0.50	0.80
Navy E1-E6 Females vs. Navy Officer Females	0.90	0.99
Navy E1-E6 Females vs. Marine E1-E6 Females	0.80	0.96
Marine White Females vs. Marine Black Females	0.50	0.82
Marine E1-E6 Females vs. Marine E1-E6 Males	0.70	0.95
Navy E1-E6 Females vs. Navy E1-E6 Males	0.90	0.99

2.3 Frame Construction and Stratification for the Questionnaire Study

The sampling frame was constructed in two stages. The first-stage frame was comprised of sampling units that were geographically proximal organizational units defined within each Service; the second-stage frame was comprised of eligible active-duty military personnel attached to selected first-stage sampling units (FSUs).

2.3.1 First-Stage Sampling Frame Construction and Stratification

The FSUs were constructed to be of a minimum size determined by the rates at which 1992 Worldwide Survey sampled persons were available for group session questionnaire administrations. Each FSU was required to contain at least one organizational unit with 300 available persons. As the basis for the first-stage frame, the first-stage frame that had already been constructed for the Navy and Marine Corps for the 1995 DoD Survey of Health Related Behaviors Among Military Personnel was used. The frame for that study was constructed from data from the September 1994 Active-Duty Military Personnel File maintained by the Defense Manpower Data Center (DMDC). The file used to construct the first-stage frame consisted of a record for each distinct value of the zone improvement plan/fleet post office (ZIP/FPO) code and unit identification code (UIC).

To update the POWR frame, an extracted file containing the counts of Navy personnel in each gender-race-paygrade group for each ZIP/FPO code/UIC combination was created from the Navy master personnel files maintained at NHRC. Marine Corps personnel counts were provided by Marine Corps Headquarters. August 1995 data were available for the Navy, and September 1995 data were available for the Marine Corps. The counts contained no recruits and were based on persons with at least 1 year of active duty. Personnel not expected to remain at their current duty assignment through April 1996 were also

excluded from the counts. This file was matched to the Navy and Marine Corps first-stage frame used for the 1995 DoD Survey by ZIP/FPO code in order to update the frame for use in the POWR study. The frame was then stratified geographically by CONUS/OCONUS. Table 2.3 presents the number of FSUs and the number of personnel on the frame used for the POWR Assessment.

Table 2.3 1995 First-Stage Stratum and Population Sizes

First-Stage Stratum		First-Stage Units		Personnel	
Region	Service	Frame	Sample	Frame	Sample
CONUS	Navy	73	26	130,769	8,631
	Marine Corps	19	11	94,652	1,962
OCONUS	Navy	14	6	25,626	1,756
	Marine Corps	13	2	18,285	275
Total	Navy	87	32	156,395	10,387
	Marine Corps	32	13	112,937	2,237
	Total	119	45	269,332	12,624

2.3.2 Second-Stage Sampling Frame Construction and Stratification

Second-stage sampling units (SSUs) are the individual active-duty personnel within each of the first-stage units. At the time the sample was selected, we knew the numbers of individuals in each of the paygrade groups by gender by race in each of the FSUs. Each name can be uniquely associated with a line on the roster (the order used to list the names is of no consequence). Then an equal probability, without-replacement sample of individuals can be selected by choosing either names or alternatively lines on the roster.

By defining SSUs to be lines on the roster, we provided a mechanism to fully account for any personnel changes taking place between the time of sample selection and data collection at a sample FSU. At the time the sample was selected, positions were numbered on a conceptual roster and a random sample of line numbers was selected. The individuals named on the sample line numbers were then identified.

The second-stage frame was stratified by paygrade group (E1-E6, E7-E9, Officer), gender (male, female), and race (white, other). The second-stage stratification was needed to control the distribution of the sample by paygrade, gender, and race to meet the precision requirements specified in Table 2.1.

2.4 Sample Allocation and Selection for the Questionnaire Study

A variety of population parameters are to be estimated from this study, and a variety of uses to be made from the data. The sample design was designed to estimate the population prevalences of 0.10 for domains given in Table 2.1 with RSEs less than or equal to those indicated.

The relative sizes of the domains of interest implied in Table 2.2 are defined by the following quantities:

$$P(y,d) = \frac{\sum_{g=1}^{N} \delta(g)_y \, \delta(g)_d}{\sum_{g=1}^{N} \delta(g)_d},$$

where

g = 1, 2, ..., N, denotes individuals in the population, and

$\delta(g)_y$ = 1, if the g-th individual belongs to the y-th response variable category,

= 0, otherwise,

$\delta(g)_d$ = 1, if the g-th individual belongs to the d-th reporting domain,

= 0, otherwise.

Let a single subscript denote the combination of a response variable category with a reporting domain. In what follows, the subscript, d = 1, 2, ..., 56, is used to denote the domains in the order listed in Table 2.2, and the parameters used as the basis for the sampling design are denoted by the binomial proportions, P(d). Our proposed design is such that

$$\frac{\sqrt{\mathrm{Var}\left[\hat{P}(d)\right]}}{0.10} \leq \mathrm{RSE}^{*}\left[\hat{P}(d)\right],$$

where $\mathrm{Var}\left[\hat{P}(d)\right]$ is the sampling variance of the estimate $\hat{P}(d)$ to be obtained from the survey, and $\mathrm{RSE}^{*}\left[\hat{P}(d)\right]$ is the design specification variance from Table 2.2.

The allocation problem can be stated in terms of determining the

- number of SSUs to be selected per FSU,
- number of FSUs to be selected,
- allocation of each to the first- and second-stage design strata, such that,

- precision requirements set for the survey are met,
- for the least cost.

Equations were developed that described the variable survey cost and sampling variances in terms of the various features of the design, the first- and second-stage sample sizes, and the nonresponse follow-up. Then the minimum cost allocations were obtained by solving the equations simultaneously subject to the precision constraints.

The solutions obtained are presented in Table 2.3. As shown, a first-stage sample of 45 units was used, allocated to the Services within geographic strata. A total sample size of 25,863 personnel was selected to yield approximately 12,000 respondents (based on eligibility rates obtained in the 1995 DoD Survey and NHRC response rate experience with this methodology). Paygrade groups were disproportionately sampled; officer grades were generally oversampled relative to the enlisted grades. Females were also oversampled. Based on the response and eligibility rates used, the sample was expected to yield about 5,000 male and 5,000 female Navy respondents, and 1,000 male and 1,000 female Marine Corps respondents. The actual number of respondents obtained is given in Chapter 5.

FSUs were selected with probability proportional to size. For this purpose, composite size measures were computed for the set of FSUs in a given first-stage stratum such that, by selecting an equal-sized second-stage sample from each FSU, the differential sampling rates applied to the gender-paygrade groups would be (on the average) obtained.

Because FSUs vary considerably with respect to numbers of personnel, the first-stage sample was selected with minimum replacement:

$$\pi(a,i) = n_1(a)\, S(a,i)/S(a),$$

where the expected frequency with which an FSU of composite size, S(a,i), was to appear in samples of $n_1(a)$ units selected from the a-th stratum. The denominator quantity in the above equation is the stratum-level sum of the composite size measures, S(a,i). The minimum replacement procedure is equivalent to without-replacement selection if none of the $\pi(a,i)$ values exceeds unity. Otherwise, the procedure achieves the expected frequencies over repeated samples and, at any specific drawing of the sample, comes within one selection of the units' expected allocation. This minimum replacement method is superior to alternative with- or without-replacement schemes in that it controls the number of selections assigned to a sampling unit so that the actual allocation and the proportional-to-size allocation differ by less than one.

The distribution of sample FSUs across major commands was controlled by using a sequential selection algorithm from a controlled ordering of the sampling frame. The selection procedure was applied within each stratum by picking an FSU at random with probability $\pi(a,i)$. Given the random starting point, selections proceeded sequentially in a circular fashion through the frame until the starting point was again reached. This sequential selection from a controlled circular ordering has the effect of implicit stratification

in the same way that a systematic selection imposes stratification on an ordered list. The random starting point for the sequential selection gives the procedure the added feature that every pair of FSUs on the frame has a chance of appearing together in the sample.

Sequential selection from an ordered frame permitted the control of the distribution of sample members by major command. To implement this procedure, FSUs were assigned to a major command on the basis of the organizational unit's affiliation. FSUs that contained units from multiple major commands were assigned to the major command that accounts for the most personnel.

At the second stage, sample individuals were selected with equal probability and without replacement from among the total personnel in the gender-paygrade-race group at the time of data collection.

3. DATA COLLECTION INSTRUMENTS

The POWR Assessment obtained data using self-report questionnaires and physical measurement instruments. This chapter briefly describes these instruments and the constructs they were designed to measure, as well as the pretest and refinement process.

3.1 Survey Questionnaire

The self-report questionnaire included 17 classes of variables: sociodemographics, medical history, current medical conditions, health perceptions, mental health, quality of life/stress, health care, self-care, lifestyle, health promotion, social support, psychosocial factors, temperament, job satisfaction/stress, casualty events, environmental/occupational exposures, and pregnancy history (see Appendix A). The goal was to produce estimates of disease prevalence, risk factors, and health care utilization that could be compared within military subpopulations and with civilian data. Priority was given to well-established instruments that (a) had published and reliable psychometric properties, (b) were appropriate to an active-duty military population, and (c) were brief. Emphasis was on using questions from the standardized large national health surveys and other military surveys for comparability. The draft questionnaire was sent to numerous investigators to review for quality and priority of content. Among the standardized instruments included in the survey were the

- Medical Outcome Survey-Short Form (MOS 36) (Ware & Sherbourne, 1992);
- Center for Epidemiologic Studies - Depression Scale (CES-D) (Orme, Reis, & Herz, 1986);
- Hopkins Checklist - Short Form (Hopkins - 21) (Deane, Leathem, & Spicer, 1992);
- Rosenberg Self-Esteem Scale (Rosenberg, 1965; Westaway & Wolmarans, 1992);
- State-Trait Anxiety Scale (short form) (Spielberger, Gorsuch, Vagg, & Jacobs, 1968, 1977);
- State-Trait Anger Inventory (short-form) (Spielberger, n.d.); and
- Job Pressures and Stresses and Job Satisfaction scales (House, McMichael, Wells, Kaplan, & Landerman, 1979).

Copyright permissions were obtained for the latter three scales, and the remaining scales were in the public domain. Other instruments from which single or more individual items were obtained included the

- National Health and Nutrition Examination Survey (NHANES III 88-89) (NCHS, 1981, 1985, 1992);
- National Health Interview Survey (NHIS 88-94) (NCHS, 1994);
- Social Adjustment Scale (Berkman & Styme, 1979; Schooler, Hogarty, & Weissman, 1977);
- Andrews and Withey's (1973) quality of life instrument;
- DoD Health Care Survey (Defense Manpower Data Center [DMDC], 1994; Lurie et al., 1993);
- DoD Women's Health Survey (Mahoney & Wright, 1989);
- NHRC's Shipboard Health Survey, Occupational History Survey, Health and Nutrition Survey, Health and Physical Readiness Survey, Follow-Up for Fitness Survey, and the Airlant Carrier Tobacco Use Survey
- Healthier People, The Carter Center of Emory University Heatlh Risk Appraisal (Siegel et al., 1993);
- 1992 DoD Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel (Bray et al., 1992);
- Army's Health Risk Appraisal (HRA); and
- Centers for Disease Control and Prevention's (CDC, 1995) Behavioral Risk Factor Questionnaire.

Other stress and trauma measures appropriate to a military population were adapted from a combination of published sources (Gerard, Gibbons, & Warner, 1991; Martin & Ickovics, 1987; Norris, 1992; Ursano, Fullerton, Kao, & Bhartiya, 1995). Inter-item reliability statistics (Chronbach's Alpha coefficients) were examined to determine the best reliability/number of items ratio when data were available.

3.2 Physical and Cardiovascular Measurements

Body measurements were limited to noninvasive, standardized procedures. These measurements included blood pressure; heart rate; height, weight, neck, waist, and hip circumference; triceps skinfold; and subscapular skinfold. All measurements were recorded on a data sheet as they were taken (Appendix B). All equipment was prepared and calibrated in accordance with standardized protocols. This equipment included two digital scales, two calipers, three automated blood pressure cuffs with digital readouts and pulse registration, two handgrip dynamometers, and six tape measures.

The two Seca, model 77000, compact digital doctor scales were used for weighing. Calibration involved weighing the same clipboard on each scale at the beginning of each session and noting any differences in the two scales. The scales were numbered scale one and scale two. Participants were asked to remove their shoes and empty their pockets prior to stepping on the scale. Once on the scale, they were asked to look straight ahead, and their weight was recorded on the data sheet to the nearest 0.1 kilogram.

Height was measured using a W.H. Collins, Inc., plastic-coated tape measure attached to the wall. Participants were asked to remove their shoes and stand with heels together next to the wall or baseboard; the tape measure was used to bisect the long axis of the body. A clipboard was placed on the highest point of the head parallel to the floor. Participants were asked to take and hold a deep breath and stretch tall. When the recorder had a reading, the participant was directed to step away, leaving the clipboard in place. The reading was verified with the clipboard still in place and then recorded on the data sheet to the nearest 0.1 centimeter.

Blood pressure was taken with automatic oscillometric electronic digital blood pressure and pulse monitors manufactured by Omron, model HEM-704C. Two machines designated as machine one and machine two were used, and machine three was used only as a backup. Batteries did not have to be checked because these machines have an indicator for low battery. Specifications with this model indicated that pressure readings are plus or minus 3 mmHG (millimeters of mercury) or 2% of reading, and pulse is plus or minus 5% of reading. Each participant was asked to be seated for approximately 5 minutes prior to taking the first reading. Participants were instructed to place their feet flat on the floor with an arm resting on the table. The cuff inflated automatically and gave an EE readout if the pressure level was set too low for inflation. The systolic and diastolic readings were recorded in millimeters, then the pulse was recorded in beats per minute. The readings were recorded on the data sheet, and the machine was turned off. The cuff was not removed prior to the procedure being repeated. The two readings were averaged. If the second reading was 5 points different from the first reading, a third reading was taken and the three readings were then averaged.

Handgrip strength was measured using 2 Jamar/Asimov Model 258-J00105 hydraulic hand dynamometers from the Lafayette Instrument Co. They were calibrated by zeroing them after each use. Data were recorded in kilograms for the dominant hand. Three readings were taken, and the highest score was used.

Circumferences of the neck, abdomen, and hip in women were taken using a Dritz plastic-coated tape measure. Participants were asked to remove their shirts for the neck and abdomen measures. If necessary, pants or skirts were lowered to gain access to the waist. In women, the hips were measured over the clothing by pulling the tape tight. These measurements were recorded to the nearest centimeter. Each circumference measurement was taken twice by the same team member; these measurements were then averaged. The protocol followed was from Technique for Measuring Body Circumferences and Skinfold Thickness by Beckett and Hodgdon (1984).

Skinfold thicknesses were measured using Harpenden, John Bull calipers from Novel Products, Inc. The protocol followed was also from Beckett and Hodgdon (1984). Calipers were checked after each measurement to be sure the indicator had returned to zero.

3.3 Telephone Interviews

The Quick Diagnostic Interview Schedule (DIS) (Marcus, Robins, & Bucholz, 1991) was the instrument used in this study and is a shortened, computerized version of the DIS used previously in the well-known Epidemiologic Catchment Area studies (Robins & Regier, 1991). The Quick DIS asks the minimum number of questions needed to make a diagnostic decision for selected diagnoses of interest in this study. These diagnoses were Tobacco Addiction, Depression, Generalized Anxiety Disorder, Panic Disorder, Agoraphobia, Social Phobia, Simple Phobia, Post Traumatic Stress Disorder (PTSD), Anorexia, Bulimia, Somatization, Obsessive Disorder, Compulsive Disorder, Antisocial Personality Disorder, and Alcohol Abuse or Dependence. It is designed to be administered by lay interviewers with little or no previous training (see Appendix C). The highly structured interview uses a probe format in which the length of the interview depends on responses to key questions. The minimum number of questions per interview was 75, requiring approximately 8 minutes to complete (i.e, if the respondent answered negatively to all questions).

3.4 Pretest and Refinements

Pilot testing of the questionnaire and physical measurement protocols was conducted on a sample of men and women in the Marine Corps stationed at Twenty-nine Palms and in the Navy stationed at the Naval Base in San Diego. Ten sailors and ten Marines (five men and women each) from local commands were asked to complete and evaluate the questionnaire. The questionnaire took an average of 45 minutes to complete. Modifications were made as needed to improve inclusiveness and clarity. Volunteers also were asked to step through the physical measurement process. Two pilot studies were conducted: one on 14 people from the USS STEADFAST, a floating dry dock, and a second with 20 volunteers from the Branch Medical Clinic at Miramar Naval Air Station.

Pilot testing of the telephone survey was conducted on eight individuals (two per interviewer) who responded positively to the written request for volunteers included with their questionnaire during the on-site survey pilot testing (see preparations below). Several summary statistics were calculated on the pilot and first "live" telephone interviews. Among the eight interviews conducted, the shortest interview took 20 minutes and the longest was 45 minutes. Average time to administer the eight interviews was 31 minutes. Only two of the eight interviews yielded a dependence on tobacco. This finding was particularly relevant because most of our respondents were expected to have used tobacco or tobacco products at some time during their lives. Any lifetime diagnosis of tobacco dependence would result in asking the respondent to answer nearly 40 questions and would lengthen the interview considerably. Including tobacco, four of the eight interviews yielded no diagnosis, three resulted in one diagnosis, and one interview showed three diagnoses. Tobacco dependence and PTSD were the most common diagnoses encountered in the pilot interviews.

4. DATA COLLECTION AND PROCESSING

4.1 Overview of Methods

The data collection methodology used for the POWR Assessment evolved over the course of the project due to various scheduling and command issues. Several data collection approaches were considered before a hybrid of two methodologies was eventually implemented.

4.1.1 Original Design

The initial data collection methodology was patterned after the DoD Worldwide Surveys and involved sending two-person field teams to 45 first-stage sampling units (FSUs) worldwide. The teams would conduct group sessions at the nucleus installation where selected personnel would be scheduled to come to a meeting/classroom and complete the questionnaire. Completed instruments would be shipped back to a scoring site in North Carolina. Eligible personnel who were selected, but were unable to attend a group session, would be sent a packet containing a questionnaire booklet and business reply envelope to return the completed instrument.

The initial design had to be modified to address issues of command support for the study and overlap with a companion shipboard study being conducted by NHRC. Resolution of these issues resulted in a number of modifications to the study design and the corresponding field operations.

4.1.2 Modified Design

The revised methodology consisted of a mixed mode that was primarily a mail survey with a small number of sites being done in group sessions. For the mailout portion, packets were sent to the selected respondents through their unit commanding officers (COs), who were asked to distribute the packets to the individuals and encourage their participation.

A second mailing was made several weeks later through the unit COs. Lists were provided of those selected unit members who had not yet responded and a second questionnaire packet included for the COs to distribute. A third mailing of a packet was sent directly to the selected personnel who had not responded to either of the first two mailings by a certain date.

In an effort to maintain the integrity of the body measurement component of the research, plans were also included to collect data via the original on-site, group session methodology described above, but at a limited number of FSUs. Five sites (two West Coast Navy bases, one Pacific Navy base, and two West Coast Marine Corps sites) were selected for on-site data collection followed by a single mailing to eligible non-attendees. While at these installations, teams from NHRC, working in conjunction with RTI field teams, collected the needed physical measurements from selected participants.

4.2 Data Collection Preparations

The groundwork for the field data collection was laid by preparing a lead letter from NHRC's CO addressed to each CO at all selected units in the Navy and Marine Corps. The letter described the importance of the research and requested CO support in encouraging their staff to participate. Self-reply postcards were also enclosed for the COs to send back if they needed further information. Coordination between NHRC and other commands was facilitated by designating a Headquarters Liaison Officer (HLO), a Lieutenent Commander detailed to NHRC, to interface directly with commands as their Point of Contact (POC) for the study. The HLO was also the Body Measurements field team leader.

4.2.1 Field Site Preparations

For the five sites where group sessions were to be conducted, additional support was obtained from the Bureau of Medicine and Surgery (BUMED), Department of the Navy. BUMED sent official naval messages addressed to the COs of the major medical facilities that endorsed the study and requested their participation and designation of a military liaison officer (MLO).

Field team leaders coordinated with the MLOs by telephone to confirm that local arrangements were proceeding. MLOs were asked to reserve suitable meeting/classroom facilities for the group sessions and schedule the various units into a group session and to encourage support and participation where possible. Field data collection procedures were documented in a brief Field Team Manual and Military Liaison Officer's Manual. The methodology involved scheduling the units into sessions once the MLOs secured local facilities for the dates of the site visits. Unit COs were notified by mail of the personnel selected and scheduled to attend from their respective units. MLOs would handle contacts from unit COs who had to reschedule group sessions. Approximately 1 week prior to the site visit, MLOs would also telephone the COs of the larger units selected at each FSU to confirm the scheduled attendance of the unit's selected personnel at a group session.

Materials were faxed to the MLOs outlining the study and their role in ensuring its success. Scheduling grids were also provided for MLO use in securing rooms for the group sessions to be held during the scheduled site visits. Completed grids were to be faxed to RTI within 10 days. As grids were returned , the process began of scheduling individual units into group sessions. Individual notices were prepared for each unit CO, and copies of the schedule notices were included for distribution to each selected respondent. Field teams participated in two training sessions prior to the beginning of data collection at the installations.

4.2.2 Body Measurement Preparations

All necessary definitions and instructions regarding how physical measurements were taken were compiled into a staff instruction manual. Measurement teams were trained by an experienced anthropometrist. A 2-week practice and reliability-testing period was conducted in which the measurement teams practiced and retrained until all members tested within 1 cm for circumferences and achieved a 90% reliability with the skinfold measurements. Training was conducted by a research physiologist with a master's degree in exercise physiology. Practice included measuring other team members, 10 volunteers, and 30 Marine Corps recruits. Practice sessions included watching each person complete every measurement on a minimum of 10 people. After determining that all team members were proficient in taking the measurements, the training leader divided them into two-person teams. Teams were assigned a specific set of measurements to practice, anticipating that as team members watched each other perform a measure, they would come to agreement on technique and begin to measure similarly, thus reducing the variance between measurers. Separate male and female teams measured men and women, respectively. One additional female team member "floated" between teams and was used to relieve other team members when necessary. It was noted that male participants were equally comfortable with male or female team members. Female participants were measured by female team members only. Blood pressure, caliper, and body circumferences were measured repeatedly on volunteers by the teams that were assigned to do these measurements noting placement and technique in an attempt to keep variance to a minimum.

To check reliability, four people assigned to take blood pressures (BPs) took two readings on the same two subjects using the same machine. The BPs were then averaged, and the strategy was repeated using a second machine. The reliability coefficients for systolic BP on machine 1 were 0.96; on machine 2, $r = .81$; and on machine 3, $r = 0.86$. Reliability coefficients for diastolic BP on machine 1 were 0.93; machine 2, $r = .86$; and machine 3, $r = .96$. Triceps measurements were taken by six measurers on two different subjects with an average correlation = 0.99. The same measurers repeated the procedure for the subscapular measurements with $r = .95$. The same six team members took one measurement each on the same two subjects on the neck and waist, generating r's of 0.99 and .95, respectively. Reliability estimates were not available for the hip measures due to the limited number of female subjects. Six trials were conducted on handgrip measures to determine the consistency between dynamometers. Two of three dynamometers were selected based on best reliability coefficients. The intra-measure correlations for the first reading were .36; for the second reading, $r = .71$ and for the third reading $r = .25$. The correlation for the average of the three readings was .68.

4.2.3 Telephone Survey Preparations

Definitions and instructions pertaining to the conduct of the telephone survey were compiled into a comprehensive staff instruction manual. Specialized training was given to four data collection staff members in the specific procedures they would perform in the telephone survey. The field team assigned to conduct the Quick Diagnostic Interview Schedule (DIS) interviews (Marcus et al., 1991) participated in the development of all procedures and forms for gaining consent for the interview, conducting the interview,

scheduling call-backs, and tracking all attempts to contact the respondent (see Appendix C for a copy of the relevant sections of the Quick DIS that were used in this study). The Principal Investigator and Project Coordinator for the study had experience with the full version of the DIS, either through a comprehensive training program or prior research. They delivered the training and served as experts when questions arose during the practice and pilot interviews and throughout the fieldwork. In addition, another member of the field team who was a clinical psychologist was available to provide advice on working with potential respondents who felt emotional discomfort or distress as a result of the interview. She served in a supervisory capacity in the event an interview became overly emotional, to provide a break in the interview or to advise the respondent of professional resources available within the military (e.g., chaplain, medical officer, and family service center).

Training consisted of lectures, practice and pilot interviews both with and without a supervisor present, and debriefings. Unlike the full version of the DIS, the Quick DIS is a self-contained computer program and is considerably shorter than the parent version. Thus, training was greatly simplified. Each member of the field team conducted a single practice interview with either a friend or a co-worker. A second pilot interview was conducted with active-duty military subjects from San Diego, who served as test subjects for the body measurement component of the study. This interview was conducted via the telephone in the presence of a supervisor. After everyone had completed one practice and one pilot interview, the group reconvened to discuss any issues that arose during the practice sessions. Issues that were raised included what probes (if any) could be used to clarify a question, how to categorize a qualifying event for posttraumatic stress disorder (PTSD), and how to code a response when it is clear that the respondent does not understand the question. Each of these issues was addressed and incorporated into the instruction manual. A final "live" interview was conducted with active-duty personnel from around the country. This interview was followed by a final debriefing to discuss any additional questions or problems that arose.

4.2.4 Mail Survey Preparations

Before the beginning of Wave 1 data collection, project staff developed survey materials and procedures. Formal preparations for the first mail-out began in October 1995. These materials included a cover letter (see Exhibit 4.1), the survey questionnaire, consent form (see Exhibit 4.2), a special handout requesting volunteers for the telephone survey (see Exhibit 4.3), and a mailing label. Other appropriate materials were also procured, such as CO envelopes and sample personnel (SP) envelopes with NHRC's return address printed on the outside, business reply envelopes, errata sheet, and unit SP lists.

A CO-to-CO letter explaining the survey, assuring confidentiality, encouraging participation, and requesting assistance in distributing the packets was developed and signed by the CO. A certificate of participation was also developed that was included in the first mail-out.

Exhibit 4.1 Wave 1 RTI Cover Letter

RESEARCH TRIANGLE INSTITUTE

November 1995 - January 1996

Dear Member of the Navy and Marine Corps:

Research Triangle Institute (RTI) of North Carolina, a nonprofit research organization, is currently conducting a survey for the Department of the Navy through the Naval Health Research Center (NHRC) to provide a comprehensive worldwide assessment of health related issues for the Navy and Marine Corps.

Thousands of Navy Department personnel are completing questionnaires around the world. Your name was chosen at random from a list of officers and enlisted personnel to participate in this survey. Substitutions for selected personnel are ***NOT*** permitted. That is why you are so important to us. In a survey such as this, each person who participates represents thousands of other service personnel. In order for us to have useful results, it is very important that you provide complete and accurate responses to the questions asked.

Because of the sensitive nature of the information in this survey, the importance of the study, and to encourage your frank and honest responses, you will mail your completed questionnaire directly to a civilian scoring contractor using the enclosed business reply envelope. Enclosed you will also find a consent form outlining the purpose of the study, confidentiality associated with the data, and points of contact at NHRC if you need additional information concerning the study. If you are willing to participate in this study, **please sign the form**. Tear off the back copies and keep them for your personal records. Please enclose the white copy in the business reply envelope provided.

Please complete the questionnaire in private and do not show it to anyone. Directions for marking your answer choices are given inside the cover page. Please read the instructions **carefully**. ***USE ONLY A SOFT LEAD (NO.2) PENCIL***; do not use a colored pencil or pen of any kind. Inside the back of the questionnaire you will find a special handout on a blue sheet. Take a few minutes to read this special handout. If you decide to complete the handout, enclose it in the business reply envelope. ***NOTE:*** At the bottom of the handout, please fill in the four digit First Stage Unit (FSU) number. You will find this number on the back cover of the questionnaire.

When you have finished, seal the questionnaire, consent form, and blue insert in the enclosed envelope and mail it to our printing and scoring contractor, Information Services Group (ISG), Morrisville, North Carolina. ***NOTE:*** Since this is a business reply envelope, no postage is required; however, you must place it in a U.S. Postal system box. On behalf of NHRC and RTI, I want to sincerely thank you for your participation in this important survey. Enclosed is a certificate in appreciation for your thoughtful responses.

Sincerely,

Randall Keesling

Randall Keesling
Data Collection Task Leader

Enclosure

PO Box 12194 Research Triangle Park, North Carolina 27709-2194 Telephone 919 541-6000

Exhibit 4.2 Voluntary Consent Form

Voluntary Consent to Participate in The 1995 POWR Assessment: Perceptions Of Wellness and Readiness

1. I am being asked to volunteer to participate in a research study titled "The 1995 POWR Assessment: PERCEPTIONS OF WELLNESS AND READINESS." The purpose of this study is to obtain baseline information on a variety of health conditions in active-duty Navy and Marine Corps personnel. Survey items will cover the following general areas: reproduction, medical/ physiologic, psychosocial, life-style, occupational, and health care. Approximately 18,000 volunteers will participate in this study. During my participation in this study, I will be involved in the following procedures or tests: completing a written questionnaire taking approximately one half to one hour on one day only, and, at selected sites, having physical measurements taken (blood pressure, heart rate, height, weight, head, neck and waist circumferences) requiring approximately ten minutes, and, if selected, being interviewed by telephone for approximately 15 minutes by a trained staff member. Some automated medical record data may also be extracted and combined with these questionnaire data for research purposes. All of these procedures are considered routine, and none is considered an experimental procedure.

2. The investigators believe that there are no direct physical or psychological risks to me as a participant in this research study. A possible exception is the risk of stress or embarrassment some people may experience related to revealing personal information.

3. The results from this project may help the Navy and Marine Corps better understand and care for the medical needs of active duty personnel. However, I may expect no direct benefit from my participation in this research.

4. There are no alternative procedures for gathering this information.

5. Confidentiality during the study will be ensured by allowing access to data only to authorized study personnel. The confidentiality of the information related to my participation in this research will be ensured by (a) having all raw data maintained in strict confidentiality and stored in locked file cabinets at the Naval Health Research Center, (b) removing individual identifiers (names and social security numbers) from the computerized data files prior to analyses and maintaining automatic data processing (ADP) security, and (c) releasing data only in aggregated (group) form.

6. If I have questions about this study I should contact the following individuals: for questions about research (science) aspects I should contact Dr. Laurel Hourani at (619)553-8460; for questions about medical aspects, injury, or any health or safety questions for myself or any other volunteer's participation, contact Dr. Lisa Meyer at (619)553-8376; and for questions about the ethical aspects of this study, my rights as a volunteer, or any problem related to protection of research volunteers, I should contact Mr. Ralph Burr at (619)553-7760.

7. My participation in this study is completely voluntary. If I do not want to participate, there will be no penalty, and I will not lose any benefit to which I am otherwise entitled. Refusal to participate will not have any negative impact on my military status. I may discontinue my participation in this study at any time I choose. If I do choose to discontinue my participation, there will be no penalty and I will not lose any benefit to which I am otherwise entitled.

8. I have received a statement informing me about the provisions of the Privacy Act.

9. I have been informed that Dr. Laurel Hourani is responsible for storage of my consent form and the research records related to my participation in this study. These records are stored at the Naval Health Research Center, San Diego, CA.

10. I have been given an opportunity to ask questions about this study and its related procedures and risks, as well as any of the other information contained in this consent form. All my questions have been answered to my satisfaction. By my signature below, I give my voluntary informed consent to participate in the research as it has been explained to me, and I acknowledge receipt of a copy of this form for my own personal records.

Volunteer	Date (DD/MM/YY)
Witness	Date (DD/MM/YY)
LHourani	20/08/95
Investigator	Date (DD/MM/YY)

Naval Health Research Center Copy

Exhibit 4.3 Special Handout for Telephone Survey

SPECIAL HANDOUT

We are looking for volunteers to participate in an additional confidential telephone survey of physical and mental health, and would greatly appreciate your assistance.

If you would be willing to participate in a confidential telephone interview regarding your physical and mental health and have a study member contact you to schedule a telephone interview appointment, please complete the following information:

Name _____ Social Security No. ___-___-____
Last, First Middle Initial
(Please Print)

If stationed in CONUS:

City and duty station where living _____
City Duty Station

Is this a DSN or commercial phone?

Daytime telephone number (___) ___-____ ___ DSN ___ Commercial

Evening telephone number (___) ___-____ ___ DSN ___ Commercial

If stationed in OCONUS:

Country and duty station where living _____
Country Duty Station

Is this a DSN or commercial phone?

Daytime telephone number _____ ___ DSN ___ Commercial

Evening telephone number _____ ___ DSN ___ Commercial

Please indicate preferred hours to be contacted (mark all that apply):

___ Morning
___ Afternoon
___ Evening
___ Anytime

FSU #				

4.3 Data Collection Implementation

4.3.1 Field Site Procedures

Data collection at the field sites was conducted by a two-person team from RTI working in conjunction with NHRC body measurement team members. The time on site varied by base; however, the daily schedule and procedures remained largely the same. Group session facilities consisted largely of a centrally located meeting room(s) with sufficient tables, chairs, lighting, and ventilation to allow participants to comfortably complete the survey. When it was not possible for significant numbers of selected personnel to get to the central location, alternative sites were secured and the team (or at least one team member) traveled to the site to administer and secure the questionnaires.

Each day, a number of sessions were scheduled from 0830 to 1700, allowing 1½ hours between the start of each session. Generally, two sessions were scheduled in the morning and three in the afternoon. As participants arrived, a team member checked names off the list of selected respondents, gave them a pencil, and directed them to a seat. When all, or most, of the participants had been checked in, a team member addressed the group and explained the purpose of the study, how the data would be used, the voluntary nature of participation, and confidentiality associated with their responses, as well as instructions on how to complete the optically scanned instrument. The questionnaires were distributed and the group allowed to begin.

During the session, the team members would check the unit lists of sampled personnel and identify those who did not attend. The list would be shown to the highest ranking person from that unit in attendance and asked to identify any who were PCS, on temporary duty (TDY), on leave, ill, separated from the Service, and so on. The person was asked to notify any whose status was not known to attend a later session. The team members and MLOs also made calls, when possible, to unit COs in an effort to document reasons for absences and to reschedule attendance at another session.

As participants completed the questionnaire, they returned them to a box that remained in the custody of the team members who, in turn, sealed and shipped full boxes of questionnaires to North Carolina for scoring. Signed consent forms were collected from each respondent and copies given to each for their files. Those who chose to complete the blue special handout, volunteering to participate in a follow-up telephone interview, returned the forms to the team members with their other materials. The consent forms and the blue special handouts were sent directly to NHRC.

The field teams utilized a laptop PC-based field control system to keep track of attendance by FSU and unit. Every one of the selected personnel had to have an attendance/absence code entered in the program. When all were documented, the system identified those non-attendees who were eligible to receive a questionnaire packet in the mail. At the end of the scheduled site visit, the team members prepared a "Phase 2" packet for mailing by inserting a questionnaire booklet, a cover letter explaining the project, a consent and

blue special handout form, and a business reply envelope. Preprinted mailing labels for each selected sample member were used to address the individual packets for mailing or distribution through the base postal system when possible.

4.3.2 Body Measurement Procedures

Recruitment for participants in the body measurement survey took place at the five sites in which the questionnaire was administered in group sessions. The sampling target was 600 Navy and 400 Marine Corps (6% of the anticipated Navy respondent questionnaires and 20% of the anticipated Marine Corps respondent questionnaires). Target cell sizes for demographic groups were calculated based on equal numbers of men and women and were proportional to those in the original sample. This number was then indicated on a grid used by the MLO or team members who greeted participants on arrival to the sessions. If a participant's demographic composition fell into a target cell, it was ticked on the grid and he or she was handed a 5½ × 8½ inch bright yellow card that informed participants that they had been randomly chosen to participate in the body measurements portion of the study. This procedure helped maintain the scheduling of participants for measuring, avoided long wait times, and allowed for a variable number of respondents per session. After chosen respondents completed their questionnaires, they were shown to the appropriate male or female measuring rooms. Measurements were taken by both trained military corpsmen and civilian contractors. These team members consisted of two four-person teams, one for men and one for women, and an additional team member for relief or backup to fill in for any other team member during a session. One member on each team took and recorded height, weight, and blood pressure (BP) measurements. The other team members worked as partners taking and recording circumference, caliper, and handgrip measurements.

Measurements were taken directly following the administration of the written survey. This ensured that all participants had been seated for at least 30 minutes prior to having their BP and heart rate taken and were not being measured immediately after exercising or working. A standardized protocol for the measurement of cardiovascular and physical parameters was developed based on a combination of the standardized National Health and Nutrition Examination Survey (NHANES) and Navy anthropometric protocols (Beckett & Hodgdon, 1984). This protocol was reflected in the design of the data sheets upon which the measurements were recorded and that accompanied the participant from measuring station to measuring station. BP feedback forms were available for interested individuals. Wellness newsletters and certificates of participation were distributed to all participants in the body measurement survey.

4.3.3 Telephone Survey Procedures

On the special handout that accompanied the questionnaire (Exhibit 4.3), all participants were asked whether they would be willing to participate in a confidential telephone interview regarding their health and mental health, and if so, to provide phone numbers and preferred contact times. Based on criteria met for a high level of psychosocial distress as determined by standardized cutoff scores on self-administered screening instruments included in the written questionnaire (CES-D and Hopkins-21) and scored at NHRC (see Section 3.1), selected individuals who responded positively about participating in a telephone interview were contacted to schedule their interview. Volunteers were compared to nonvolunteers to examine potential

for bias and necessity for statistical control. To accommodate local command requests, about 30 interviews were conducted face-to-face on-site following the body measurements survey. Most interviews, however, were conducted from phones in private offices at NHRC. A minimum of six attempts to contact a selected individual were made at various times during day and evening hours. Once contact was made, individuals were reminded of their earlier consent to an interview, asked whether it was a good time to complete the survey, informed that it would take between 15 and 45 minutes to complete, and answered other questions usually pertaining to anonymity and privacy issues. For example, individuals were assured that no military individual would have access to an individual's interview results nor would any aspect of the interview be made part of his or her Navy record, and that most of the questions could be answered with a yes or no.

Call-back appointments were made as needed and recorded on a separate appointment sheet or call-back log. The average interview length was 26 minutes. Interviewers maintained a written log of attempted contacts and/or completed interviews with time and length of interview. Interviewers entered questionnaire responses directly into PCs. In a small number of cases in which the respondent clearly indicated present and untreated symptomatology, following the interview, interviewers reminded respondents of the problem they had expressed and were advised to seek help from the resources available on base. Also, at the conclusion of the interview, interviewers advised respondents of the possibility of retesting and obtained their approval with the following script: "Our research design necessitates that we repeat some interviews. Therefore, we will be calling a random sample of respondents. It is unlikely that you will be called but in the event you are recalled, would you mind being interviewed again by another person from our office?" Interviewers readministered the Quick DIS to a random sample of each others' previous interviewees. The test-retest correlations (Kappas) for specific diagnoses ranged from a low of .41 to 1.00. Completed interviews were scored by computer software, thus ensuring the anonymity of results. To link DIS and questionnaire files, a separate file was created that matched interview number with social security number (SSN), then the SSN was dropped after data were merged.

4.3.4 Mail Survey Procedures

Mail survey operations began in November 1995, with the first mail-out to 1,734 unit COs containing 21,458 survey packets (18,502 Navy and 2,956 Marine Corps). The following materials were included in the Wave 1 mailing:

- Outer envelope for COs,
- Label with a return address for all COs,
- CO-to-CO letter,
- Unit sample personnel (SP) list(s),
- Business reply envelope, and
- Inner envelope(s) for each SP, which included:

    - Cover letter;
    - A pre-coded (with FSU #) questionnaire;
    - Confidential follow-up survey insert;

- Consent form;
- Certificate of participation; and
- Business reply envelope.

A subsequent mailing to those selected personnel who did not respond to the first mailing took place in January 1996. To determine wave eligibility, a Mail-out Eligibility Tracking System was developed that worked as follows: A data file containing name, rank, sex, and SSN of those personnel who returned a questionnaire were merged into the master Mail-out Eligibility Tracking System. The selected personnel who did not respond before a specified date remained eligible to receive the Wave 2 materials.

For the second mail-out, there were 18,252 (15,775 Navy and 2,477 Marine Corps) selected personnel who were still eligible to receive a replacement packet. The packets were addressed to COs of selected personnel requesting their assistance in distributing the enclosed packets to those selected to participate. The above list of materials were also sent during Wave 2, except the certificate of participation, and slight modifications to the CO-to-CO and cover letter (see Exhibit 4.4) to selected personnel.

A subsequent mailing to those selected personnel who did not respond to the first and second mailings took place in March 1996. The Mail-out Eligibility Tracking System identified 13,990 (11,976 Navy and 2,014 Marine Corps) selected personnel who were still eligible to receive a second replacement packet. However, instead of sending the packets to the COs requesting them to distribute the packets to selected personnel, the packets were sent directly to selected personnel. The following replacement materials were included in the final wave's envelope with NHRC's return address printed on the outside:

- Cover letter (modifications from Wave 1 and 2) (see Exhibit 4.5),
- A pre-coded questionnaire with sequential number printed on back,
- Confidential follow-up survey insert,
- Consent form, and
- Business reply envelope.

4.3.5 Data Collection Monitoring

To monitor the progress of completed questionnaires, project staff designed two software monitoring systems, one for the body measurement site component and another for the mail-out component, that stored respondent and eligibility information in a master project database. The body measurement site system was a laptop PC-based system developed for documenting eligibility, attendance at a session, and mailing of a questionnaire for each selected personnel. As selected personnel arrived at a group administration to complete the survey, field staff entered attendance information into their laptop computer. This system allowed field staff to view and update records for sample personnel who attended and who did not attend for some reason (PCS, TDY, SEP). Records not marked as having attended or for which no "disqualifying" reason for absence (i.e., PCS, SEP, DEC, AWOL) had been entered, resulted in a

Exhibit 4.4 Wave 2 RTI Cover Memo

RESEARCH TRIANGLE INSTITUTE

January 1996

Dear Member of the Navy and Marine Corps:

Research Triangle Institute (RTI) of North Carolina, a nonprofit research organization, is currently conducting a survey for the Department of the Navy through the Naval Health Research Center (NHRC) to provide a comprehensive worldwide assessment of health related issues for the Navy and Marine Corps.

Thousands of Navy Department personnel are completing questionnaires around the world. Your name was chosen at random from a list of officers and enlisted personnel to participate in this survey. Substitutions for selected personnel are ***NOT*** permitted. That is why you are so important to us. In a survey such as this, each person who participates represents thousands of other service personnel. In order for us to have useful results, it is very important that you provide complete and accurate responses to the questions asked.

Because of the sensitive nature of the information in this survey, the importance of the study, and to encourage your frank and honest responses, you will mail your completed questionnaire directly to a civilian scoring contractor using the enclosed business reply envelope. Enclosed you will also find a consent form outlining the purpose of the study, confidentiality associated with the data, and points of contact at NHRC if you need additional information concerning the study. If you are willing to participate in this study, **please sign the form**. Tear off the back copies and keep them for your personal records. Please enclose the white copy in the business reply envelope provided.

Please complete the questionnaire in private and do not show it to anyone. Directions for marking your answer choices are given inside the cover page. Please read the instructions **carefully**. ***USE ONLY A SOFT LEAD (NO.2) PENCIL***; do not use a colored pencil or pen of any kind. Inside the back of the questionnaire you will find a special handout on a blue sheet. Take a few minutes to read this special handout. If you decide to complete the handout, enclose it in the business reply envelope. ***NOTE:*** At the bottom of the handout, please fill in the four digit First Stage Unit (FSU) number. You will find this number on the back cover of the questionnaire.

When you have finished, seal the questionnaire, consent form, and blue insert in the enclosed envelope and mail it to our printing and scoring contractor, Information Services Group (ISG), Morrisville, North Carolina, **NOT LATER THAN TWO WEEKS FROM THE DATE YOU RECEIVE THIS PACKET**. ***NOTE:*** Since this is a business reply envelope, no postage is required; however, you must place it in a U.S. Postal system box. On behalf of NHRC and RTI, I want to sincerely thank you for your participation in this important survey.

Sincerely,

Randall Keesling
Data Collection Task Leader

Enclosures

PO Box 12194 Research Triangle Park, North Carolina 27709-2194 Telephone 919 541-6000

Exhibit 4.5 Wave 3 RTI Cover Letter

RESEARCH TRIANGLE INSTITUTE

25 March 1996

Dear Member of the Navy and Marine Corps:

Research Triangle Institute (RTI) of North Carolina, a nonprofit research organization, is currently conducting a survey for the Department of the Navy through the Naval Health Research Center (NHRC) to provide a comprehensive worldwide assessment of health related issues for the Navy and Marine Corps.

In November, we sent questionnaire packets to selected Navy and Marine Corps personnel for distribution through their unit commanders. Those from whom we had not received a completed questionnaire by early January were sent a second questionnaire packet, again through their unit CO for distribution.

Those from whom we have still not received a questionnaire in the mail as of the date of this letter, we are sending a replacement questionnaire packet directly to you with a final request to please consider participating in this important and confidential survey.

If you recently completed the POWR95 questionnaire and mailed it in the enclosed postage-free envelope, please disregard this letter. You do not need to complete and mail a second questionnaire.

In the event you did not receive the earlier mailings, misplaced them, did not have time before, or have reconsidered an earlier decision not to participate, please use the materials in this mailing to communicate your experiences and opinions, as requested by the survey, by completing and returning the questionnaire booklet. **Please note, this is the last mailing you will receive.**

Thousands of Navy Department personnel are completing questionnaires around the world. Your name was chosen at random from a list of officers and enlisted personnel to participate in this survey. Substitutions for selected personnel are ***NOT*** permitted. That is why you are so important to us. In a survey such as this, each person who participates represents thousands of other service personnel. In order for us to have useful results, it is very important that you provide complete and accurate responses to the questions asked.

Because of the sensitive nature of the information in this survey, the importance of the study, and to encourage your frank and honest responses, you will mail your completed questionnaire directly to a civilian scoring contractor using the enclosed business reply envelope. Enclosed you will also find a consent form outlining the purpose of the study, confidentiality associated with the data, and points of contact at NHRC if you need additional information concerning the study. If you are willing to participate in this study, please sign the form. Tear off the back copies and keep them for your personal records. Please enclose the white copy in the business reply envelope provided.

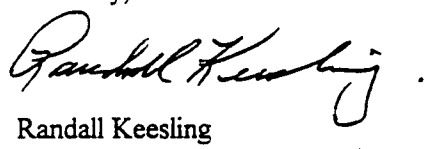
PO Box 12194 Research Triangle Park, North Carolina 27709-2194 Telephone 919 541-6000

Exhibit 4.5 (continued)

Please complete the questionnaire in private and do not show it to anyone. Directions for marking your answer choices are given inside the cover page. Please read the instructions **carefully**. ***USE ONLY A SOFT LEAD (NO.2) PENCIL***; do not use a colored pencil or pen of any kind. Along with the questionnaire you will find a special handout on a blue sheet. Take a few minutes to read this special handout. If you decide to complete the handout, enclose it in the business reply envelope.

When you have finished, seal the questionnaire, consent form, and blue insert in the enclosed envelope and mail it to our printing and scoring contractor, Information Services Group (ISG), Morrisville, North Carolina, **NOT LATER THAN TWO WEEKS FROM THE DATE YOU RECEIVE THIS PACKET**. ***NOTE:*** Since this is a business reply envelope, no postage is required; however, you must place it in a U.S. Postal system box. On behalf of NHRC and RTI, I want to sincerely thank you for your participation in this important survey.

Sincerely,



Randall Keesling
Data Collection Task Leader

Enclosures

questionnaire packet, similar to the Wave 3 packet, being mailed to the eligible nonattendee. After the site visit was completed, field staff created an outbound data file and sent it electronically to the host system.

The Mail-out Eligibility Tracking System was designed to identify sampled personnel who returned the questionnaire in the postage-paid envelope and to monitor eligibility status for follow-up mail-out waves. The selected personnel who completed a questionnaire were identified in a data file containing respondent ID information that was downloaded into the host control system. This system then determined who was eligible for the next wave of mailings. In addition, there also was information on the unit SP lists that COs annotated and sent back via postage-paid envelope identifying selected personnel who were not forwarded his or her packet (PCS, SEP, TDY). These data were then keyed into the Mail-out Eligibility Tracking System to determine wave eligibility. Nondeliverable mail returned for wrong address was researched on the Military Location System and re-sent if an updated address was available.

4.3.6 Questionnaire Receipt and Scanning

All completed questionnaires and other materials returned by mail were received, reviewed, scanned, and batched. Problems identified during this phase were either resolved by RTI or NHRC project staff. After this manual review phase, completed questionnaires were optically scanned. A data file was generated for use in data analysis.

4.4 Survey Response Rates

Response rate information is useful for assessing the quality of survey field operations and for assessing nonresponse bias. This section describes the response rates among eligibles for the questionnaire study and for the body measurement study.

4.4.1 Questionnaire Study

Table 4.1 presents response data and response rates for the questionnaire study, both for the group session methodology and the mail methodology. As shown, response rates among eligibles were notably higher at the group session sites (57.2%) than at the mail sites (36.0%). These results indicate that the group session methodology was more effective than the mail methodology in obtaining participation. Although the reasons for the differences could not be documented formally, they likely stem from differences in participants' perceptions of the importance of the survey. Participants at group sessions may have attached greater importance to completing the survey than those at mail sites because they were given time during the duty day to attend a group session and complete the questionnaire and because command personnel gave reminders and urged selected persons to participate. Persons at mail sites had to complete the questionnaire during off-duty time and may have perceived it as more of a burden.

Two overall response rates were computed. The first, 39.6%, included all persons determined to be eligible; the second, 41.8%, eliminated 1,305 persons whose questionnaires from the third wave of

Table 4.1 Survey Response Data and Response Rates for Questionnaire Study

Data Collection Method	USMC	Navy	Total
Group Session Sites			
1. Number of persons selected	1,747	2,658	4,405
2. Number of eligible persons	1,664	2,544	4,208
3. Number of respondents	726	1,680	2,406
4. Response rate among eligibles (%) = Item 3/Item 2 × 100	43.6	66.0	57.2
Mail Sites			
5. Number of persons selected	2,956	18,502	21,458
6. Number of eligible persons	2,913	17,777	20,690
7. Number of respondents	1,069	6,384	7,453
8. Response rate among eligibles (%) = Item 7/Item 6 × 100	36.7	35.9	36.0
Total			
9. Number of persons selected	4,703	21,160	25,863
10. Number of eligible persons	4,577	20,321	24,898
11. Number of respondents	1,795	8,064	9,859
12. Response rate A among eligibles (%)[a] = Item 11/Item 10 × 100	39.2	39.7	39.6
13. Response rate B among eligibles (%)[b] = Item 11/(Item 10 - 1,305) × 100	NA	NA	41.8

NA = Not available.

Note: Most ineligibles were screened out of the frame prior to sample selection. Because of the long field period, some selected personnel became ineligible and were reported by commanders. These rates of ineligibles, which are assumed to be conservative, were applied to all FSUs.

[a]Rate was based on the data in the table.

[b]During Wave 3 mailing, 1,305 questionnaires were returned due to bad addresses. However, because the first two waves of mailings were sent directly to unit commanders, it was not known if these individuals received the early mailings. This response rate eliminates them as eligibles assuming that they did not receive any of the mailings.

mailing were returned because of bad addresses. Unfortunately, both rates were relatively low and raise the potential for nonresponse bias in the survey estimates. That is, because persons who did not respond may differ from those who did respond, estimates based on respondents alone have the potential to misrepresent the population of interest. Although the potential for bias cannot be entirely ruled out, a nonresponse adjustment was made to help compensate for this problem. As described in Chapter 5, the weights were adjusted by poststratifying them to the population counts within cells defined by gender, race, paygrade, region, and Service. Because prior literature suggests that estimates are expected to vary among respondents defined by these cells, these adjustments tend to diminish differences attributable to varying cooperation rates among respondents in these groups. To the extent that there are few differences between respondents and nonrespondents to the survey, biases will be minimal.

4.4.2 Body Measurement Study

Table 4.2 presents the response data and response rates for the body measurement study. The top portion of the table repeats the information from Table 4.1 regarding the response rates for eligibles at the group session sites because the response rates for the body measurement study are conditional on those rates. The bottom portion of the table gives the cooperation rates among those selected and the overall response rates among eligibles. As shown, cooperation rates were very high for both the Marine Corps (97.3%) and the Navy (89.1%) personnel. The overall response rates were lower, however, because they take into account the numbers who attended the group sessions. The final rates were 42.4% for the Marine Corps, 58.8% for the Navy, and 52.5% overall. Although these rates were higher than those for the questionnaire study, they are still sufficiently low that they may be subject to potential nonresponse bias. Given the high cooperation rates for this portion of the study and the fact that the study involved unobtrusive physical measurements, it seems unlikely that serious bias would be introduced by the nonrespondents. As discussed in Chapter 5, relative weights were applied to these data to permit them to properly reflect the population at the five sites for the body measurement study, and no further adjustments for nonresponse were made for the data in this study.

4.4.3 Telephone Interview Study

Table 4.3 presents the response rates for the telephone interview study. Again, the top portion of the table repeats information from Table 4.1 but from the total number of questionnaire eligible persons. It also gives the number of respondents or telephone interview volunteer rates among the total eligible for the survey. These volunteer rates of 14-15 % were low but not unexpected for a telephone interview. The bottom portion of the table gives the cooperation and overall response rates. The cooperation rates, the number of persons interviewed out of the number selected, was high; most non-respondents having moved within the 6 month data collection period leaving no forwarding number. The low overall response rate suggests that the power to detect diagnoses with low prevalence rates is compromised. However, when screening test scores were compared between telephone interview volunteers and eligible questionnaire respondents, they were found to be very similar suggesting the potential for bias in the volunteer sample was small.

Table 4.2 Survey Response Data and Response Rates for Body Measurement Study

Group Session Sites	USMC	Navy	Total
Questionnaire Study			
1. Number of eligible persons	1,664	2,544	4,208
2. Number of respondents	726	1,680	2,406
3. Response rate among eligibles (%) = Item 2/Item 1 × 100	43.6	66.0	57.2
Body Measurement Study			
4. Number of eligible persons selected	450	959	1,409
5. Number of respondents	438	854	1,292
6. Cooperation rate (%) = Item 5/Item 4 × 100	97.3	89.1	91.7
7. Response rate among eligibles (%) = (Item 3 × Item 6)/100	42.4	58.8	52.5

Table 4.3 Survey Response Data and Response Rates for Telephone Interview Study

Total Survey	USMC	Navy	Total
Volunteers			
1. Number of persons selected	4,703	21,160	25,863
2. Number of eligible persons	4,577	20,321	24,898
3. Number of respondents (volunteers)	545	3046	3591
4. Response rate A among eligibles (%)[a] = Item 3/Item 2× 100	11.9	15.0	14.4
5. Response rate B among eligibles (%)[b] = Item 2/Item 1× 100	N/A	N/A	15.2
Telephone Interviews			
6. Number of eligible persons selected	128	841	969
7. Number interviewed	95	687	782
8. Cooperation rate (%) = Item 7/Item 6× 100	74.2	81.7	80.7
9. Response rate A among eligibles (%)[a] = Item 4/Item 8/ 100	8.8	12.3	11.6
5. Response rate B among eligibles (%)[b] = Item 5/Item 8/ 100	N/A	N/A	12.3

[a]Rate was based on the data in the table.

[b]During Wave 3 mailing, 1,305 questionnaires were returned due to bad addresses. However, because the first two waves of mailings were sent directly to unit commanders, it was not known if these individuals received the early mailings. This response rate eliminates them as eligibles assuming that they did not receive any of the mailings.

5. SAMPLE WEIGHTING AND ESTIMATION PROCEDURES

In this chapter, information is presented for the methods used to develop sample weights in the questionnaire study (i.e., initial sample weights, adjustments for nonresponse), the estimation methods used for the questionnaire study (i.e., population totals and proportions, domain estimates, the analysis software), and the weighting used for the body measurement study.

5.1 Sample Weighting for the Questionnaire Study

This section describes how sampling weights were assigned in the questionnaire study to reflect differences in the sample selection rate and response rates. Weighting consisted of calculating initial sample weights and making adjustments for nonresponse.

5.1.1 Initial Sample Weights

Initial sample weights were calculated as the inverse of the probability of selection at each stage of the design. At the first stage, the expected frequency of selecting the i-th first-stage sampling unit (FSU) from the a-th first-stage stratum was

$$\pi(a,i) = n_1(a) \bullet S(a,i) / S(a),$$

where

$n_1(a)$ = number of FSUs selected from the a-th stratum,

$S(a,i)$ = composite size measure assigned to the i-th FSU, and

$S(a)$ = sum of the composite size measures in the a-th stratum.

At the second stage, simple random samples of personnel were selected from each gender/paygrade-race group with sampling rates that attained the desired stratum sizes. The overall selection probabilities assigned to personnel in the same first- and second-stage strata were made equal whenever possible. The probability of selecting the j-th person from the b-th gender/paygrade-race stratum conditional on the selection of the i-th FSU from the a-th first-stage stratum was

$$\pi(j \mid a,i,b) = \text{Min}[1, n_2(a,b) / N(a,i,b)] ,$$

where

$N(a,i,b)$ = total number of personnel in the b-th gender/paygrade-race second-stage stratum of the I-th FSU from the a-th first-stage stratum, and

$n_2(a,b)$ = targeted second-stage sample size for the b-th gender/paygrade-race second-stage stratum for FSUs in the a-th first-stage stratum.

Thus, the initial sample weight assigned to the j-th person of the b-th gender/paygrade-race second-stage stratum of the I-th FSU was

$$w(a,i,b,j) = [\pi(a,i) \bullet \pi(j \mid a,i,b)]^{-1} .$$

This initial sampling weight was assigned to each of the 21,160 Navy and 4,703 Marine Corps personnel selected for the sample.

The POWR Assessment survey population comprised all shore-based Navy and Marine Corps personnel on active duty at the time the sample was selected (September 1995) and who were expected to be at their September 1995 location through April 1, 1996. Exceptions who were excluded from the survey were

- basic trainees,
- Service academy cadets and midshipmen,
- personnel undergoing a permanent change of station (PCS), and
- personnel with an unauthorized leave (UA).

Basic trainees, academy cadets, and midshipmen were excluded because of their lack of military experience. We excluded personnel who were either undergoing a PCS or had a UA because of the difficulties associated with contacting them during the relatively short data collection period.

During the group administrations and mailings of the survey questionnaires, it was determined that some sampled persons were ineligible. 769 personnel identified as having left active duty, were PCS, were AWOL, or were deceased were considered to be ineligible for the survey. Personnel who were deployed, ill, on leave, or on temporary duty (TDY) were considered to be eligible but unavailable for the survey. Personnel were also considered eligible who were available but did not attend the group administrations. To give all eligible sampled members an opportunity to participate in the survey, questionnaires were mailed to those not attending the group administrations. Some mailed questionnaires were returned because of incorrect addresses; these persons were considered eligible for the survey.

5.1.2 Adjustments for Nonresponse

To adjust the weights for nonresponse, counts of the numbers of shore-based Navy and Marine Corps personnel were obtained as of January 1996. Personnel not expected to remain at their current location through April 1, 1996, were omitted. These counts were available for each of the 48 cells defined by the intersection of Service, region, gender, paygrade group, and race. To help ensure stable sampling estimates, 10 cells with fewer than 25 respondents were collapsed to form 38 poststrata. Any necessary collapsing was done by combining across regions. These cells formed the poststratification cells for weight adjustment. Some persons had changed paygrades since the sample was selected, and the new (current) paygrade was used in defining the poststrata.

Table 5.1 presents the counts of the eligible active-duty population by Service, gender, race, and paygrade group. These counts were used to adjust the initial sampling weights of survey participants so that the sum of their adjusted weights within a poststratum equaled the number of eligible personnel in the poststratum.

Table 5.1 Total Eligible Personnel

			Navy			Marine Corps		
Gender	**Race**	**Paygrade**	**CONUS**	**OCONUS**	**Total**	**CONUS**	**OCONUS**	**Total**
Male	White	E1-E6	62,439	13,267	75,706	53,605	11,396	65,001
		E7-E9	15,043	2,367	17,410	6,467	1,273	7,740
		Officer	22,926	3,747	26,673	11,647	2,031	13,678
	Nonwhite	E1-E6	21,737	5,292	27,029	19,340	4,246	23,586
		E7-E9	3,419	822	4,241	2,885	697	3,582
		Officer	1,925	397	2,322	1,213	245	1,458
Female	White	E1-E6	11,231	3,216	14,447	2,149	401	2,550
		E7-E9	1,097	289	1,386	313	61	374
		Officer	4,068	746	4,814	477	81	558
	Nonwhite	E1-E6	6,105	1,643	7,748	1,453	314	1,767
		E7-E9	264	78	342	164	46	210
		Officer	674	149	823	87	12	99
Total			150,928	32,013	182,941	99,800	20,803	120,603

Note: Table contains the number of shore-based personnel, excluding cadets, midshipmen, and basic trainees, who were on active duty as of January 1996 and expected to remain at their current location through April 1, 1996.

Source: Data provided by NHRC, 1996.

Sampled members were considered respondents if they returned a usable questionnaire. Questionnaires were considered "usable" if the sampled person responded to at least two items. Accordingly, the following response indicator was assigned to the *j*-th person of the *b*-th gender/paygrade-race stratum in the *i*-th FSU of the *a*-th first-stage stratum:

$$r(a,i,b,j) = \begin{cases} 1 \text{ if he/she provided a usable questionnaire, and} \\ 0 \text{ otherwise.} \end{cases}$$

This indicator was set to 1 for the 9,859 sampled members who provided a usable questionnaire. To force the sum of the adjusted weights of respondents to equal the number of eligible personnel, the following adjustment factor was calculated for each poststratum *c*:

$$A(c) = \frac{N(c)}{\sum_{a,b\in c} \sum_{i\in a} \sum_{j\in b} w(a,i,b,j) \bullet r(a,i,b,j)},$$

where *N(c)* is the total number of eligible personnel in poststratum *c*. Then the adjustment factor was applied to the initial sampling weight of each respondent to obtain the following adjusted weight:

$$w^*(a,i,b,j) = A(c) \bullet w(a,i,b,j) \bullet r(a,i,b,j).$$

Nonzero values of this weight were assigned to the 9,859 respondents who provided questionnaires with usable information. Table 5.2 presents the number of survey respondents.

5.2 Estimation for the Questionnaire Study

This section discusses the statistical estimation procedures appropriate for the complex sample design of the survey. Estimates can be produced for different reporting domains, such as demographic groups defined by Service, race/ethnicity, sex, age, and family status. The main types of estimates to be produced are means and percentages. Differences can also be produced. In addition, linear and logistic regression models can be fitted to estimate the combined effect of sociodemographic variables on a variety of dependent variables.

Estimation procedures used should be those appropriate for the two-stage, deeply stratified, two-phase design (e.g., see Cochran, 1977). The first step in the estimation process is the development of response-adjusted analysis weights (discussed in Section 5.1). Next, frequencies of categorical variables should be examined, and unreasonably large or small values in the data investigated and resolved.

Estimates of population totals are linear statistics, and their variances can be expressed in closed form. Ratios are calculated by separately estimating the numerators and denominators of the ratios, then dividing to obtain the ratio. Because ratio estimates are nonlinear statistics, their sampling variance cannot

Table 5.2 Respondent Sample Size, by Service, Gender, Paygrade, and Race

Paygrade/ Race	Service and Gender				
	Navy, Male	Navy, Female	Marine Corps, Male	Marine Corps, Female	Total
E1 - E6					
White	1,768	2,062	169	386	4,385
Other	498	906	84	225	1,713
E7-E9					
White	558	282	152	70	1,062
Other	246	62	95	36	439
Officer					
White	649	690	251	167	1,757
Other	186	157	133	27	503
Total	3,905	4,159	884	911	9,859

be expressed in closed form. Variance approximations can be calculated using first-order Taylor series linearizations. The estimation of regression coefficients is a multivariate extension of the Taylor series linearization for ratios.

5.2.1 Estimate of Population Totals

In this section, response or observation variables (which are questionnaire items or quantities recoded from questionnaire items) are denoted by Y, and the values obtained for the response variables for the j-th person from the b-th second-stage stratum of the r-th FSU in the a-th first-stage stratum are denoted by $y(a,i,b,j)$.

A population total is estimated by the quantity,

$$\hat{Y} = \sum_{a=1}^{4} \sum_{i=1}^{n_1(a)} \sum_{b=1}^{12} \sum_{j=1}^{n_2(a,i,b)} w^*(a,i,b,j) \bullet y(a,i,b,j) \qquad (1)$$

where

$n_1(a)$ = number of FSUs selected from the a-th stratum,

$n_2(a,i,b)$ = number of responding personnel in the b-th second-stage stratum of the i-th FSU in the a-th first-stage stratum,

$w^*(a,i,b,j)$ = final adjusted sampling weight (described in Section 5.1), and

$y(a,i,b,j)$ = response obtained for the j-th respondent in the b-th second stratum of the i-th FSU in the a-th first-stage stratum.

For purposes of estimating the sampling variances, Equation (1) can be conveniently rewritten as a sum of the separate estimates for each of the sampled first-stage units. To this end, define:

$$\hat{Y}(a,i) = \sum_{b=1}^{12} \sum_{j=1}^{n_2(a,i,b)} w^*(a,i,b,j) \bullet y(a,i,b,j). \tag{2}$$

Then Equation (1) can be rewritten as:

$$\hat{Y} = \sum_{a=1}^{4} \sum_{i=1}^{n_1(a)} \hat{Y}(a,i),$$

and the sampling variance, assuming sampling with replacement at the first stage of the design, is estimated by:

$$\hat{Var}\{\hat{Y}\} = \sum_{a=1}^{4} \frac{n_1(a)}{n_1(a)-1} \sum_{i=1}^{n_1(a)} \left[\hat{Y}(a,i) - \hat{\bar{Y}}(a)\right]^2, \tag{3}$$

where

$$\hat{\bar{Y}}(a) = \frac{1}{n_1(a)} \sum_{i=1}^{n_1(a)} \hat{Y}(a,i).$$

5.2.2 Estimates of Population Proportions

Estimates of population proportions take the form of (combined) ratio estimates, denoted in general by:

$$\hat{R} = \frac{\hat{Y}}{\hat{X}}.$$

The numerator and denominator totals are individually estimated as described above. Because the numerator and denominator quantities are random variables, the estimator is a nonlinear statistic. Ratio estimates are usually biased, but the bias becomes negligible in a large sample (e.g., see Cochran, 1977).

The variance of the estimator can be approximated using a Taylor series linearization. The linearized response variable value,

$$z(a,i,b,j) = y(a,i,b,j) - \hat{R}\, x(a,i,b,j) \qquad (4)$$

is computed and used in place of the y-values in Equation (2). The variance estimate is then computed as given in Equation (3). Here, $y(a,i,b,j)$ and $x(a,i,b,j)$ denote the responses to two different observation variables of the j-th person in the b-th second-stage stratum of the i-th FSU in the a-th first-stage stratum.

5.2.3 Domain Estimates

Membership of a sampled person in some specified subpopulation or domain of interest can be denoted by the indicator variable,

$\delta(a,i,b,j)$ = 1, if the j-th sampled individual (in the b-th gender/paygrade group, i-th first-stage unit, and a-th first-stage stratum) is a member of the domain, and

= 0, otherwise.

The products, $\delta(a,i,b,j)$ and $y(a,i,b,j)$, when substituted for the y-values alone in the previous formulae, restrict the calculations to the specified domain. Note that the ranges of summation in the formulae remain the same, namely over all of the individuals in the sample. This convention ensures that sampling variances are computed using the correct sample sizes.

Domain comparisons, taking the form of the difference or other linear combinations of domain estimates, have, in general, a covariance arising from the two-stage selection of the sample. This is, using a difference between two domains by way of example:

$$\mathrm{Var}\{\hat{\theta}_1 - \hat{\theta}_2\} = \mathrm{Var}\{\hat{\theta}_1\} + \mathrm{Var}\{\hat{\theta}_2\} - 2\ \mathrm{Cov}\ \{\theta_1, \theta_2\},$$

where $\hat{\theta}_1$ and $\hat{\theta}_2$ denote the two domain estimates. In terms of the previous formulae, the first-stage level differences,

$$\hat{D}(a,i) = \hat{Y}_1(a,i) - \hat{Y}_2(a,i),\ i = 1, 2, \ldots, n_1(a),$$

$$a = 1,2,3,4,$$

and their corresponding means,

$$\hat{\bar{D}}(a) = \frac{1}{n_1(a)} \sum_{i=1}^{n_1(a)} \hat{D}(a,i),$$

can be computed and used in Equation (3) to estimate the variance of the difference. Except as the necessary distributional assumptions may not apply, the quasi student's *t* statistic,

$$t^* = \frac{\hat{\theta}_1 - \hat{\theta}_2}{[\text{Var}\{\hat{\theta}_1 - \hat{\theta}_2\}]^{1/2}}$$

could be used with 41 degrees of freedom as an indicator of the statistical significance of the difference. The total number of degrees of freedom suggested is the number of first-stage units minus the number of first-stage strata.

Computer software packages that perform this type of estimation and testing include PC CARP (available from the Iowa State University Statistics Laboratory), and SUDAAN (available from RTI). Section 5.2.4 contains a brief description of SUDAAN and an example of its use with the questionnaire data from the 1995 POWR Assessment.

5.2.4 SUDAAN Analysis Software

SUDAAN is a software package developed at the RTI for the specific purpose of analyzing data from complex surveys (Shah, Barnwell, & Bieler, 1995). RTI developed this software because most of the popular statistical software packages (e.g., SAS, SPSS, BMDP) do not contain procedures for properly estimating the variance of survey statistics (e.g., means, ratios, totals, proportions, regression coefficients) obtained from a complex sample survey, such as the POWR Assessment. The analytical procedures in these packages assume that the data come from simple random samples. Many software packages have no mechanism for dealing with sample design factors and either do not allow the use of sampling weights or use them in an unreliable or inconsistent fashion.

The DESCRIPT procedure in SUDAAN calculates weighted estimates of proportions, means, and totals along with estimates of their standard errors. Estimates are calculated separately for specified population domains. DESCRIPT also has the capability of producing standardized estimates for comparing the characteristics of two populations with differing distributions of confounding attributes. The approach used for calculating the standard errors is a first-order Taylor series approximation of the deviation of the estimates from their expected values (Woodruff, 1971). The RATIO procedure generalizes the capacities of DESCRIPT to general ratio estimates and their standard errors. The CROSSTAB procedure produces weighted frequencies, percentages, and estimates of their standard errors for specified domains.

For fitting the linear and logistic regression models, the SUDAAN procedures REGRESS and LOGISTIC (as suggested by Binder, 1981) fit linear and logistic regression models using sample design weights and a design-consistent estimate of the model parameters and covariance matrix. The Horvitz-Thompson estimators (Cochran, 1977) of the regression coefficients are produced, as well as a Taylor series approximation of the variance-covariance matrix of the regression coefficients in which the mean square error between primary sampling units within strata is used to estimate the variance and covariance parameters. Tests of hypotheses about regression coefficients estimated using LOGISTIC were based on a Hotelling's T^2-type statistic, which is assumed to have a transformed F-distribution in repeated samples (Shah, Holt, & Folsom, 1977).

The following example shows how the CROSSTAB procedure can be used to estimate the proportions of persons in each level of marital status by service. Marital status is given in the questionnaire variable Q8:

```
PROC CROSSTAB  DATA = IN.POWR95  FILETYPE = SAS
        DESIGN = WR;
NEST  STRATUM  XFSU;
WEIGHT ANALWT;
SUBGROUP  SERVICE Q8;
LEVELS  2  6;
TABLES  Q8*SERVICE;
SETENV  DECWIDTH = 5.0;
PRINT  WSUM = 'ESTIMATED TOTAL PERSONS'
        NSUM = 'SAMPLE SIZE'
        COLPER = 'COLUMN PERCENTAGE'
        SECOLPER = 'STANDARD ERROR OF COLUMN PERCENTAGE'
        /WSUMFMT = F15.0 NSUMFMT = F6.0;
TITLE "1995 POWR ASSESSMENT";
TITLE "MARITAL STATUS";
```

5.3 Weighting for the Body Measurement Study

Five sites (two West Coast Navy bases, one Pacific Navy base, and two West Coast Marine Corps bases) were selected for participation in the body measurement sample. These sites were chosen after the FSUs had been selected for the questionnaire study. The rationale for the particular body measurement sites chosen was primarily because support could be obtained to conduct on-site group administrations of the questionnaires and to obtain body measurements from persons who participated in the group administrations. No probability mechanism was used to select the particular sites.

Sample sizes were set to obtain a total of 600 Navy and 400 Marine Corps personnel for body measurements. These were allocated approximately equally to men and women, and to the paygrade-race

strata. Targeted sample sizes were set within each of the sites to obtain an approximately proportional allocation within each of the 12 cells. At the time of the group administration, these targeted sample sizes were allowed to vary in order to obtain as many body measurements as could be conducted during each group session. Thus, some cells have more than the targeted respondents and some have fewer. Persons in the harder to fill cells (rarer groups) were selected first, followed by the persons in the other groups. It was not possible to preselect persons for the body measurement samples because of the uncertainty of which sampled persons would actually attend the group sessions. For this reason, persons were selected as they arrived. Table 5.3 presents the actual numbers of body measurements obtained by service and by gender, paygrade, and race.

Inferences using data collected in the body measurement sample can be made only to the set of sites that were included because no probability mechanism was used to select the sites. However, the particular sites are among the larger West Coast and OCONUS Navy and Marine Corps bases.

For analyzing the data, weights were computed that reflect the relative frequency with which persons in the body measurement sample occur in 30 classes defined by branch of Service, location (CONUS or OCONUS), paygrade, gender, and race. Race was not used in defining the classes for female E7s to E9s or female officers in either Service because of the small respondent sample sizes. Within each class (denoted by the subscript h), the analysis weight for each person providing body measurements (denoted by the subscript i), was computed as

$$BMWT_{hi} = N_h / n_h$$

where n_h is the number of respondents in class h, and N_h is the total number of persons across all sites in class h. For the Marine Corps, the numerator counts were obtained from September 1995 data, and for the Navy from January 1996 data. N_h includes only persons stationed at the nucleus site; persons in statellite units were not a part of the body measurement study because it was difficult for them to attend the group sessions. These weights do not reflect the initial selection probabilities of the individuals. The weights cannot correct for other potential biases in the sample (e.g., if only the most physically fit agreed to participate). They do, however, reflect the disproportionalities in the actual obtained sample across the sites and gender-paygrade-race categories. These weights can be used to make estimates and inferences that are applicable to persons stationed at those five sites. Estimates can be computed by Service, by CONUS versus OCONUS for the Navy, and for categories defined by paygrade, race, and gender. Except for the OCONUS Navy site, analysts should not use these data to make estimates for the other four individual sites. As with any analyses, one should pay attention to cell sizes and collapse if necessary.

The SUDAAN design statements for computing estimates and estimated standard errors are

```
DESIGN=STRWR
NEST BMCLASS;
WEIGHT BMWT;
```

Table 5.3 Number of Body Measurements Obtained

Paygrade, Race	Service and Gender				Total
	Navy, Male	Navy, Female	Marine Corps, Male	Marine Corps, Female	
E1-E6					
White	150	169	36	124	479
Other	89	111	31	65	296
E7-E9					
White	68	31	31	11	141
Other	61	7	29	6	103
Officer					
White	31	91	33	28	183
Other	39	14	28	9	90
Total	438	423	188	243	1,292

where BMCLASS is a variable that denotes the 30 weighting classes and BMWT is the analysis weight. The design option STRWR will give a conservative estimate of the standard error.

For some of the groups of interest (particularly the female E7s to E9s and female officers), a fairly large proportion of those at the site were included in the body measurement sample. The finite population correction factors can be used in SUDAAN to obtain a smaller estimate of the variance. The design statements would be

```
DESIGN=STRWOR
NEST BMCLASS;
TOTCNT BMTOTS;
WEIGHT BMWT;
```

The values for the totals (BMTOTS variable) are given in Table 5.4 along with the classes used for developing these relative analysis weights.

Table 5.4 Classes, Population Counts, and Sample Sizes Used to Develop the Analysis Weights for the Body Measurement Sample

Class Number (BMCLASS)	Class	Population Size (BMTOT)	Body Measurements Obtained
	Navy, CONUS		
101	Male, White, E1-E6	2,717	59
102	Male, White, E7-E9	927	27
103	Male, White, Officer	774	15
104	Male, Nonwhite, E1-E6	1,138	39
105	Male, Nonwhite, E7-E9	410	36
106	Male, Nonwhite, Officer	102	14
107	Female, White, E1-E6	544	71
110	Female, Nonwhite, E1-E6	284	57
108	Female, E7-E9	67	19
109	Female, Officer	114	41
	Navy, OCONUS		
201	Male, White, E1-E6	2,561	91
202	Male, White, E7-E9	612	41
203	Male, White, Officer	800	16
204	Male, Nonwhite, E1-E6	880	50
205	Male, Nonwhite, E7-E9	174	25
206	Male, Nonwhite, Officer	66	25
207	Female, White, E1-E6	482	98
210	Female, Nonwhite, E1-E6	206	54
208	Female, E7-E9	39	19
209	Female, Officer	144	64
	Marine Corps, CONUS		
301	Male, White, E1-E6	15,691	36
302	Male, White, E7-E9	997	31

Table 5.4 (continued)

Class Number (BMCLASS)	Class	Population Size (BMTOT)	Body Measurements Obtained
303	Male, White, Officer	2,161	33
304	Male, Nonwhite, E1-E6	6,025	31
305	Male, Nonwhite, E7-E9	633	29
306	Male, Nonwhite, Officer	277	28
307	Female, White, E1-E6	552	124
310	Female, Nonwhite, E1-E6	336	65
308	Female, E7-E9	69	17
308	Female, Officer	95	37

6. RESULTS AND CONCLUSIONS

The analysis and presentation of results of this study are planned in two phases. Phase One consists of four core descriptive papers titled:

1. The Health Status of Women in the Navy and Marine Corps: Preliminary Findings From the 1995 Perceptions of Wellness and Readiness (POWR) Assessment.

2. Demographic Differences in Anthropometry of Navy and Marine Corps Personnel and Concordance of Selected Body Composition Measures.

3. The Mental Health of Women in the Navy and Marine Corps: Preliminary Findings From the 1995 Perceptions of Wellness and Readiness (POWR) Assessment.

4. Occupational Exposure and Reproductive Health in the U.S. Navy and Marine Corps: Preliminary Findings From the 1995 Perceptions of Wellness and Readiness (POWR) Assessment.

Abstracts and drafts of these papers and/or presentations are included as Appendices D-G, respectively. Please note: Due to a delay in CDC's release of the NHANES 1988-1994 data tapes until late January 1997, comparative data between military and civilian prevalence rates are pending and therefore completed manuscripts are expected in February 1997.

Phase Two consists of 10-20 analytic papers based on POWR data contingent on funding from 8 proposals to be submitted during the next 3 years. These 8 topic areas are described as follows:

1. Correlates of Health Behaviors Among Navy and Marine Corps Men and Women.
   This proposal will examine the relationships between lifestyle and health behaviors, such as smoking, diet, and exercise, and health care utilization, personality, perceived health, medical conditions and psychosocial factors. (2-4 papers)

2. Correlates of Current Medical Conditions and Medication Use Among Navy and Marine Corps Men and Women.
   This proposal will examine the relationships between selected current medical conditions and medication use with perceived health status and health control, as well as personality and psychosocial factors. (2-4 papers)

3. Correlates of Health Care Utilization, Access, and Satisfaction Among Navy and Marine Corps Men and Women.
   This proposal will examine the relationships between health care utilization, access, and satisfaction relative to occupational stress, perceived health, personality, and psychosocial factors. (2-4 papers)

4. Demographic and Psychosocial Predictors of Suicide Contemplation Among Navy and Marine Corps personnel.

This proposal will examine the demographic, personality traits, and psychosocial predictors of Navy and Marine Corps personnel who report comtemplating suicide across several time periods. (1-2 papers)

5. Persian Gulf Health: Findings From the 1995 Perceptions of Wellness and Readiness (POWR) Assessment.

This proposal will examine the prevalence of medical and psychological disorders (including Post-traumatic Stress Disorder, current symptoms and help-seeking behavior, and adverse reproductive outcomes, in conjunction with a wide range of risk factors among four comparison groups of 1000 sailors and marines who reported serving in Desert Storm or Desert Shield only, 300 who served in non-Gulf foreign theaters only, 600 serving in both, and 6000 serving in no foreign theater. (2-3 papers)

6. Prevalence and Risk Factors for Hypertension Among U.S. Navy and Marine Corps Men and Women.

This proposal will examine the relationship between blood pressure as measured in the physical measurements survey, self-reported hypertension, and associated risk factors among Navy and Marine Corps men and women and will present comparative rates with civilian populations. (1-2 papers)

7. Correlates of Self-reported Exposure to Violence, Disaster, and Abuse Among Navy and Marine Corp Men and Women.

This proposal will examine the relationships between self-reported exposure to violence, disaster, and abuse with respect to demographic, psychosocial, and medical history variables. (1-2 papers)

8. Prevalence, Risk Factors, and Recommended Interventions for Tobacco and Alcohol Dependence Among Navy and Marine Corps Women.

This proposal will examine the prevalence and predictors of tobacco and alcohol dependence in Navy and Marine Corps women with clinically based DSM-III diagnoses obtained from telephone interviews. (1 paper)

Selected abstracts and preproposals are included in Appendix H.

The information obtained in this survey provides the means to evaluate women's health status in the Navy and Marine Corps by providing the baseline for future comparisons, as the demographic profile of the military changes over the next few years and as women move into traditionally male occupations. This information was collected in a methodology similar to the national surveys and is therefore comparable to civilian populations. These data may be used to reaffirm or guide current policies on occupation and medical care in the military. This is important because the Navy and Marine Corps may need to re-examine their policies ranging from health care utilization to women's health issues. Despite the Department of the Navy's directive to maintain an optimal state of health and well-being (37) and the Bureau of Medicine and Surgery's strategic plan to provide timely access to the finest quality health care for all those served (38), neither the Navy nor Marine Corps possessed the type or amount of epidemiological or health services data required to optimally support or to ensure continuous quality improvement of these efforts. This study was designed to rectify this inadequacy by providing baseline information on the prevalence and distribution of disease, health risks, and health care behaviors in a representative sample of active-duty Navy and Marine Corps women. The data from this study will be used to evaluate a variety of health and physical readiness-related questions of vital importance to their operational readiness. Among the relevant directives and instructions, in addition

to Naval Medical Research and Development Command (NMRDC)'s Defense Women's Health Research Program (DWHRP)(39) are: OPNAVINST 6100.2 (37), BUMED's strategic goals 2 and 3 (38), and NMRDC's FY93 guidance (40). Navy medical and line decision-makers will use the results of this research project in policy formation.

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MEETING ABSTRACTS

TITLE: The Health Status of Women in the Military: The 1995 Perceptions of Wellness and Readiness Assessment (POWR '95)

PRESENTER: Laurel Hourani, Ph.D., Naval Health Research Center, P.O. Box 85122, San Diego, CA 92186-5122 (619)553-8460

MEETING: Department of Defense Human Factors Engineering Technical Advisory Group Meeting, Monterey, CA, November 1995

The Department of the Navy lacks baseline epidemiologic and health services data to adequately assess the health status of women in the United States Navy and Marine Corps. This baseline data is needed at present to appropriately anticipate and plan for health care needs as the role of women in the military changes over the next five years. POWR '95 was designed to provide baseline health and risk factor information to estimate the prevalence of a wide range of health conditions and to make relevant comparisons both within military subpopulations and between military and civilian populations. The study approach includes the administration of an extensive self-report health questionnaire to a population-based sample of active-duty Navy and Marine Corps women and a comparison sample of active duty and Marine Corps men. Clinically-based structured telephone interviews and cardiovascular (blood pressure, heart rate) and physical measurements (height, weight, body circumferences, skinfold thickness) are also administered to a subsample of the surveyed population. In order to produce rates comparable with national and other military data, the survey instruments are based on standardized measures used in previous national and military health surveys. The data from this study will be used to evaluate a variety of women's health and physical parameters of importance to the Navy and Marine Corps including the identification of women's health problems, risk factors and health care needs and practices in the following general issue areas: reproductive, medical/nutritional, psychosocial, lifestyle, occupational/environmental, and health services. It will also be used to identify appropriate populations for subsequent studies, experiments and interventions needed to address specific health issues regarding women's health in the military and their operational readiness. The information provided by this survey will be particularly timely as the next five years will see the demographic character of the military change as a higher proportion of women comprise the operational force and Navy and Marine Corps women expand into positions previously held by men only. This study will provide the essential baseline information required to monitor the effect of these changes on women's health and health care needs.

TITLE: The Mental Health Status of Women in the Navy and Marine Corps: Preliminary Findings from the 1995 Perceptions of Wellness and Readiness Assessment (Powr '95).

AUTHORS: Laurel L. Hourani, Ph.d., M.p.h., and Huixing Yuan, Ph.d. Naval Health Research Center, P.o. Box 85122, San Diego, CA 92152

MEETING: Presented at the 104th Annual Convention of the American Psychological Association, Toronto, Ontario, Canada, August 9-13, 1996

As women in the military move into potentially stressful non-traditional occupations previously held by men only and as a higher proportion of women comprise the operational force and are exposed to combat-supportive positions, essential baseline information is required to monitor the effect of these changes on women's health, to appropriately anticipate and plan for their health care needs, and to address psychiatric epidemiology and prevention issues. Patterned after the large national health surveys, the 1995 Perceptions of Wellness and Readiness Assessment (POWR '95) was designed to provide baseline health and risk factor information to estimate the prevalence of a wide range of physical and mental health conditions and to make comparisons both within military subpopulations and with civilian populations. As part of POWR '95, a population-based 2-stage cluster sample of 10,000 active-duty Navy and Marine Corps women and men were screened for above-normal levels of psychosocial distress and depressive symptomatology using standard cutpoints on the CES-D and Hopkins-21. A third stage stratified sampling frame oversampled respondents who screened positive and took proportional samples of respondents who screened negative and those who had missing screening data. A clinically-based, structured computerized telephone interview (Quick DIS-III-R) was administered to respondents to make DSM-III-R diagnoses of somatization, depressive, anxiety, eating, alcohol abuse and antisocial personality disorders. Preliminary analyses of the data include lifetime and 1-year prevalence rates of mental disorders adjusted for sex, race and paygrade. An evaluation of the screening measures as predictors of caseness is also presented.

TITLE: Demographic Differences in Anthropometry of Navy and Marine Corps Personnel and Concordance of Selected Body Composition Measaures

AUTHORS: Wendy F. Graham, Ph.D., Laurel L. Hourani, Ph.D., M.P.H., Diane Sorenson, M.P.H., and Huixing Yuan, Ph.D., Naval Health Research Center

MEETING: Assessing Readiness in Military Women: The Relationship to Nutrition. A Workshop Sponsored by Committee on Body Composition, Nutrition and Health of Military Women, Food and Nutrition Board, Institute of Medicine, Irvine, CA, September, 1996

The 1995 Perceptions of Wellness and Readiness Assessment (POWR '95) was designed to provide baseline health and risk factor information to estimate the prevalence of a wide range of physical and mental health conditions and to make relevant comparisons both within military subpopulations and between military and civilian populations. The three components of POWR '95 consisted of self-report questionnaires which were mailed to approximately 25,000 randomly-sampled active-duty Navy and Marine Corps personnel, physical measurements which were taken on 1,300 subjects who participated in the survey, and a clinically-structured telephone interview which addressed issues of mental health with approximately 800 active-duty personnel.

The specific objective of POWR '95 which is addressed in this presentation is to provide baseline information on the anthropometric characteristics of women and men of the Navy and Marine Corps. The POWR study, using noninvasive, standardized hip circumferences; triceps and subscapular skinfolds; and handgrip strength. Although two Naval Health Research Center (NHRC) technical reports (in preparation) provide comprehensive descriptions of all measures taken, this presentation will focus exclusively on measures of body composition. Various indices were constructed to reflect the relative fatness of Navy and Marine Corps personnel. Among the five measures used in this study were (1) body mass index (BMI), (2) an indication of overweightness determined by gender-specific cutoff values for BMI, (3) percent body fat based on circumference measurements, (4) percent body fat using age-adjusted circumferences, and (5) percent exceeding the body fat standard which is based on gender-specific cutoff values established by the Navy and Marine Corps. Use of the BMI as an overall indicator of obesity for the civilian population has been endorsed by the National Institutes of Health Consensus Development Panel (NIH, 1985). The Department of the Navy currently uses circumference-derived % body fat to ascertain fitness for continued duty. Generalized equations based on girth measurements are commonly used to determine body fat in many special population studies. Preliminary analyses of the body measurement data include descriptive statistics on each of the five measures of body fat/body mass by gender, race, age, and paygrade. Attention is given to branch of service comparisons and to comparisons between BMI and the two circumference-based body fat measures.

TITLE: Health and Nutrition Profile of Women in the Navy

AUTHORS: Laurel L. Hourani, Ph.D., and Linda K. Trent, M.A., Naval Health Research Center

MEETING: Assessing Readiness in Military Women: The Relationship to Nutrition. A Workshop Sponsored by Committee on Body Composition, Nutrition and Health of Military Women, Food and Nutrition Board, Institute of Medicine, Irvine, CA, September, 1996

This overview will draw from three large survey studies of active-duty Navy men and women conducted over the last 12 years. The first, a mailed survey of nutrition knowledge and practices, found that women had better diets and higher nutrition knowledge scores than did men. Knowledge scores were positively associated with healthful dietary choices. White women reported significantly better diets and higher knowledge scores than did nonwhites. While 9% of the women exceeded the Navy's percent body fat (%BF) standard (cutpoint = 30% fat for women), 47% of the sample perceived themselves as being overweight, and 60% were attempting to lose weight. More nonwhites exceeded the body fat standard, yet there was no difference in the percentage of white and nonwhite women who felt that they were overweight. Among those trying to lose weight, whites relied equally on calorie reduction and increased physical activity, whereas nonwhites were more likely to diet rather than exercise to lose weight. Feelings of helplessness with regard to eating behavior (e.g., "I have no willpower") were associated with poorer dietary choices. There were no significant differences between the within-standards and out-of-standards groups on nutrition knowledge, overeating, helplessness, or diet scores, though the small sample of overweight women (N = 23) might have precluded attaining statistical significance in the analyses.

The second study, currently in progress, involves the longitudinal follow-up of several earlier Navywide samples, originally surveyed between 1983 and 1989, then contacted again in 1994 if the member was still on active duty. Results for a cohort of 97 women tracked over 10 years revealed that, although there was an increase in mean %BF and in the percentage of women exceeding standards, the women's aerobic and muscular fitness had also increased significantly, as measured by age- and sex-adjusted Physical Readiness Test (PRT) scores for run and situps. In general, however, a significant negative relationship was observed between %BF and PRT performance. Although some researchers have found lean body mass (LBM) to be a more promising index of military performance than %BF, LBM was not related to any of the PRT elements in this sample. An overview of the health habits of these women revealed 31% smokers and an average weekly intake of 3-4 alcoholic drinks. The women were physically active (approximately 1,300 calories expended per week in exercise), and 33% received overall PRT ratings of Excellent or Outstanding. Dietary choices favored fruits, vegetables, and grains over meat and dairy products, and healthful food choices over poorer ones. Yet analyses failed to show a relationship between the overall diet score and physical fitness, body composition, medical visits, or self-perceived health.

A third large study, the 1995 Perceptions of Wellness and Readiness Assessment (POWR), surveyed a representative sample of over 10,000 Navy and Marine Corps men and women. In addition to self-reported dietary behaviors and values, a clinically-based telephone interview of 784 active-duty personnel provided DSM-III diagnoses of eating disorders. Preliminary analyses showed that both Navy and Marine Corps women had higher scores than men on many positive dietary behaviors such as eating breakfast, taking

vitamins and eating healthier foods; however, they also considered themselves overweight, wanted to lose weight, had tried to lose weight in the past year, had changed their eating patterns due to a medical condition, took diet pills in the part year, were unsatisfied with their eating patterns, and ate in secret. The combination of the last two items, taken from the Eating Disorders Index, was shown to be a good predictor of bulimia. Prevalence rates for bulimia of 1.5 and 1.2 (lifetime and recent diagnoses, respectively), were obtained with the Quick Diagnostic Interview Schedule; all cases being among women.

TITLE: Occupational Exposure and Reproductive Health in the U.S. Navy and Marine Corps: Preliminary Findings from the 1995 Perceptions or Wellness and Readiness Assessment (POWR'95).

AUTHORS: Laurel Hourani, Ph.D., and Huixing Yuan, Ph.D.

MEETING: 124th Annual Meeting of the American Public Health Association, New York, NY, November 20, 1996. (Accepted but not presented).

The majority of active duty women are at the peak of their reproductive years and reproductive issues are becoming of greater importance to military leaders as the percentage of women increases in the military. In addition to a lack of baseline data regarding pregnancy rates, timing, motivation, access to health care, and outcome, other occupational (chemical, radiological and biologic) exposures associated with their new duties are of concern. It has been suggested that a number of reproductive health hazards such as electromagnetic radiation, lead exposure, heavy lifting, and organic solvents are present across naval and marine commands. This aim of this proposal is to present information on reproductive history, existing gynecological and obstetrical (OB/GYN) conditions, and occupational exposures from the 1995 Perceptions of Wellness and Readiness Assessment, a comprehensive population-based self-report survey of 10,000 active-duty Navy and Marine Corps personnel worldwide. In addition, perceptions, attitudes, and health care use patterns regarding existing utilization of OB/GYN facilities and services will be examined. Multivariate logistic regression will analyze overall and occupational exposure-specific differentials in pregnancy outcomes and gynecologic conditions controlling for sociodemographic, and protective gear use and availability.

TITLE: Health Promotion Research Reduces Health Risks

AUTHORS: Laurel L. Hourani, Ph.D., M.P.H., Linda K. Trent, M.A., Suzanne Hurtado, M.P.H., and Susan Hilton, M.A., Naval Health Research Center

MEETING: U.S. Surgeon General's Leaders Conference, Crystal City, Virginia, August 1966

(Please see attached exhibit)

Naval Health Research Center

San Diego, California

Health Promotion Research Reduces Health Risks

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Suzanne L. Hurtado, M.P.H.
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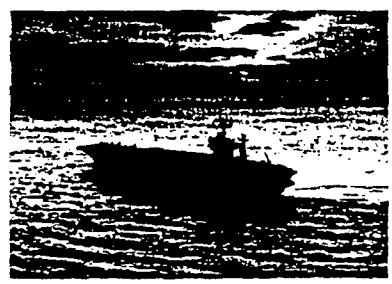
Division of Health Sciences
Health Sciences and Epidemiology Department

Abstract

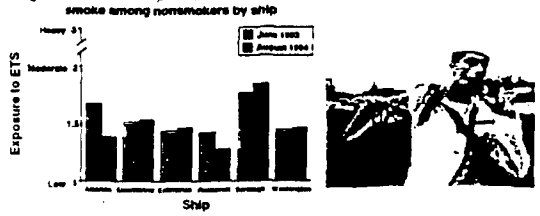
The Division of Health Sciences at the Naval Health Research Center conducts research in support of the U.S. Navy Surgeon General's strategic goal of readiness. The Division's mission is to optimize physical and mental health and readiness through health promotion research, disease prevention, and behavioral interventions. Significant contributions have been made in areas such as alcohol abuse, physical fitness, weight management, tobacco use, cardiovascular risks, and health care delivery. Recent accomplishments include research demonstrating that the Navy could reduce the length of its costly inpatient alcohol treatment program from 6 to 4 weeks without any loss of program efficacy. Another study which surveyed crew members aboard 6 Atlantic Fleet aircraft carriers found that exposure to environmental tobacco smoke significantly decreased during a time of tighter shipboard smoking restrictions. The special health needs of military women have been addressed in the 1995 Perceptions of Wellness and Readiness Assessment, a major study of the Defense Women's Health Research Program. This study has surveyed over 10,000 Navy and Marine Corps women and men to obtain detailed baseline data on a wide range of physical and mental conditions and their risk factors. The Division is the only group in the Navy currently conducting comprehensive health promotion research and evaluation.

Tobacco Use



A recent study in tobacco use focused on exposure to environmental tobacco smoke (ETS) and cigarette use aboard six aircraft carriers. Participants were 9,996 crew members who voluntarily completed a tobacco survey in 1993 and 8,348 crew members who completed another tobacco survey in 1994. Overall, exposure to ETS among nonsmokers significantly decreased over time. Considering the aircraft carriers individually, there were significant decreases in overall ETS exposure (Fig. 1), frequency of exposure, how bothersome ETS was, and the level of discomfort caused by ETS over time among nonsmokers aboard USS America (CV 66) and USS Theodore Roosevelt (CVN 71). There was no change in the overall percentage of smokers over time (34% in both 1993 and 1994). In general, there were positive increases in attitudes regarding the fairness and consistency of enforcement of the smoking restrictions. Results suggest that there were more consistent reductions in ETS among ships that had greater declines in the number of designated smoking areas over time; however, there was no evidence of increased smoking cessation during the time of the tighter smoking restrictions.

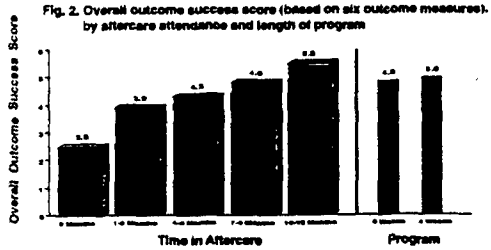
Fig. 1. Mean overall exposure to environmental tobacco smoke among nonsmokers by ship



Alcohol Abuse

An evaluation of the Navy's residential alcohol treatment program was conducted in which baseline and one-year follow-up data were collected for 2,823 active-duty inpatients. Baseline questionnaires captured demographic data, personal history, and clinical profile. Follow-up data included alcohol use, behavior problems, job performance, recommendation for reenlistment, and quality of life. Approximately 68% of the alcohol study participants remained abstinent during the first year after leaving the treatment program. The best predictor of treatment success was the number of months that a participant had attended aftercare meetings such as Alcoholics Anonymous (Fig. 2). That is, the longer the aftercare attendance, the better the outcomes in terms of drinking, job performance, and retention on active duty. These results suggest that alcohol program managers should consider focusing resources on aftercare support. The study also found that a 4-week treatment program was as effective as a 6-week program (Fig. 2.). Thus, the Navy can enjoy considerable cost savings by reducing the standard length of stay in treatment from 6 to 4 weeks without sacrificing treatment quality and effectiveness.

Fig. 2. Overall outcome success score (based on six outcome measures), by aftercare attendance and length of program



Women's Health

A comprehensive, population-based health and risk factor assessment, the Perceptions of Wellness and Readiness study, has surveyed over 10,000 Navy and Marine Corps women and men, obtained anthropometric and physical measurements on over 2,000 participants, and obtained approximately 800 detailed mental health telephone interviews. The prevalence of specific diseases, risk factors, and comparative estimates are currently being analyzed in the following health areas: reproductive history, medical history, health behaviors, mental health, environmental exposures, and health care utilization. This comprehensive study makes comparisons of risk factors possible between men and women and military personnel and civilians. It also establishes baseline data from which to evaluate trends and identify and address women's health and readiness issues.

LIST OF NHRC STAFF AND CONTRACT PERSONNEL RECEIVING PAY FROM CONTRACT SUPPORT*

NHRC STAFF

Laurel Lockwood Hourani, Ph.D., M.P.H., Principal Investigator	50%
Linda Trent, M.A., Associate Investigator	10%
Suzanne Hurtado, M.P.H., Associate Investigator	5%
Sue Hilton, M.A., Data Manager	25%

NHRC CONTRACT PERSONNEL

Diane Sorenson, M.P.H., Research Asst, Body Measurement Team Leader	100%
Lynn Powers, Ph.D., Telephone Interviewer Team Leader	20%
Cynthia Simon-Arndt, M.A., Research Asst, Team Member	20%
Ian Gocka, M.S., Statistician	50%
Wendy Graham, Ph.D., Team Member	20%
Brian Appleton, Retired Military, Team Member	20%
John Overland, Computer Specialist/Programmer	100%
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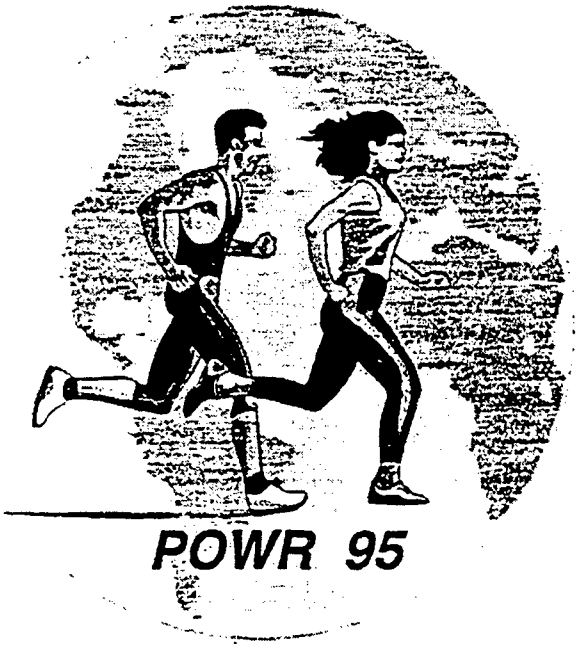
* 3 Parttime Military Personnel, 1 Military Liasion Officer, 2 Team Members received travel and overhead from study funds but not pay

Appendix A

1995 POWR Assessment:
Perceptions of Wellness and Readiness Questionnaire

1995 *POWR* Assessment: Perceptions of Wellness and Readiness



DEPARTMENT OF THE NAVY
NAVAL HEALTH RESEARCH CENTER
SAN DIEGO, CA

PRIVACY ACT STATEMENT

1. Authority. 5 USC 301, 10 USC 1071. OPNAV 6000-15a-c, 11/30/95. 2. Purpose. Medical research information will be collected to enhance basic medical knowledge concerning medical care and health promotion. 3. Routine use. Medical research information will be used in statistical analyses by the Department of the Navy, Defense, and other U.S. Government agencies, provided this is compatible with the purpose for which information was collected. Use of the information may be granted to non-Government agencies by the Chief, Bureau of Medicine and Surgery, in accordance with the provisions of the Freedom of Information Act. 4. Voluntary disclosure. I understand that all information derived from the study will be retained at the Naval Health Research Center, San Diego, and that my anonymity will be maintained. I voluntarily agree to its disclosure to agencies or individuals identified in the preceding section, and I have been informed that failure to agree to such disclosure may negate the purposes of the study. I understand that my provision of information is voluntary, and that I am free to discontinue filling out the questionnaire and withdraw from the study at any time without prejudice or loss of medical treatment or privileges to which I would otherwise be entitled.

ABOUT THIS QUESTIONNAIRE

WHY ME?

You have been selected at random to be a part of the group of people who represent all active duty Navy and Marine Corps personnel. Enough people were selected to participate in this survey so that valid conclusions can be made about the health status of military personnel and the appropriateness of military health services.

WHY SHOULD I BOTHER? DO SURVEYS CHANGE ANYTHING?

In general, statistics from surveys provide valuable information to policymakers and planners about your health and health care services. Survey data help to identify parts of our health care system that work well and the parts that need to be improved. Changes to the system may take time, but filling out this survey will help ensure that we make changes as quickly as possible. Your response counts!

WILL MY SURVEY RESULTS BE KEPT PRIVATE?

Yes. Under no circumstances will any information about individuals be released to anyone. Any identifiable information will be used only by persons engaged in, and for the purposes of, the survey. A number will be given to each questionnaire and only that number will be used in analyses. Moreover, the results will be derived from pooled data and no individual's responses will be identifiable.

AREN'T SOME OF THE QUESTIONS VERY PERSONAL?

Yes. Although people will have different views on what is or is not personal, most people will consider at least some of the questions to be very personal. We are asking questions to evaluate the health of military members and the health care they receive. Good estimates can be made only if most people answer all the questions in the survey. However, you can choose not to answer particular items.

MARKING INSTRUCTIONS

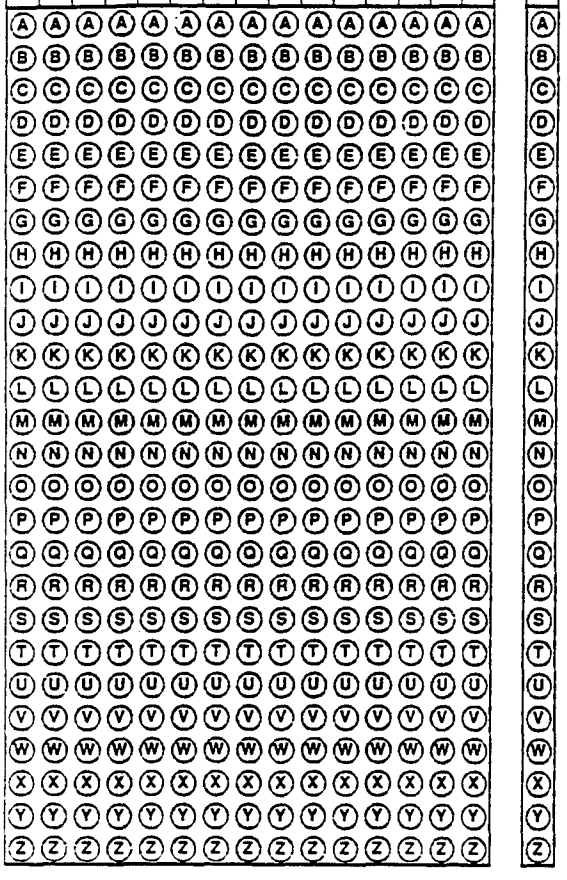
- USE A NO. 2 PENCIL.
- MAKE HEAVY MARKS THAT FILL THE CIRCLE FOR YOUR ANSWER.
- ERASE CLEANLY ANY MARKS YOU WISH TO CHANGE.
- PLEASE DO NOT MAKE STRAY MARKS OF ANY KIND.

CORRECT MARK ○●○○

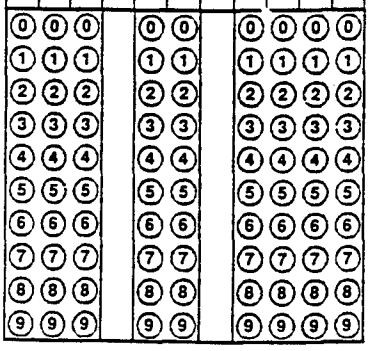
INCORRECT MARKS ⊘⊗◔◕

DEMOGRAPHIC DATA

1. **LAST NAME** / **FI**



2. **SOCIAL SECURITY NUMBER**



3. **TODAY'S DATE**

MO	DAY	YEAR
01	01–31	00–99

4. **HEIGHT**

FT	IN
4	0
5	1
6	2
7	3
	4
	5
	6
	7
	8
	9
	10
	11

5. **WEIGHT**

POUNDS
000–444

6. **What age were you on your last birthday?**

AGE YRS
00–99

7. **BIRTHDAY**

MO	DAY	YEAR
01	01–31	00–99

8. **MARITAL STATUS**

- ◯ Married
- ◯ Living as married
- ◯ Separated and not living as married
- ◯ Divorced and not living as married
- ◯ Widowed and not living as married
- ◯ Single, never married and not living as married

9. **TOTAL TIME IN SERVICE**

YRS	MOS
00–55	00–11

10. **SEX**

- Male ◯
- Female ◯

11. **HIGHEST LEVEL OF EDUCATION**

- ◯ 11 years or less
- ◯ GED or ABE certificate
- ◯ High school graduate
- ◯ Trade or technical school
- ◯ Some college
- ◯ 4-year college degree
- ◯ Graduate or professional study but no degree
- ◯ Graduate or professional degree

12. **RACE/ETHNIC GROUP**

- ◯ White - not Hispanic
- ◯ Black - not Hispanic
- ◯ Hispanic
- ◯ American Indian or Alaskan Native
- ◯ Asian
- ◯ Pacific Islander
- ◯ Filipino
- ◯ Other

13. **Is your spouse currently living with you at your present duty location?**

- ◯ Yes
- ◯ No
- ◯ Not applicable. I currently have no spouse or live-in partner

DEMOGRAPHIC DATA (CONTINUED)

14. PAY GRADE/ RANK

○ E-1	○ O-1
○ E-2	○ O-2
○ E-3	○ O-3
○ E-4	○ O-4
○ E-5	○ O-5
○ E-6	○ O-6
○ E-7	○ O-7
○ E-8	○ O-8
○ E-9	○ O-9
○ W-1	○ O-10
○ W-2	
○ W-3	
○ W-4	

If your rating abbreviation has <u>two</u> letters instead of three, use the first two columns, starting with the first box on the left.

15. ENLISTED RATING

○ Not rated or designated striker

A	A	A
B	B	B
C	C	C
D	D	D
E	E	E
F	F	F
G	G	G
H	H	H
I	I	I
J	J	J
K	K	K
L	L	L
M	M	M
N	N	N
O	O	O
P	P	P
Q	Q	Q
R	R	R
S	S	S
T	T	T
U	U	U
V	V	V
W	W	W
X	X	X
Y	Y	Y
Z	Z	Z

16. NOBC or NEC if enlisted

○ I don't know

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

17. Officer Designator Code

○ I don't know

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

18. Officer Primary Subspecialty Code

○ I don't know

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

19. Marine Corps MOS

○ I don't know

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

20. Member of which branch of service?

○ Navy ○ Marine Corps

21. To what type of command are you currently assigned?

○ CONUS Shore	○ OCONUS Submarine
○ CONUS Submarine	○ Overseas FMF
○ CONUS Ship	○ Overseas Non-FMF
○ OCONUS Shore	○ CONUS FMF
○ OCONUS Ship	○ CONUS Non-FMF

22. What is the approximate total time you have served aboard ship counting all time on all ships on which you have served?

Yrs.	Mos.
0 0	0
1 1	1
2 2	2
3 3	3
4 4	4
5 5	5
6 6	6
7 7	7
8 8	8
9 9	9
	10
	11

23. What is the approximate total time you have been deployed counting all time on all ships on which you have served?

Yrs.	Mos.
0 0	0
1 1	1
2 2	2
3 3	3
4 4	4
5 5	5
6 6	6
7 7	7
8 8	8
9 9	9
	10
	11

24. Did you serve with the military in any of the following areas? ***(Mark all that apply)***

	No	Yes, Aboard ship	Yes, Ashore
a. Persian Gulf -- Operation Desert Shield	○	○	○
b. Persian Gulf -- Operation Desert Storm	○	○	○
c. Somalia -- Operation Restore Hope	○	○	○
d. Bangladesh	○	○	○
e. Haiti	○	○	○
f. Other foreign areas	○	○	○

MEDICAL HISTORY

25. Has a health care provider ever told you that you had any of the following? *(If yes, please answer question 26.)*				26. If yes, what was your age at first diagnosis?				
	No, Never	Yes, Recovered	Yes, Still have	0 - 16 Years	17 - 24 Years	25 - 34 Years	35 - 44 Years	45+ Years
a. Asthma	○	○	○	○	○	○	○	○
b. Chronic bronchitis	○	○	○	○	○	○	○	○
c. Emphysema	○	○	○	○	○	○	○	○
d. Chronic rhinitis or hay fever	○	○	○	○	○	○	○	○
e. Other allergies	○	○	○	○	○	○	○	○
f. Positive skin test for tuberculosis	○	○	○	○	○	○	○	○
g. Skin cancer	○	○	○	○	○	○	○	○
h. Breast cancer	○	○	○	○	○	○	○	○
i. Cervical cancer	○	○	○	○	○	○	○	○
j. Other cancer	○	○	○	○	○	○	○	○
k. Heart disease	○	○	○	○	○	○	○	○
l. Hypertension (high blood pressure)	○	○	○	○	○	○	○	○
m. High cholesterol	○	○	○	○	○	○	○	○
n. Heart murmur	○	○	○	○	○	○	○	○
o. Other heart problems	○	○	○	○	○	○	○	○
p. Anemia	○	○	○	○	○	○	○	○
q. Varicose veins	○	○	○	○	○	○	○	○
r. Scrotal varices (varicose vein in scrotum)	○	○	○	○	○	○	○	○
s. Hernia or rupture	○	○	○	○	○	○	○	○
t. Hemorrhoids	○	○	○	○	○	○	○	○
u. Other blood circulation problems	○	○	○	○	○	○	○	○
v. Ulcer	○	○	○	○	○	○	○	○
w. Bowel or intestinal trouble (e.g. colitis)	○	○	○	○	○	○	○	○
x. Gallstones	○	○	○	○	○	○	○	○
y. Thyroid disease	○	○	○	○	○	○	○	○
z. Diabetes	○	○	○	○	○	○	○	○
aa. Hepatitis (Jaundice)	○	○	○	○	○	○	○	○
bb. Other liver problem	○	○	○	○	○	○	○	○
cc. Urinary tract infection	○	○	○	○	○	○	○	○
dd. Repeated kidney infections	○	○	○	○	○	○	○	○
ee. Kidney stones	○	○	○	○	○	○	○	○
ff. Other bladder trouble	○	○	○	○	○	○	○	○
gg. Pelvic inflammatory disease (PID)	○	○	○	○	○	○	○	○
hh. Gonorrhea ("clap")	○	○	○	○	○	○	○	○
ii. Syphilis	○	○	○	○	○	○	○	○
jj. Chlamydia	○	○	○	○	○	○	○	○
kk. Herpes or genital warts	○	○	○	○	○	○	○	○
ll. Sterility/infertility	○	○	○	○	○	○	○	○
mm. Arthritis	○	○	○	○	○	○	○	○
nn. Neuralgia	○	○	○	○	○	○	○	○
oo. Anorexia or bulimia (eating disorder)	○	○	○	○	○	○	○	○
pp. Migraines	○	○	○	○	○	○	○	○
qq. Head injury (involving stitches or unconsciousness)	○	○	○	○	○	○	○	○
rr. Depression	○	○	○	○	○	○	○	○
ss. Other psychological condition	○	○	○	○	○	○	○	○
tt. Speech problems	○	○	○	○	○	○	○	○
uu. Hearing loss/problems	○	○	○	○	○	○	○	○
vv. Vision impairment/problems	○	○	○	○	○	○	○	○
ww. Peridontal disease (gum disease)	○	○	○	○	○	○	○	○
xx. Other (please specify) _____	○	○	○	○	○	○	○	○

CURRENT MEDICAL CONDITIONS:

27. Have you experienced any of the conditions listed below any time in the past 30 days regardless of whether or not they resulted in a visit to sick call or a health care provider? (Please check NO or YES for every condition) ***(If yes, please answer question 28.)***

28. If yes, what did you do?

	No	Yes	Nothing	Self Care	Seek Medical Care
a. Common cold symptoms	○	○	○	○	○
b. Dizziness	○	○	○	○	○
c. Chills	○	○	○	○	○
d. Cough	○	○	○	○	○
e. Sore throat	○	○	○	○	○
f. Fever	○	○	○	○	○
g. Flu	○	○	○	○	○
h. Diarrhea lasting at least 3 days	○	○	○	○	○
i. Stomach problems	○	○	○	○	○
j. Constipation	○	○	○	○	○
k. Indigestion	○	○	○	○	○
l. Nausea/vomiting	○	○	○	○	○
m. Sinus trouble	○	○	○	○	○
n. Hay fever	○	○	○	○	○
o. Shortness of breath	○	○	○	○	○
p. Hoarseness	○	○	○	○	○
q. Sleeping problems	○	○	○	○	○
r. Headaches	○	○	○	○	○
s. Skin problems	○	○	○	○	○
t. Muscle sprain or strain	○	○	○	○	○
u. Back problems	○	○	○	○	○
v. Ringing in the ears	○	○	○	○	○
w. Irritated eyes	○	○	○	○	○
x. Trouble seeing with one or both eyes even if wearing glasses	○	○	○	○	○
y. Teeth/gum/dental problems	○	○	○	○	○
z. Broken bones	○	○	○	○	○
aa. Other (please specify) _____	○	○	○	○	○

29. Was there any time when you used a fair amount of any of these medications? Include both prescribed and nonprescribed medications for the last 30 days and the last 12 months.

	In the last 30 days		In the last 12 months	
	Yes	No	Yes	No
a. Allergy pills	○	○	○	○
b. Aspirin or other pain killers	○	○	○	○
c. Diet pills	○	○	○	○
d. Laxatives	○	○	○	○
e. Sleeping pills	○	○	○	○
f. Stomach medicine	○	○	○	○
g. Tranquilizers (Valium, Librium)	○	○	○	○
h. Antibiotics	○	○	○	○
i. Antimalarial pills	○	○	○	○
j. Pyridostigmine (pills to protect you from a chemical weapon attack)	○	○	○	○
k. Other anti-CBW pills or agents	○	○	○	○
l. Prescribed medicine for psychological condition	○	○	○	○
m. Ciprofloxacin (Cipro or anti-anthrax pills)	○	○	○	○
n. Other medicine	○	○	○	○
o. Other vaccine	○	○	○	○

HEALTH PERCEPTIONS:

30. In general, would you say your health is:

- ○ Excellent
- ○ Very good
- ○ Good
- ○ Fair
- ○ Poor

31. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	Yes	No
a. Cut down the amount of time you spent on work or other activities	○	○
b. Accomplished less than you would have liked	○	○
c. Were limited in the kind of work or other activities you could do	○	○
d. Had difficulty performing the work or other activities (took extra effort)	○	○

32. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	Yes	No
a. Cut down the amount of time you spent on work or other activities	○	○
b. Accomplished less than you would have liked	○	○
c. Didn't do work or other activities as carefully as usual	○	○

33. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

- ○ Not at all
- ○ Slightly
- ○ Moderately
- ○ Quite a bit
- ○ Extremely

34. How much bodily pain have you had during the past 4 weeks?

- ○ None
- ○ Very mild
- ○ Mild
- ○ Moderate
- ○ Severe
- ○ Very Severe

35. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

- ○ Not at all
- ○ A little bit
- ○ Moderately
- ○ Quite a bit
- ○ Extremely

36. How much of the time during the past 4 weeks:

	None of the time	A little of the time	Some of the time	A good bit of the time	Most of the time	All of the time
a. Did you feel full of pep?	○	○	○	○	○	○
b. Did you have a lot of energy?	○	○	○	○	○	○
c. Did you feel worn out?	○	○	○	○	○	○
d. Did you feel tired?	○	○	○	○	○	○

37. During the past 4 weeks, how much of the time have your physical or emotional problems interfered with your social activities (like visiting with friends, relatives,etc.)?

- ○ All of the time
- ○ Most of the time
- ○ Some of the time
- ○ A little of the time
- ○ None of the time

38. How true or false is each of the following statements for you?

	Definitely false	Mostly false	Don't know	Mostly true	Definitely true
a. I seem to get sick a little easier than other people I know.	○	○	○	○	○
b. I am as healthy as anybody I know.	○	○	○	○	○
c. I expect my health to get worse.	○	○	○	○	○
d. My health is excellent.	○	○	○	○	○
e. I don't have the time to be ill.	○	○	○	○	○
f. I sometimes allow myself to be ill.	○	○	○	○	○
g. I don't have a choice about being ill.	○	○	○	○	○
h. I can will myself not to become ill.	○	○	○	○	○
i. I wait until the last minute to seek medical care.	○	○	○	○	○

EMOTIONS

39. Below is a list of ways you might have felt or behaved. Please indicate how often you have felt this way during the past 7 days.

	Rarely or none of the time (less than 1 day)	Some or a little of the time (1 - 2 days)	Occasionally or a moderate amt. of time (3 - 4 days)	Most or all of the time (5 - 7 days)
a. I was bothered by things that usually don't bother me.	○	○	○	○
b. I did not feel like eating; my appetite was poor.	○	○	○	○
c. I felt I could not shake off the blues even with help from my family or friends.	○	○	○	○
d. I felt that I was just as good as other people.	○	○	○	○
e. I had trouble keeping my mind on what I was doing.	○	○	○	○
f. I felt depressed.	○	○	○	○
g. I felt that everything I did was an effort.	○	○	○	○
h. I felt hopeful about the future.	○	○	○	○
i. I thought my life had been a failure.	○	○	○	○
j. I felt fearful.	○	○	○	○
k. My sleep was restless.	○	○	○	○
l. I was happy.	○	○	○	○
m. I talked less than usual.	○	○	○	○
n. I felt lonely.	○	○	○	○
o. People were unfriendly.	○	○	○	○
p. I enjoyed life.	○	○	○	○
q. I had crying spells.	○	○	○	○
r. I felt sad.	○	○	○	○
s. I felt that people disliked me.	○	○	○	○
t. I could not get "going".	○	○	○	○

40. How have you felt during the past 7 days including today? Use the following scale to describe how distressing you have found the following things over this time.

	Not at all	A little	Quite a bit	Extremely
a. Difficulty in speaking when you are excited	○	○	○	○
b. Trouble remembering things	○	○	○	○
c. Worried about sloppiness or carelessness	○	○	○	○
d. Blaming yourself for things	○	○	○	○
e. Pains in the lower part of your back	○	○	○	○
f. Feeling lonely	○	○	○	○
g. Feeling blue	○	○	○	○
h. Your feelings being easily hurt	○	○	○	○
i. Feeling others do not understand you or are unsympathetic	○	○	○	○
j. Feeling that people are unfriendly or dislike you	○	○	○	○
k. Having to do things very slowly in order to be sure you are doing them right	○	○	○	○
l. Feeling inferior to others	○	○	○	○
m. Soreness in your muscles	○	○	○	○
n. Having to check and double check what you do	○	○	○	○
o. Hot or cold spells	○	○	○	○
p. Your mind going blank	○	○	○	○
q. Numbness or tingling in parts of your body	○	○	○	○
r. A lump in your throat	○	○	○	○
s. Trouble concentrating	○	○	○	○
t. Weakness in parts of your body	○	○	○	○
u. Heavy feeling in your arms and legs	○	○	○	○

QUALITY OF LIFE

	Pleased/Delighted	Mostly satisfied	Mixed	Mostly dissatisfied	Terrible/Unhappy
41. How do you feel about your job?	○	○	○	○	○
42. How do you feel about yourself?	○	○	○	○	○
43. How do you feel about your own personal life?	○	○	○	○	○
44. How do you feel about your life as a whole?	○	○	○	○	○

STRESS

45. **Think about your life over the past 7 days. On the whole, how much stress do you think is in your life right now?**

- ○ None at all
- ○ A little bit
- ○ Moderate amount
- ○ Quite a bit
- ○ Extreme amount

46. **Over the past 7 days, stress has affected *my personal life*:**

- ○ Not at all
- ○ A little bit
- ○ Moderate amount
- ○ Quite a bit
- ○ Extreme amount

47. **Over the past 7 days, stress has affected *my performance* on the job:**

- ○ Not at all
- ○ A little bit
- ○ Moderate amount
- ○ Quite a bit
- ○ Extreme amount

48. **Over the past 7 days, how well have you coped with stress?**

- ○ Very poorly
- ○ Somewhat poorly
- ○ In-between (neutral)
- ○ Somewhat well
- ○ Very well

HEALTH CARE

49. **Please indicate how many times you went to a military medical facility for your own health care during the past 12 months. (Mark one response in each row)**

	Number of times											11 or more
a. Illness or injury	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
b. Follow-up for illness or injury	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
c. General physical exam	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
d. Prescription refill only	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
e. Eye exam only	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
f. Prenatal care	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
g. Same day surgery	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
h. Mental health	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
i. Emergency care	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
j. Other type of care (please specify type of care)	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

_____

50. **Please indicate how many times you went to a civilian doctor's office or outpatient clinic for your own health care during the past 12 months. (Mark one response in each row)**

	Number of times											11 or more
a. Illness or injury	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
b. Follow-up for illness or injury	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
c. General physical exam	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
d. Prescription refill only	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
e. Eye exam only	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
f. Prenatal care	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
g. Same day surgery	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
h. Mental health	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
i. Emergency care	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
j. Other type of care (please specify type of care)	⓪	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

_____

51. Please take a moment to recall your visit(s) to a military medical facility. Then mark one response that describes the strength of your agreement or disagreement with the following statements.

	Not applicable	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. The doctor (or Corpsman, etc.) seemed warm and friendly to me.	○	○	○	○	○	○
b. The doctor (or Corpsman, etc.) seemed interested in me as a person.	○	○	○	○	○	○
c. I felt the doctor (or Corpsman, etc.) did not treat me with appropriate respect.	○	○	○	○	○	○
d. The doctor (or Corpsman, etc.) seemed to take my problem seriously.	○	○	○	○	○	○

52. On your last non-OB/GYN visit to a military medical facility, how satisfied were you with each of the following?

	Not applicable	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
a. The quality of medical services provided.	○	○	○	○	○	○
b. The amount of time it took you to get to the medical facility	○	○	○	○	○	○
c. The amount of time you waited at the facility to see a health care provider	○	○	○	○	○	○
d. The priority you were shown as an active-duty member	○	○	○	○	○	○
e. The priority you were shown when you had orders to deploy	○	○	○	○	○	○
f. The variety of medical services available to you	○	○	○	○	○	○
g. The type of medical professionals that you saw	○	○	○	○	○	○
h. The amount of privacy you had during the visit	○	○	○	○	○	○
i. The consideration and respect shown to you	○	○	○	○	○	○
j. The timeliness of the follow-up care	○	○	○	○	○	○

53. When you go to a military medical facility, who is the primary person who treats you?

- ○ Doctor
- ○ Physician's assistant
- ○ Corpsman
- ○ Nurse
- ○ Other

54. After you arrive at a military medical facility, how long do you typically have to wait to see a doctor or other health care professional?

- ○ Less than 5 minutes
- ○ At least 5 minutes, but less than 15 minutes
- ○ At least 15 minutes, but less than half an hour
- ○ At least half an hour, but less than an hour
- ○ At least one hour
- ○ Two or more hours

55. Can you ask someone in the military medical system questions about a health concern on the telephone?

- ○ Yes
- ○ No
- ○ Don't know

SELF CARE

56. How often do you do a testicular self exam?

- ○ Monthly
- ○ Once every few months
- ○ Rarely/Never
- ○ Not applicable

57. About how long has it been since you had a rectal exam?

- ○ Less than 1 year
- ○ 1 year
- ○ 2 years
- ○ 3 or more years
- ○ Never had exam

58. How often do you examine your breasts for lumps?

- ○ Monthly
- ○ Once every few months
- ○ Rarely or never
- ○ Not applicable

LIFESTYLE

59. Do you consider yourself now to be:

- ○ Overweight
- ○ Underweight
- ○ About the right weight

60. Would you like to weigh:

- ○ Less
- ○ More
- ○ Stay about the same

61. During the past 12 months, have you tried to lose weight?

- ○ Yes
- ○ No

62. During the past 12 months, have you changed what you eat because of any medical condition?

- ○ Yes
- ○ No

63. Are you satisfied with your eating patterns?

- ○ Yes
- ○ No

64. Do you ever eat in secret?

- ○ Yes
- ○ No

65. During the past 7 days, approximately how many days did you:

	DAYS
a. Eat breakfast	⓪ ① ② ③ ④ ⑤ ⑥ ⑦
b. Eat snacks between meals	⓪ ① ② ③ ④ ⑤ ⑥ ⑦
c. Overeat	⓪ ① ② ③ ④ ⑤ ⑥ ⑦
d. Not eat enough	⓪ ① ② ③ ④ ⑤ ⑥ ⑦
e. Take vitamin pills	⓪ ① ② ③ ④ ⑤ ⑥ ⑦
f. Take anti-oxidants	⓪ ① ② ③ ④ ⑤ ⑥ ⑦

66. During the past 7 days, approximately how many times did you:

	More than 7 times per week	4 - 6 times per week	1 - 3 times per week	Never
a. Eat high-fat meats or dairy (e.g. hamburger, hot dogs, steak, bacon, whole milk, cheese, ice cream)	○	○	○	○
b. Eat fried foods (e.g. french fries, fried chicken, fried eggs)	○	○	○	○
c. Eat refined sugar products (e.g. cakes, pies, cookies, candies)	○	○	○	○
d. Eat low-fat meats or dairy (e.g. chicken or turkey without skin, low-fat milk, yogurt)	○	○	○	○
e. Eat 'leafy' vegetables (e.g. broccoli, cabbage, greens)	○	○	○	○
f. Eat 'starchy' vegetables (e.g. beans, peas, corn, potatoes)	○	○	○	○
g. Eat fruits (e.g. apples, oranges, raisins, dried fruit, melons, bananas)	○	○	○	○
h. Eat high fiber foods (whole grain breads, cereals, bran)	○	○	○	○

67. Are you interested in hearing/reading about nutrition?

- ○ Yes, very much
- ○ Yes, sometimes
- ○ Don't really care
- ○ No, not usually
- ○ No, not at all

68. How important do you feel that diet is in terms of your health?

- ○ Probably the most important factor
- ○ Very important, but not the primary factor
- ○ Important
- ○ Not very important
- ○ Of little or no consequence

69. How important to you are the following considerations when you purchase foods?

	Extremely important	Very important	Moderately important	Somewhat important	Not at all important
a. Health benefits, nutritional value	○	○	○	○	○
b. Price, cost	○	○	○	○	○
c. Likes or dislikes, eating enjoyment	○	○	○	○	○
d. Convenience, easy to prepare	○	○	○	○	○
e. Calories	○	○	○	○	○

70. During the past 30 days, on the average, how many hours of sleep did you get per night?

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ or more

71. In an average 7 days, how many times do you engage in exercise or work that lasts at least 20 minutes without stopping and that is hard enough to make you breathe heavier and make your heart beat faster?

- ○ Less than 1 time per week
- ○ 1 or 2 times per week
- ○ At least 3 times per week

72. How long have you been on the exercise or work schedule in question 71?

- ○ Less than 1 month
- ○ 1 - 3 months
- ○ 4 - 11 months
- ○ 1 - 2 years
- ○ 3 - 4 years
- ○ 5+ years

73. How would you rate your current physical fitness?

- ○ Poor
- ○ Fair
- ○ Good
- ○ Very good
- ○ Excellent

74. Have you smoked at least 100 cigarettes in your entire life? (That would be 5 or more packs in your entire life.)

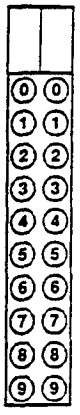
- ○ Yes
- ○ No

75. How would you describe your cigarette smoking habits?

- ○ Never smoked
- ○ Current smoker
- ○ Former smoker

76. During the past 30 days, how many cigarettes did you usually smoke on a typical day?

○ Did not smoke cigarettes in the last 30 days



77. How many times have you tried to quit smoking?

⓪①②③④⑤⑥⑦⑧⑨+

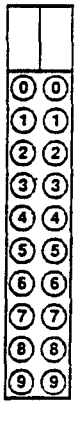
○ Did not ever smoke

78. If you quit, was it because you had a health problem that was caused or made worse by smoking?

○ Quit due to health problem
○ Quit due to other reason
○ Never quit
○ Never smoked

79. If you quit, on average, how many cigarettes did you smoke a day when you last smoked every day?

○ Did not smoke cigarettes in the last 30 days



80. How many years have you used *(or did you use)* any form of tobacco on a regular basis? Do not count any time when you quit using tobacco.

○ Never used tobacco
○ Less than one year
○ 1 year
○ 2 years
○ 3 years
○ 4 years
○ 5 years
○ 6 years
○ 7 years
○ 8 years
○ 9 years
○ 10 years
○ 11 years
○ 12 years
○ 13 years
○ 14 years
○ 15+ years

81. How many cigars and/or pipes do you usually smoke per day?

NUMBER

⓪①②③④⑤⑥⑦⑧⑨⑩+

82. How many times per day do you usually use smokeless tobacco? (Chewing tobacco, snuff, pouches, etc.)

NUMBER

⓪①②③④⑤⑥⑦⑧⑨⑩+

83. During the past 7 days, on the average, how many caffeinated beverages did you have per day? (cola, coffee, tea)

NUMBER

⓪①②③④⑤⑥⑦⑧⑨⑩⑪⑫⑬+

84. During the past 30 days, how much alcohol did you drink on a typical day? (Consider a single shot, single mixed drink, glass of wine, or can of beer as one drink.)

○ 18 or more drinks
○ 15 - 17 drinks
○ 12 - 14 drinks
○ 9 - 11 drinks
○ 8 drinks
○ 7 drinks
○ 6 drinks
○ 5 drinks
○ 4 drinks
○ 3 drinks
○ 2 drinks
○ 1 drink
○ Didn't drink any alcohol in the past 30 days

LIFESTYLE (CONTINUED)

85. During the past 30 days, on how many days did you drink alcoholic beverages?

- ○ 28 - 30 days (about every day)
- ○ 20 - 27 days (5 - 6 days a week, average)
- ○ 11 - 19 days (3 - 4 days a week, average)
- ○ 4 - 10 days (1 - 2 days a week, average)
- ○ 2 - 3 days in the past 30 days
- ○ Once in the past 30 days
- ○ Didn't drink any alcohol in the past 30 days

86. How many sexual partners have you had in the last six months?

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ or more

87. What birth control method(s) do you currently use? ***(Mark all that apply)***

- a. ○ Tubal ligation
- b. ○ Vasectomy
- c. ○ Norplant
- d. ○ Depo-Provera
- e. ○ Birth control pills
- f. ○ IUD
- g. ○ Diaphragm
- h. ○ Condom
- i. ○ Spermicide (foam, jelly, cream, suppositories)
- j. ○ Sponge
- k. ○ Douche
- l. ○ Withdrawal
- m. ○ Rhythm
- n. ○ Abstinence
- o. ○ Other (please specify) _____
- p. ○ None

88. If you do not use birth control, please indicate reason: ***(Mark all that apply)***

- a. ○ Religious/moral beliefs
- b. ○ My partner's preference
- c. ○ Inconvenient/interferes with spontaneity
- d. ○ Want to get pregnant
- e. ○ Other (please specify) _____
- f. ○ Use birth control/abstinent

HEALTH PROMOTION SERVICE

89. During the past 12 months, if I had needed it, counseling was readily available to me on:

	Do not know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
a. Quitting smoking	○	○	○	○	○	○
b. Alcohol abuse	○	○	○	○	○	○
c. Drug abuse	○	○	○	○	○	○
d. Birth control/family planning	○	○	○	○	○	○
e. Weight control	○	○	○	○	○	○
f. Stress management	○	○	○	○	○	○

FRIENDS AND FAMILY

90. How many close friends do you have (people that you feel at ease with, can talk to about private matters, and can call for help)?

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ or more

91. How many relatives do you have that you feel close to?

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ or more

92. How many of these friends or relatives do you see at least once a month?

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ or more

93. Are you a member of any social clubs or groups?

- ○ Yes
- ○ No

94. Are you an active member of a church, temple, or other religious organization?

- ○ Yes
- ○ No

95. How often have you asked the advice of relatives or friends about your marriage?

- ○ Never
- ○ Seldom
- ○ Several times
- ○ Often
- ○ Very often
- ○ Not married

96. How often have you gone to a doctor, counselor or clergyman for marriage problems?

- ○ Never
- ○ Seldom
- ○ Several times
- ○ Often
- ○ Very often
- ○ Not married

97. How much time do you spend thinking about marriage problems?

None		Some		A lot	Not Married
①	②	③	④	⑤	⑥

98. I am definitely satisfied with my marriage

- ○ Strongly agree
- ○ Agree
- ○ Neutral (undecided)
- ○ Disagree
- ○ Strongly disagree
- ○ Not married

99. How many children (natural, adopted, stepchildren, or grandchildren) under the age of 21 live in your household? ***(Mark all that apply)***

Children's age	None	1	2	3	4	5+
a. Less than 6 weeks old	⓪	①	②	③	④	⑤
b. 6 weeks to under 1 year	⓪	①	②	③	④	⑤
c. 12 to 23 months	⓪	①	②	③	④	⑤
d. 24 to 35 months	⓪	①	②	③	④	⑤
e. 3 to 5 years	⓪	①	②	③	④	⑤
f. 6 to 9 years	⓪	①	②	③	④	⑤
g. 10 to 12 years	⓪	①	②	③	④	⑤
h. 13 to 15 years	⓪	①	②	③	④	⑤
i. 16 to 20 years	⓪	①	②	③	④	⑤

100. How old were you when your first child was born?

○ No children

AGE

⓪	⓪
①	①
②	②
③	③
④	④
⑤	⑤
⑥	⑥
⑦	⑦
⑧	⑧
⑨	⑨

PSYCHOSOCIAL

101. In the last year, how many serious personal losses or difficult problems have you had to handle (e.g., promotion passover, divorce/separation, legal or disciplinary action, bankruptcy, death of someone close, serious illness/injury of a loved one, etc.)?

- ○ Several
- ○ Some
- ○ Few
- ○ None

102. Have you seriously considered suicide within the last 2 years?

- ○ Yes
- ○ Yes, within the last year
- ○ Yes, within the last 2 months
- ○ No

103. How often do you have any serious problems dealing with your husband or wife, parents, friends, or with your children?

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

104. How often did you experience a major pleasant change in the last year (for example, promotion, marriage, birth, award, etc.)?

- ○ Often
- ○ Sometimes
- ○ Seldom
- ○ Never

105. What causes the biggest problem in your life? ***(Darken only one circle)***

- ○ Money
- ○ Social life
- ○ Family
- ○ Supervisor
- ○ Job
- ○ Health
- ○ No problem

PSYCHOSOCIAL (CONTINUED)

106. **Were you abused prior to entering the military?** ***(Mark all that apply)***

a. ○ Yes, emotionally abused
b. ○ Yes, sexually abused
c. ○ Yes, physically abused
d. ○ No, not abused

107. **Since entering the military, have you been abused?** ***(Mark all that apply)***

a. ○ Yes, emotionally abused
b. ○ Yes, sexually abused
c. ○ Yes, physically abused
d. ○ No, not abused

108. **If abused either prior to entering the military or after entering the military, have you ever received treatment?**

○ Yes
○ No
○ Not applicable

	Strongly disagree	Disagree	Agree	Strongly agree
109. I feel that I'm a person of worth at least on an equal basis with others.	○	○	○	○
110. I feel that I have a number of good qualities.	○	○	○	○
111. All in all, I'm inclined to feel that I am a failure.	○	○	○	○
112. I am able to do things as well as others.	○	○	○	○
113. I feel I do not have much to be proud of.	○	○	○	○
114. I take a positive attitude towards myself.	○	○	○	○
115. On the whole I am satisfied with myself.	○	○	○	○
116. I wish I could have more respect for myself.	○	○	○	○
117. I certainly feel useless at times.	○	○	○	○
118. At times I think I'm no good at all.	○	○	○	○

TEMPERAMENT

A number of statements people use to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you generally feel.

	Almost always	Often	Sometimes	Almost never
119. I am quick-tempered.	○	○	○	
120. I have a fiery temper.	○	○	○	
121. I am a hotheaded person.	○	○	○	
122. I get angry when I am slowed down by others' mistakes.	○	○	○	
123. I feel annoyed when I am not given recognition for doing good work.	○	○	○	
124. I fly off the handle.	○	○	○	
125. When I get mad, I say nasty things.	○	○	○	
126. It makes me furious when I am criticized in front of others.	○	○	○	
127. When I get frustrated, I feel like hitting someone.	○	○	○	
128. I feel infuriated when I do a good job and get a poor evaluation.	○	○	○	
129. I feel irritated.	○	○	○	
130. I feel angry.	○	○	○	
131. People who think they are always right irritate me.	○	○	○	
132. I get annoyed when I am singled out for correction.	○	○	○	
133. My blood boils when I am pressured.	○	○	○	
134. I feel pleasant.	○	○	○	
135. I feel nervous and restless.	○	○	○	
136. I feel satisfied with myself.	○	○	○	
137. I wish I could be as happy as others seem to be.	○	○	○	
138. I feel like a failure.	○	○	○	
139. I feel rested.	○	○	○	
140. I feel "calm, cool, and collected".	○	○	○	
141. I feel that difficulties are piling up so much that I cannot overcome them.	○	○	○	
142. I worry too much over something that really doesn't matter.	○	○	○	
143. I am happy.	○	○	○	
144. I have disturbing thoughts.	○	○	○	
145. I lack self-confidence.	○	○	○	
146. I feel secure.	○	○	○	
147. I make decisions easily.	○	○	○	
148. I feel inadequate.	○	○	○	
149. I am content.	○	○	○	
150. Some unimportant thought runs through my mind and bothers me.	○	○	○	
151. I take disappointments so keenly that I can't put them out of my mind.	○	○	○	
152. I am a steady person.	○	○	○	
153. I get in a state of tension or turmoil as I think over my recent concerns and interests.	○	○	○	

WORK

154. How often are you bothered by each of the following in your work?

	Nearly all the time	Rather often	Sometimes	Rarely	Not at all
a. Not having enough help and equipment to get the job done well	○	○	○	○	○
b. Feeling you have too much responsibility for the work of others	○	○	○	○	○
c. Thinking that you'll not be able to meet the conflicting demands of various people you work with	○	○	○	○	○
d. Having to do or decide things where mistakes could be quite costly	○	○	○	○	○
e. Not knowing just what the people you work with expect from you	○	○	○	○	○
f. Thinking that the amount of work you have to do may interfere with how well it gets done	○	○	○	○	○
g. Feeling that you have to do things on the job that are against your better judgement	○	○	○	○	○
h. Feeling that your job tends to interfere with your family life	○	○	○	○	○
i. Feeling unable to influence your immediate supervisor's decisions and his/her actions that affect you	○	○	○	○	○
j. Having to deal with or satisfy too many different people	○	○	○	○	○
k. Being asked to work overtime when you don't want to	○	○	○	○	○
l. Feeling trapped in a job you don't like but can't change and can't get out of	○	○	○	○	○

The following ask you about how you feel about your present job <u>overall</u>.

155. Overall, how satisfied would you say you are with your present job?

- ○ Not at all satisfied
- ○ Not too satisfied
- ○ Somewhat satisfied
- ○ Very satisfied

156. Knowing what you know now, if you had to decide all over again whether to join the military, what would you decide?

- ○ Decide definitely not to join
- ○ Have some second thoughts
- ○ Decide without hesitation to join

157. In general, how well would you say that your regular military job measures up to the sort of job you wanted when you took it?

- ○ Very much like
- ○ Somewhat like
- ○ Not very much like

158. If a good friend told you he/she was interested in working in a job like your regular military job, what would you tell him/her?

- ○ Advise him/her against it
- ○ Have doubts about recommending it
- ○ Strongly recommend it

159. How sad/happy do you feel about your job?

Happy ① ② ③ ④ ⑤ ⑥ Sad

CASUALTY EVENTS

Exposure to a disaster or violence can sometimes have long-term effects. The following questions will help to provide a baseline history of exposure to disasters or violence that may help in studying these effects.

160. Have you ever been exposed to a natural disaster involving injuries or fatalities? (e.g., earthquakes, fire, flood, etc.)
(Mark all that apply)

- a. ○ Yes, witnessed
- b. ○ Yes, survivor/victim
- c. ○ Yes, participated in aid, clean-up, rescue, or investigation
- d. ○ No

161. Have you even been exposed to combat or violence involving injuries or fatalities? ***(Mark all that apply)***

- a. ○ Yes, witnessed
- b. ○ Yes, survivor/victim
- c. ○ Yes, used deadly force as a part of my military job
- d. ○ Yes, participated in aid, clean-up, rescue, or investigation
- e. ○ No

162. Have you ever witnessed or been involved in a major accident involving injuries or fatalities?
(Mark all that apply)

- a. ○ Yes, witnessed
- b. ○ Yes, survivor/victim
- c. ○ Yes, participated in aid, clean-up, rescue, or investigation
- d. ○ No

ENVIRONMENTAL/OCCUPATIONAL HEALTH

163. Is protective gear available for your use in your current job? Examples of protective gear are gloves, respirator, filter, mask, boots, ear plugs, film badge, hazardous materials suit and fire fighting suit.

- ○ Yes
- ○ No
- ○ Sometimes
- ○ Not applicable

164. When you have contact with substances that might be harmful, how often do you use protective gear?

- ○ Never
- ○ Some of the time
- ○ Most of the time
- ○ Always
- ○ Not applicable

165. Which reasons for not wearing protective gear are the most true for you? *(Mark all that apply)*

- a. ○ It doesn't work properly
- b. ○ It interferes with job performance
- c. ○ It is uncomfortable
- d. ○ I don't know how to use it
- e. ○ It is not needed
- f. ○ None, always wear protective gear
- g. ○ Not applicable

166. During the past 30 days, have you been exposed to tobacco smoke for an hour or more a day in your immediate work or living area?

- ○ Not exposed
- ○ Work area only
- ○ Living area only
- ○ Both work and living area

167. Are you currently in one or more of the following medical surveillance programs? *(Mark all that apply)*

- a. ○ Asbestos
- b. ○ Noise
- c. ○ Lead
- d. ○ Chromium
- e. ○ Cadmium
- f. ○ Non-ionizing radiation
- g. ○ Ionizing radiation
- h. ○ Other _____
- i. ○ None

168. For all jobs or hobbies you have had, indicate the known health hazards that are/were present and the number of years you have been/were exposed.

Exposure	5 years or more	3 - 4 years	1 - 2 years	Less than 1 year	Not exposed
a. Fibrous glass (fiberglass)	○	○	○	○	○
b. Asbestos	○	○	○	○	○
c. Coal dust or rock dust	○	○	○	○	○
d. Silica powder or sandblasting dust	○	○	○	○	○
e. Other specific dusts (woods, talc, lime)	○	○	○	○	○
f. Respiratory or skin irritants	○	○	○	○	○
g. Chemicals (acids, alkalis, solvents)	○	○	○	○	○
h. Metal fumes (from molten metal)	○	○	○	○	○
i. Welding fumes	○	○	○	○	○
j. Coal tar, pitch, asphalt's	○	○	○	○	○
k. Engine exhaust, grease, oils, fuel	○	○	○	○	○
l. Heat (severe)	○	○	○	○	○
m. Cold (severe)	○	○	○	○	○
n. Noise (loud)	○	○	○	○	○
o. Non-ionizing radiation	○	○	○	○	○
p. Ionizing radiation (X-rays, etc.)	○	○	○	○	○
q. Vibration (vibrating tools, motors)	○	○	○	○	○
r. General shop dust	○	○	○	○	○
s. Pesticides, herbicides	○	○	○	○	○
t. Acids	○	○	○	○	○
u. Alcohol's (industrial)	○	○	○	○	○
v. Other (please specify)	○	○	○	○	○

ENVIRONMENTAL/OCCUPATIONAL HEALTH continued →

169. Have you been exposed to any of the following in the past 12 months:

(If you answer "yes" to any question, please complete all items on that line.)

If yes, average:

		No	Yes	No. of MONTHS exposed (1 = 0-6, 2 = 7-12, 3 = 13-24, 4 = 25-36)	No. of DAYS exposed per month (1 = 1-2, 2 = 3-5, 3 = 6-14, 4 = 15+)	No. of HOURS exposed per day (1 = 0-2, 2 = 3-5, 3 = 6-8, 4 = 9-13, 5 = 14+)
a.	Adhesives or gluing compounds	○	○	①②③④	①②③④	①②③④⑤
b.	Asbestos (loose)	○	○	①②③④	①②③④	①②③④⑤
c.	Carbon monoxide	○	○	①②③④	①②③④	①②③④⑤
d.	Diesel exhaust (within 50 ft)	○	○	①②③④	①②③④	①②③④⑤
e.	Diesel fuel (within 50 ft)	○	○	①②③④	①②③④	①②③④⑤
f.	Dry cleaning solvent	○	○	①②③④	①②③④	①②③④⑤
g.	Exhaust from gasoline engine	○	○	①②③④	①②③④	①②③④⑤
h.	Gasoline (liquid or vapor)	○	○	①②③④	①②③④	①②③④⑤
i.	Guided missile fuel	○	○	①②③④	①②③④	①②③④⑤
j.	High temperature (above 95° F)	○	○	①②③④	①②③④	①②③④⑤
k.	Hypodermic needles (used)	○	○	①②③④	①②③④	①②③④⑤
l.	Insecticides	○	○	①②③④	①②③④	①②③④⑤
m.	Jet exhaust (within 50 ft)	○	○	①②③④	①②③④	①②③④⑤
n.	Jet fuel (within 50 ft)	○	○	①②③④	①②③④	①②③④⑤
o.	Loud noise (jets, etc)	○	○	①②③④	①②③④	①②③④⑤
p.	Lifting 25 - 49 pounds	○	○	①②③④	①②③④	①②③④⑤
q.	Lifting 50 or more pounds	○	○	①②③④	①②③④	①②③④⑤
r.	Low temperature (below 32° F)	○	○	①②③④	①②③④	①②③④⑤
s.	Metal scrapings or filings	○	○	①②③④	①②③④	①②③④⑤
t.	Microwave oven (within 3 ft)	○	○	①②③④	①②③④	①②③④⑤
u.	Paint, (oil based), or thinner	○	○	①②③④	①②③④	①②③④⑤
v.	Paint, unknown type	○	○	①②③④	①②③④	①②③④⑤
w.	Paint scrapings or paint sanding	○	○	①②③④	①②③④	①②③④⑤
x.	Radar antenna or array (within 50 ft)	○	○	①②③④	①②③④	①②③④⑤
y.	Solvent or degreaser	○	○	①②③④	①②③④	①②③④⑤
z.	Torpedo fuel	○	○	①②③④	①②③④	①②③④⑤
aa.	Transmitting antennas (within 50 ft)	○	○	①②③④	①②③④	①②③④⑤
bb.	Nuclear reactor (within 50 ft)	○	○	①②③④	①②③④	①②③④⑤
cc.	Nuclear fuel	○	○	①②③④	①②③④	①②③④⑤
dd.	Nuclear ordnance	○	○	①②③④	①②③④	①②③④⑤
ee.	Nuclear medicines (radioisotopes)	○	○	①②③④	①②③④	①②③④⑤
ff.	Video display terminal	○	○	①②③④	①②③④	①②③④⑤
gg.	Welding fumes	○	○	①②③④	①②③④	①②③④⑤
hh.	Dust particles	○	○	①②③④	①②③④	①②③④⑤
ii.	Explosives (non-nuclear)	○	○	①②③④	①②③④	①②③④⑤
jj.	Nitrous oxide	○	○	①②③④	①②③④	①②③④⑤
kk.	Ethylene dibromide (EDB)	○	○	①②③④	①②③④	①②③④⑤
ll.	Perchlorethylene (PERC)	○	○	①②③④	①②③④	①②③④⑤

If you are MALE: ***Please STOP here. Please complete the special handout page. Place the completed handout and questionnaire in the enclosed postage-free envelope. Thank you for your time and cooperation.***

If you are FEMALE: ***We would appreciate it if you would take a few extra minutes to answer some addtional questions about health issues for women.***

SUPPLEMENT FOR WOMEN

This section is to report female-specific conditions that you had during the past 3 months, whether or not they resulted in a visit to sick call or a health care provider.

170. Did you have any of these conditions?

	Yes	No
a. Bleeding between periods	○	○
b. Cramps or pain during menstrual period requiring medication or time off of work	○	○
c. Excessive frequency of periods (time between periods too short)	○	○
d. Heavy periods (excessive menstrual flow)	○	○
e. Period lasting longer than a week	○	○
f. Missed period	○	○
g. No menstrual periods for 2 or more months	○	○
h. Scanty menstrual flow	○	○
i. Abdominal pain (from known cysts)	○	○
j. Abdominal pain (from other unknown cause)	○	○
k. Endometriosis	○	○
l. Discharge from breast	○	○
m. Breast lump	○	○
n. Premenstrual symptoms or pain (PMS, premenstrual cramps)	○	○
o. Vaginal rash, discharge, or other disorder except yeast infection or sexually transmitted diseases	○	○
p. Yeast or vaginal infection	○	○
q. Problem with uterus (womb)	○	○

171. If you missed a period in the last 30 days, have you had a pregnancy test?

- ○ Yes
- ○ No, not yet
- ○ No, hysterectomy
- ○ No, menopausal
- ○ No, other
- ○ Not applicable/Did not miss a period

172. At what age did your menstrual cycles begin?

- ○ Younger than 10 years old
- ○ 10 - 12 years old
- ○ 13 - 15 years old
- ○ 16+ years old
- ○ Don't know

173. What is the total number of years you have taken birth control pills in your lifetime?

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ or more

174. During the past 30 days, have you taken replacement estrogens?

- ○ No
- ○ Yes, hormone pills
- ○ Yes, hormone creams or other hormone preparation such as the skin patch

175. Have you had a mammogram in the past 5 years?

- ○ Yes
- ○ No

176. How long has it been since you had a Pap smear?

- ○ Less than 1 year
- ○ 1 year
- ○ 2 years
- ○ 3 years or more
- ○ Never had a Pap smear

177. Have you ever had a Pap smear where the result was NOT normal?

- ○ Yes
- ○ No
- ○ Don't know

178. About how long has it been since you had your breasts examined by a physician or nurse?

- ○ Less than 1 year
- ○ 1 year
- ○ 2 years
- ○ 3 years or more
- ○ Never had breasts examined

179. Have you received training from a medical provider on breast self-exam (BSE)?

- ○ Yes
- ○ No

180. Have you ever had an operation to remove a lump from your breast that was found to be noncancerous?

- ○ Yes
- ○ No

SUPPLEMENT FOR WOMEN continued ⟶

SUPPLEMENT FOR WOMEN (CONTINUED)

181. For your last OB/GYN visit in a military medical facility, how satisfied were you with each of the following?

	Not applicable	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
a. The quality of medical services provided	○	○	○	○	○	○
b. The amount of time it took you to get to the medical facility	○	○	○	○	○	○
c. The amount of time you waited at the facility to see a health care provider	○	○	○	○	○	○
d. The priority you were shown as an active-duty member	○	○	○	○	○	○
e. The priority you were shown when you had orders to deploy	○	○	○	○	○	○
f. The variety of medical services available to you	○	○	○	○	○	○
g. The type of medical professionals whom you saw	○	○	○	○	○	○
h. The amount of privacy you had during the visit	○	○	○	○	○	○
i. The consideration and respect shown to you	○	○	○	○	○	○
j. The timeliness of follow-up care	○	○	○	○	○	○

182. Do you know where to get information about pregnancy and possible risks from your job and job environment?

- ○ Yes
- ○ No
- ○ Not applicable

183. When you are pregnant, do you feel there are enough OB/GYN trained personnel available to see you when necessary?

- ○ Yes
- ○ No
- ○ Not applicable

184. When you are pregnant, do you feel you are given enough time off from your job to be seen in OB/GYN when necessary?

- ○ Yes
- ○ No
- ○ Not applicable

185. While on OCONUS orders, has it been difficult to receive the kind of OB/GYN care you would like?

- ○ Yes
- ○ No
- ○ Not applicable

PREGNANCY HISTORY

186. How many times have you been pregnant?

- ○ 0 Never
- ○ 1 time
- ○ 2 times
- ○ 3 times
- ○ 4 times
- ○ 5 times
- ○ 6 times
- ○ 7 times
- ○ 8 times
- ○ 9 or more times

187. Have you been pregnant in the past 12 months?

- ○ Yes
- ○ No

188. Have you become pregnant since coming on active duty?

- ○ Yes
- ○ No

189. Are you pregnant now?

- ○ Yes
- ○ No
- ○ Not sure

190. If yes, was this a planned pregnancy?

- ○ Yes
- ○ No
- ○ Not applicable

191. In the past 12 months, have you had:

	Yes	No	Not Applicable
a. Problems becoming pregnant?	○	○	○
b. Pregnancy complications?	○	○	○
c. A miscarriage/spontaneous abortion?	○	○	○
d. An elected abortion?	○	○	○
e. A stillbirth?	○	○	○
f. Childbirth problems? (e.g. hemorrhaging, Cesarean section, induced labor)	○	○	○
g. Post-partum complications	○	○	○

192. How happy or unhappy would you be if you were to become pregnant in the next year?

- ○ Extremely happy
- ○ Moderately happy
- ○ Neither happy nor unhappy
- ○ Moderately unhappy
- ○ Extremely unhappy

PREGNANCY HISTORY continued ——→

PREGNANCY HISTORY (CONTINUED)

193. How convenient or inconvenient would it be for you to get pregnant in the next year?

- ○ Extremely convenient
- ○ Moderately convenient
- ○ Neither convenient nor inconvenient
- ○ Moderately inconvenient
- ○ Extremely inconvenient

194. How many live births have you had?

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ or more

195. Were any of the babies born prematurely or under 5 pounds?

- ○ Yes
- ○ No
- ○ Not applicable

196. Did any of the babies stay in the hospital after you came home?

- ○ Yes
- ○ No
- ○ Not applicable

197. Did you breast feed at least one of your children?

- ○ Yes
- ○ No
- ○ Not applicable

198. How healthy would you say your children are relative to other children their age?

- ○ Less healthy
- ○ Same
- ○ More healthy
- ○ Not applicable

Thank you for the extra effort to complete these questions. Please take a moment to complete the special handout page. Place the completed handout and questionnaire in the enclosed postage-free envelope. Thank you for your time and cooperation.

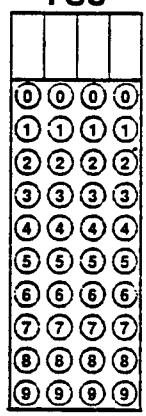
YOUR COMMENTS ON THIS SURVEY ARE WELCOME

We have attempted to be thorough in examining issues that are related to your health and the health care you receive. If you have comments that may help us to better understand your experience with the military health system, please write them in the space below.

If your comments concern a particular question, be sure to write the question and page number before your comment.

THIS BLOCK FOR OFFICE USE ONLY

FSU



Nucleus Installation: _____

Survey Phase

I ○ II ○

DO NOT WRITE IN THIS AREA

14803

Appendix B

POWR 1995 Measurement Form

POWR 1995 MEASUREMENT FORM

ID: _ _ _ _ _ _ _ _ _ _ SEX: M F BIRTHDAY: _ _ _ _ _ _ Date: _ _ _ _ _ _
Mo Day Yr Mo Day Yr

BLOOD PRESSURE:

SYSTOLIC DIASTOLIC (Machine # _____)

1. _____/_____ mmHG 2. _____/_____ mmHG 3. _____/_____ mmHG

AVERAGE _____/_____ mmHG

HEART RATE:

1. _ _ _ bp 2. _ _ _ bpm 3. _ _ _ bpm

AVERAGE _ _ _ bpm

Blood pressure refused? Yes No Reason right arm not used? _____

STATURE:

1. Weight: _ _ _._ KG _ _ _._ LBS (Scale # _____)
2. Height: _ _ _._ CM _ _ _._ IN

Is female pregnant? Yes No

CIRCUMFERENCES	Measurement 1	Measurement 2	AVERAGE
3. Waist (women): Abdomen (men):	_ _ _._cm	_ _ _._cm	_ _ _._cm
4. Hip:	_ _ _._cm	_ _ _._cm	_ _ _._cm
5. Neck:	_ _ _._cm	_ _ _._cm	_ _ _._cm

DOMINANT HANDGRIP STRENGTH:

6. Righthand: _ _._ KG _ _._ KG _ _._ KG **Highest:** _ _._ KG

OR

7. Lefthand: _ _._ KG _ _._ KG _ _._ KG **Highest:** _ _._ KG

SKINFOLDS:

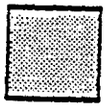
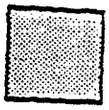
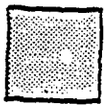
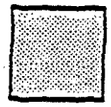
AVERAGE

8. Triceps: _ _._mm _ _._mm _ _._mm
9. Subscap: _ _._mm _ _._mm _ _._mm

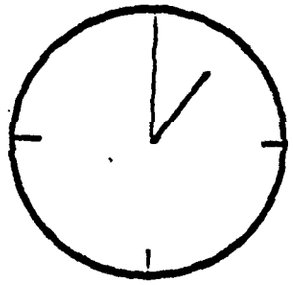
Appendix C

Quick Diagnostic Interview
Schedule III-R (Version 1.0)

(Questionnaire is not complete; the appendix includes only sections relevant to the telephone survey study.)

Quick Diagnostic Interview Schedule III-R



Version 1.0

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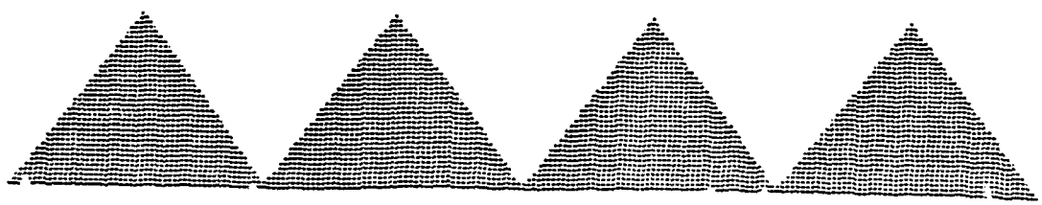

DEMOGRAPHICS

A1 Are you male or female?
1) MALE
2) FEMALE

A2 How old are you?

A4 Are you presently married or are you widowed, separated, divorced, or have you never been married?
1) MARRIED
2) WIDOWED
3) SEPARATED
4) DIVORCED
5) NEVER MARRIED

A9 Have you ever lived with someone for at least a year as though you were married?

A11 Have you had any children, not counting any who are yours by adoption or were born dead?

A11A Have you ever acted as a parent for children who were not your own natural children?

A13 Are you employed now?
1) YES
2) NO

A14 What is the highest grade in school you completed?
00-12 CODE ACTUAL GRADE
13 1 YR OF COLLEGE OR TECHNICAL SCHOOL
14 2 YRS COLLEGE
15 3 YRS COLLEGE
16 4 YRS COLLEGE: B.A., B.S.
17 POST GRAD. M.D., PH.D

A15 What ethnic group do you belong to?
1) AMERICAN INDIAN
2) ASIAN
3) PACIFIC ISLANDER
4) BLACK-NOT OF HISPANIC ORIGIN
5) BLACK-HISPANIC ORIGIN
6) WHITE-NOT OF HISPANIC ORIGIN
7) WHITE-HISPANIC ORIGIN
8) OTHER

TOBACCO

B1AA	Now I'm going to ask you some questions about using tobacco. Have you ever smoked cigarettes daily for a month or more?
B1AB	Did you smoke as many as 20 cigarettes per day during the period when you were smoking most?
B1BA	Have you ever smoked cigars daily for a month or more?
B1BB	Did you smoke as many as 3 cigars per day during the period when you were smoking most?
B1CA	Have you ever smoked a pipe daily for a month or more?
B1CB	Did you smoke as many as 4 pipes per day during the period when you were smoking most?
B1DA	Have you ever used snuff or chewed tobacco daily for a month or more?
B1DB	Did you do that as much as 4 times per day during the period when you were using most?
B3	Have you often had periods when you smoked a lot more or used a lot more tobacco than you intended to?
B4	Have you more than once wanted to quit or cut down on smoking or using tobacco?
B5	Have you ever tried to quit or cut down on smoking or using tobacco?
B6	Did you ever find you couldn't quit or cut down?
B7	Did you try to cut down several times?
B91	I'm going to ask you about some problems you might have had in the first day or two after you quit or cut down. For instance, did you crave tobacco?
B92	Were you irritable or angry?
B93	Were you nervous?
B94	Were you restless?
B95	Did you have trouble concentrating?
B99	Did your heart slow down?
B910	Did your appetite increase or did you gain weight?
B10	In weeks, what is the longest any of these problems from cutting down lasted?
B10A	Did you have these problems several times after cutting down?
B11	You said you've had problems with (INSERT POSITIVE SYMPTOMS HERE). Have you ever kept using tobacco or started up again to avoid any such problem or to avoid gaining weight or getting irritable?
B11X	Did you ever keep using tobacco or start up again to avoid problems like gaining weight or getting irritable?

B12 Did tobacco cause you any health problems like coughs, problems with your heart or blood pressure, or lung trouble?

B12A Did you continue to use tobacco after you knew it caused you health problems?

B13 Have you ever continued to smoke or use tobacco when you had a serious illness that you knew made it unwise to use tobacco?

B14 Did using tobacco make you nervous or jittery or cause you any other emotional or mental problems?

B14A Did you continue to use tobacco after you knew it caused you problems with your nerves?

B15 Have you ever given up or greatly reduced important activities like work or sports or associating with friends or relatives, so you could smoke or use tobacco?

B15A Have you repeatedly given up important activities to smoke or use tobacco or have you done so for at least a month?

RECTOB Within the last 12 months, have you smoked or used tobacco every day for a month or more?

SOMATIZATION

C36 Now I'm going to ask you some questions about your health. Has your physical health been pretty good or have you been sickly for the majority of your life?

1) PRETTY GOOD MOST OF LIFE
2) SICKLY MOST OF LIFE

AOC36 How old were you the FIRST time you considered yourself sickly?

ARC36 How old were you the LAST time you considered yourself sickly?

C1 Have you ever had a lot of trouble with abdominal or belly pain not counting times when you were menstruating?

AOC1 How old were you the FIRST time you had abdominal or belly pain?

ARC1 How old were you the LAST time you had abdominal or belly pain?

C2 Have you ever had a lot of trouble with back pain?

AOC2 How old were you the FIRST time you had back pain?

ARC2 How old were you the LAST time you had back pain?

C3 Have you ever had pains in the joints?

AOC3 How old were you the FIRST time you had pains in the joints?

ARC3 How old were you the LAST time you had pains in the joints?

C4 Have you ever had pains in your arms or legs other than in the joints?

AOC4 How old were you the FIRST time you had pains in your arms or legs?

ARC4 How old were you the LAST time you had pains in your arms or legs?

C5 Have you ever had chest pains?

AOC5 How old were you the FIRST time you had chest pains?

ARC5 How old were you the LAST time you had chest pains?

C7 Have you ever had a lot of trouble with excessively painful menstrual periods?

AOC7 How old were you the FIRST time you had painful menstrual periods?

ARC7 How old were you the LAST time you had painful menstrual periods?

C8 Have you ever had pain when you urinated, that is, passed your water?

AOC8 How old were you the FIRST time you had pain when you urinated?

ARC8 How old were you the LAST time you had pain when you urinated?

C9 Have you ever been completely unable to urinate, or pass water, or had great difficulty urinating for 24 hours or longer, other than after childbirth or surgery?

AOC9	How old were you the FIRST time you were unable to urinate?
ARC9	How old were you the LAST time you were unable to urinate?
C10	Have you ever had burning pain around your private parts?
AOC10	How old were you the FIRST time you had burning pain around your private parts?
ARC10	How old were you the LAST time you had burning pain around your private parts?
C11	Have you ever had pain anywhere else other than in the places we've already talked about?.
AOC11	How old were you the FIRST time you had these other pains?
ARC11	How old were you the LAST time you had these other pains?
C14	Have you ever had a lot of trouble with vomiting (*FEMALES:* when you were not pregnant)?
AOC14	How old were you the FIRST time you had trouble with vomiting?
ARC14	How old were you the LAST time you had trouble with vomiting?
C15	During any pregnancy did you vomit all through the pregnancy?
AOC15	How old were you the FIRST time you vomited throughout your pregnancy?
ARC15	How old were you the LAST time you vomited throughout your pregnancy?
C16	Have you ever had a lot of trouble with nausea—feeling sick to your stomach but not actually vomiting?
AOC16	How old were you the FIRST time you had trouble with nausea?
ARC16	How old were you the LAST time you had trouble with nausea?
C17	Have you ever had a lot of trouble with loose bowels or diarrhea?
AOC17	How old were you the FIRST time you had trouble with diarrhea?
ARC17	How old were you the LAST time you had trouble with diarrhea?
C18	Have you ever had a lot of trouble with excessive gas or bloating of your stomach or abdomen?
AOC18	How old were you the FIRST time you had trouble with excessive gas?
ARC18	How old were you the LAST time you had trouble with excessive gas?
C19	Have you found that there were several kinds of foods that you couldn't eat because they made you ill?
AOC19	How old were you the FIRST time you felt ill because of foods you ate?
ARC19	How old were you the LAST time you felt ill because of foods you ate?

C20 Have you ever been blind in one or both eyes where you couldn't see anything at all for a few seconds or more?

AOC20 How old were you the FIRST time you had blindness?

ARC20 How old were you the LAST time you had blindness?

C21 Has your vision ever become blurred for some period, when it wasn't just due to needing glasses or changing glasses?

AOC21 How old were you the FIRST time you had blurred vision?

ARC21 How old were you the LAST time you had blurred vision?

C22 Have you ever been deaf when you completely lost your hearing for a period of time?

AOC22 How old were you the FIRST time you became deaf?

ARC22 How old were you the LAST time you were deaf?

C23 Have you ever had trouble walking?

AOC23 How old were you the FIRST time you had trouble walking?

ARC23 How old were you the LAST time you had trouble walking?

C24 Have you ever been paralyzed—that is, completely unable to move a part of your body for at least a few minutes?

AOC24 How old were you the FIRST time you were paralyzed?

ARC24 How old were you the LAST time you were paralyzed?

C25 Was there ever a time when you lost your voice for 30 minutes or more and couldn't speak above a whisper?

AOC25 How old were you the FIRST time you lost your voice?

ARC25 How old were you the LAST time you lost your voice?

C26 Have your ever had a seizure or convulsion since you were 12 where you were unconscious and your body jerked?

AOC26 How old were you the FIRST time you had a seizure?

ARC26 How old were you the LAST time you had a seizure?

C27 Have you ever had fainting or falling out spells where you felt weak or dizzy and then passed out?

AOC27 How old were you the FIRST time you had a fainting spell?

ARC27 How old were you the LAST time you had a fainting spell?

C28 Have you ever been unconscious for any reason other than those already mentioned?

AOC28 How old were you the FIRST time you were unconscious?

ARC28 How old were you the LAST time you were unconscious?

C29 Have you ever had a period of amnesia—that is, a period of several hours or days where you couldn't remember anything afterwards about what happened during that time?

AOC29 How old were you the FIRST time you had amnesia?

ARC29 How old were you the LAST time you had amnesia?

C30 Have you ever had problems with double vision?

AOC30 How old were you the FIRST time you had double vision?

ARC30 How old were you the LAST time you had double vision?

C31 Have you ever had shortness of breath when you had not been exerting yourself?

AOC31 How old were you the FIRST time you had shortness of breath?

ARC31 How old were you the LAST time you had shortness of breath?

C32 Has your heart ever beat so hard that you could feel it pound in your chest?

C32A Has that happened only when you were exerting yourself or at other times too?
1) ONLY UPON EXERTION
2) OTHER TIMES TOO

AOC32 How old were you the FIRST time your heart beat hard when you were not exerting yourself?

ARC32 How old were you the LAST time your heart beat hard when you were not exerting yourself?

C33 Have you ever been bothered by dizziness?

AOC33 How old were you the FIRST time you were bothered by dizziness?

ARC33 How old were you the LAST time you were bothered by dizziness?

C34 Have you ever been bothered by periods of weakness, that is, when you could not lift or move things you could normally lift or move?

AOC34 How old were you the FIRST time you had periods of weakness?

ARC34 How old were you the LAST time you had periods of weakness?

C35 Have you ever felt as though there was a lump in your throat that made it difficult to swallow?

AOC35 How old were you the FIRST time you experienced a lump in your throat?

ARC35 How old were you the LAST time you experienced a lump in your throat?

C37 Other than your first year of menstruation, have your menstrual periods ever been irregular?

AOC37 How old were you the FIRST time you had irregular menstrual cycles?

ARC37 How old were you the LAST time you had irregular menstrual cycles?

C38 Have you ever had excessive bleeding with your menstrual periods?

AOC38 How old were you the FIRST time you had excessive bleeding?

ARC38 How old were you the LAST time you had excessive bleeding?

R22 In general, has your sex life been important to you or could you have gotten along as well without it?
1) SOMEWHAT IMPORTANT OR NO SEXUAL EXPERIENCE
2) GOTTEN ALONG AS WELL WITHOUT IT

R25 Has having sexual relations ever been physically painful for you?

AOR25 How old were you the FIRST time sexual relations were painful?

ARR25 How old were you the LAST time sexual relations were painful?

R27 Have you had any other kind of sexual difficulties (MALES: such as a period of two months or more when you had trouble having an erection)?

AOR27 How old were you the FIRST time you had sexual difficulties?

ARR27 How old were you the LAST time you had sexual difficulties?

RECSOM You said you have had problems or experiences with: (INSERT POSITIVE SYMPTOMS). Have you had a problem or experience like that within the last 12 months?

PANIC DISORDER

D1	Have you ever had a spell or attack when all of a sudden you felt frightened, anxious or very uneasy in situations when most people would not be afraid or anxious—that is when you were not in danger, or the center of attention or anything like that?
D3AI	During one of your worst spells of suddenly feeling frightened or anxious or uneasy, did you ever notice that you were short of breath—having trouble catching your breath?
D3BI	During this spell did your heart pound?
D3CI	During this spell were you dizzy or lightheaded?
D3DI	During this spell did you have tightness or pain in your chest?
D3EI	During this spell did your fingers or feet tingle?
D3FI	During this spell did you feel like you were choking?
D3GI	During this spell did you feel faint?
D3HI	During this spell did you sweat?
D3II	During this spell did you tremble or shake?
D3JI	During this spell did you have hot flashes or chills?
D3KI	During this spell did you or things around you seem unreal?
D3LI	During this spell were you afraid that you might die?
D3MI	During this spell were you afraid that you might act in a crazy way?
D3NI	During this spell did you have nausea?
D3OI	During this spell did you have belly pain?
D3PI	During this spell did you feel like you were smothering?
D7A	Have you ever had four or more of these spells within a four week period, that is, four or more spells where you felt anxious and had some of these other problems like (INSERT POSITIVE SYMPTOMS).
D8	After having an attack, did you ever have a month or more when you were afraid that you might have another attack?
D9	During at least several of your attacks of feeling frightened or anxious, did some of those problems begin suddenly, and get worse within the first few minutes of the attack?
RECPAN	You said you've had sudden attacks of being afraid or anxious during which you had problems like: (INSERT POSITIVE SYMPTOMS). Have you had a problem or experience like that within the last 12 months?

GENERALIZED ANXIETY

E1A Have you ever had a period of at least 6 months when you felt worried or anxious?

E2 During one of these periods, were you worrying about things that were unlikely to happen?

E2A Were you worrying a great deal over things that were not really serious?

E3 During any of those periods, did you have different worries on your mind at the same time?

E3A Were any of your worries about not having enough money or about bad things that might happen to family members or to you?

E3B Were all your worries about how you looked or behaved, or how you were feeling?
1) YES
2) NO, OTHER THINGS

E41 I'd like to ask you about other problems you might have had when you were worried and anxious—problems that could not be entirely explained by a physical illness or any medication, drugs or alcohol you had taken. When you were worried and anxious, were you also easily tired?

E42 When you were worried and anxious, were you also easily startled?

E43 When you were worried and anxious, were you also trembly or shaky?

E44 When you were worried and anxious, were you also restless?

E45 When you were worried and anxious, were you also bothered by tense, sore, or aching muscles?

E46 When you were worried and anxious, were you also having a lot of trouble keeping your mind on what you were doing?

E47 When you were worried and anxious, were you also keyed up or on edge?

E48 When you were worried and anxious, were you also particularly irritable?

E49 When you were worried and anxious, were you also sweating a lot?

E410 When you were worried and anxious, were you also aware of your heart pounding or racing?

E411 When you were worried and anxious, were you also having cold and clammy hands?

E412 When you were worried and anxious, were you also feeling dizzy or light-headed?

E413 When you were worried and anxious, were you also having a dry mouth?

E414 When you were worried and anxious, were you also having nausea or diarrhea?

E415 When you were worried and anxious, were you also having to urinate too frequently?

E416 When you were worried and anxious, were you also having hot flashes or chills?

E417 When you were worried and anxious, were you also short of breath or feeling like you were smothering?

E418 When you were worried and anxious, were you also having trouble swallowing?

E419 When you were worried and anxious, were you also having trouble falling asleep or staying asleep?

RECGAD You said that during a period of six months or more of feeling anxious and worried about several things, you also have had problems or experiences like: (INSERT POSITIVE SYMPTOMS). Have you had a month or more like that in the last 12 months?

AGORAPHOBIA

F1 Some people have such an unreasonably strong fear of being in a crowd, leaving home alone, traveling in buses, cars or trains, or crossing a bridge that they always get very upset in such a situation or avoid it altogether. Did you ever go through a period when being in such a situation always frightened you badly?

F4D When you were in any situation like that, did you ever feel dizzy, like you might fall?

F4E When you were in any situation like that, did you ever feel your heart pound?

F4F When you were in any situation like that, did you ever get nauseated or vomit?

F4G When you were in any situation like that, did you ever feel like you couldn't control your bodily functions?

F4I When you were in any situation like that, did you ever feel that you or things around you were unreal?

F8 Have you ever been unable to travel some place because of any of these fears?

RECAGP You said you feared situations like being in a crowd, or having to cross a bridge, or ride in public transportation, so much that you would (INSERT POSITIVE SYMPTOMS). Have you had a bad fear like that in the last 12 months?

SOCIAL PHOBIA

F11	Some people have such an unreasonable fear of speaking in public, or using public toilets, or eating or drinking in front of others, or writing while someone watches, that they avoid those things or feel extremely uncomfortable or uneasy about doing them. Have you ever had a strong unreasonable fear of doing any of those things?
F13	Did any of these fears continue for months or even years?
F14C	Did any of those fears or having to avoid those situations interfere with your life or activities a lot?
F15	Have you ever been very upset with yourself for having such a fear?
F16	Has an unreasonable fear of doing any of these things ever kept you from carrying out a task at work, taking on new responsibilities at work, or taking on a new job?
F17	When you had to do any of those things in public, did it almost always make you extremely nervous or panicky?
F17A	Did it sometimes?
F18	Has an unreasonable fear of doing any of these things ever kept you from going to a party, social event or meeting?
RECSCP	Have you had a problem with any of those fears within the last 12 months?

SIMPLE PHOBIA

F19 There are other things that frighten some people so much that they try to avoid them. Things like heights, flying, seeing blood, being near an insect, or a snake, or a bird, a rat, a cat, or a dog, getting a shot, being in an open space, hearing thunder or seeing lightning, or being in water. Have you ever had such an unreasonable fear of something like that, that you tried to avoid it?

F21 Did any of these fears continue for months or even years?

F22C Did any of those fears or having to avoid those situations interfere with your life or activities a lot?

F23 Have you ever been very upset with yourself for having such a fear?

F24 Has an unreasonable fear of any of these things ever kept you from carrying out a task at work, taking on new responsibilities at work, or taking on a new job?

F25 When you had to be in such a situation, did it almost always make you extremely nervous or panicky?

F25A Did it sometimes?

F26 Has an unreasonable fear of any of these things ever kept you from going to a party, social event or meeting?

RECSMP Have you had a problem with any of those fears within the last 12 months?

POST-TRAUMATIC STRESS

G1 A few people have terrible experiences that most people never go through — things like being attacked (*FEMALES:* or raped), being in a fire or flood or bad traffic accident, being threatened with a weapon, or seeing someone being badly injured or killed. Did something like this ever happen to you?

G1X Have you ever suffered a great shock because something like that happened to someone close to you?

G1A What was the worst thing that like this that you experienced?
1) MILITARY COMBAT
2) RAPE
3) BEING ATTACKED
4) SEEING SOMEONE HURT OR KILLED
5) BEING IN A FIRE, FLOOD OR OTHER DISASTER
6) BEING THREATENED WITH A WEAPON
7) BEING ALMOST KILLED OR BADLY HURT
8) BEING IN AN ACCIDENT
9) GETTING NEWS OF SOMEONE ELSE'S SUDDEN DEATH OR BAD ACCIDENT

G2A Bad experiences can cause changes in the way some people feel. You might or might not have experienced any of these changes. For example, did you keep remembering *EVENT** when you didn't want to?

G3A Did you keep having dreams or nightmares about it afterwards?

G4A Did you ever suddenly act or feel as though it was happening again, even though it wasn't?

G5A After *EVENT**, did you ever experience something that was similar or that reminded you of it?

G5AA Did that upset you very much?

G5BA Afterwards, when you would experience something that was similar to or reminded you of *EVENT**, did you sweat or did your heart beat fast or did you tremble?

G6A Did you go out of your way to avoid activities or situations that might have reminded you of it?

G7A After *EVENT** did you try hard not to think about it?

G8A Do you remember it well or is your memory blank for all or part of it?
1) REMEMBER WELL
2) BLANK FOR ALL OR PART OF IT

G9A Were you injured during *EVENT**?

G9AA Did you suffer a head injury as a result of it?

G9BA Were you unconscious for more than 10 minutes?

G10A After *EVENT**, did you lose interest in doing things that used to be important to you?

G11A Afterwards, did you find that you no longer had loving or warm feelings toward anyone?

G12A After *EVENT**, did you feel isolated or distant from other people?

G13A After *EVENT**, did you begin to feel that there was no point in thinking about the future anymore?

G14A Afterwards, did you have more trouble sleeping than is usual for you — either trouble falling asleep, or staying asleep?

G15A After *EVENT**, did you act unusually irritable or lose your temper a lot?

G16A Afterwards, did you have more trouble concentrating than is usual for you?

G17A After *EVENT**, did you become overly concerned about danger or overly careful and watchful?

G18A Afterwards, did you become jumpy or easily startled so that ordinary noises or movements would make you jump or put you on guard?

G20AA Did you continue to have any of these problems for at least a month because of *EVENT**?

G1B Have you had any other terrible or shocking experience?

G1B1 What did you experience?

1) MILITARY COMBAT
2) RAPE
3) BEING ATTACKED
4) SEEING SOMEONE HURT OR KILLED
5) BEING IN A FIRE, FLOOD OR OTHER DISASTER
6) BEING THREATENED WITH A WEAPON
7) BEING ALMOST KILLED OR BADLY HURT
8) BEING IN AN ACCIDENT
9) GETTING NEWS OF SOMEONE ELSE'S SUDDEN DEATH OR BAD ACCIDENT

G2B Did you keep remembering *EVENT2** when you didn't want to?

G3B Did you keep having dreams or nightmares about it afterwards?

G4B Did you ever suddenly act or feel as though it was happening again, even though it wasn't?

G5B After *EVENT2**, did you ever experience something that was similar or that reminded you of it?

G5AB Did that upset you very much?

G5BB Afterwards, when you would experience something that was similar to or reminded you of *EVENT2**, did you sweat or did your heart beat fast or did you tremble?

G6B Did you go out of your way to avoid activities or situations that might have reminded you of it?

G7B After *EVENT2** did you try hard not to think about it?

G8B Do you remember it well or is your memory blank for all or part of it?

1) REMEMBER WELL
2) BLANK FOR ALL OR PART OF IT

G9B Were you injured during *EVENT2**?

G9AB Did you suffer a head injury as a result of it?

G9BB Were you unconscious for more than 10 minutes?

G10B After *EVENT2**, did you lose interest in doing things that used to be important to you?

G11B Afterwards, did you find that you no longer had loving or warm feelings toward anyone?

G12B After *EVENT2**, did you feel isolated or distant from other people?

G13B After *EVENT2**, did you begin to feel that there was no point in thinking about the future anymore?

G14B Afterwards, did you have more trouble sleeping than is usual for you — either trouble falling asleep, or staying asleep?

G15B After *EVENT2**, did you act unusually irritable or lose your temper a lot?

G16B Afterwards, did you have more trouble concentrating than is usual for you?

G17B After *EVENT2**, did you become overly concerned about danger or overly careful and watchful?

G18B Afterwards, did you become jumpy or easily startled so that ordinary noises or movements would make you jump or put you on guard?

G20AB Did you continue to have any of these problems for at least a month because of *EVENT2**?

RECPTS You said you have had problems or experiences like: (INSERT POSITIVE SYMPTOMS). Have you had a problem or experience like that within the last 12 months?

*NOTE: The specific event in G1A is substituted for *EVENT*. The specific event in G1B1 is substituted for *EVENT2*.

MAJOR DEPRESSIVE EPISODE

H1 In your lifetime, have you ever had two weeks or more when nearly every day you felt sad, blue, or depressed?

H6I Has there ever been a period of two weeks or longer when you lost your appetite?

H7I Have you ever lost weight without trying to — as much as two pounds a week for several weeks or as much as ten pounds altogether?

H8I Has there ever been at least 2 weeks when you had an increase in appetite?

H9I Have you ever had a period when your eating increased so much that you gained as much as two pounds a week for several weeks or 10 pounds altogether?

H10I Have you ever had two weeks or more when nearly every night you had trouble falling asleep, staying asleep, or waking up too early?

H12I Have you ever had two weeks or longer when nearly every day you were sleeping too much?

H13I Has there ever been a period lasting 2 weeks or more when you lacked energy or felt tired out all the time even when you had not been working very hard?

H15I Has there ever been two weeks or more when nearly every day you talked or moved more slowly than is normal for you?

H16I Has there ever been two weeks or more when nearly every day you had to be moving all the time — that is, you couldn't sit still and paced up and down?

H19I Has there ever been 2 weeks or longer when you lost all interest in things like work or hobbies or things you usually liked to do for fun?

H21I Has there ever been two weeks or more when nearly every day you felt worthless, sinful, or guilty?

H25I Has there ever been two weeks or more when nearly every day you had a lot more trouble concentrating than is normal for you?

H26I Have you ever had two weeks or more when nearly every day your thoughts came much slower than usual or seemed mixed up?

H27I Have you ever had two weeks or more when nearly every day you were unable to make up your mind about things you ordinarily have no trouble deciding about?

H28I Has there ever been a period of two weeks or more when you thought a lot about death — your own, someone else's, or death in general?

H29I Has there ever been a period of two weeks or more when you felt like you wanted to die?

H30I Have you ever felt so low you thought about committing suicide?

H31I Have you ever attempted suicide?

H34 You said you've had a period of (*FEELING DEPRESSED / LOSING INTEREST IN THINGS*) and also said you've had some other problems with (INSERT POSITIVE SYMPTOMS). Has there ever been a time when (*FEELING DEPRESSED / LOSING INTEREST IN THINGS*) and some of these other problems occurred together — that is, within the same month?

H34A So you've never had a period of (*FEELING DEPRESSED / LOSING INTEREST IN THINGS*) at the same time you were having some of these other problems?
1) NEVER BEEN A PERIOD
2) HAS BEEN A PERIOD

H35 You said you have had periods of: (INSERT POSITIVE SYMPTOMS). Was there ever a time when several of these problems occurred together — that is, within the same month?

H35A When you were having some of these problems, at about the same time were you feeling okay or were you feeling low, gloomy, blue, or uninterested in everything?
1) OKAY
2) GLOOMY, LOW, ETC.

H36 Have you ever had a period of three months or longer when you were feeling low and had several of these other problems at the same time?

H38D Was any spell so bad that it kept you from working or from seeing friends or relatives?

H40 Did any of these spells occur just after someone close to you died?

H40A Did you ever have a period like this, other than after a death?
1) NO, ONLY AFTER A DEATH
2) YES, OTHER TIMES

H6II During that spell of depression did you lose your appetite?

H7II During that spell of depression did you lose weight without trying to — as much as two pounds a week for several weeks or as much as 10 pounds altogether?

H8II During that spell of depression did you have an increase in appetite?

H9II During that spell of depression did your eating increase so much that you gained as much as two pounds a week for several weeks or 10 pounds altogether?

H10II During that spell of depression did you have trouble falling asleep, staying asleep, or waking up too early?

H12II During that spell of depression were you sleeping too much?

H13II During that spell of depression did you feel tired out all the time even when you had not been working very hard?

H15II During that spell of depression did you talk or move more slowly than is normal for you?

H16II During that spell of depression did you have to be moving all the time — that is, you couldn't sit still and paced up and down?

H19II During that spell of depression did you lose all interest in things like work or hobbies or things you usually liked to do for fun?

H21II During that spell of depression did you feel worthless, sinful, or guilty?

H25II	During that spell of depression did you have a lot more trouble concentrating than is normal for you?
H26II	During that spell of depression did your thoughts come much slower than usual or seem mixed up?
H27II	During that spell of depression were you unable to make up your mind about things you ordinarily have no trouble deciding about?
H28II	During that spell of depression did you think a lot about death — your own, someone else's, or death in general?
H29II	During that spell of depression did you feel like you wanted to die?
H30II	During that spell of depression did you feel so low you thought about committing suicide?
H31II	During that spell of depression did you attempt suicide?
RECDEP	In the last 12 months, have you had one of the spells of feeling low or sad, along with some of the other problems you have mentioned?

MANIC EPISODE / BIPOLAR DISORDER

J1 Has there ever been a period of days when you were so happy or excited or high that you got into trouble, or your family or friends worried about it, or a doctor said you were manic?

J2I Has there ever been a period when you were so much more active than usual that you or your family or friends were concerned about it?

J3I Has there ever been a period of several days when you couldn't sit still and paced up and down?

J4I Has there ever been a period when you went on spending sprees — spending so much money that it caused you or your family some financial trouble, or had a period when you made foolish decisions about money?

J5I Have you ever had a period when your interest in sex was so much stronger than is typical for you that you wanted to have sex a lot more frequently than is normal for you or with people you normally wouldn't be interested in?

J6I Has there ever been a period when you talked so fast that people said they couldn't understand you or when you had to keep talking all of the time?

J7I Have you ever had a period when thoughts raced through your head so fast that you couldn't keep track of them?

J8I Have you ever had a period when you felt that you had a special gift or special powers to do things others couldn't do or that you were a specially important person?

J9I Has there ever been a period when you hardly slept at all but still didn't feel tired or sleepy?

J10I Was there ever a period when you were easily distracted, so that any little interruption could get you off the track?

J14 You said you had a period of feeling high or excited and also said you've had some feelings or experiences like (INSERT POSITIVE SYMPTOMS). Has there ever been a period when the feelings of being excited or manic and some of these other feelings or experiences occurred together?

J14A So there's never been a period when you felt high or excited at the same time you were having any of these other experiences?

1) NEVER BEEN A PERIOD
2) HAS BEEN A PERIOD

J15 You said you've had some feelings or experiences like (INSERT POSITIVE SYMPTOMS). Was there ever a period when some of these feelings or experiences occurred together?

J15A When you were feeling that way, were you unusually irritable or likely to fight or argue?

J18 Were you ever in the hospital overnight because of any such spell?

J19C Did any such spell interfere with your life, work or activities a lot?

J21I During that spell of being high or irritable were you more active than usual?

J31I During that spell of being high or irritable were you unable to sit still and did you pace up and down?

J4II During that spell of being high or irritable did you go on spending sprees?

J5II During that spell of being high or irritable was your interest in sex stronger than is usual for you?

J6II During that spell of being high or irritable did you talk so fast that people couldn't understand you?

J7II During that spell of being high or irritable did your thoughts race through your head so fast that you couldn't keep track of them?

J8II During that spell of being high or irritable did you feel that you had a special gift or special powers?

J9II During that spell of being high or irritable did you hardly sleep but didn't feel tired?

J10II During that spell of being high or irritable were you easily distracted?

RECMAN In the last 12 months, have you had one of these spells of feeling high or irritable, along with some of these other problems?

ANOREXIA

L1	Have you ever worried a lot about eating too much, gaining too much weight, or being too fat?
L2	Have you ever lost a lot of weight — that is, 15 pounds or more, either by dieting or without meaning to. Do not count having a baby or an operation.
L4LB	What is the lowest weight you ever dropped to after losing 15 pounds or more?
L5	Did relatives or friends ever say that you were much too thin or looked like a skeleton?
L7FT	How tall were you then? Enter as feet and inches. So, for example, if you are 5 feet 7 inches tall, enter 507.
L9	Did you ever think you were overweight when other people such as your parents or friends said you had gotten too thin?
L10	Did you ever miss three menstrual periods in a row around the time you were losing weight?
RECANR	You said you have had problems or experiences like: (INSERT POSITIVE SYMPTOMS). Have you had a problem or experience like that within the last 12 months?

BULIMIA

L1	Have you ever worried a lot about eating too much, gaining too much weight, or being too fat?
L11A	Have you had several periods when you would eat abnormally large amounts of food within a few hours — that is, binge eating?
L11B	Have you ever had a period of 3 months or more when you went on eating binges at least twice a week?
L14	Have you ever been afraid that you might not be able to stop one of these eating binges?
L15	When you ate unusually large amounts, have you ever had to do something special to make yourself quit — like going to sleep, leaving the house or making yourself vomit?
L16	Have you sometimes stopped only because your stomach hurt?
L21	Have you several times tried fasting in order to make up for eating binges — not eating at all or only taking liquids?
L22A	Have you ever done anything regularly in order to keep from gaining weight — like exercising?
L22B	Have you regularly stayed on a strict diet in order to keep from gaining weight?
L22C	Have you regularly taken water pills or diuretics in order to keep from gaining weight?
L22D	Have you regularly taken laxatives or enemas in order to keep from gaining weight?
L22E	Have you regularly made yourself vomit in order to keep from gaining weight?
RECBUL	You said you have had problems or experiences like (INSERT POSITIVE SYMPTOMS). Have you had a problem or experience like that within the last 12 months?

ALCOHOL

M3 Now I'm going to ask you some questions about your use of alcoholic beverages. Have you had any wine, beer, or any mixed drink or drink that contains alcohol at least once a month for six months or more? If so, what is the largest number of drinks that you've ever had in one day? (Enter 0 if you have not had at least one drink per month for six months or more)

M6 Have you ever gone on binges or benders where you kept drinking for a couple of days or more without sobering up?

M6A Did you neglect some of your usual responsibilities then?

M6B Did you do that several times or go on a binge that lasted a month or more?

M7 Did you ever get tolerant to alcohol, that is, you needed to drink a lot more in order to get an effect, or found that you could no longer get high on the amount you used to drink?

M7A Some months or years after you started drinking, did you begin to be able to drink a lot more before you would get drunk?

M7B Did your ability to drink more without feeling its effect last for a month or more?

M8 Have there been many days when you drank much more than you expected to when you began, or have you often continued drinking for more days in a row than you intended to?

M9 Have you more than once wanted to quit or cut down on your drinking?

M9A Have you ever tried to quit or cut down on drinking?

M9B Did you find you couldn't quit or cut down?
1) NO, I WAS ABLE TO QUIT
2) COULD NOT QUIT

M9C Were you unable to quit or cut down more than once?

M10 Some people try to control their drinking by making rules, like not drinking before 5 o'clock or never drinking alone. Have you ever made rules like that for yourself?

M10A Did you make these rules because you were having trouble limiting the amount you were drinking?

M10B Did you try to follow those rules for a month or longer or make rules for yourself several times?

M11 Has there ever been a period when you spent so much time drinking alcohol or getting over its effects that you had little time for anything else?

M11A Did the period when you spent a lot of time drinking last a month or longer?

M12 Have you ever given up or greatly reduced important activities in order to drink—like sports, work, or associating with friends or relatives?

M12A Did you give up or cut down on activities for a month or more, or several times, in order to drink?

M13 Has your drinking or being hung over often kept you from working or taking care of children?

M13A Have you often worked or taken care of children at a time when you had drunk enough alcohol to make your speech thick or make you unsteady on your feet?

M14 Were there ever objections about your drinking from your family, friends, your doctor, or your clergyman, your boss or people at work or school? Or have you gotten into fights while drinking or have the police stopped or arrested you or taken you to a treatment center because of drinking?
1) NONE OF THOSE THINGS HAPPENED
2) AT LEAST ONE OF THOSE THINGS HAPPENED

M16 Did you drink more than once after having any of these problems?

M17 Have you ever had trouble driving because of drinking—like having an accident or being arrested for drunk driving?

M17A Have you several times had trouble driving because of drinking?

M18 Have you ever accidentally injured yourself when you had been drinking, for example, had a bad fall or cut yourself badly?

M18A Did that happen several times?

M19 Have you several times been high from drinking in a situation where it increased your chances of getting hurt—for instance, when driving a car or boat, using knives, machinery, or guns, crossing against traffic, climbing or swimming?

M21 People who cut down or stop drinking after drinking for a considerable time often have withdrawal symptoms. Common ones are the 'shakes', being unable to sleep, feeling anxious or depressed, sweating, having your heart beat fast or having the DTs, or seeing or hearing things that aren't really there. Have you had any problems like that when you stopped or cut down on drinking?

M21A Have you had withdrawal symptoms several times?

M23A Did you ever take a drink right after you woke up to keep from having a hangover or the shakes?

M23B Have you ever taken a drink to keep from having a hangover, the shakes, or any withdrawal symptoms or taken a drink to make them go away?

M23C Have you several times taken a drink to keep from having withdrawal symptoms?

M25 There are several health problems that can result from drinking. Did drinking ever cause you to have liver disease, or yellow jaundice, give you stomach disease, or make you vomit blood, cause your feet to tingle or feel numb, give you memory problems even when you weren't drinking, or give you pancreatitis?

M26 Did you continue to drink more than once knowing that drinking caused you to have a health problem or an injury?

M27 Have you continued to drink when you knew you had a serious physical illness that might be made worse by drinking?

M29 Has alcohol ever caused you emotional or psychological problems, such as feeling uninterested in things, depressed, suspicious of others or paranoid, or caused you to have strange ideas?

M29A Did you continue to drink more than once after you knew that drinking caused you psychological or emotional problems?

RECALC You said you have had problems or experiences like: (INSERT POSITIVE SYMPTOMS). Have you had a problem or experience like that within the last 12 months?

OBSESSIONS

N1 I want to ask you next about whether you have ever been bothered by having certain unpleasant thoughts all the time. An example would be the persistent idea that your hands are dirty or have germs on them, no matter how much you wash them, or that relatives who are away have been hurt or killed. Have you ever had any kind of unreasonable thought like that?

N1A Was this only for a short time or was it over a period of at least 2 weeks?
1) LESS THAN TWO WEEKS
2) TWO WEEKS OR MORE

N2 Were these thoughts only about feeling guilty, losing weight, or using drugs, alcohol or tobacco?
1) ONLY THESE THINGS
2) OTHER THINGS

N3 Did these unreasonable thoughts keep coming back into your mind again and again no matter how hard you tried to get rid of them?

N5 Another example of an unpleasant thought would be the persistent idea that you might harm or cause the death of someone you loved, even though you really didn't want to. Or that you had accidentally done something that harmed or endangered someone. Or you might have had thoughts you were ashamed of, but couldn't keep out of your mind. Have you ever been bothered by these or by any other unpleasant and persistent thoughts?

N5A Was this only for a short time, or did these thoughts keep coming into your mind over a period of at least two weeks?
1) LESS THAN TWO WEEKS
2) TWO WEEKS OR MORE

N6 Were these thoughts only about feeling guilty, losing weight, or using drugs, alcohol or tobacco?
1) ONLY THESE THINGS
2) OTHER THINGS

N7 Did these unpleasant thoughts keep coming back into your mind again and again no matter how hard you tried to get rid of them?

N9 Did these thoughts often bother you for more than an hour at a time?

N9A Did thinking about these ideas interfere with your life or work, or cause you difficulty with your relatives or friends, or upset you a great deal?

RECOBS Have you had an unreasonable or unpleasant thought like this within the last 12 months?

COMPULSION

N10 Some people have the unpleasant feeling that they have to do something over and over again even though they know it is really foolish—but they can't resist doing it—things like washing their hands again and again, or going back several times to be sure they've locked a door or turned off the stove. Have you ever had to do something like that over and over?

N11 Was there a time when you felt you had to do something in a certain order, like getting dressed perhaps, and had to start all over again if you did it in the wrong order?

N12 Has there ever been a period when you felt you had to count something, like the squares in a tile floor, or always touch a particular thing, and couldn't resist doing it even when you tried to?

N15 Did you have to do this several times over a period of at least two weeks?
1) NO, SHORTER TIME
2) YES, TWO WEEKS

N16 When you did this, did it often take you more than an hour a day?

N17 Did this interfere with your life or work, or cause you difficulty with your relatives or friends, or upset you a great deal?

RECCOM You said you have had problems or experiences like: (INSERT POSITIVE SYMPTOMS). Have you had a problem or experience like that within the last 12 months?

ANTISOCIAL PERSONALITY

R5 Now I'd like to ask you about your life as a child before you were 15 years old. Did you ever skip school or play hooky at least twice in one year?

R5A Was that only in your last year in school or before that?
1) LAST YEAR ONLY
2) BEFORE LAST YEAR

R5B Before you were 15, did you skip school or play hooky as much as 5 days a year in at least two school years, not counting your last year in school?

R6 Before you were 15, did you often get into fights that you had started?

R7 Did you more than once use a weapon in a fight or threaten someone with a weapon before you were 15?

R8 Before you were 15, did you sometimes try to physically hurt anyone?

R9 Did you ever hurt or kill an animal on purpose before you were 15? (Do not include hunting, fishing, or exterminating rats, mice or insects.)

R10 Before you were 15, did you ever run away from home overnight?

R10A Did you run away more than once before 15?

R10B Did you return home to live after running away?
1) YES
2) NO

R11 Of course, no one tells the truth all the time, but did you tell a lot of lies before you were 15 years old?

R12 Before you were 15 years old, did you more than once swipe things from stores or from other children or steal from your parents or from anyone else?

R13 Before you were 15, did you ever rob or mug anyone or snatch a purse or threaten to hurt anyone if they didn't give you money or jewelry?

R14 Since you've been 15, have you stolen anything or robbed or threatened anyone?

R15 Before you were 15, did you intentionally damage someone's car or do anything else to destroy or severely damage someone else's property?

R16 Before you were 15, did you intentionally start any fires? Don't count fires that you were supposed to start like bonfires, or fires in stoves or fireplaces.

R17 Since age 15, have you intentionally set any fires or tried to destroy something that belonged to someone else?

R19A Have you more than once been arrested for anything other than traffic violations since 15?

R20 Have you ever been convicted of a felony?

R21 Have you had at least four traffic tickets in your life for speeding or running a light or causing an accident?

R31B Before you were 15, did you ever force someone to have sex with you?

R33 Have you ever been faithful for more than a year — with no other sexual relationships at all during that period?
1) YES, OR NEVER HAD A PROLONGED PARTNERSHIP
2) NO

R35 Have you ever been paid for having sex with someone?

R36 Have you ever made money by finding customers for male or female prostitutes?

R37 Have you ever made money illegally by buying or selling stolen goods, selling drugs, or being part of a gambling or betting operation?

R38 Have you ever moved to avoid paying rent or borrowed money without making any payments on it?

R39A Have you more than once been sued for a bad debt or had things you bought taken back because you didn't meet the payments?

R42B Have you more than once hit or thrown things at your wife/husband or partner first, regardless of who started the argument?

R43 Have you ever spanked or hit any child hard enough so that he or she had bruises or had to stay in bed or see a doctor?

R44 Since age 15, have you been in more than one fight that came to swapping blows, other than fights with your wife/husband or partner?

R45 Since you've been 15, have you ever used a weapon like a stick, knife, or gun in a fight?

R46 Since you were 15, have you ever physically attacked anyone other than while fighting?

R48 You mentioned (INSERT POSITIVE SYMPTOMS). Did you feel that doing that was okay because you had been mistreated or the person deserved it?

R51 Have you ever quit a job three times or more before you already had another job lined up?

R52 On any job you have had since 18, were you late or absent an average of 3 days a month or more?

R52 Was your being absent 3 days or more a month always due to a physical illness or injury?

R54 In the last 5 years, have you been out of work for six months or more not including times you were retired, in school full-time, a housewife, or too physically ill to work?

R55 Have you ever used an alias or assumed name? Do not include pen names or stage names.

R56 Since you've been 15, have you thought you lied pretty often?

R57 Since you've been 15, have you ever traveled around for a month or more without having any arrangements ahead of time and not knowing how long you were going to stay or where you were going to work?

R58 Since you've been 15, has there ever been a period when you had no regular place to live, for at least a month or so?

R60 Has there ever been a period when you did not provide your child with the financial support you were supposed to?

R61 Since you've been 15, have you sometimes left young children under 6 years old at home alone while you were out shopping or doing anything else?

R62 Since you've been 15, have there been times when someone else fed a child of yours or a child you were caring for because you didn't cook or have food in the house, or has someone kept your child overnight because no one was taking care of him or her at home?

R63 Since you've been 15, has a nurse or social worker or teacher ever said that any child of yours or a child you were taking care of wasn't being given enough to eat or wasn't being kept clean enough or wasn't getting medical care when it was needed?

R64 Since you've been 15, have you more than once run out of money for food for your family because you had spent the food money on yourself or on going out?

M17 Since you've been 15, have you ever had trouble driving because of drinking — like having an accident or being arrested for drunk driving?

RECASP You said you have had problems or experiences like: (INSERT POSITIVE SYMPTOMS). Have you had a problem or experience like that within the last 12 months?

Appendix D

DRAFT

The Health Status of Women in the Navy and Marine Corps: Preliminary Findings from the 1995 Perceptions of Wellness and Readiness (POWR) Assessment

(Manuscript incomplete pending CDC release of NHANES 88-94 data tapes.)

DRAFT

THE HEALTH STATUS OF WOMEN IN THE NAVY AND MARINE CORPS: PRELIMINARY FINDINGS FROM THE 1995 PERCEPTIONS OF WELLNESS AND READINESS (POWR) ASSESSMENT

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National health surveys, such as the National Health and Nutrition Survey (NHANES) (National Center for Health Statistics (NCHS), 1981; NCHS, 1992; NCHS, 1985) and the National Health Interview Survey (NHIS) (NCHS, 1994) have served as important parts of the nation's health monitoring systems. These surveys have established the normative distributions for certain population parameters such as height, weight, blood pressure and nutrition. In addition, these surveys have ascertained the prevalence of certain chronic diseases as well as the prevalence of risk factors for given conditions. This information is essential in identifying health care needs and facilitating health care planning.

The numerous advantages of these types of data on civilians have been realized only to a very limited degree in research on military populations. Three Department of Defense (DOD)-wide surveys have provided population-based health data on active-duty members: the Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel (Bray et al., 1992), the 1992 DoD Survey of Military Medical Care Beneficiaries (Lurie et al., 1993), and the 1989 Department of Defense Women's Health Survey (Mahoney & Wright, 1990). Unfortunately, none of these studies allows estimation of baseline disease prevalence rates. In general terms, however, it has been shown that the number of illnesses experienced by active-duty members per year (as measured by the number of survey respondents who reported the number of times they were sick in the past 12 months with symptoms such as feeling flushed or sweaty, or having a runny nose or eyes, chills, nausea or vomiting, stomach cramps, diarrhea, muscle pains, or severe headaches) has significantly increased between 1985 and 1992, with a particularly high level in 1988 (Mahoney & Wright, 1990). This study was designed to provide the disease-specific and sex-specific rates to understand such illness patterns and to identify particular health problems in specific groups.

In addition, with the rapidly changing demographic character of the U.S. military (i.e., the increasing proportion of women in the military) (Willis, 1993), their expanded role into nontraditional occupations within the service, and their recent assignment to combat vessels, the development of baseline data to monitor changes in health status and health care delivery needs within the DOD as a whole, and the naval service in particular, is of critical importance to the maintenance of military readiness. That is, it is expected that as the demographic composition of

the Navy and Marine Corps changes, the nature and distribution of health care problems as well as the health care system itself will change.

This survey was designed to provide the means to evaluate women's health status in the Navy and Marine Corps by providing the baseline for future comparisons, as the demographic profile of the military changes over the next few years and as women move into traditionally male occupations. Baseline information was obtained in six general issue areas: reproductive, medical and physiological, psychosocial, lifestyle, occupational/environmental, and health services. These issue areas have been reviewed in detail (Hourani et al.,1996). The general objectives of this study were to: (1) produce estimates of means and proportions for a broad range of health variables by sex, race, ethnic, age, and military status subgroups of U. S. Navy and Marine Corps women; (2) estimate the prevalence of selected diseases and disease risk factors in Navy and Marine Corps women; (3) make comparisons between differing populations of interest in the Navy and Marine Corps (e.g., women vs. men, sea vs. shore, junior enlisted vs. senior enlisted, different rating groups, surface vs. aviation, and U.S. vs. overseas); (4) make comparisons of prevalence information between the Navy and Marine Corps and civilian female populations; (5) develop baseline information for future status and trends of Navy and Marine Corps women's risk factor and health information; (6) identify appropriate female Navy and Marine Corps populations for specialized studies; and (7) contribute to the understanding of disease etiology in female populations by collecting and analyzing risk factor information.

METHODS

The POWR Assessment consisted of three components: a questionnaire study yielding approximately 10,000 respondents, a body measurement study yielding measurements on approximately 1,000 persons, and a telephone study. The main portion of the POWR Assessment, with which the present paper is concerned, was a questionnaire administered to a probability sample of active-duty, shore-based Navy and Marine Corps personnel. The questionnaire was administered to sampled personnel in group sessions in three Navy and two Marine Corps locations. Sampled personnel in the remaining sites were surveyed by mail.

Sample

The sample design for the POWR Assessment was a two-stage probability sample, with installations selected at the first stage and personnel assigned to selected installations chosen at the second stage. This approach allowed the sample to be restricted to a predetermined number of installations while preserving its inferential capability. In addition, stratification was used to further control the sample distribution with respect to organizational and demographic characteristics. The first-stage sampling frame for the Navy and Marine Corps for the 1995 DoD Survey of Health Related Behaviors Among Military Personnel (Bray et al., 1995) was used as the basis for the first-stage frame for the 1995 POWR Assessment. The geographic distribution of the sample was controlled by stratifying by continental United States (CONUS) and outside the continental United States (OCONUS).

The total sample size for the survey consisted of approximately 25,863 Navy and Marine Corps personnel selected from 45 geographic locations worldwide. This sample size was based on precision requirements for and targeted sample sizes of approximately 10% of the women in each service and an equal number of men, response rates based on experience with similar methodology, and eligibility rates obtained in the 1995 DoD Survey of Health Related Behaviors Among Military Personnel (Bray et al., 1995).

The eligible population of survey participants was all active-duty, shore-based personnel, except recruits, cadets, persons with unauthorized leave (UA), and persons who had a permanent change of station at the time of data collection. The POWR Assessment had two specified precision requirements adopted from NHANES:

a. A prevalence statistic of 10% should have a relative standard error (RSE) less than 30%.

b. Differences of at least 10% in health or nutrition statistics between any two subdomains should be detected with a type I error of no more than 0.05 and a type II error of no more than 0.10.

Domains of interest for the study were those defined by: (a) service (Navy, Marine Corps); (b) gender (male, female); (c) race (white, other); and (d) paygrade (E1-E6, E7-E9, Officer).

Further, the targeted responding eligible sample sizes for the study were specified as approximately 10% of the number of women in each of the services and an equal number of men. Hourani and her colleagues (1996) described the details of the sampling design, sampling weighting and estimation procedures.

Measures

The 11 major classes of variables examined in the present report were self-reported and are described as follows:

Sociodemographics. Sociodemographic measures included sex, age, race/ethnicity, highest education level, marital status, family status (living with spouse at present duty station), number of children under age 21 living in household, age at first child's birth, paygrade, total time in service, branch of service region/type of command currently assigned (CONUS/OCONUS, ship/shore/submarine, FMF/non-FMF), approximate total time served aboard ships, approximate total time deployed, service in foreign operation (Persian Gulf, Somalia, Bangladesh, Haiti, other), duty station in foreign operation (aboard ship/ashore), and occupational code/rating.

Medical history. The medical history portion of the questionnaire consisted of a list of 50 medical conditions to which respondents indicated whether a health care provider had ever told them they'd had any of these. This list was adapted from NHANES III and excluded conditions primarily associated with the elderly, such as stroke and osteoporosis. Lifetime prevalence was assessed by presence of any recovered or current condition and point prevalence was assessed by presence of current condition. Age at first diagnosis was obtained for each condition.

Type and number of symptoms within the last 30 days were assessed from responses to a list of 26 common symptoms experienced, regardless of whether they resulted in a visit to sick call or a health care provider. Type of care (self-care, sought medical care, did nothing) was obtained for each symptom.

Recent and past medication use was assessed by responses to items concerning whether the respondent had ever used a "fair amount" of 13 classes of medications (prescribed or nonprescribed) for the last 30 days and the last 12 months, respectively.

Perceived health. Perceived health status was assessed with six scales from the Rand 36-Item Health Survey (Version 1.0) adapted from the Medical Outcomes Study (MOS) (Ware &

Sherbourne, 1992). The first scale consisted of five items and tapped general health perceptions. The second scale consisted of four items and assessed role limitations due to physical health. The third scale consisted of three items assessing role limitations due to emotional problems. The fourth scale consisted of four items and assessed vitality (energy level and fatigue). The fifth scale included two items assessing social functioning, and the sixth scale included two items assessing bodily pain. These scales have been found to have reliability (alpha) coefficients ranging from .78 to .86 and are scored from 0 to 100, with 100 representing optimal health status (Rand, 1992).

Five additional items were piloted in this survey to assess degree of personal control respondents perceived themselves having over their health status. A low interitem correlation between items (Chronbach's alpha = .20) indicated these items were measuring separate domains and were subjected to further factor analysis.

Mental health. Depressive symptomatology was assessed with the 20-item Center for Epidemiologic Studies - Depression Scale (CES-D). Widely used in community samples, the four-point scale ranges from rarely or none of the time (less than 1 day) (0) to most or all of the time (5-7 days) and inquires about how often respondents "have felt this way during the past 7 days" (Comstock & Helsing, 1976; Radloff, 1977; Radloff & Locke, 1986; Weissman et al., 1977). Items are scored such that the higher the score, the more depressed the response. A score of 15 or greater is considered an indicator of depression (Reis, 1995).

Psychological distress was assessed with the 21-item version of the Hopkins Symptom Checklist (HSCL-21). This shortened version of the widely used HSCL has a 4-point scale ranging from not at all (0) to extremely (3) and, as with the CES-D, inquires how the respondent felt during the past 7 days. The total distress score has been found to have acceptable alpha coefficients of .90 (Green et al., 1988) and .89 (Deane et al,1992). Three reliable subscales previously identified in Green et al. (1988) -- performance difficulty, somatic distress and general feelings of distress -- were also created as in their article. Items were summed and averaged to obtain subscale and total distress scores such that the higher the score, the higher the distress. Normative data on 224 registered nurses found a mean total distress score of 35.56 (SD = 8.52) (Deane et al., 1992).

Psychosocial functioning. Perceived quality of life was assessed, with 4 items adapted

from Andrews and Withey (1976), on 5-point scales: A global item inquiring how respondents felt about their "life as a whole" and three items inquiring how they felt about their job, themselves, and their personal life. These items represented the four life domains as assessed in Caplan (1984) and Woodruff and Conway (1990) and have been shown to have an internal consistency of alpha = .81 (Conway et al., 1989). Response options ranged from terrible/unhappy (0) to pleased/delighted (4). This measure has been used in several previous Navy samples (Conway et al., 1989; Woodruff & Conway, 1990; Woodruff & Conway, 1992) and provides a single summary score.

Life events were assessed with four items taken from the U.S. Army's Fit to Win Health Risk Appraisal (HRA). One item inquired how many serious personnel losses or difficult problems the respondent had to handle in the last year. A 4-point response scale ranged from none (0) to several (3). One item inquired how often respondents had serious problems dealing with their spouse, parents, friends, or their children, and one item inquired how often they experienced a major pleasant change in the past year. Four response options ranged from never (0) to often (3). A fifth item inquired what caused the biggest problem in the respondent's life. Seven response options included money, social life, family, supervisor, job health, or no problem.

A suicidal ideation was also assessed with an item taken from the HRA that inquired whether the respondent had seriously considered suicide within the last 2 years. Recency of suicidal ideation was assessed by affirmative responses indicating within the last year and within the last 2 months.

History of abuse was assessed with seven items specifically developed for this survey: three items inquired whether the respondent had been abused (emotionally, sexually, physically) prior to entering the military and three items inquired whether the respondent had been abused (emotionally, sexually, physically) since entering the military. An additional item inquired whether respondents had received treatment for abuse.

Stress and coping were assessed by four items developed at the Department of Military Psychiatry at the Walter Reed Army Institute of Research and modified for this Navy sample. Three items inquired how much stress had affected the respondent's life as a whole, personal life, and performance on the job over the past 7 days, and were scored on a 5-point scale from none at

all (0) to an extreme amount (4). A fourth item inquired how well the respondent coped with stress over the past 7 days and was scored on a 5-point scale from very poorly (0) to very well (4).

Exposure to disaster/violence was assessed by three items specifically developed for this study. Respondents were queried whether they had ever been exposed to a natural disaster, combat or violence, and a major accident involving injuries or fatalities and if so, as a witness, survivor/victim, or participant in aid, cleanup, rescue, or investigation.

Social support was assessed with a modified version of the Social Network Index (Berkman, 1977; Berkman & Syme, 1979; Strawbridge, 1995). This index was developed by the Human Population Laboratory and has predicted a number of health outcomes. It also has been used in several previous Navy samples (Conway et al., 1989). In accord with scale developers, 10 questions inquiring about various group affiliations were reduced to a single question regarding nonchurch group membership and another about church-connected groups. The standard scoring protocol for the index was followed in which a sociability score was obtained from three items inquiring about the respondent's number of close friends and relatives and was combined with marital status to form the index of intimate ties. Scores from the index of intimate ties are then combined with the organizational membership score and the church membership score to form the Social Network Index.

Marital relations measures were taken from a restructured version of the Social Adjustment Scale-II (Schooler et al., 1977). The marital conflict measure was derived from factor analyses conducted on studies of blue-collar workers (Parkinson & Bromet, 1983; Parkinson et al., 1986) and averaged the sum of two items dealing with help-seeking for marital problems and one item on time spent thinking about marital problems (1 = never, 5 = very often). This measure was supplemented with a single-item measure of marital satisfaction taken from the Marital Satisfaction Scale (Roach et al., 1981). This single item had the highest correlation ($r = .79$) with the whole score of the original 73-item scale and was included as a balance to the negative wording of the marital conflict scale.

Personality. Global self-esteem was assessed with the Rosenberg Self-Esteem Scale (RSE). This 10-item scale was shown to have an internal consistency of $r = 0.78$ and significant

negative correlations with depression measures (Westaway & Wolmarans, 1992). The 4-point scale ranges from strongly agree to strongly disagree and yields a range of scores from 0 (lowest self-esteem) to 40 (highest self-esteem).

Trait Anger was assessed with the T-anger scale from Spielberger's State-Trait Anger Expression Inventory (STAXI). This 15-item scale measures individual differences in the disposition to experience anger and as 2 subscales: Anger Temperament, a 4-item subscale which measures a general propensity to experience and express anger without specific provocation, and Angry Reaction, a 4-item subscale, which measures individual differences in the disposition to express anger when criticized or treated unfairly by other individuals (Spielberger, 1979). Alpha coefficients with Navy samples have been shown to range from .84 to .86 and .71 to .75 for each scale, respectively. The 4-point scale ranges from almost never (1) to almost always (4) and yields a range of scores from 10 to 40.

Trait anxiety was evaluated by the 20-trait items of the Spielberger State-Trait Anxiety Inventory (STAI) (Spielberger, 1977). The 4-point scale ranging from almost never (1) to almost always (4) inquired about how respondents "generally feel" and yielded a range of scores from 20 to 80. The STAI is a widely used measure of relatively stable individual differences in anxiety-proneness, and it reflects the frequency and intensity with which anxiety states have been manifested in the past and the probability that state anxiety will be experienced in the future (Spielberger, 1977). Test-retest correlations for college students have ranged from .73 to .86, and a high internal consistency reliability coefficient of alpha = .93 was obtained in a sample of working adult males (Spielberger et al., 1970).

Occupational Stress. Perceived job pressures were assessed with the 12-item Job Pressures scale constructed by James House in his research with factory workers (House, 1980). On the basis of principal component factor analysis, these items could be clustered into four indices reflecting job versus non-job conflict, role conflict, quality concern, and responsibility. Respondents were asked to indicate how often they were "bothered" by the pressure or stresses on a 5-point scale ranging from not at all (0) to nearly all the time (4). Overall and subscale scores were obtained by summing and averaging the raw scores (House et al., 1979).

General job satisfaction was assessed with four items from Quinn and Shepherd (1974)

and from an occupational self-esteem item to form the Job Satisfaction Index adopted by House (1980). Two items concerning the level of satisfaction and happiness with the job, two items concerning the respondent's readiness to make the same decision how to take the job and/or recommend it to a good friend, and one item concerning whether the job measures up to prior expectations were reworded to indicate the respondent's military job and averaged to create a measure of military job satisfaction. Scores can range from 0 (low satisfaction) to 10 (high satisfaction). This scale was found to have an internal reliability of alpha = .79 among a sample of nuclear power plant workers (Parkinson & Bromet, 1983).

Lifestyle. Diet and nutrition measures were obtained primarily from previous national and Navywide surveys. Body mass index (BMI) was calculated from self-reported height and weight.

Weight satisfaction was assessed with four items taken from NHANES III (NHANES, 1988-1994). Two items concerning satisfaction with eating patterns and eating in secret were taken from the Eating Disorders Index (EDI). The presence of the first item and absence of the second item were found to be useful in predicting bulimia among women in a primary care setting (Freund et al., 1993).

Developed for the Navy's Health and Physical Readiness (H&PR) Studies (Conway, Trent, & Conway, 1989; Trent, 1992), an Eating Behaviors Index was created that summed the average number of "good" food choices during the past week (e.g., low-fat, high-fiber) and subtracted the average number of "poor" choices (e.g., high fat, fried foods, sugars). Eight food choices were included on a scale ranging from never (1) to more than seven times per week (4).

A Dietary Index was also created that measured general dietary behavior. Respondents indicated the approximate number of days they ate breakfast, ate snacks, overate, didn't eat enough, and took vitamins and antioxidants during the past 7 days. As with the Eating Index, "good" behaviors (eating breakfast, taking vitamins) were summed and "poor" behaviors were subtracted to obtain an average index score.

A Food Purchasing Index was created that assessed the importance of considering health, price, taste, convenience, and calories when purchasing food. This 5-item scale ranged from not at all (1) to extremely important (5).

Nutritional value was assessed with two items taken from the Navy Health and Nutrition

Survey. One item inquired whether the respondent was interested in hearing/reading about nutrition and was scaled from "yes, very much" (1) to "no, not at all" (5). A second item inquired how important respondents felt diet was in terms of their health and was assessed on a scale ranging from "probably the most important factor" (1) to "of little or no consequence" (5).

Sleep was assessed with a single item inquiring how many hours of sleep the respondent received on the average during the past 30 days.

Frequency of physical activity was assessed by an item taken from the Healthier People Survey (Carter Center HRA) that inquired how many times in an average week the respondent engaged in exercise or work that lasted at least 20 min without stopping. Duration of physical activity was assessed by an item inquiring how long the respondent had been on this schedule. A third item taken from the H&PR Studies (Conway, et al, 1989) assessed perceived physical fitness on a 5-point scale ranging from poor (0) to excellent (4).

Tobacco use was assessed by nine items concerned with amount and frequency of smoking tobacco, use of smokeless tobacco, and quit history. Amount of lifetime tobacco use was assessed by total number of pack-years. Exposure to tobacco smoke in work and/or living area in the past 30 days was also obtained.

Caffeine use was assessed by a single item concerned with the average number of caffeinated beverages the respondent had per day during the past 7 days.

Alcohol use was assessed with two items concerned with the amount and frequency of alcohol consumed in the past 30 days. These items were adapted from the 1992 Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel (Bray et al., 1992).

Birth control practices were assessed with three items. The first item, taken from NHANES III inquired how many sexual partners the respondent had in the last 6 months. Current birth control method was assessed from a list of 14 possible methods. Reason for not using birth control was obtained from a list of possible reasons.

Environmental/Occupational health. Occupational exposure measures were taken from the NHIS (1992) and from previous NHRC occupational surveys. Three items taken from NHIS (1992) assessed utilization of protective gear on the job. These items inquired whether protective gear was available, frequency of use, and reasons for nonuse. A fourth item inquired about the

participation in a medical surveillance program (Navy industrial hygiene monitoring program for known occupational exposures, including asbestos, noise, lead, chromium, cadmium, nonionizing radiation, and ionizing radiation).

Lifetime and recent (within past year) environmental and occupational exposures were assessed with a list of 40 known health hazards taken from NHRC's Occupational History Survey (1984). Intensity and duration of exposure were obtained for each hazard.

Health care. Extent of health care utilization by type of care was assessed by 10 items concerned with the number of times respondents went to a military medical facility for their own health care during the past 12 months and by 10 items concerned with the number of times respondents went to a civilian doctor's office or outpatient clinic. These items were adapted from the 1994-1995 Health Care Survey of DoD Beneficiaries (Defense Manpower Data Center [DMDC], 1994).

Satisfaction with health care (non-OB/GYN) services was assessed with a 10-item scale taken from the 1989 DoD Women's Health Survey Mahoney & Wright, 1990). The scale inquired how satisfied respondents were on their last non-OB/GYN visit to a military medical facility and ranged from very satisfied (1) to very dissatisfied (5). An additional 4-item scale concerned the satisfaction with medical personnel and was scored on a 5-point scale from strongly agree (1) to strongly disagree (5). Items on both satisfaction scales were reverse coded as needed and summed such that higher scores reflected higher satisfaction.

Access to health care services was assessed with three items inquiring about the primary person who treats the respondent, ability to address health concerns via telephone, and typical waiting time to be seen after arriving at the Military Treatment Facility (MTF). The latter item also was taken from the 1989 DoD Women's Health Survey (Mahoney & Wright, 1990).

Self-care was assessed with three items concerned with the frequency respondents do testicular exams, examine their breasts for lumps, and time since last rectal exam.

Availability of health promotion services was assessed with a 6-item scale inquiring whether counseling for smoking cessation, alcohol and drug abuse, birth control, weight control, and stress management was readily available if needed during the past 12 months. The 5-point scale ranged from strongly agree (1) to strongly disagree (5) and was developed specifically for

this survey.

Reproductive history. A special supplement for women measured female-specific conditions, menstrual problems and estrogen use, access to and satisfaction with OB/GYN facilities, pregnancy history and planning, and cancer screening. Most items were adapted from the national health surveys or risk factor measures.

Prevalence of female-specific conditions was assessed from a list of 17 conditions the respondent had during the past 3 months, regardless of whether they resulted in a visit to sick call or a health care provider.

Menstrual history and estrogen use included four questions regarding the missing of a period in the last 30 days and why, age menstrual cycles began, total number of years taking birth control pills, and type of replacement estrogens taken during past 30 days.

Six questions were used to assess female-health preventive behaviors and cancer screening: two items on time since last Pap smear and lifetime prevalence of a negative Pap result, and four items regarding time since last breast exam by a physician or nurse, mammogram in past 5 years, training in breast self-exam, and lifetime occurrence of noncancerous lump removal.

Fourteen questions assessed access and satisfaction with military OB/GYN services. Adapted from the 1989 DoD Women's Health Survey (Mahoney & Wright, 1990), 10 items on a 5-point scale ranging from very satisfied (1) to very dissatisfied (5) assessed the respondent's satisfaction with services on her last OB/GYN visit in a military medical facility. An additional four questions assessed access to information regarding pregnancy and risks, sufficient number of trained personnel, time off the job for prenatal care, and difficulty of receiving care while on OCONUS orders.

Thirteen items, primarily obtained from NHANES III, were used to obtain pregnancy and child-bearing history. Current pregnancy rate, annual pregnancy rate, and active-duty pregnancy rates were assessed as well as adverse reproductive outcomes within the past 12 months. Two items, adapted from Gerrard and colleagues (1991) assessed attitudes toward pregnancy. For desirability, women were asked how happy or unhappy they would be if they were to become pregnant in the next year and scored on a 5-point scale from extremely happy (1) to extremely unhappy (5). For convenience, women were asked how convenient or inconvenient it would be to

get pregnant in the next year and scored on a 5-point scale from extremely convenient (1) to extremely inconvenient (5). Gravida, parity, history of breast-feeding, history of prematurity, and perceived general healthiness of respondent's children relative to other children their age were each single-item measures.

Procedures

The survey design consisted of a mixed mode that was primarily a mail survey with a small number of sites being done in group sessions. For the mailout portion, packets were sent to the selected respondents through their unit commanding officers (COs), who were asked to distribute the packets to the individuals and to encourage their participation.

A second mailing was made several weeks later through the unit COs. Lists were provided of those selected unit members who had not yet responded, and a second questionnaire packet was included for the COs to distribute. A third mailing of a packet was sent directly to the selected personnel who had not responded to either of the first two mailings by a certain date.

To accommodate the body measurement component of the research, questionnaires were administered during on-site group sessions at a limited number of First Stage Sampling Units (FSU). Five sites (two West Coast Navy bases, one Pacific Navy base, and two West Coast Marine Corps sites) were selected for on-site data collection followed by a single mailing to eligible nonattendees. Details of the data collection preparations and procedures are discussed elsewhere (Hourani et al.,1996).

RESULTS

The response rates among eligibles were notably higher at the group session sites (57.2%) than at the mail sites (36.0%). Two overall response rates were computed. The first, 39.6%, included all persons determined to be eligible; the second, 41.8%, eliminated 1,305 persons whose questionnaires from the third wave of mailing were returned because of bad addresses. Although the potential for bias cannot be ruled out entirely, a nonresponse adjustment was made to help compensate for this problem. As described by Hourani and her colleagues (1996), the weights were adjusted by poststratifying them to the population counts within cells defined by gender,

race, paygrade, region, and service. Because prior literature suggests that estimates are expected to vary among respondents defined by these cells, these adjustments tend to diminish differences attributable to varying cooperation rates among respondents in these groups. To the extent that there are few differences between respondents and nonrespondents to the survey, biases will be minimal.

Table 1 shows the distribution of lifetime and point prevalence of 48 conditions reported by Navy and Marine Corps men and women. Among both Navy and Marine Corps men, the most prevalent lifetime conditions were head injury (involving stitches or unconsciousness), vision impairment/problems, hearing loss/problems, and allergies. Among women, the most prevalent lifetime conditions were urinary tract infections, vision impairment/problems, allergies, and anemia. Women in general had equal or somewhat higher rates than men of most lifetime disorders. Notable exceptions of higher rates for Navy and Marine Corps men were for hernias, kidney stones, gonorrhea, head injuries, and hearing loss/problems. Rates for Navy men but not Marines exceeded those for women in lifetime hypertension and high cholesterol.

Current or point prevalence rates were highest for vision impairment/problems, hearing loss/problems and allergies among Navy and Marine Corps men. Among both Navy and Marine Corps women, current rates were highest for vision impairment/problems, allergies, and migraines. Women reported substantially higher (i.e., threefold) rates than men for anemias, varicose veins, other blood circulation problems, bowel or intestinal trouble (colitis), urinary tract infections, repeated kidney infections, other bladder trouble, thyroid disease, eating disorders, migraines, and depression.

Table 2 shows one-month prevalence rates of common symptoms and what was done about them. Cold symptoms, sore throats, sinus trouble, and headaches led the list for both men and women, followed by back problems. Women were more likely to report gastrointestinal problems, whereas men were more likely to report muscle sprains or strains. Men and women reported utilizing self-care about equally frequently, whereas women reported seeking medical care more frequently than men.

Table 3 shows the one-month and one-year prevalence of medication use by sex. Aspirin or other pain killers are the most frequently used medications by both men and women. Women

report greater use of all medications, with the exceptions of those meds used in combat or other foreign operations, such as antimalarial pills, pyridostigmine, and ciprofloxacin (anti-anthrax pills).

Table 4 gives the mean scores for the MOS, with a score of 100 indicating perceived optimal health. Both Navy and Marine Corps women had lower scores than the men on all six scales. Further, Marine Corps women scored lower than Navy women, particularly on the scale that measured role limitation due to physical health.

On the mental health measures for which higher scores indicate higher symptom levels, Marines tended to score higher than sailors and women higher than men, with female Marines reporting the most depression and psychological distress (Table 5). Quality of life scores were almost identical for both Navy and Marine Corps men and women, however, as shown in Table 6, Marine Corps women report a greater amount of stress in their lives than Navy women, and both female sailors and marines report more stress in their lives than their male colleagues.

Tables 7a and 7b show the average number of visits to a military medical facility and a civilian doctor's office or outpatient clinic, respectively. Women tended to have a greater number of visits to both military and civilian health care facilities than men did across types of care. Both male and female Marines had slightly higher rates of utilization for illness or injury and follow-up for illness or injury than Navy personnel.

CONCLUSION

Although relatively low rates of disorder were found in the military populations examined, female sailors and marines, as indicated in the civilian literature, tend to have higher rates of illness, poorer perceptions of their health status, higher levels of stress, and greater health care and medication utilization than their male counterparts. These issues must be taken into account when planning to accommodate greater numbers of women into the Navy and Marine Corps. Navy women appear to be somewhat healthier than Marine Corps women and this would seem to be an area for further investigation.

The information obtained in this survey provides the means to evaluate women's health status in the Navy and Marine Corps by providing the baseline for future comparisons, as the

demographic profile of the military changes over the few years and as women move into traditionally male occupations. This information was collected in a methodology similar to the national surveys and is therefore comparable to civilian populations. These data may be used to reaffirm or guide current policies on occupation and medical care in the military. This is important because the Navy and Marine Corps may need to re-examine their policies ranging from health care utilization to women's health issues. Despite the Department of the Navy's directive to maintain an optimal state of health and well-being (CNO, 1992) and the Bureau of Medicine and Surgery's strategic plan to provide timely access to the finest quality health care for all those served (Bureau of Medicine and Surgery [BUMED], 1995), neither the Navy nor Marine Corps possess the type or amount of epidemiological or health services data required to optimally support or to ensure continuous quality improvement of these efforts. This study was designed to rectify this inadequacy by providing baseline information on the prevalence and distribution of disease, health risks, and health care behaviors in a representative sample of active-duty Navy and Marine Corps women. The data from this study will be used to evaluate a variety of health and physical readiness-related questions of vital importance to their operational readiness. Among the relevant directives and instructions, in addition to Naval Medical Research and Development Command (NMRDC)'s Defense Women's Health Research Program (NMRDC, 1993) are: OPNAVINST 6100.2 (CNO, 1992), BUMED's strategic goals 2 and 3 (BUMED, 1995), and NMRDC's FY93 guidance (Flynn, 1993). Navy medical and line decision-makers will use results of this research project in policy formation.

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Table 1. Lifetime and Point Prevalence Rates* of Medical Conditions Among Navy and Marine Corps Men and Women, POWR '95 (Has a health care provider ever told you that you had any of the following?)

Condition	Lifetime Prevalence			Point Prevalence		
	Men No. (%)	Women No. (%)	Total No. (%)	Men No. (%)	Women No. (%)	Total N0. (%)
Asthma						
Navy	226 (5.8)	280 (6.8)	506 (6.0)	66 (1.8)	141 (3.4)	207 (2.1)
Marine Corps	55 (6.3)	75 (8.2)	130 (6.4)	17 (2.3)	36 (3.7)	53 (2.3)
Civilian**						
Chronic Bronchitis						
Navy	129 (3.5)	294 (7.2)	423 (4.1)	22 (0.7)	56 (1.4)	78 (0.8)
Marine Corps	29 (4.0)	74 (7.7)	103 (4.2)	7 (1.0)	20 (2.1)	27 (1.1)
Civilian						
Emphysema						
Navy	4 (0.1)	15 (0.4)	19 (0.1)	4 (0.1)	7 (0.1)	11 (0.1)
Marine Corps	5 (0.4)	1 (0.1)	6 (0.4)	3 (0.1)	0 (0.0)	3 (0.1)
Civilian						
Chronic Rhinitis or Hay Fever						
Navy	342 (9.0)	448 (10.6)	790 (9.3)	255 (7.0)	350 (8.2)	605 (7.2)
Marine Corps	73 (5.9)	63 (6.5)	136 (5.9)	57 (5.1)	50 (5.1)	107 (5.1)
Civilian						
Other Allergies						
Navy	613 (15.5)	997 (24.3)	1610 (16.9)	494 (12.7)	835 (20.2)	1329(13.9)
Marine Corps	122 (13.0)	209 (22.3)	331 (13.4)	99 (9.9)	177 (18.8)	276 (10.3)
Civilian						
Pos. Test for TB						
Navy	383 (8.6)	214 (5.3)	597 (8.0)	160 (3.4)	100 (2.4)	260 (3.3)
Marine Corps	45 (2.6)	41 (4.8)	86 (2.7)	15 (0.7)	21 (2.5)	36 (0.8)
Civilian						

* Rate per 100 (%) weighted to Navy and Marine Corps populations

Table 1 (Cont.). Lifetime and Point Prevalence Rates of Medical Conditions Among Navy and Marine Corps Men and Women, POWR '95 (Has a health care provider ever told you that you had any of the following?)

Condition	Lifetime Prevalence			Point Prevalence		
	Men No. (%)	Women No. (%)	Total No. (%)	Men No. (%)	Women No. (%)	Total N0. (%)
Skin Cancer						
Navy	53 (1.2)	43 (1.0)	96 (1.1)	14 (0.3)	7 (0.2)	21 (0.3)
Marine Corps	12 (0.7)	10 (1.0)	22 (0.7)	2 (0.1)	2 (0.2)	4 (0.1)
Civilian						
Cervical Cancer						
Navy	n/a	104 (2.5)	104 (0.4)	n/a	10 (0.3)	10 (0.0)
Marine Corps	n/a	40 (4.6)	40 (0.2)	n/a	3 (0.3)	3 (0.0)
Civilian						
Other Cancer						
Navy	18 (0.5)	34 (0.8)	52 (0.5)	3 (0.1)	7 (0.2)	10 (0.1)
Marine Corps	5 (0.5)	7 (0.6)	12 (0.5)	1 (0.0)	2 (0.1)	3 (0.0)
Civilian						
Heart Disease						
Navy	18 (0.4)	10 (0.2)	28 (0.4)	13 (0.3)	7 (0.2)	20 (0.3)
Marine Corps	1 (0.0)	0 (0.0)	1 (0.0)	1 (0.0)	0 (0.0)	1 (0.0)
Civilian						
Hypertension (High Blood Pressure)						
Navy	324 (8.0)	241 (5.9)	565 (7.7)	178 (4.2)	81 (2.0)	259 (3.8)
Marine Corps	54 (4.3)	30 (3.3)	84 (4.2)	23 (2.1)	8 (0.9)	31 (2.0)
Civilian						
High Cholesterol						
Navy	614 (14.3)	315 (7.5)	929 (13.2)	349 (8.0)	148 (3.6)	497 (7.3)
Marine Corps	99 (5.8)	57 (6.0)	156 (5.8)	49 (3.5)	28 (2.4)	77 (3.4)
Civilian						

Table 1 (Cont.). Lifetime and Point Prevalence Rates of Medical Conditions Among Navy and Marine Corps Men and Women, POWR '95 (Has a health care provider ever told you that you had any of the following?)

Condition	Lifetime Prevalence			Point Prevalence		
	Men No. (%)	Women No. (%)	Total No. (%)	Men No. (%)	Women No. (%)	Total N0. (%)
Heart Murmur						
Navy	265 (6.5)	464 (11.0)	729 (7.2)	116 (2.8)	269 (6.3)	385 (3.4)
Marine Corps	56 (5.5)	128 (13.8)	184 (5.8)	28 (2.2)	70 (7.7)	98 (2.4)
Civilian						
Other Heart Problems						
Navy	71 (1.9)	88 (2.1)	159 (1.9)	50 (1.4)	75 (1.5)	112 (1.4)
Marine Corps	10 (0.3)	19 (2.5)	29 (0.4)	7 (0.2)	13 (1.8)	20 (0.3)
Civilian						
Anemia						
Navy	52 (1.3)	758 (18.4)	810 (4.1)	13 (0.3)	237 (5.9)	250 (1.2)
Marine Corps	10 (0.6)	176 (20.4)	186 (1.6)	2 (0.0)	57 (7.0)	59 (0.4)
Civilian						
Varicose Veins						
Navy	80 (1.9)	280 (6.8)	360 (2.7)	73 (1.8)	244 (5.8)	317 (2.4)
Marine Corps	16 (0.9)	48 (5.0)	64 (1.1)	15 (0.9)	42 (4.3)	57 (1.0)
Civilian						
Scrotal Varices (Varicose Vein in Scrotum)						
Navy	112 (2.8)	n/a	112 (2.3)	82 (2.1)	n/a	82 (1.7)
Marine Corps	25 (1.6)	n/a	25 (1.5)	19 (0.7)	n/a	19 (0.7)
Civilian						
Hernia or Rupture						
Navy	347 (9.0)	105 (2.6)	452 (8.0)	32 (0.8)	14 (0.3)	46 (0.7)
Marine Corps	98 (7.3)	26 (2.7)	124 (7.1)	10 (0.7)	3 (0.3)	13 (0.7)
Civilian						

Table 1 (Cont). Lifetime and Point Prevalence Rates of Self-Reported Medical Conditions Among Navy and Marine Corps Men and Women, POWR '95 (Has a health care provider ever told you that you had any of the following?)

Condition	Lifetime Prevalence			Point Prevalence		
	Men No. (%)	Women No. (%)	Total No. (%)	Men No. (%)	Women No. (%)	Total N0. (%)
Hemorrhoids						
Navy	525 (12.3)	623 (14.5)	1148 (12.6)	232 (5.5)	303 (7.1)	535 (5.7)
Marine Corps	127 (8.5)	119 (12.5)	246 (8.7)	58 (3.4)	51 (5.1)	109 (3.5)
Civilian						
Other Blood Circulation Problems						
Navy	26 (0.6)	70 (1.6)	96 (0.7)	15 (0.3)	48 (1.1)	63 (0.4)
Marine Corps	5 (0.5)	22 (2.2)	27 (0.6)	3 (0.4)	14 (1.4)	17 (0.4)
Civilian						
Diabetes						
Navy	15 (0.4)	54 (1.3)	69 (0.6)	13 (0.4)	5 (0.1)	18 (0.3)
Marine Corps	3 (0.1)	13 (1.4)	16 (0.1)	3 (0.1)	2 (0.2)	5 (0.1)
Civilian						
Ulcer						
Navy	146 (3.8)	184 (4.6)	330 (3.9)	33 (0.9)	50 (1.1)	83 (0.9)
Marine Corps	35 (3.6)	27 (3.0)	62 (3.6)	7 (0.6)	8 (1.0)	15 (0.6)
Civilian						
Bowel or Intestinal Trouble (e.g. Colitis)						
Navy	128 (3.0)	246 (5.6)	374 (3.4)	50 (1.1)	132 (3.1)	182 (1.4)
Marine Corps	13 (1.3)	48 (5.1)	61 (1.5)	4 (0.1)	23 (2.5)	27 (0.2)
Civilian						
Gallstones						
Navy	41 (1.0)	66 (1.6)	107 (1.1)	5 (0.1)	4 (0.1)	9 (0.1)
Marine Corps	4 (0.2)	11 (0.9)	15 (0.2)	1 (0.0)	0 (0.0)	1 (0.0)
Civilian						

Table 1 (cont). Lifetime and Point Prevalence Rates of Self-Reported Medical Conditions Among Navy and Marine Corps Men and Women, POWR '95 (Has a health care provider ever told you that you had any of the following?)

Condition	Lifetime Prevalence			Point Prevalence		
	Men No. (%)	Women No. (%)	Total No. (%)	Men No. (%)	Women No. (%)	Total N0. (%)
Hepatitis (Jaundice)						
Navy	116 (2.8)	124 (2.7)	240 (2.8)	14 (0.3)	14 (0.3)	28 (0.3)
Marine Corps	22 (1.3)	31 (3.1)	53 (1.4)	1 (0.0)	3 (0.2)	4 (0.0)
Civilian						
Other Liver Problem						
Navy	30 (0.6)	19 (0.4)	49 (0.6)	10 (0.2)	6 (0.2)	16 (0.2)
Marine Corps	4 (0.1)	3 (0.4)	7 (0.2)	1 (0.0)	0 (0.0)	1 (0.0)
Civilian						
Urinary Tract Infection						
Navy	445 (10.9)	1867 (44.8)	2312 (16.4)	11 (0.3)	39 (1.1)	50 (0.4)
Marine Corps	86 (7.5)	399 (45.3)	485 (9.3)	1 (0.0)	19 (2.2)	20 (0.1)
Civilian						
Repeated Kidney Infections						
Navy	24 (0.6)	202 (4.7)	226 (1.3)	4 (0.1)	16 (0.4)	20 (0.1)
Marine Corps	4 (0.7)	53 (5.6)	57 (1.0)	0 (0.0)	4 (0.4)	4 (0.0)
Civilian						
Kidney Stones						
Navy	143 (3.5)	66 (1.5)	209 (3.2)	15 (0.3)	9 (0.2)	24 (0.3)
Marine Corps	20 (2.0)	12 (0.9)	32 (2.0)	0 (0.0)	2 (0.1)	2 (0.0)
Civilian						
Other Bladder Trouble						
Navy	27 (0.7)	154 (3.7)	181 (1.2)	5 (0.1)	47 (1.1)	52 (0.3)
Marine Corps	5 (0.8)	38 (4.2)	43 (0.9)	2 (0.1)	7 (0.6)	9 (0.1)
Civilian						

Table 1 (Cont). Lifetime and Point Prevalence Rates of Self-Reported Medical Conditions Among Navy and Marine Corps Men and Women, POWR '95 (Has a health care provider ever told you that you had any of the following?)

Condition	Lifetime Prevalence (Yes, Recovered)			Point Prevalence (Yes, Still have)		
	Men No. (%)	Women No. (%)	Total No. (%)	Men No. (%)	Women No. (%)	Total N0. (%)
Pelvic Inflammatory Disease (PID)						
Navy	n/a	206 (4.8)	206 (0.8)	n/a	14 (0.3)	14 (0.0)
Marine Corps	n/a	43 (5.2)	43 (0.2)	n/a	3 (0.3)	3 (0.0)
Civilian						
Gonorrhea						
Navy	402 (9.9)	110 (2.8)	512 (8.8)	3 (0.1)	1 (0.0)	4 (0.1)
Marine Corps	82 (6.2)	21 (2.5)	103 (6.0)	1 (0.0)	0 (0.0)	1 (0.0)
Civilian						
Syphilis						
Navy	28 (0.7)	24 (0.6)	52 (0.7)	2 (0.0)	0 (0.0)	2 (0.0)
Marine Corps	1 (0.4)	3 (0.3)	4 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)
Civilian						
Chlamydia						
Navy	107 (2.8)	524 (13.4)	631 (4.5)	1 (0.0)	8 (0.2)	9 (0.1)
Marine Corps	24 (2.5)	112 (13.5)	136 (3.0)	0 (0.0)	0 (0.0)	0 (0.0)
Civilian						
Herpes or Genital Warts						
Navy	241 (5.8)	453 (10.7)	694 (6.6)	102 (2.5)	177 (4.3)	279 (2.8)
Marine Corps	44 (4.2)	105 (11.5)	149 (4.5)	20 (1.2)	51 (5.5)	71 (1.4)
Civilian						
Sterility/Infertility						
Navy	68 (1.5)	164 (3.9)	232 (1.9)	59 (1.2)	119 (2.8)	178 (1.5)
Marine Corps	17 (10.0)	29 (3.2)	46 (1.1)	12 (0.8)	20 (2.2)	32 (0.8)
Civilian						

Table 1 (Cont.). Lifetime and Point Prevalence Rates of Self-Reported Medical Conditions Among Navy and Marine Corps Men and Women, POWR '95 (Has a health care provider ever told you that you had any of the following?)

Condition	Lifetime Prevalence (Yes, Recovered)			Point Prevalence (Yes, Still have)		
	Men No. (%)	Women No. (%)	Total No. (%)	Men No. (%)	Women No. (%)	Total N0. (%)
Thyroid Disease						
Navy	16 (0.3)	126 (2.9)	142 (0.7)	7 (0.1)	84 (1.9)	91 (0.4)
Marine Corps	6 (0.6)	12 (1.1)	18 (0.6)	3 (0.1)	8 (0.7)	11 (0.2)
Civilian						
Arthritis						
Navy	223 (5.1)	240 (5.4)	463 (5.2)	198 (4.6)	215 (4.8)	413 (4.6)
Marine Corps	37 (2.2)	46 (4.5)	83 (2.3)	32 (2.1)	40 (3.8)	72 (2.2)
Civilian						
Neuralgia						
Navy	7 (0.1)	16 (0.4)	23 (0.2)	6 (0.1)	9 (0.2)	15 (0.1)
Marine Corps	0 (0.0)	3 (0.3)	3 (0.0)	0 (0.0)	1 (0.1)	1 (0.0)
Civilian						
Anorexia or Bulimia (Eating Disorder)						
Navy	12 (0.3)	93 (2.3)	105 (0.7)	6 (0.2)	19 (0.5)	25 (0.2)
Marine Corps	0 (0.0)	24 (2.8)	24 (0.1)	0 (0.0)	7 (0.6)	7 (0.0)
Civilian						
Migraines						
Navy	213 (5.6)	651 (15.7)	864 (7.2)	105 (2.8)	427 (10.3)	532 (4.0)
Marine Corps	37 (3.7)	132 (14.9)	169 (4.2)	24 (2.1)	82 (9.0)	106 (2.4)
Civilian						
Head Injury (Involving Stitches or Unconsciousness)						
Navy	1087 (27.8)	583 (13.8)	1670 (25.5)	11 (0.3)	10 (0.2)	21 (0.3)
Marine Corps	248 (29.9)	140 (15.1)	388 (29.2)	3 (0.4)	4 (0.4)	7 (0.4)
Civilian						

Table 1 (Cont). Lifetime and Point Prevalence Rates of Self-Reported Medical Conditions Among Navy and Marine Corps Men and Women, POWR '95 (Has a health care provider ever told you that you had any of the following?)

Condition	Lifetime Prevalence			Point Prevalence		
	Men No. (%)	Women No. (%)	Total No. (%)	Men No. (%)	Women No. (%)	Total N0. (%)
Depression						
Navy	166 (4.3)	350 (8.4)	516 (4.9)	47 (1.3)	116 (2.9)	163 (1.5)
Marine Corps	23 (2.9)	73 (7.7)	96 (3.1)	6 (0.5)	27 (2.7)	33 (0.6)
Civilian						
Other Psychological Condition						
Navy	73 (1.9)	100 (2.2)	173 (2.0)	21 (0.6)	36 (0.8)	57 (0.6)
Marine Corps	11 (1.3)	23 (2.5)	34 (1.4)	5 (0.8)	10 (0.8)	15 (0.8)
Civilian						
Speech Problems						
Navy	102 (2.9)	97 (2.5)	199 (2.8)	30 (1.0)	15 (0.4)	45 (0.9)
Marine Corps	22 (4.0)	16 (1.7)	38 (3.9)	3 (0.4)	5 (0.5)	8 (0.4)
Civilian						
Hearing Loss/Problems						
Navy	674 (16.7)	297 (6.7)	971 (15.1)	546 (13.4)	236 (5.2)	782 (12.1)
Marine Corps	161 (17.1)	85 (8.9)	246 (16.7)	138 (14.5)	59 (6.1)	197 (14.1)
Civilian						
Vision Impairment/Problems						
Navy	971 (24.0)	1128 (26.4)	2099 (24.4)	793 (19.7)	923 (21.6)	1716 (20.0)
Marine Corps	204 (24.1)	227 (24.0)	431 (24.1)	163 (18.8)	193 (20.4)	356 (18.9)
Civilian						
Peridontal Disease (Gum Disease)						
Navy	454 (10.4)	350 (7.7)	804 (10.0)	252 (6.0)	172 (3.7)	424 (5.6)
Marine Corps	93 (6.0)	64 (6.5)	157 (6.1)	51 (3.2)	32 (2.6)	83 (3.2)
Civilian						

Table 2. One-Month Prevalence Rates of Current Medical Conditions Among Navy and Marine Corps Men and Women, POWR '95 (Have you experienced any of the conditions listed below any time in the past 30 days regardless of whether or not they resulted in a visit to sick call or a health care provider?

	Men Type of Care				Women Type of Care			
	Rate	Nothing	Self-Care	Med Care	Rate	Nothing	Self-Care	Med Care
Common Cold Symptoms	2516(55.8)	353(17.9)	1853(70.6)	232(8.3)	2954(58.6)	351(11.8)	2159(72.2)	367(13.3)
Dizziness	309(7.09)	141(45.7)	91(27.6)	66(20.2)	751(15.0)	346(44.9)	225(29.7)	158(22.2)
Chills	434(10.5)	68(20.4)	279(57.1)	72(17.9)	855(16.7)	181(21.1)	479(54.5)	164(20.5)
Cough	1570(35.5)	246(18.9)	1049(64.5)	214(12.2)	1995(39.6)	299(14.8)	1280(63.5)	343(17.8)
Sore Throat	1427(31.6)	183(15.6)	973(65.0)	220(15.4)	2012(39.9)	257(12.5)	1292(63.8)	379(19.4)
Fever	785(18.0)	51(6.8)	550(68.9)	156(20.7)	1082(21.1)	77(7.0)	693(62.7)	271(26.2)
Flu	693(14.9)	29(4.4)	452(66.4)	191(25.2)	800(15.6)	40(5.2)	451(55.3)	267(34.0)
Diarrhea at Least 3 Days	220(4.7)	42(20.5)	105(41.9)	61(33.8)	266(5.6)	50(19.5)	125(46.5)	85(31.4)
Stomach Problems	422(8.5)	90(24.0)	224(45.0)	87(27.2)	752(14.9)	193(25.3)	385(49.9)	156(22.0)
Constipation	212(4.0)	64(37.9)	132(57.3)	13(3.8)	646(13.0)	163(25.5)	406(63.0)	59(8.5)
Indigestion	592(11.2)	124(23.7)	429(69.1)	20(4.6)	684(13.3)	131(19.2)	511(73.8)	25(3.8)
Nausea/Vomiting	295(6.6)	62(25.2)	148(47.7)	71(24.5)	794(15.7)	216(26.6)	355(43.9)	204(26.6)
Sinus Trouble	1229(27.7)	187(18.3)	820(64.4)	180(12.7)	1624(32.3)	191(11.8)	1047(63.6)	340(21.4)
Hay Fever	215(4.3)	37(14.3)	141(67.5)	30(15.2)	283(5.7)	36(13.3)	187(64.4)	43(16.3)
Shortness of Breath	166(3.5)	75(51.3)	44(16.8)	40(25.3)	330(6.7)	136(40.6)	100(30.0)	84(26.4)
Hoarseness	225(4.9)	66(36.8)	117(49.7)	30(10.6)	463(9.2)	130(26.8)	236(51.1)	82(18.1)
Sleeping Problems	577(13.8)	370(67.5)	153(21.9)	34(7.7)	925(18.3)	533(57.8)	298(32.5)	71(7.0)
Headaches	1459(30.9)	152(14.0)	1190(78.5)	79(4.5)	2463(49.2)	236(9.3)	1957(79.1)	209(8.9)
Skin Problems	475(9.9)	68(16.5)	221(46.8)	175(35.3)	666(13.2)	85(13.3)	319(47.5)	241(35.9)
Muscle Sprain or Strain	832(17.0)	135(15.3)	449(50.2)	225(31.9)	654(12.6)	119(18.3)	281(42.5)	236(36.5)
Back Problems	891(18.9)	254(31.5)	389(38.4)	220(27.5)	1112(22.2)	335(30.4)	457(41.3)	294(25.7)
Ringing in the Ears	438(11.2)	311(73.1)	54(11.1)	56(13.1)	368(7.5)	257(70.9)	46(12.6)	50(11.8)
Irritated Eyes	480(10.3)	165(38.1)	230(47.9)	68(10.0)	681(13.2)	235(34.5)	330(48.0)	97(14.6)

Table 2 (cont.). One-Month Prevalence Rates of Current Medical Conditions Among Navy and Marine Corps Men and Women, POWR '95 (Have you experienced any of the conditions listed below any time in the past 30 days regardless of whether they resulted in a visit to sick call or a health care provider?

	Men Type of Care				Women Type of Care			
	Rate	Nothing	Self-Care	Med Care	Rate	Nothing	Self-Care	Med Care
Trouble seeing with one or both eyes even if wearing glasses	218(4.5)	112(49.5)	21(9.3)	75(35.2)	309(6.2)	168(51.9)	35(10.9)	96(33.9)
Teeth/gum/dental problems	520(10.2)	75(15.6)	51(10.4)	377(69.0)	592(11.4)	106(18.5)	73(12.4)	395(65.5)
Broken bones	91(1.8)	1(1.7)	2(1.5)	84(93.9)	56(1.1)	1(1.6)	2(3.7)	51(90.8)

Table 3. One-month and One-year Prevalence of Prescribed and Nonprescribed Medication Use Among Navy and Marine Corps Personnel, POWR '95 ("Was there any time when you used a fair amount of any of these medications?")

	Males		Females		Total	
Medication	**Last Month**	**Last Year**	**Last Month**	**Last Year**	**Last Month**	**Last Year**
	No. (%)	**No. (%)**	**No. (%)**	**No. (%)**	**No. (%)**	**No. (%)**
Allergy pills	350(6.9)	656(12.9)	538(10.2)	985(19.2)	888(7.3)	1641(13.6)
Aspirin or other pain killers	2257(47.5)	2855(59.6)	2951(58.1)	3581(70.7)	5208(48.8)	6436(60.8)
Diet pills	109(2.7)	150(4.0)	297(5.9)	551(10.9)	406(3.1)	701(4.8)
Laxatives	136(3.1)	231(4.7)	393(8.0)	743(14.9)	529(3.7)	974(5.9)
Sleeping pills	104(2.2)	151(3.2)	183(3.5)	333(6.5)	287(2.3)	484(3.6)
Stomach medicine	529(10.5)	772(15.0)	647(12.5)	991(19.3)	1176(10.7)	1763(15.5)
Tranquilizers (Valium, Librium)	66(1.7)	116(2.6)	66(1.2)	143(2.7)	132(1.6)	259(2.7)
Antibiotics	516(12.0)	1264(26.4)	882(17.6)	2054(40.3)	1398(12.6)	3318(28.0)
Antimalarial pills	54(1.4)	122(3.1)	36(0.7)	61(1.2)	90(1.3)	183(2.9)
Pyridostigmine (pills to protect you from a chemical weapon attack)	48(1.2)	54(1.3)	27(0.5)	31(0.6)	75(1.1)	85(1.3)
Other anti-CBW pills or agents	48(1.2)	53(1.5)	29(0.5)	32(0.6)	77(1.1)	85(1.4)
Prescribed medicine for psych. cond.	73(1.5)	91(2.0)	115(2.1)	163(3.1)	188(1.6)	254(2.1)
Ciprofloxacin (Cipro or anti-anthrax pills)	66(1.4)	90(1.8)	49(0.9)	82(1.5)	115(1.3)	172(1.8)
Other medicine	872(18.6)	1154(24.7)	1440(28.0)	1793(34.9)	2312(19.7)	2947(25.9)
Other vaccine	530(11.5)	1021(21.3)	566(11.5)	1125(22.3)	1096(11.5)	2146(21.4)

Table 4. Perceived health of Navy and Marine Corps Personnel as Measured by the Medical Outcomes Survey (MOS) Scales Means and Standard Errors (Score of 100 = optimal health status)

	Navy		Marine Corps	
MOS Scale	Women	Men	Women	Men
Role limitation due to physical health	82.0 (0.5)	87.7 (0.4)	75.4 (1.3)	85.8 (1.1)
Role limitation due to emotional problem	87.2 (0.5)	90.8 (0.4)	84.5 (1.1)	89.7 (1.3)
Energy/fatigue	55.7 (0.5)	62.2 (0.4)	52.9 (1.4)	60.1 (1.2
Social functioning	82.0 (0.5)	86.5 (0.4)	79.0 (1.3)	85.6 (1.4)
Pain	78.8 (0.3)	82.1 (0.4)	74.2 (0.3)	79.0 (1.2)
General health	76.3 (0.5)	78.5 (0.4)	74.8 (1.3)	78.7 (1.0)

Table 5. Mental Health and Quality of Life of Navy and Marine Corps Personnel, POWR '95

	Navy		Marine Corps	
	Women	Men	Women	Men
	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)
CES-D	10.2 (0.3)	8.3 (0.2)	11.5 (0.8)	9.67 (0.5)
Hopkins-21	30.0 (0.2)	29.0 (0.2)	31.4 (0.5)	30.8 (0.7)
Quality of Life (Summary Score)	11.4 (0.1)	11.9 (0.1)	11.4 (0.2)	11.7 (0.2)

Table 6. Percent Distribution of Stress and Coping Among Navy and Marine Corps Personnel, POWR '95

	Navy			Marine Corps		
	Women	Men	Total	Women	Men	Total
Think about your life over the past 7 days. On the whole, how much stress do you think is in your life right now?						
None at all	4.6	6.4	6.1	5.8	6.3	6.3
A little bit	28.6	30.1	29.8	26.4	28.8	28.7
Moderate amount	32.9	35.0	34.6	30.9	32.0	31.9
Quite a bit	5.3	22.3	22.8	25.9	25.1	25.1
Extreme amount	7.8	5.7	6.1	10.2	7.7	7.8
Stress has affected my personal life:						
Not at all	23.2	31.5	30.2	26.3	31.8	31.5
A little bit	41.3	40.0	40.2	36.0	37.8	37.8
Moderate amount	20.3	16.8	17.4	20.0	18.0	18.1
Quite a bit	10.8	8.8	9.1	12.4	9.2	9.4
Extreme amount	3.7	2.4	2.6	4.5	3.0	3.1
Stress has affected my performance on the job:						
Not at all	51.2	55.4	54.7	50.5	53.4	53.2
A little bit	33.4	30.9	31.3	33.8	32.0	32.1
Moderate amount	9.6	8.8	8.9	9.4	10.0	10.0
Quite a bit	3.8	3.3	3.4	4.4	2.9	3.0
Extreme amount	1.1	1.1	1.1	1.1	1.2	1.2
How well have you coped with stress?						
Very poorly	1.5	1.1	1.2	2.0	1.1	1.2
Somewhat poorly	5.5	4.4	4.6	4.5	4.5	4.5
In-between (neutral)	23.1	15.6	16.8	21.9	18.0	18.2
Somewhat well	31.2	30.8	30.9	28.9	26.7	26.8
Very well	37.8	47.3	45.8	41.9	49.2	48.8

Table 7a. Health Ccare Utilization During Past 12 Months: Average Number of Visits to Military Medical Facility

	Navy				Marine Corps			
	Women		Men		Women		Men	
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)
Illness or injury	2.5	(0.1)	1.7	(0.0)	3.0	(0.2)	2.1	(0.1)
Follow-up for illness or injury	1.9	(0.1)	1.4	(0.0)	2.4	(0.1)	1.6	(0.1)
General physical exam	0.7	(0.0)	0.6	(0.0)	0.9	(0.1)	0.6	(0.1)
Rx refill only	1.8	(0.0)	0.8	(0.0)	1.7	(0.1)	0.6	(0.1)
Eye exam only	0.5	(0.0)	0.4	(0.0)	0.4	(0.0)	0.4	(0.0)
Prenatal care	1.1	(0.1)	0.0	(0.0)	1.3	(0.2)	0.0	(0.0)
Same day surgery	0.2	(0.0)	0.1	(0.0)	0.2	(0.0)	0.2	(0.0)
Mental health	0.3	(0.0)	0.1	(0.0)	0.2	(0.0)	0.1	(0.0)
Emergency care	0.4	(0.0)	0.2	(0.0)	0.5	(0.0)	0.3	(0.0)
Other type of care	0.6	(0.0)	0.3	(0.0)	0.6	(0.0)	0.4	(0.0)

Table 7b. Health Care Utilization During Past 12 Months: Average Number of Visits to Civilian Doctor's Office or Outpatient Clinic

	Navy				Marine Corps			
	Women		Men		Women		Men	
	Mean	(SE)	Mean	(SE)	Mean	(SE)	Mean	(SE)
Illness or injury	0.2	(0.0)	0.1	(0.0)	0.2	(0.0)	0.2	(0.0)
Follow-up for illness or injury	0.1	(0.0)	0.1	(0.0)	0.1	(0.0)	0.1	(0.0)
General physical exam	0.0	(0.0)	0.0	(0.0)	0.1	(0.0)	0.0	(0.0)
Rx refill only	0.1	(0.0)	0.0	(0.0)	0.1	(0.0)	0.0	(0.0)
Eye exam only	0.2	(0.0)	0.1	(0.0)	0.2	(0.0)	0.1	(0.0)
Prenatal care	0.2	(0.0)	0.0	(0.0)	0.4	(0.2)	0.0	(0.0)
Same day surgery	0.2	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Mental health	0.0	(0.0)	0.1	(0.0)	0.0	(0.0)	0.1	(0.0)
Emergency care	0.1	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
Other type of care	0.2	(0.0)	0.1	(0.0)	0.2	(0.0)	0.0	(0.0)

Appendix E

DRAFT

Demographic Differences in Anthropometry of Navy and Marine Corps Personnel and Concordance of Selected Body Composition Measures

DEMOGRAPHIC DIFFERENCES IN ANTHROPOMETRY OF NAVY AND MARINE CORPS PERSONNEL AND CONCORDANCE OF SELECTED BODY COMPOSITION MEASURES

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Summary

Problem

In recent years the role of women in the military has expanded to include nontraditional occupations, such as assignment to combat vessels. With this change in duty a concomitant increase has occurred in the numbers of women in all branches of the service. The shift in the demographic makeup and occupational role of women in the military was acknowledged by a large-scale military population-based women's health survey that included biological and physical measurements, entitled the 1995 Defense Women's Health Research Program Perceptions of Wellness and Readiness (POWR '95) Assessment. The physical measurements obtained in this survey were designed to establish baseline data for military women which would help in setting appropriate accession and retention standards and in designing useful prevention and intervention programs in the areas of physical fitness and health.

Since all of the services employ weight or body composition standards to admit and retain military personnel, much debate centers on the appropriateness of various weight standards for men and women of different ages and racial groups. The establishment of any standard requires consideration of the anthropometric characteristics of the civilian population from which applicants are drawn, the services' ability to prevent or treat the accumulation of excess weight/body fat among its members, and any inherent differences in body composition by race and age. The purpose of this study was to assess the extent to which military women meet current standards based on Navy/Marine Corps weight-for-height standards and Navy percent body fat (%BF) maximums. In addition, military women were compared with the eligible civilian pool and their body fat (BF) ascertained based on the National Health and Nutrition Examination Survey (NHANES) standard for overweight which is defined by body mass index (BMI).

Objectives

This report had three main objectives. The first was to present anthropometric data for the study sample, making comparisons between women and men, white versus other races, different age groups, and enlisted versus officer designation. The second objective was to compare other military and civilian populations with the Navy and Marine Corps. The third objective was to establish the relative concordance between BMI and %BF. A principal focus of

the latter objective was to ascertain the extent of association among these body composition measures for military women and men of different ages and ethnic groups.

Approach

The sample design for the POWR Assessment survey conducted between December 1994 and December 1996, was a two-stage probability sample, with installations selected at the first stage and personnel assigned to selected installations chosen randomly from within strata at the second stage. The targeted sample for the survey consisted of 25,863 Navy and Marine Corps active-duty members selected from 45 geographic locations worldwide. Because it was not feasible to measure all survey respondents, a third sampling stage was initiated at three large West Coast and Pacific Region naval bases and two West Coast Marine Corps bases. A sample of persons responding to the group-administered questionnaire study was randomly selected for body measurements within strata according to gender, race, and rank. Approximately 854 Navy and 438 Marine Corps active-duty personnel participated in the body measurement study.

Results

Using the NHANES criterion for overweight based on BMI, approximately 15% of military women and 23% of military men had elevated levels of BMI. The prevalence of overweight was considerably lower among Marine Corps women as compared with Navy women and slightly less for Marine Corps men compared with their Navy counterparts. Between one fifth and one third of military personnel exceeded Navy/Marine Corps weight-for-height standards. Navy women tended to meet weight standards more often than Navy men. The ability of Marine Corps women to meet standards was mixed; fewer women than men were overweight but more exceeded their weight-for-height standards. Nearly 45% of Navy men and women were above maximum allowable %BF. Comparisons between the military and civilian population for white individuals (including Hispanic whites) indicated that among military women were leaner than civilian women, but men were similar in body composition in both populations. BMI and %BF were similarly distributed for age and race and showed relatively high concordance.

Conclusions

BMI and %BF are reasonable measures to consider to estimate body composition in the military because they correlate highly and predict individual body fat reasonably well and because they exhibit no inherent bias based on age and race. However, the study results indicate that a

very different level of resources may be required for weight reduction treatment depending upon which standard the sample was judged against.

INTRODUCTION

In recent years the role of women in the military has expanded to include nontraditional occupations, such as assignment to combat ships. With this change in duty a concomitant increase has occurred in the numbers of women in all branches of the service. Between 1981 and 1990, for example, women's representation in the Navy grew from 6.5% to 9.9% (DoD, 1981; DoD, 1991). This shift in the demographic makeup and occupational role of women in the military was acknowledged by a large-scale military population-based women's health survey that included biological and physical measurements, entitled the 1995 Defense Women's Health Research Program Perceptions of Wellness and Readiness (POWR '95) Assessment. The physical measurements obtained in this survey were designed to establish baseline data for military women which would help in setting appropriate accession and retention standards and in designing useful prevention and intervention programs in the areas of physical fitness and health.

All of the services employ weight or body composition standards to screen members into military service as well as to determine their fitness for continued duty (Marriott & Grumstrup-Scott, 1992). Body fat standards vary between services, and, in some services, by age; however the services are consistent in recognizing a gender-appropriate level of body fat that is higher in women (Friedl, in press, 1996). The Navy's policy on body fat standards for active-duty personnel has changed in the last 5 years, replacing the within standards/overfat/obese categorization with a simpler, dichotomous criterion of within standards and out of standards. Body fat is assessed through the Physical Readiness Training program. A failed semiannual PRT screen based on a height/weight table will trigger a follow-up body fat assessment based on circumferences (Chief of Naval Operations, 1995). The allowable body fat maximum for male sailors of all ages is 22%, while the maximum acceptable body fat value for women is 30%. The U.S. Marine Corps (USMC) employs a height/weight standard (Commandant of the Marine Corps, 1993) that is slightly more stringent than the corresponding Navy height/weight table (see Appendix A). Although there are approved procedures in place to rectify an unacceptable body fat level, failure to meet weight standards will result in discharge from military service, even if physical performance is outstanding.

The military exists as a microcosm of the larger, civilian society, and its ranks are often filled by the fittest of this nation's young men and women (Friedl, Vogel, Bovee, & Jones, 1989). Because the military depends on an abundant supply of able-bodied men and women who will volunteer their services to protect the nation's welfare, it is appropriate to compare the health and fitness of military personnel with that of the civilian population. Moreover, the availability of health and anthropometric data provided by such national surveys as NHANES and National Health Interview Survey (NHIS) provide a ready data resource upon which to base these comparisons. These surveys have established the normative distributions for certain population parameters, such as height, weight, subscapular and triceps skinfolds, and body mass.

The national surveys have utilized body mass index (BMI) as an overall indicator of obesity. Although BMI provides only an approximation of an individual's fatness, it is a simple and convenient measure (based upon height and weight) and has been shown to correlate with disease risk (National Institutes of Health (NIH), 1985). The National Center for Health Statistics (NCHS) has established the definition of overweight for men as BMI $\geq$ 27.8 kg/m^2 and for women as BMI $\geq$ 27.3 kg/m^2 (NCHS, 1987). These cutoff points represent the sex-specific 85th percentiles for persons 20 to 29 years of age in the NHANES II. Further support for the use of the BMI as an overall indicator of obesity was achieved through its endorsement by the National Institutes of Health Consensus Development Panel (NIH, 1985).

Quantification of body fat has relied on various technologies, such as hydrostatic weighing, anthropometry, and electrical impedence. Whereas hydrostatic weighing generally produces a valid and reliable result and is the current "gold standard" against which other methods are compared, it is cumbersome, expensive, and can only be accomplished in a laboratory (Vogel & Friedl, 1992). Although anthropometry and electrical impedance lend themselves to epidemiological investigation, these methods have been criticized based on validity and accuracy concerns. Each of these methods presents unique problems, especially when applied to women (Hassager, Gotfredsen, Jensen, & Christiansen, 1986; Vanderburgh, 1992). The pattern of distribution of body fat is dissimilar for men and women. "Women carry more fat on and less in their smaller frames compared to men" (Garn, 1957), and they also distribute more of it to the extremities than men; this is reflected in the higher triceps and skinfold thicknesses relative to trunk measures, such as the subscapular skinfold (Vogel & Friedl, 1992). Unlike men, women

have fat deposits in the breasts, hips, and thighs to accommodate pregnancy and lactation. These gender differences have given rise to a variety of anthropometric equations to predict body fat that encompass various combinations of height, weight, circumference, and skinfold measurements. Since it is widely recognized that an increasing amount of body fat is associated with age, age has been added to the equation in determining body fat composition (Tran & Weltman, 1989). Although others argue that BF should not, ideally, increase with age, the increase is generally attributed to decreased activity (Going, Williams, & Lohman, 1995). This is also why there is no change in BF standards with age for the Navy.

This report has three main objectives. The first is to present anthropometric data for the study sample, making comparisons between women and men, white versus other races, different age groups, and enlisted versus officer designation. The second objective is to compare other military and civilian populations with the Navy and Marine Corps. The third objective is to establish the relative concordance between BMI and percent body fat (%BF). A principal focus of the latter objective is to ascertain the extent of association among these body composition measures for military women and men of different ages and ethnic groups.

METHODS

Sampling Procedure

The POWR '95 Assessment consisted of three components: a questionnaire to which approximately 10,000 active-duty military personnel responded, a body measurement study of a subsample of approximately 1,300 persons, and a telephone interview conducted with about 780 respondents.

The sample design for the POWR Assessment was a two-stage probability sample, with installations selected at the first stage and personnel assigned to selected installations chosen randomly from within strata at the second stage. This approach allowed the sample to be restricted to a predetermined number of installations while preserving its inferential capability. In addition, stratification was used to further control the sample distribution with respect to organizational and demographic characteristics. The total targeted sample size for the survey consisted of 25,863 Navy and Marine Corps personnel selected from 45 geographic locations worldwide.

Since it was not feasible to measure all survey respondents, a third sampling stage was initiated at installations in which the questionnaire was administered in group sessions. The sites were determined after the original sample had been selected and corresponded to one naval base outside the continental United States (OCONUS), two West Coast naval bases, and two West Coast Marine Corps bases. The bases were the largest West Coast and OCONUS bases. Although a nonprobability procedure was used to select the bases to participate in the body measurement study, persons were selected within gender, race, and rank strata in a random manner. A sample large enough to yield body measurements for 800 Navy and 400 Marine Corps personnel with approximately equal representation of women and men was selected (a 10% subsample of the anticipated questionnaire sample).

A sample of persons reporting to the group sessions was selected to participate in the body measurement study based upon predetermined demographic quotas. Target cell sizes for demographic groups were calculated based on equal numbers of men and women and were proportional to those in the original sample. This number was then indicated on a grid used by the military liaison officer who greeted participants on arrival at the sessions. As each participant signed in for the survey session, his/her demographic composition was determined from a master list and screened to decide if his/her gender, race (white vs. other), and rank (E1 to E6, E7 to E9, officer) fell into a target cell. If so, it was ticked on the grid and he/she was handed a 5 ½ X 8 ½ bright yellow card informing participants that they had been randomly chosen to participate in the body measurements portion of POWR '95. This card also included a brief mention of the measurements to be taken and why they were important to the Navy and Marine Corps. This procedure helped maintain the schedule of participants for measurement, avoided long wait times, and allowed for a variable number of respondents per session. For example, if 25 or fewer showed up to a session, all were given cards. However, if a larger group showed up, every second or third individual was chosen depending on the target number needed for the cell. After chosen respondents completed their questionnaires, they were shown to the appropriate male or female measuring rooms.

Table 1 presents the response data and response rates for the questionnaire study and for the body measurement study. The top portion of the table gives the response rates for eligibles at the group session sites because the response rates for the body measurement study are conditional

on those rates. The bottom portion of the table gives the cooperation rates among those selected and the overall response rates among eligibles. As shown, cooperation rates were very high for both Marine Corps (97.3%) and Navy personnel (89.1%). The overall response rates were lower, however, because they take into account the numbers who attended the group sessions. The final participation rates were 42.4% for the Marine Corps, 58.8% for the Navy, and 52.5% for the total sample. Although these rates were higher than those for the questionnaire study overall (mailed and group session), they still are sufficiently low that they may be subject to potential nonresponse bias. Given the high cooperation rates for this portion of the study and the fact that the study involved unobtrusive physical measurements, it seems unlikely that serious bias would be introduced by non-participation in the measurements.

Table 1. Survey response data and participation rates for body measurement study, U.S. Navy and Marine Corps, 1995

Group Session Site	USMC	Navy	Total
Questionnaire Study			
1. Number of eligible persons	1,664	2,544	4,208
2. Number of respondents	726	1,680	2,406
3. Response rate among eligibles (%) = Item 2/Item 1 × 100	43.6	66.0	57.2
Body Measurement Study			
4. Number of eligible persons selected	450	959	1,409
5. Number of participants	438	854	1,292
6. Cooperation rate (%) = Item 5/Item 4 × 100	97.3	89.1	91.7
7. Participation rate among selected eligibles (%) = (Item 3 X Item 6) /100	42.4	58.8	52.5

The body measurement sample data were weighted to allow inferences to the population of Navy and Marine Corps personnel in the set of sites included in the group sessions. The purpose of weighting was to make adjustments for deviations between the distribution of characteristics in the respondent sample and the target population. Due to the relatively small fraction of women in the military, poststratification weights were applied to obtain a true estimate

of the gender distribution in the population. In this study, the weights were computed to reflect the relative frequency with which persons in the body measurement sample occurred in 30 classes defined by branch of service, location (continental U.S. (CONUS) or outside continental U.S.(OCONUS)), paygrade, gender, and race. Race was not used in defining the classes for female E7s to E9s or female officers in either service because of the small respondent sample sizes. Appendix B gives actual and weighted sample counts (population estimates) for the body measurement study by gender, race, age, and paygrade.

Data Collection Procedure

Physical and cardiovascular measurements. Body measurements were limited to noninvasive, standardized procedures. These measurements included height, weight, neck, waist, and hip circumference; triceps skinfold; and subscapular skinfold. All measurements were recorded on a data sheet as they were taken (see Appendix C). All equipment was prepared and calibrated in accordance with standardized protocols. This equipment included 2 digital scales, 2 calipers, and 6 tape measures.

Two Seca, model 77000, compact digital physician scales were used for weighing. Calibration involved weighing the same clipboard on each scale at the beginning of each session and noting any differences in the two scales. The scales were numbered scale one and scale two. Participants were asked to remove their shoes and empty their pockets prior to stepping on the scale. Once on the scale, they were asked to look straight ahead and their weight was recorded on the data sheet to the nearest 0.1 kg.

Height was measured using a W.H. Collins, Inc., (San Diego, CA), plastic-coated tape measure attached to the wall. Participants were asked to remove their shoes and stand with heels together next to the wall or baseboard with the tape measure bisecting the long axis of the body. A clipboard was placed on the highest point of the head, parallel to the floor. They were asked to take and hold a deep breath and stretch tall. When the recorder had a reading, the participants were directed to step away, leaving the clipboard in place. The reading was verified with the clipboard still in place and then recorded on the data sheet to the nearest 0.1 cm.

Circumferences of the neck, abdomen, and hip in women were taken using a Scoville-Dritz, (Seattle, WA), plastic-coated tape measure. Participants were asked to remove their shirts for the neck and abdomen measures. If necessary, pants or skirts were lowered to gain access to

the waist. In women, the hips were measured over the clothing, pulling the tape tight. These measurements were recorded to the nearest centimeter. Each circumference measurement was taken twice by the same surveyor. These measurements then were averaged. The protocol followed was from "Technique for Measuring Body Circumferences and Skinfold Thickness," (Beckett and Hodgdon, 1984).

Skinfold thicknesses were measured using Harpenden, John Bull calipers from Novel Products, Inc., (Holland, MI). The protocol followed was also from Beckett and Hodgdon (1984). Calipers were checked after each measurement to be sure the indicator had returned to zero.

Body measurement preparations. An experienced anthropometrist trained the measurement teams. A 2-week practice and reliability-testing period was conducted in which the measurement teams practiced and retrained until all members tested within 1 cm for circumferences and achieved a 90% reliability with the skinfold measurements.

Pilot testing of the physical measurement protocols was conducted on 14 people from the USS STEADFAST, a floating dry dock, and a second with 20 volunteers from the Branch Medical Clinic at Miramar Naval Air Station. The 6-member team achieved interrater reliabilities between .95 and .99 for the various measurements.

Body measurement procedures. Measurements were taken by personnel consisting of both trained military corpsmen and civilian contractors. Surveyors consisted of two 4-person teams, one for men and one for women, and an additional surveyor for relief or backup to fill in for any other team member during a session. One surveyor on each team took and recorded height, weight, and blood pressure measurements. The other 6 team members worked as partners taking and recording circumference and caliper measurements. A standardized protocol for the measurement of physical parameters was developed based on a combination of the standardized NHANES and Navy anthropometric protocols (Beckett & Hodgdon, 1984; NCHS, 1981; NCHS, 1985). This protocol was reflected in the design of the data sheets (see Appendix C) upon which the measurements were recorded and that accompanied the participant from measuring station to measuring station. Wellness newsletters and participation certificates were distributed to all participants in the physical measurements survey.

Construction of Body Composition Indices

Indices were constructed and cutoff values established to reflect the relative fatness of Navy and Marine Corps personnel. Among the measures used in this study were: (1) BMI; (2) %BF estimated from generalized equations using circumference measurements and height; (3) %BF estimated by circumferences, age, and height; (4) an indication of overweight determined by gender-specific cutoff values for BMI; (5) percent exceeding the Navy's and Marine Corps' gender-based weight-for-height standards; and (6) percent exceeding the Navy's body fat standard, also based on gender-specific cutoff values.

The formulae for the body composition measures and cutoff values were as follows:

1. Body mass index (BMI)

   BMI = weight (kg)/ height (meter) ^{2}

2. Percent body fat (%BF)[a]

   %BF (women) = (161.27327 * lg_{10} [waist (in) + hip (in) - neck (in)])

   -(100.81032 * lg_{10} [height (in)]) - 69.55016

   %BF (men) = (85.20969 * lg_{10} [waist (in) - neck (in)])

   -(69.73016 * lg_{10} [height (in)]) + 37.26673

3. Percent body fat (age-adjusted)[b]

   BD[b] (women) = (1.168297 - 0.002824 * waist (cm) + 0.0000122098 * waist^2)

   -(0.000733128 * hip (cm)) + (0.000510477 * height (cm))

   -(0.000216161 * age)

   %BF (women) = (4.95/BD - 4.5) * 100

4. Overweight [as defined by NHANES (NCHS, 1987)]

   Overweight (women) = BMI $\geq$ 27.3 kg/m^2

   Overweight (men) = BMI $\geq$ 27.8 kg/m^2

5. Exceed Navy/Marine Corps weight-for-height standard (see Appendix A)

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[a] Personal communication, J. A. Beckett, August 1996.

[b] Body density (BD) was calculated and converted to percent body fat using the Siri equation (1961).

6. Exceed body fat standard[c]

Navy

Exceed body fat standard (women): %BF > 30.0

Exceed body fat standard (men): %BF > 22.0

Statistical Approach

Statistical analyses were conducted with the software for SUrvey DAta ANalysis (SUDAAN), a program developed by Research Triangle Institute, Research Triangle Park, NC, for the specific purpose of analyzing data from complex surveys. SUDAAN permits statistical analyses of weighted data in a reliable and consistent fashion by providing correct variance estimates for complex multi-stage sample designs. Chi-square, t-test, and analysis of variance (ANOVA) procedures available in SUDAAN's CROSSTAB, DESCRIPT, and REGRESS, respectively, provided descriptive univariate and bivariate analyses. The t-test procedure assessed mean differences between two subgroups (e.g., men compared to women, white compared to other races) for the military population as a whole and for branch of service and military and civilian population comparisons. Comparisons between military and civilians were made with the Z-statistic rather than the T-statistic as large degrees of freedom allowed for assumptions of normality. Analysis of variance procedures using REGRESS assessed multiple group differences of means for age groups and paygrade. Chi-square analyses tested for significant proportional differences between the demographic subgroups and among populations of interest in the study. All p-values were two-tailed. The civilian data were obtained on multiple disks from the NCHS. The NHANES III exam file, which contained height, weight, and BMI, was merged with the household demographic file to extract exam weight and respondent demographics. This allowed the civilian adult population to be restricted to the same age group represented in the POWR '95 sample (18 to 54 years). Comparisons made between military and civilian populations are restricted to whites only and include Hispanic whites. Other race comparisons could not be made (and likewise totals) because the categories were not comparable. The other race category in NHANES III consisted primarily of blacks (75%), whereas military personnel of other races who participated in the body measurement study were predominantly Pacific Islanders (60%). This

[c] The Navy uses a height/weight table for prescreening. Those who fail the prescreen are subsequently assessed for body fat.

abundance of largely Philippine natives should be borne in mind when interpreting differences in anthropometric characteristics along racial lines.

RESULTS

Sample Representativeness

One way in which we examined representativeness was to compare the physical measurement weighted sample with the Navy and Marine Corps population. The Navy and Marine Corps samples closely approximated the population values for gender and race (Appendix D). Officers in both branches of service were slightly underrepresented in the physical measurements sample. Offsetting this shortage of officers, the Navy sample had more E7s to E9s while the Marine Corps sample had more E1s to E6s.

A second way in which we addressed bias or the representativeness of our sample was to compare self-reports of height and weight from the questionnaire data with measured height and weight from the body measurement study. Self-reported height and weight were assessed for all survey participants and BMI was calculated to permit a comparison of all three variables. These comparisons were made separately for men and women and were based on the unweighted sample means. Men were measured at 180.4 pounds, 70.4 inches in height, and a computed BMI of 25.6, compared with their self-reports of 178.5 pounds, 69.3 inches, and 26.1 BMI, respectively. The comparable measurements for women were 140.7 pounds, 64.8 inches, and 23.5 BMI versus their self-reports of 140.5 pounds, 65.4 inches, and 23.2 BMI. No significant differences were found between self-reported and measured weight, height, or BMI.

Anthropometric Characteristics of the Military Population

Table 1 shows summary statistics (sample size, mean, and standard error) for anthropometric characteristics of U.S. Navy and Marine Corps women combined by demographic variables. These statistics were based on the weighted sample. Pregnant women were excluded from all analyses so as not to distort the summary statistics presented in this report.

The average height of Navy and Marine Corps women between the ages of 18 to 54 was 64.8 inches. The average weight of these women was 141.5 pounds. Increases in weight were noted with age, Wald $F(4, 1262)^{1} = 3.37$, $p = .02$, and female officers weighed, on average, at least 5 pounds less than enlisted personnel, $F(3, 1262) = 7.57$, $p < .001$.

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[1] Degrees of freedom for all subgroups analyzed for body measurements were based on a single stage design and

Subscapular and triceps skinfolds were approximately equal among active-duty women, 17.3 mm and 18.0 mm, respectively. Subscapular skinfolds were larger among women of other races, $t_{1262} = 4.64$, $p < .001$, whereas triceps measurements were approximately equal for the two groups. Both skinfold measures increase with age, probably due to a less strenuous physical fitness regimen among older military women. Similar to the weight differentials between officers and enlisted personnel, the smallest subscapular skinfold measurements were noted for officers, $F(3, 1262) = 16.60$, $p < .001$ and likewise for triceps measurements, $F(3, 1262) = 4.87$, $p < .01$.

The circumference measurements taken in this study included neck, abdomen, and hip. These girth measurements, when combined with height, produced an estimate of body fat. The average values for women's neck size, abdomen, and hip were 32.6 cm, 73.5 cm, and 100.0 cm, respectively. Although abdomen and hip girths appeared to increase slightly with age, only neck circumference reached statistical significance $F(4, 1262) = 2.66$, $p = .05$. Based on circumference measurements, officers presented a trimmer appearance than enlisted personnel (neck: $F[3, 1262] = 7.39$, $p < .001$; abdomen: $F[3, 1262] = 18.86$, $p < .001$; and hip: $F[3, 1262] = 11.92$, $p < .001$).

Height and weight data, taken in ratio, furnished an estimate of body mass. Military women had an average BMI of 23.6. While this was well below the NHANES cutoff for BMI of 27.3, which stipulates an overweight condition, 15.3% of military women in the study exceeded this cutoff (see Overweight % column in Table 1). The first percent body fat (%BF) shown in Table 1 is the unadjusted value based on the generalized equations of Beckett and Hodgdon (personal communication, J. A. Hodgdon, August 1996). The second %BF is age-adjusted. The mean values for the unadjusted %BF and adjusted %BF among women in our sample were 28.8 and 29.6, respectively. Although the mean value of BMI is fairly stable across age groups at around 23, there was a small increase in %BF with age of about 2 units and a larger increase in the adjusted %BF of nearly 5 units. However, only the adjusted %BF was statistically significant, $F(4, 1262) = 9.06$, $p < .001$. More pronounced differences were observed for the prevalence of an overweight condition in women below and above the age of 45, amounting to a two- to three-fold increase in the later years. For both measures of %BF, officers showed approximately 4%BF

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calculated as the number of subjects minus the number of strata (1,292 - 30) similar to *e* for a multistage design reported by Shah, B. V., Barnwell, B. G., & Bieler, G. S., 1996, p. 4-3. All F tests reported used the Wald sstatistic.

less than E7s to E9s, $F(3, 1262) > 20.0$, $p < .001$. Similarly, half the percentage of officers than enlisted personnel were overweight.

(Table 1 about here)

Table 2 reports the same anthropometric data for men as for women, omitting only hip girth and age-adjusted %BF which was available for women only. The average height of military men ages 18 to 54 was 69.5 inches. Height did not vary by subgroups based on sample demographics. Military men of all ages weighed 176.4 pounds, on average. There was a weight differential of roughly 12 pounds between the youngest and oldest groups in our sample, though it was not statistically significant. The lowest ranked enlisted personnel (E1 to E6) weighed considerably less than higher ranked enlisted personnel or officers $F(3,1262) = 4.03$, $p = .02$. This difference may be partially attributed to the effect of age.

The average subscapular skinfold among military men was 16.3, nearly twice as high as their mean triceps skinfold measurement of 9.4. Although both skinfold measures increased with age (subscapular: $F[4, 1262] = 4.92$, $p < .01$; triceps: $F[4, 1262] = 3.38$, $p = .02$), changes in subscapular skinfold dimensions were more pronounced when comparing the youngest and oldest groups represented in the sample. Skinfold measurements were not significantly different based upon rank.

Circumference measurements for men's neck size and abdomen were 39.2 cm and 89.8 cm, respectively. Mean abdomen girths showed substantial increases with age, from 87.2 cm for military men between the ages of 18 to 24 years to 98.2 cm for the 45- to 54-year-old group, $F(4, 1262) = 11.99$, $p < .001$. E1s to E6s presented a trimmer appearance than higher ranked enlisted personnel or officers, $F(3, 1262) = 8.33$, $p < .001$.

Military men had a mean BMI of 25.7. Using the NHANES definition of overweight for men, which is a BMI value of 27.8, nearly one fourth of our sample of Navy and Marine Corps men was overweight. The mean value for %BF among men in our sample was 19.1. Body fat comparisons between men and women showed the normal 8 to 10 percentage point difference between the sexes (Friedl, K. E., Vogel, J.A., Bovee, M. W. & Jones, B. H., 1989). Both BMI and %BF increased with age (BMI: $F[4, 1262] = 5.13$, $p < .01$; %BF: $F[4, 1262] = 18.48$, $p <$

.001). Average BMI varied between 25.4 and 27.6 for the youngest and oldest groups of military men. %BF was more wide ranging than BMI for the same age comparison, from 17.5% to 24.7%. Like each of the body composition measures previously discussed, E1s to E6s presented the trimmest profile.

(Table 2 about here)

Detailed tables presenting summary statistics and selected percentiles for BMI and %BF are included in Appendix E. These tables show age comparisons by race and paygrade for male and female military personnel and also separately for Navy and Marine Corps personnel. These tables can be particularly helpful when evaluating two or more standards that might be applied to retain personnel. Consider BMI, for example, which is shown in Appendix Table E.1. Suppose the DOD wishes to consider two possible standards for BMI for women--the NHANES standard of 27.3 and the more stringent NHANES standard of 25.7, which applies to women under 20 years of age. A BMI of approximately 27.3 is located at the 85th percentile among our sample of military women; a BMI of 25.7 is reached at the 75th percentile. The implications for weight reduction using either standard necessitates the treatment of 15% or 25% of military women, respectively.

Anthropometric Characteristics of the Military Population Compared With the Civilian Population

Table 3 reports anthropometric data for military and civilian men and women. As explained in the Methods section of this report, comparisons were made between the military population and civilian population for Whites only. Anthropometric characteristics for which comparisons could be made, based upon prerelease NHANES III data, included height, weight, BMI, and the prevalence of overweightness. Skinfold data were from NHANES II, which were collected between 1976 and 1980 (NCHS, 1987).

White military women in the POWR sample were slightly taller than their civilian counterparts, $Z = 6.17$, $p < .001$. However, the average weight of military women 18 to 54 years of age was considerably less than civilian women of the same race, 141.8 pounds compared with 148.4 pounds, $Z = 4.21$, $p < .001$. Mean weights for the civilian and military populations were very similar for younger women between the ages of 18 to 24 years and 25 to 34 years. The weight differential became apparent for the 35 to 44 age group.

Mean subscapular skinfolds for white military women ages 18 to 54 years were smaller than for civilian women, 16.4 mm compared with 19.6 mm. Although subscapular skinfold measurements were equivalent for both reference populations between the ages of 18 to 24, these measurements were higher among civilian women in each of the other three age groups. While white military women, showed only one conspicuous increase in skinfold thickness at ages 45 to 54, civilian women displayed a constant increase in subscapular skinfold measurements with increasing age.

Mean triceps skinfold for white military women 18 to 54 years of age was 18.2 mm, compared with 24.0 mm for similarly aged white civilian women. Similar to the pattern for subscapular skinfold, any detectable increase in triceps skinfold thickness among white military women occured at age 45, while triceps skinfold values increased at a constant rate in the civilian white female population.

The mean value of BMI was considerably lower among white military women ages 18 to 54 than among civilian women of the same age and race, 23.5 compared with 25.3, $Z = 7.93$, $p < .001$. However, BMI values were the same for the youngest age group in the two populations. These differences were more dramatic when considering the BMI cutoff value NHANES uses to define overweight. The prevalence of overweight was twice the rate in the female civilian white population between the ages of 18 to 54 than in the military population (28.6% vs. 13.8%). The largest difference in prevalence rates between the two reference populations (on the order of three times) occured among white women 35 to 44 years of age.

As shown in Table 3, the average height and weight of military and civilian men were roughly equivalent. In addition, mean subscapular skinfold was about the same for the two populations. Similar to the trend for women, subscapular skinfold increased with age among men in both reference populations. These differences were approximately 6 mm between the youngest and oldest age groups of white males. For white adults 18 to 54 years, the difference between the sexes in mean subscapular skinfold was negligible for the military and small (about 3 mm) for civilians.

The average triceps skinfold for white men 18 to 54 years of age was lower in the military population than the civilian population (9.4 mm vs. 13.0 mm). Increases in triceps skinfold among military and civilian men were slight across age groups, varying by no more than 2 mm.

For white adults 18 to 54 years of age, mean triceps skinfold thickness was approximately twice as great for women as for men in the military and civilian reference populations.

BMI among white men of all ages in both reference populations was approximately equivalent. Moreover, BMI was nearly identical for civilian men and women of each age group. For the military population, however, white males of various ages had an average BMI that generally was 1 to 3 points higher than their female counterparts. Although a lower proportion of military men were overweight than their civilian counterparts (22.8% vs. 28.5%), the rates were not statistically different. The high proportion of military men ages 45 to 54 who were overweight may have been overstated due to the small sample size (n = 13). Prevalence rates for overweight in the civilian population were roughly equivalent for the sexes for each of the age groups shown in Table 3, but were substantially higher among military men as compared with military women of the same age group. More stringent accession and retention standards for women may explain this difference.

(Table 3 about here)

Comparison of Anthropometric Characteristics of Navy and Marine Corps Personnel

Table 4 shows selected anthropometric characteristics for women of the Navy and the Marine Corps. As a result of the stricter weight standard applied in the Marine Corps (see Appendix A), it is not surprising to find that female Marines weighed nearly 10 pounds less than Navy women, $t_{(1262)} = 5.0$, $p < .001$. A leaner profile among Marine Corps women was also demonstrated by smaller skinfold measurements, lower BMI values, and less body fat, $t_{(1262)}$ $p < .01$. In addition, three times fewer overweight women were serving in the Marine Corps than in the Navy (6.0% vs. 19.0%). Although women of the Marine Corps were leaner than Navy women in every regard, because their weight-for-height standard is more stringent than the Navy's, a greater proportion exceeded their respective branch's weight-for-height standards (36.0% vs. 19.0%). The differences in anthropometric characteristics which were observed between Navy and Marine Corps women were generally mirrored in the White and other race categories.

Figures 1 and 2 show the fraction of men and women of various ages in the Navy and Marine Corps who exceeded each of three standards: overweight, weight-for-height, and %BF. In practice, the Navy uses the weight-for-height standard as a prescreen. Only if a sailor exceeds the prescreen will circumference measurements be taken to estimate %BF. The %BF data presented in Figure 1 were based on the entire population, rather than the subset failing the height-weight prescreen. Between the ages of 18 and 34, the proportions of Navy women who were overweight and who exceeded their branch's weight-for-height standards remained stable at about 1 in 5. A slight drop in these proportions occurred at age 35, followed by a doubling of the fraction of Navy women who exceeded either weight standard at age 45. The fraction of Navy women who exceeded the body fat standard remained constant at about 45% for each age interval with the exception of 45 to 54 years, where fully half were not in compliance. Overweight women of the Marine Corps were equally distributed among the age categories shown in Figure 2. The group that most often exceeded the weight-for-height standard among female Marines was 25 to 34 years of age.

(Figures 1 and 2 about here)

As discussed earlier, female officers generally presented a trimmer profile than enlisted personnel. This pattern held for most branch of service comparisons, with the exception of Marine Corps women ranked E1 to E6 who had similar weight and triceps measurements as officers (Table 4). Comparing personnel of the same rank, female E1s to E6s of the Marines were consistently leaner than Navy women of the same rank.

Similar to the branch of service differences noted in women's physique, Navy men were slightly heavier than their Marine Corps counterparts and had greater skinfold thicknesses and %BF (see Table 5). These differences were more pronounced for white men and for all age groups except 18 to 24 years of age. Skinfold thickness and %BF were consistently lower for Marine Corps E1s to E6s than for similarly ranked male sailors. Higher ranked enlisted personnel and officers of the Marine Corps also presented smaller triceps skinfolds than Navy men.

Navy men 18 to 24 years of age were the leanest, based on consideration of any of the three standards shown in Figure 1. A sharp rise in the fraction of male sailors ages 25 to 34 who exceeded the weight-based (overweight or weight-for-height) and body fat standards was

followed by a subsequent drop in the weight-based measures at age 35. Among Navy men 45-54 years of age, a dramatic rise occurred in the proportion who exceeded the Navy's body fat criterion to nearly 80%, though it was not accompanied by an increase in the numbers exceeding either of the weight-based standards. The prevalence of overweight male Marines and the fraction who exceeded branch weight-for-height standards was roughly the same for each age group shown in Figure 2. Up until age 34, these rates were 20% or less. By age 35, the fraction of the population exceeding either standard rose to approximately 36%.

Healthy People 2000: National Health Promotion and Disease Prevention Objectives (U.S. Dept of Health and Human Services, 1991) set a goal for the civilian population specifying a prevalence of no more than 20% overweightness (as defined by NHANES) among people ages 20 or older. Applying this standard to the military population, the women in this sample met the goal. Men of the Marine Corps also met the goal, but Navy men were somewhat above the *Healthy People 2000* objective.

Overweight sailors (men and women) of all races were clustered in the enlisted ranks of E1 to E6, whereas among Marine Corps personnel, the greatest proportion of those exceeding standards was found in the enlisted rank of E7-E9 (see Tables 4 & 5). Officers generally showed the lowest proportion of overweight personnel among their ranks, with the exception of male Marines. Consistent with %BF data presented earlier, female and male officers of the Navy more often met weight-for-height standards than did enlisted personnel. While this is also true for Marine Corps women, male officers of this service had greater %BF than enlisted personnel of rank E1 to E6.

(Tables 4 and 5 about here)

Concordance Between BMI and %BF

This section of the report presents data on BMI and %BF by race and age and establishes the level of concordance between the two body composition measures. Figure 3 shows the relationship between mean BMI and %BF for 4 age groups and 2 race categories for Navy and Marine Corps women and men. Average BMI values for women varied between 23 and 24 across age groups. The %BF values derived by Beckett and Hodgdon also showed a narrow

range of approximately 2 %BF across age groups. The age-adjusted percent body fat (%BF adj) showed a greater increase with age of about 4 to 5 %BF. Racial differences were negligible for BMI and both approximations of %BF. The correspondence between BMI and %BF was reflected in the similarity of the lines of the graph. Correlation coefficients confirmed the strong relationship between BMI and %BF, %BF adj. (r = .92). In addition, a high degree of agreement or concordance between individual values of BMI and %BF for women was found in terms of tertile positioning (75%).

In contrast to the positioning of the lines depicting BMI and %BF for women of various ages, BMI values for men appear at the top of the graph and %BF (unadjusted only) appear near the bottom. This difference can be accounted for by the greater lean body mass of men and by their relatively larger weight and stature. Average BMI values for men ranged from approximately 25 to 28 for age groups 18 to 24 and 45 to 54. The lines depicting BMI values for racial groups were nearly overlapping, suggesting no difference in BMI between whites and other racial groups. %BF for men showed a modest range, from a low of 17 for white sailors ages 18-24 to 25 for the oldest sailors of the same race. The lines representing BMI and %BF generally paralleled each other showing slight increases with age. The correlation between BMI and %BF was strong (r = .82) and concordance among tertiles was 68% for men.

(Figure 3 about here)

DISCUSSION

This study provided detailed distributions of several body composition measures in which to assess different cutoffs for various segments of the military population. Using the NHANES criterion for overweightness, which is based on BMI, approximately 15% of military women and 23% of military men had elevated levels of BMI. The prevalence of overweightness was considerably lower among Marine Corps women in comparison with Navy women and slightly less for Marine Corps men when compared with their Navy counterparts. Between one fifth and one third of military personnel exceeded Navy/Marine Corps weight-for-height standards. Navy women tended to meet weight-based standards more often than Navy men. Performance based on gender in the Marine Corps was mixed; fewer women than men were overweight but more

exceeded their weight-for-height standards. Nearly 45% of Navy men and women in the present study were above maximum allowable %BF. Comparisons between the military and civilian population for white individuals (including Hispanic whites) yielded a leaner figure among military women yet similar body composition among men. BMI and %BF were similarly distributed for age and race and showed relatively high concordance.

The study's main strengths were that body measurement participants were chosen from a population-based sample, a large number of women were represented in this sample, and the study included physical measurements on many anthropometric dimensions, not just self-reported height and weight. Although the low response rate for the questionnaire survey may have impacted who was chosen for the physical measurements study, the sample appeared to be representative. Perhaps the most significant shortcoming of this research was that other races could not be broken out into black, Hispanic, Asian, and other. This was particularly salient since African-Americans constitute a large percentage of active-duty Navy enlisted personnel (nearly 20%), while Hispanics represent a growing segment of the population as based on demographic data from the Navy master personnel tapes maintained at NHRC.

Questions pertaining to ethnic differences in body composition have surfaced in recent years, generating some important new research for the military (Vogel & Friedl, 1992; Stolarczyk & Heyward, 1996). Early initiatives to respond to potential racial differences in body composition included an inquiry by the Defense Advisory Committee on Women in the Services, which solicited basic information on the military's policies (Jowers, 1996). Apart from learning that none of the services apply differential weight standards based on race/ethnicity, a review of Air Force discharges found that white women were discharged for weight control failure in fiscal 1995 at a much higher rate than other groups. This research addressed racial differences and found no inherent bias in any of the body composition measures considered as applied to white/other race personnel.

Assessment of body composition can be performed using any number of indicators. This study included BMI, %BF, weight-for-height maximums, and subscapular and triceps skinfolds. Another possible indicator is weight, used alone, which was proposed as one of two alternative measures (the other being BMI) by Friedl (in press, 1996). The question that must be addressed

is "Which measure to use?" To answer this question, a review of the bases upon which the military established its body composition standards is needed.

In 1981, the Department of Defense (DoD) issued Directive 1308.1. The directive established the policy that the "determining factor in deciding whether or not a service member is overweight is the member's percent BF (DoD Directive 1308.1, p.2, Encl. 2, 1981)." The directive also indicated three concerns relate to the need for establishing a weight control policy. First, body composition is an integral part of physical fitness and is, therefore, essential for maintaining combat readiness. Second, control of BF is necessary to maintain appropriate military appearance. Third, control of BF is important in maintaining the general health and well-being of armed forces personnel.

Turning to the body of literature that establishes the relationship between BF and physical fitness, %BF was found to be moderately related to performance of physical tasks (Harmen & Frykman, 1992; Hodgdon, 1992; Jette, Sidney, & Lewis, 1990; Conway, Cronan, & Peterson, 1989; Slack, Ferguson, & Banta, 1985). This finding is particularly relevant to military policy as most of the studies cited were conducted using military subjects. Regarding a second basis for establishment of fitness standards, the literature offers little support for using BF criteria to ensure acceptable appearance in uniform (Hodgdon, 1992; Hodgdon, Fitzgerald, & Vogel, 1986). The last consideration, controlling BF to maintain health in the armed services, derives considerable support in the literature (NIH, 1985; Jette, Sidney, & Quenneville, 1993; Vanderburgh, 1992b; Terry, Page, & Haskell, 1991). Much of this research utilized BMI rather than %BF since the components of BMI (height and weight) are readily accessible measures in large epidemiological investigations. Returning to the question of which measure to use, the weight of empirical evidence suggested that BMI and %BF each had a bearing on at least one of the most critical of the DOD's concerns. The next question to consider is "What is the appropriate level or cutoff value for BMI and %BF?"

This question can be addressed from several perspectives. The first is that any discussion of an appropriate cutoff for BMI or %BF must include a review of the pertinent anthropometric characteristics of the available pool from which recruits are drawn. Depending upon the characteristics of that pool and the quotas required to fill the services' ranks, one must consider the military's ability to intervene to ensure that weight and BF standards are met. A last

consideration, as mentioned earlier, is at what level of BMI or BF are performance and health compromised.

The findings of this study demonstrated that the white female military population was a subset of the larger, civilian population, one that tended to be trimmer with respect to triceps and subscapular skinfolds, and one that showed a lower prevalence of overweightness. In contrast, white military men are likened to civilian men of the same race. The most recent statistics relating to the trends in body composition of the U.S. population are somewhat sobering, based on the military's need to recruit the fittest of soldiers and sailors, and more generally, with respect to the health of the nation. The latest National Health and Nutrition Exam Survey reported that, as a country, we have become 30 percent more overweight in the last decade (Gittleman, 1996). The author cited a University of Alabama report finding that within a recent 7-year time frame young adults between the ages of 25 and 30 have gained an average of 10 pounds. Considering the U.S. population as a whole, roughly one third of adults and one quarter of children in the U.S. are obese (Blackburn, 1996).

Beyond considerations of the available pool of young recruits, the services must consider their mainstay, the men and women who devote their lives to military careers. Much of this report addresses the subgroups of military personnel defined by gender, age, race, paygrade, and branch of service who fail NHANES standard of overweightness and the military's standards for weight and BF. Body composition profiles of Navy and Marine Corps personnel suggested that the services would find the costs of weight reduction treatment to be prohibitive should they decide to strictly adhere to their body fat and weight-for-height standards. Results for the Navy's weight-for-height prescreen stipulate that 1 in 5 Navy women require treatment for an overweight condition. More Navy men, 1 in 4, require weight control. Treating this fraction of the male population requires substantial resources, yet may be deemed manageable, especially in light of the relative ease in which men can increase their activity or exercise. However, providing treatment to the near 45% of men and women who exceeded the Navy's BF limits is impractical. The implications for treatment based on the outcomes of this study with regard to the NHANES standard are similar to the Navy's weight-based prescreen. The Marine Corps' weight-for-height standard for women is very stringent, and, if strictly enforced, would require slightly more than one third of this sample to report for weight reduction treatment. Treating male Marines under

the age of 35 who exceed either of the weight-based standards may be possible, but it would be impractical for the large numbers between the ages of 35 to 44 years who are out of standard.

The establishment of the NHANES standard for obesity was based on comprehensive data on prevalence of cardiovascular disease risk factors from their first two surveys representative of the civilian population (NHANES I and NHANES II). Analysis of NHANES II data determined that the prevalence of hypertension is 2.9 times higher for overweight than for nonoverweight persons (NIH, 1985, p. 1074). Similarly, the prevalence of reported diabetes is 2.9 times higher in overweight than in nonoverweight persons in the NHANES data. The preponderance of evidence offers strong support for the use of the cutoff of 27.8 BMI for men and 27.3 BMI for women should the NHANES definition of overweight be incorporated into military policy. Little empirical evidence has been amassed pertaining to a valid cutoff for %BF that identifies an individual at higher risk for certain diseases. The health impact of elevated BMI and excessive BF will be addressed in future POWR '95 studies.

By most indications, women and men alike are challenged to stay trim as they age. With the focus on fitness in the services, military personnel are more able to remain within a healthy weight range than their civilian counterparts as shown in this study. The issue of lifelong fitness is particularly problematic for the Navy and Marine Corps since their weight and body fat standards make no accommodations for age as do those of the Army and Air Force (Hodgdon, 1992). Although gains in weight and increases in girth and BF are well documented in the literature, much debate focuses on whether this is necessary for body functioning or even desirable (Going, Williams, & Lohman, 1995; Vanderburgh, 1992b; Vogel & Friedl, 1992; Steen, 1988). Currently, no consensus exists in the empirical research to support or negate the necessity of excess BF later in life. For the military, perhaps the more relevant question is "What will it take to maintain a single body composition standard applied throughout a serviceman's career?" This question encompasses an array of concerns, including an individual's ability to lose weight/BF and maintain it; the costs associated with the provision of treatment; the loss of time from work related to an individual's participation in a weight reduction/fitness program; and, failing to succeed, the loses incurred as a result of a discharge.

The ability to lose weight and to maintain that loss in the military was considered by experts who attended the Body Composition and Nutrition Workshop held in Irvine, California

(Institute for Medicine, National Academies of Science and Engineering, September 9, 1996). One question raised was whether it was possible for older women to achieve and maintain a lower weight. Conference participants were unable to cite specific empirical evidence to resolve the debate. Public reports show the costs associated with the provision of weight reduction treatment to be astronomical. Rough estimates for treating obesity in the civilian population range from $34 to $56 billion annually. A Navy-commissioned study provided insight into the costs of treatment for military personnel and the costs associated with separation and replacement (Devine, Bishop, & Mensch, 1989). Caliber Associates conducted a cost-benefit study of the Navy's Level III alcohol rehabilitation program, which also treats obese sailors based on bed availability. The study determined that the per patient cost of treatment (in 1983 dollars) was $5,029, taking into account program costs, patient salary, and transportation to treatment (p. iv). Separation and replacement costs for a single serviceman was estimated at $122,829 (p. viii). Any extrapolation of these figures to the results of this study would be staggering. Treatment issues might be obviated if several workshop participants' recommendations were incorporated into military policy: eliminate BF standards altogether and focus on performance as the most important and fair measure of military readiness.

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Table 1. Anthropometric characteristics by demographic variables of women, U.S. Navy and Marine Corps, 1995

Demographic category (%)	N	Anthropometric characteristic (mean and standard error)										
				Skinfold, mm		Circumference, cm						Over-
		Height, in.	Weight, lbs.	Subscapular	Triceps	Neck	Abdomen	Hip	BMI[1]	%BF[2]	%BF adj[3]	Weight[4]
All women	621	64.8 (.10)	141.5 (.97)	17.3 (.29)	18.0 (.25)	32.6 (.07)	73.5 (.30)	100.0 (.31)	23.6 (.13)	28.8 (.23)	29.6 (.21)	15.3
Race												
White	419	65.1 (.12)♦♦♦	141.8 (1.19)	16.4 (.36)♦♦♦	18.2 (.32)	32.5 (.09)	73.3 (.37)	100.0 (.39)	23.5 (.16)	28.6 (.29)	29.4 (.26)	14.5
Other	202	64.3 (.18)	140.8 (1.67)	19.3 (.50)	17.3 (.39)	32.7 (.12)	74.0 (.54)	99.8 (.51)	24.0 (.22)	29.4 (.41)	30.1 (.36)	17.0
Age												
18 - 24	238	64.5 (.16)†	138.6 (1.53)†	17.0 (.46)†	17.3 (.40)†††	32.4 (.11)†	72.8 (.49)	99.1 (.47)	23.4 (.21)	28.3 (.38)	28.6 (.34)†††	15.6**
25 - 34	233	65.1 (.17)	144.9 (1.61)	17.7 (.51)	18.4 (.44)	32.8 (.12)	74.2 (.51)	100.8 (.52)	24.0 (.20)	29.3 (.38)	30.3 (.34)	16.0
35 - 44	131	65.1 (.20)	140.6 (1.97)	16.9 (.58)	18.3 (.51)	32.3 (.13)	73.6 (.56)	100.1 (.62)	23.3 (.28)	28.8 (.47)	30.7 (.42)	11.9
45 - 54	19	65.5 (.55)	150.0 (5.84)	20.2 (1.04)	22.6 (1.06)	33.1 (.38)	75.9 (1.56)	102.1 (2.26)	24.3 (.69)	30.3 (1.34)	33.2 (1.20)	37.5
Paygrade[5]												
E1 - E6	431	64.7 (.12)†††	141.6 (1.15)†††	17.5 (.35)†††	18.0 (.30)††	32.6 (.08)†††	73.6 (.36)†††	100.0 (.37)†††	23.8 (.15)†††	29.0 (.28)†††	29.6 (.25)†††	16.5***
E7 - E9	52	65.4 (.25)	148.5 (2.75)	19.2 (.72)	19.4 (.67)	33.0 (.24)	76.4 (.86)	102.7 (.89)	24.3 (.36)	31.0 (.65)	32.7 (.60)	17.0
Officer	135	65.5 (.19)	137.4 (1.31)	15.0 (.43)	17.1 (.38)	32.1 (.12)	71.2 (.41)	98.3 (.42)	22.5 (.17)	26.7 (.33)	28.4 (.32)	7.0

[1]Weight (kg)/Height (meter)^2.
[2]Percent body fat formula developed by Hodgdon using circumferences and height. (ref.)
[3]Percent body fat formula developed by Tran & Weltman using circumferences, height, and age. (ref.)
[4]Overweight was defined in terms of BMI greater than or equal to 27.3 for women and 27.8 for men and reported as a percentage.
[5]Unknown for 3 persons.
Significance: Wald F-statistic † $p \leq .05$ †† $p \leq .01$ ††† $p \leq .001$.
Chi-square: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$.
t-test: ♦ $p \leq .05$ ♦♦ $p \leq .01$ ♦♦♦ $p \leq .001$.

Table 2. Anthropometric characteristics by demographic variables, men, U.S. Navy and Marine Corps, 1995

Demographic category	N	Anthropometric characteristic (mean and standard error) Height, in.	Weight, lbs.	Skinfold, mm Subscapular	Triceps	Circumference, cm Neck	Abdomen	BMI	%BF	Over-Weight (%)
All men	626	69.5 (.21)	176.4 (1.80)	16.3 (.51)	9.4 (.21)	39.2 (.17)	89.8 (.68)	25.7 (.23)	19.1 (.43)	23.2
Race										
White	349	69.7 (.26)	176.5 (2.24)	16.1 (.63)	9.4 (.25)	39.2 (.21)	90.1 (.87)	25.6 (.29)	19.2 (.54)	23.0
Other	277	69.0 (.32)	176.0 (2.77)	17.1 (.77)	9.5 (.34)	39.0 (.23)	88.8 (.93)	26.0 (.26)	18.8 (.56)	23.7
Age[1]										
18 - 24	102	69.1 (.31)	172.3 (3.25)	15.1 (.92)[ll]	8.8 (.34)[l]	39.0 (.32)	87.2 (1.24)[lll]	25.4 (.39)[ll]	17.5 (.75)[lll]	17.5***
25 - 34	225	70.2 (.46)	178.9 (2.95)	16.9 (.72)	10.4 (.38)	39.2 (.21)	91.2 (1.01)	25.5 (.41)	19.8 (.68)	23.4
35 - 44	269	69.5 (.24)	180.9 (2.03)	17.8 (.69)	9.6 (.37)	39.3 (.20)	92.5 (.82)	26.4 (.33)	21.1 (.53)	31.9
45 - 54	29	68.7 (.66)	184.9 (4.46)	20.8 (1.20)	10.3 (.77)	40.4 (.49)	98.2 (1.38)	27.6 (.49)	24.7 (.65)	51.8
Paygrade										
E1 - E6	306	69.4 (.26)	174.7 (2.25)[l]	16.1 (.63)	9.3 (.25)	39.1 (.21)	88.9 (.86)[lll]	25.5 (.28)[l]	18.6 (.53)[lll]	21.9***
E7 - E9	189	69.5 (.22)	182.2 (1.96)	17.3 (.45)	10.0 (.30)	39.4 (.16)	93.1 (.63)	26.5 (.27)	21.4 (.37)	30.2
Officer	131	70.1 (.29)	182.8 (2.51)	16.8 (.65)	9.7 (.39)	39.7 (.22)	92.7 (.91)	26.1 (.32)	20.6 (.56)	25.5

Significance: Wald F-statistic [l] $p \leq .05$ [ll] $p \leq .01$ [lll] $p \leq .001$.
Chi square * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$.
[1]Unknown for 1 person.

Table 3. Anthropometric characteristics of the military population compared with the civilian population[1] by gender and age whites, POWR, 1995, NHANES II, 1976 - 1980, and NHANES III, 1988 - 1991

Gender and age in years	N		Height, in		Weight, lbs		Skinfold, mm: Subscapular		Skinfold, mm: Triceps		BMI	Overweight (%)[2]		
	POWR	NHANES III	POWR	NHANES III	POWR	NHANES III	POWR	NHANES II	POWR	NHANES II	POWR	NHANES III	POWR	NHANES III
White women														
18 - 54	419	3,265	65.1 (.12)	64.2 (.08)*	141.8 (1.19)	148.4 (1.10)*	16.4 (.36)	19.6*[3]	18.2 (.32)	24.0*[3]	23.5 (.16)	25.3 (.18)*	13.8	28.6*
18 - 24	150	892	64.7 (.19)	64.1 (.18)#	138.6 (1.92)	136.7 (1.96)	16.2 (.59)	16.1 (.54)	17.5 (.53)	20.8 (.70)	23.3 (.26)	23.4 (.33)	12.1	16.1
25 - 34	155	1,000	65.5 (.20)	64.4 (.16)*	146.0 (198)	147.7 (2.06)	16.7 (.62)	19.1 (.60)	18.8 (.58)	23.3 (.74)	23.9 (.25)	25.1 (.33)†	16.3	26.8†
35 - 44	99	726	65.3 (.24)	64.1 (.14)*	139.6 (2.31)	152.5 (2.06)*	15.9 (.66)	21.4 (.79)	18.0 (.58)	26.1 (.97)	23.0 (.32)	26.2 (.37)*	10.6	33.4*
45 - 54[5]														
White men														
18 - 54	3,49[4]	3,017	69.7 (.26)	69.6 (.09)	176.5 (2.23)	179.0 (1.25)	16.1 (.63)	16.8[3]	9.4 (.25)	13.0[3]	25.6 (.30)	26.0 (.16)	22.8	28.5
18 - 24	71	846	69.0 (.36)	69.7 (.19)	170.6 (3.90)	165.5 (2.14)	15.0 (1.12)	13.8 (.47)	8.7 (.40)	11.9 (.41)	25.2 (.48)	24.0 (.29)#	17.6	14.7
25 - 34	133	901	70.8 (.57)	69.6 (.16)#	181.3 (3.49)	178.2 (2.08)	16.2 (.69)	16.9 (.56)	10.5 (.46)	13.1 (.44)	25.5 (.52)	25.9 (.27)	20.9	25.8
35 - 44	131	653	69.9 (.31)	69.9 (.19)	183.0 (2.71)	187.2 (2.85)	17.7 (.96)	18.5 (.72)	9.7 (.52)	13.9 (.54)	26.4 (.59)	26.9 (.34)	33.1	36.9
45 - 54[5]														

[1]Source: All NHANES data reported were from National Center for Health Statistics, NHANES III, 1988-91, with the exception of skinfolds (NHANES II, 1976-80).
[2]Overweight was defined in terms of a BMI $\geq$ 27.3 for women and 27.8 for men, and is reported as a percentage.
[3]Overall means calculated from age group Ns and means.
[4]One person with no reported age.
[5]Due to few cases for white females and white males, age 45 - 54 years (n=15, n=12) results are not shown.
Significance: Z-statistic # $p \leq .05$, † $p \leq .01$, * $p \leq .001$.

Table 4. Comparison of women on selected anthropometric characteristics by race, age, and paygrade, U.S. Navy and Marine Corps, 1995

Anthropometric characteristic (mean and standard error)

Demographic category	N		Height, in		Weight,lbs		Skinfold, mm: Subscapular		Skinfold, mm: Triceps		BMI		%BF		Exceed ht/wt: Overweight (%)		Exceed ht/wt: Standard (%)[1]	
	Navy	Marines	Navy	Marines	Navy	Marines	Navy	Marines	Navy	Marines	Navy	Marines	Navy	Marines	Navy	Marines	Navy	Marines
All military women	401	220	64.9 (.12)	64.7 (.17)	144.7 (1.3)	135.4*** (1.3)	18.5 (.39)	15.1*** (.39)	19.5 (.34)	15.1*** (.32)	24.1 (.17)	22.8*** (.17)	29.3 (.32)	28.0** (.32)	19.0	6.0***	19.0	36.0
Race																		
White	272	147	65.3 (.15)	64.7* (.21)	145.1 (1.59)	134.9*** (1.54)	17.5 (.49)	14.1*** (.41)	19.8 (.44)	15.0*** (.39)	23.9 (.21)	22.6*** (.20)	29.0 (.38)	27.6* (.39)	17.9	5.2***	19.0	32.1
Other	129	73	64.0 (.23)	64.7 (.30)	143.7 (2.24)	136.3* (2.46)	20.8 (.64)	16.9*** (.80)	18.9 (.52)	15.3*** (.57)	24.6 (.31)	23.0*** (.32)	29.8 (.55)	28.6 (.59)	21.6	7.3***	18.9	42.9
Age																		
18 - 24	129	109	64.3 (.20)	64.7 (.25)	142.1 (2.23)	133.9** (1.90)	18.7 (.69)	14.7*** (.55)	19.3 (.59)	14.5*** (.45)	24.1 (.31)	22.5*** (.25)	29.0 (.56)	27.3* (.48)	22.2	4.8***	20.5	30.8
25 - 34	157	76	65.4 (.21)	64.3** (.28)	148.7 (2.08)	136.4*** (2.17)	18.7 (.65)	15.5*** (.73)	19.8 (.57)	15.3*** (.52)	24.4 (.26)	23.1*** (.26)	29.6 (.50)	28.6 (.49)	18.5	7.6*	20.8	43.3
35 - 44	98	33	65.0 (.23)	65.4 (.36)	141.2 (2.33)	138.9 (3.53)	17.3 (.73)	15.8 (.82)	18.8 (.60)	16.9 (.86)	23.5 (.33)	22.8 (.46)	28.8 (.56)	29.1 (.84)	12.3	7.0	10.7	38.0
45 - 54[2]																		
Paygrade																		
E1 - E6	263	168	64.8 (.15)	64.5 (.20)	145.6 (1.58)	134.4*** (1.50)	18.9 (.48)	15.1*** (.45)	19.8 (.42)	14.8*** (.36)	24.3 (.21)	22.7*** (.20)	29.6 (.38)	27.8*** (.37)	21.2	6.1***	21.1	35.4
E7 - E9	37	15	64.8 (.33)	66.3** (.39)	147.3 (3.49)	150.5 (4.48)	19.6 (.93)	18.6 (1.11)	19.6 (.88)	19.1 (1.03)	24.5 (.49)	24.0 (.53)	30.5 (.92)	32.0 (.80)	16.2	13.3	17.5	60.0
Officer	100	35	65.5 (.21)	65.3 (.40)	138.4 (1.50)	134.5 (2.62)	15.8 (.55)	12.8*** (.54)	17.8 (.46)	15.1*** (.68)	22.6 (.21)	22.2 (.27)	26.7 (.41)	26.6 (.54)	7.2	0.0***	7.3	25.7

[1]Because the weight-for-height standards are different for the Navy and Marine Corps, proportional differences were not tested.
[2]Due to few cases for female Marines, ages 45-54 (n = 7), results are not shown.
Significance: t-test, *= .05, **= .01, ***= .001.

Table 5. A comparison of Navy and Marine Corps men on selected anthropometric characteristics by race, age, and paygrade

Demographic category	N Navy	N Marines	Height, in Navy	Height, in Marines	Weight, lbs Navy	Weight, lbs Marines	Skinfold, mm Subscapular Navy	Skinfold, mm Subscapular Marines	Skinfold, mm Triceps Navy	Skinfold, mm Triceps Marines	BMI Navy	BMI Marines	%BF Navy	%BF Marines	Overweight (%) Navy	Overweight (%) Marines	Exceed ht/wt Standard (%)[1] Navy	Exceed ht/wt Standard (%)[1] Marines
All military men	438	188	69.7 (.15)	69.4 (.29)	180.6 (1.41)	174.5* (2.51)	18.0 (.34)	15.6** (.71)	10.9 (.24)	8.8*** (.28)	26.2 (.18)	25.5 (.32)	20.8 (.30)	18.4*** (.60)	30.0	19.9*	26.3	21.8
Race																		
White	249	100	70.2 (.17)	69.4* (.37)	183.5 (1.68)	173.3** (3.15)	17.7 (.42)	15.3* (.89)	11.1 (.30)	8.6*** (.34)	26.2 (.22)	25.3 (.41)	21.2 (.36)	18.3*** (.77)	31.6	18.7*	27.8	19.3
Other	189	88	68.0 (.26)	69.4** (.43)	171.6 (2.55)	177.7 (3.74)	18.8 (.55)	16.5 (1.06)	10.3 (.33)	9.2† (.46)	26.0 (.30)	25.9 (.35)	19.5 (.46)	18.6 (.76)	25.1	22.9	21.7	28.7
Age																		
18 - 24	50	52	69.3 (.46)	69.1 (.34)	171.9 (3.56)	172.4 (3.55)	15.1 (.82)	15.1 (1.01)	10.0 (.63)	8.7 (.37)	25.3 (.48)	25.4 (.43)	17.6 (.87)	17.5 (.82)	21.4	17.2	17.3	19.6
25 - 34	177	48	70.1 (.23)	70.4 (.90)	183.8 (2.25)	173.8 (5.49)	18.7 (.53)	15.0* (1.26)	11.3 (.38)	9.3** (.63)	26.3 (.28)	24.7* (.73)	20.9 (.46)	18.7 (1.30)	35.0	10.4***	31.6	11.7
35 - 44	187	82	69.5 (.21)	69.4 (.42)	180.1 (2.28)	181.5 (3.28)	18.0 (.56)	17.6 (1.20)	10.8 (.37)	8.6*** (.54)†	26.2 (.30)	26.5 (.57)	21.5 (.44)	20.7 (.91)	27.3	35.3	24.1	36.2
45 - 54[2]																		
Paygrade																		
E1 - E6	239	67	69.5 (.18)	69.4 (.34)	179.6 (1.85)	173.0 (2.95)	18.1 (.45)	15.5** (.83)	10.8 (.29)	8.8*** (.32)	26.1 (.24)	25.3 (.37)	20.4 (.39)	18.0** (.70)	32.7	18.3*	28.8	20.1
E7 - E9	129	60	69.4 (.26)	69.5 (.39)	180.9 (2.64)	183.9 (2.92)	17.9 (.58)	16.5 (.71)	11.0 (.45)	8.6*** (.37)	26.3 (.33)	26.8 (.45)	21.9 (.46)	20.7 (.62)	26.9	31.5	23.4	33.5
Officer	70	61	70.7 (.45)	69.8 (.37)	184.3 (3.36)	181.7 (3.56)	17.6 (.93)	16.3 (.89)	11.5 (.70)	8.5*** (.43)	26.0 (.47)	26.3 (.43)	21.3 (.78)	20.2 (.77)	22.2	26.2	19.3	29.3

[1]Because the weight-for-height standards are different for the Navy and Marine Corps, proportional differences were not tested.
[2]Due to few cases for male Marines ages 45-54, results are not shown.
Significance: t-test, *p ≤ .05, **p ≤ .01, ***p ≤ .001.

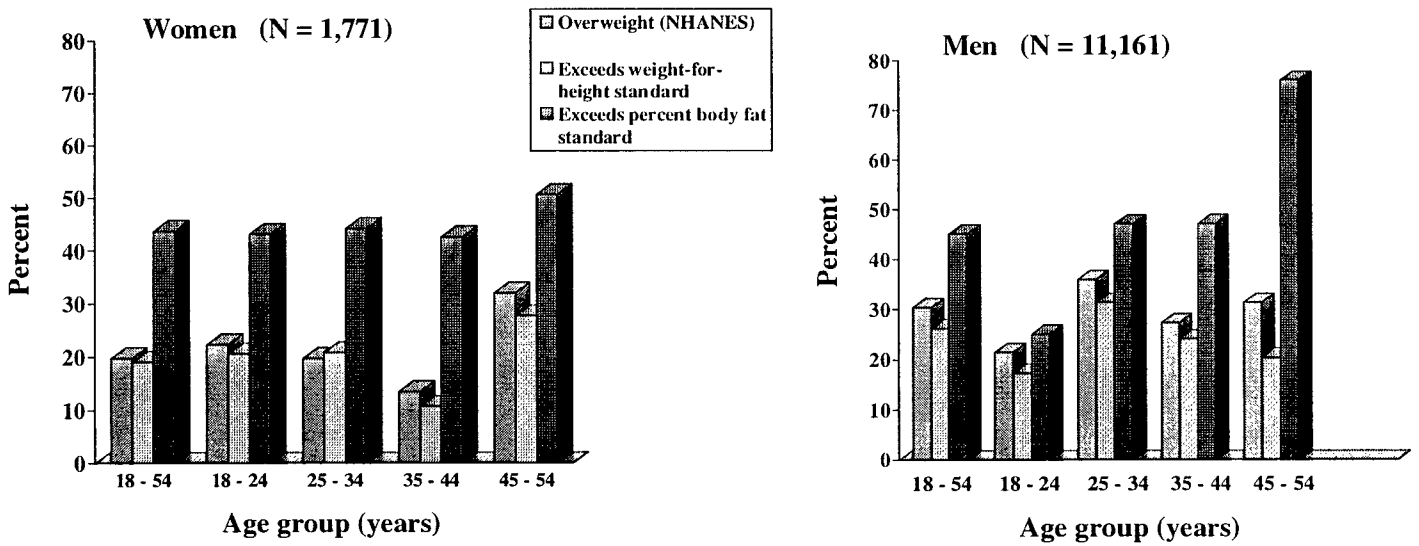

Figure 1. Personnel exceeding BMI cutoff for overweight (NHANES) and Navy weight-for-height and %BF standards, U.S. Navy, 1995

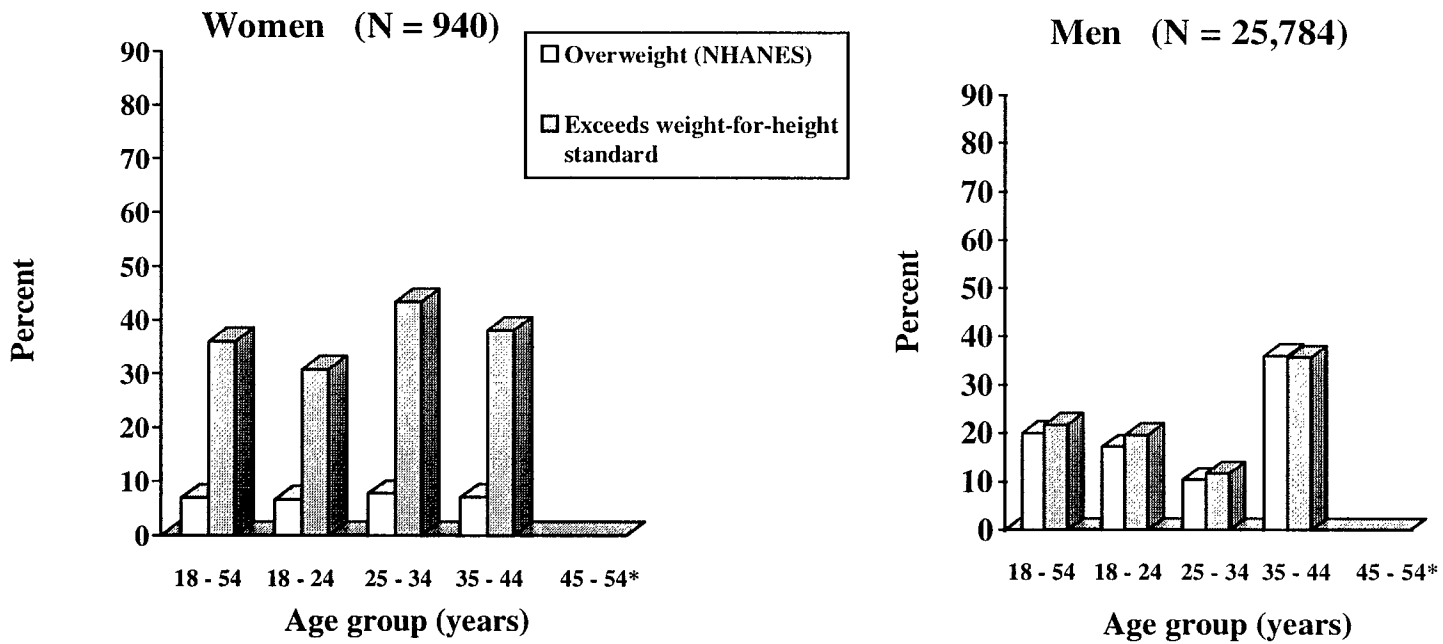

Figure 2. Personnel exceeding BMI cutoff for overweight (NHANES) and Marine Corps weight-for-height standard, U.S. Marine Corps, 1995

*Insufficient N.

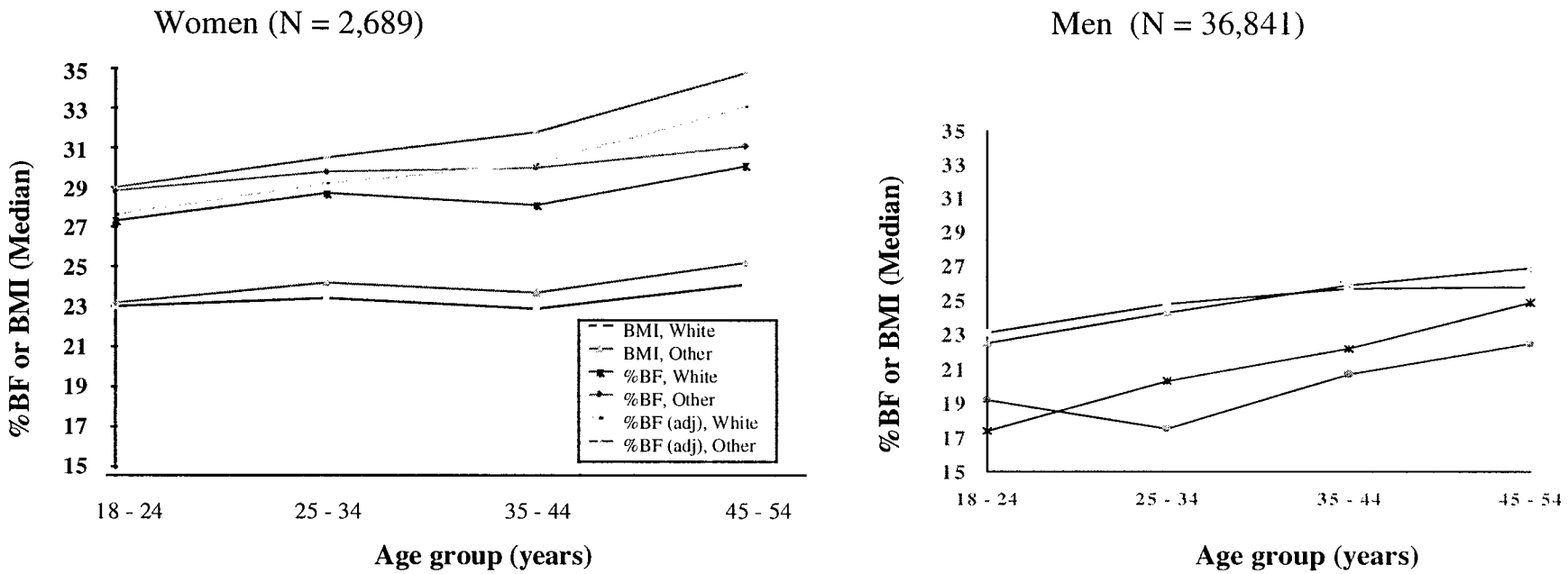

Figure 3. BMI and %BF (unadjusted and age-adjusted) comparisons by gender and race, U.S. Navy and Marine Corps, 1995

Appendix A

Appendix Table A-1. Weight Standards for Men and Women , U.S. Navy and Marine Corps

	Maximum Allowable Weight (pounds)			
	Navy[1]		Marine Corps[2]	
Height (inches)	Men	Women	Men	Women
58	*	139	*	121
59	*	141	*	123
60	*	144	*	125
61	161	147	*	127
62	164	151	*	130
63	167	155	*	134
64	170	160	160	138
65	174	164	165	142
66	178	168	170	147
67	181	172	175	151
68	185	176	181	156
69	188	179	186	160
70	192	183	192	165
71	196	187	197	170
72	200	*	203	175
73	205	*	209	180
74	210	*	214	185
75	215	*	219	190
76	*	*	225	*
77	*	*	230	*
78	*	*	235	*
79	*	*	241	*
80	*	*	247	*

[1]NAVADMIN 315/95.
[2]MCO 6100.10B.
*No figure given.

APPENDIX B

Appendix Table B-1. Demographics of body measurement participants (sample) and population estimates (weighted sample) by branch of service, U.S. Navy and Marine Corps, 1995

	Total				Navy				Marine Corps			
	Sample		Population		Sample		Population		Sample		Population	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All groups	**1,295**	**100.0**	**39,877**	**100.0**	**862**	**100.0**	**13,041**	**100.0**	**433**	**100.0**	**26,836**	**100.0**
Gender												
Female	669	51.7	2,932	7.4	424	49.2	1,880	14.4	245	56.6	1,052	3.9
Male	626	48.3	36,945	92.6	438	50.8	11,161	85.6	188	43.4	25,784	96.1
Race												
White	803	62.0	29,246	73.3	540	62.6	9,728	74.6	263	60.7	19,518	72.7
Other	492	38.0	10,631	26.7	322	37.4	3,313	25.4	170	39.3	7,318	27.3
Age												
18 - 24 years	370	28.6	19,000	47.6	193	22.4	2,322	17.8	177	40.9	16,678	62.1
25 - 34 years	472	36.4	10,828	27.2	341	39.6	5,725	43.9	131	30.3	5,103	19.0
35 - 44 years	403	31.1	9,235	23.2	287	33.3	4,451	34.1	116	26.8	4,784	17.8
45 - 59 years[1]	49	3.8	779	2.0	40	4.6	508	3.9	9	2.1	271	1.0
Unknown	1	0.1	34	0.1	1	0.1	34	0.3	0	0.0	0	0.0
Paygrade												
E1 - E6	775	59.8	31,416	78.8	519	60.2	8,812	67.6	256	59.1	22,604	84.2
E7 - E9	244	18.8	3,928	9.9	167	19.4	2,229	17.1	77	17.8	1,699	6.3
Officer	273	21.1	4,533	11.4	175	20.3	2,000	15.3	98	22.6	2,533	9.4
Unknown	3	0.2	--	--	1	0.1	--	--	2	0.5	--	--

[1]Includes 54 people who are between the ages of 55 and 59.

Appendix C

POWR 1995 MEASUREMENT FORM

ID: _ _ _ _ _ _ _ _ _ _ SEX: M F BIRTHDAY: __ __ __ (Mo Day Yr) Date: __ __ __ (Mo Day Yr)

BLOOD PRESSURE:

HEART RATE: __ __ __ bpm

SYSTOLIC DIASTOLIC

Automatic _____/_____ mmHG **Blood pressure refused?** Yes No

Manual _____/_____ mmHG **Reason right arm not used?** _____

STATURE:

1. Weight: _ _ _.__ KG _ _ _.__ LBS
2. Height: _ _.__ CM _ _ _.__ IN

CIRCUMFERENCES:

MEN	Measurement 1	Measurement 2	Measurement 3
3. Abdomen:	_ _ _.__cm	_ _ _.__cm	_ _ _.__cm
5. Neck:	_ _ _.__cm	_ _ _.__cm	_ _ _.__cm

WOMEN	Measurement 1	Measurement 2	Measurement 3
3. Waist:	_ _ _.__cm	_ _ _.__cm	_ _ _.__cm
4. Hip:	_ _ _.__cm	_ _ _.__cm	_ _ _.__cm
5. Neck:	_ _ _.__cm	_ _ _.__cm	_ _ _.__cm

DOMINANT HANDGRIP STRENGTH:

6. Righthand: ___ ___.___ KG ___ ___.___ KG ___ ___.___ KG Highest: ___ ___.___ KG

OR

7. Lefthand: ___ ___.___ KG ___ ___.___ KG ___ ___.___ KG Highest: ___ ___.___ KG

SKINFOLDS:

8. Triceps: ____ ____.____mm ____ ____.____mm ____ ____.____mm
9. Subscap: ____ ____.____mm ____ ____.____mm ____ ____.____mm

Appendix D

Appendix D-1. Population estimates of physical measurement sample (weighted) compared with total eligible personnel, U.S. Navy and Marine Corps, 1995

	Navy				Marine Corps			
	Physical measurements		Total eligible personnel		Physical measurements		Total eligible personnel	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Gender								
Female	1,880	14.4	29,560	16.2	1,052	3.9	5,558	4.6
Male	11,161	85.6	153,381	83.8	25,784	96.1	115,045	95.4
Race								
White	9,728	74.6	140,436	76.8	19,518	72.7	89,901	74.5
Other	3,313	25.4		23.2	7,318	27.3	30,702	25.5
Paygrade								
E1-E6	8,812	67.6	124,930	68.3	22,604	84.2	92,904	77.0
E7-E9	2,229	17.1	23,379	12.8	1,699	6.3	11,906	9.9
Officer	2,000	15.3	34,632	18.9	2,533	9.4	15,793	13.1

Appendix E

Table E.1. Means and selected percentiles for BMI[1] of Navy and Marine Corps personnel by race and age

Race and age	N	MEAN	S. E.[2]	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
All females												
18 - 54 years	611	23.6	.13	18.9	19.6	20.2	21.1	23.4	25.6	27.2	28.3	29.9
18 - 24 years	236	23.4	.21	18.3	19.3	19.8	20.7	23.1	25.4	27.1	28.9	30.7
25 - 34 years	229	24.0	.20	19.5	20.0	20.9	21.8	23.8	26.0	27.6	28.2	29.3
35 - 44 years	128	23.3	.28	19.1	19.5	19.9	20.8	23.1	25.3	26.0	27.6	30.0
45 - 54 years	18	24.3	.69	19.6	20.4	20.8	21.6	24.2	27.6	27.8	29.8	30.1
White												
18 - 54 years	415	23.5	.16	18.9	19.5	20.1	21.2	23.1	25.3	27.1	28.1	29.8
18 - 24 years	149	23.3	.26	18.4	19.0	19.6	20.7	23.0	25.2	26.6	28.0	30.0
25 - 34 years	154	23.9	.25	19.4	20.3	20.8	21.8	23.4	25.8	27.9	28.4	29.5
35 - 44 years	97	23.0	.32	19.0	19.3	19.8	20.5	22.9	25.1	25.8	27.3	28.9
45 - 54 years	15	24.3	.80	19.2	20.1	20.5	21.5	24.1	27.8	27.8	29.8	30.1
Other races												
18 - 54 years	196	24.0	.22	19.3	19.9	20.3	21.1	23.8	26.0	27.7	28.5	30.7
18 - 24 years	87	23.7	.36	17.8	19.5	19.9	20.7	23.2	26.2	28.4	29.5	31.1
25 - 34 years	75	24.2	.33	19.6	20.0	21.0	21.4	24.3	26.0	27.2	27.8	28.9
35 - 44 years	31	24.2	.56	19.5	20.5	20.8	21.2	23.7	25.7	26.2	28.0	30.5
45 - 54 years	3	24.5	.70	†	†	†	†	25.5	†	†	†	†

[1]Weight in kilograms divided by height in meters squared.
[2]Standard Error.
†Insufficient n.

Table E.1 Cont'd. Means and selected percentiles for BMI[1] of Navy and Marine Corps personnel by race and age

Race and age	N	MEAN	S.E.[2]	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
All males												
18 - 54 years	622	25.7	.23	20.7	21.6	22.1	23.6	25.9	27.7	28.8	29.6	30.3
18 - 24 years	102	25.4	.39	20.7	21.4	22.1	23.4	25.8	27.2	27.9	29.1	29.7
25 - 34 years	224	25.5	.41	19.9	20.8	21.6	23.0	25.9	27.6	28.7	29.8	30.9
35 - 44 years	267	26.4	.33	21.8	22.2	23.5	24.4	26.0	28.3	29.1	30.1	31.3
45 - 54 years	29	27.6	.49	22.8	24.0	24.7	26.5	28.1	29.0	29.3	30.2	31.4
White												
18 - 54 years	346	25.6	.30	20.7	21.3	21.8	23.3	26.0	27.6	28.9	29.6	30.2
18 - 19 years	71	25.2	.48	20.7	21.3	21.6	22.7	25.9	27.2	27.9	29.6	29.7
25 - 34 years	132	25.5	.52	19.9	20.8	20.8	23.0	25.9	27.5	28.5	29.2	30.7
35 - 44 years	130	26.4	.46	21.8	22.0	23.3	24.1	26.0	28.9	29.2	30.7	31.5
45 - 54 years	13	27.9	.59	24.0	24.0	25.4	26.5	28.7	29.1	29.3	29.3	31.4
Other races												
18 - 54 years	276	26.0	.26	21.6	22.8	23.4	24.3	25.8	27.8	28.3	29.6	30.4
18 - 24 years	31	25.9	.43	23.3	23.4	23.7	24.7	25.8	27.7	27.8	29.1	30.4
25 - 34 years	92	25.7	.58	21.6	21.6	21.6	23.7	24.9	28.0	29.8	30.1	31.2
35 - 44 years	137	26.3	.31	21.8	22.9	24.0	24.9	26.0	28.1	28.3	28.9	30.4
45 - 54 years	16	26.5	.73	21.9	22.6	23.8	24.7	26.9	27.2	30.2	31.4	31.4

[1]Weight in kilograms divided by height in meters squared.
[2]Standard Error.

Table E.2. Body fat using circumferences and age-adjusted circumferences for Navy and Marine Corps personnel by race and age and race and paygrade

Race and age, race and paygrade	FEMALE %BF (circumferences) N	Mean	S.E.[1]	Median	FEMALE %BF (age-adjusted circumferences) N	Mean	S.E.[1]	Median	MALE %BF (circumferences) N	Mean	S.E.[1]	Median
All races												
18 - 54	613	28.8	.23	28.5	613	29.6	.21	29.2	622	19.1	.43	20.0
18 - 24	235	28.3	.38	27.7	235	28.6	.34	27.9	102	17.5	.75	18.5
25 - 34	230	29.3	.38	29.0	230	30.3	.34	29.6	224	19.8	.68	20.8
35 - 44	129	28.8	.47	28.9	129	30.7	.42	30.7	267	21.1	.53	21.7
45 - 54	19	30.3	1.34	30.1	19	33.2	1.20	33.1	29	24.7	.65	24.9
White												
18 - 54	416	28.6	.29	28.1	416	29.4	.26	28.9	346	19.2	.54	20.2
18 - 24	148	27.9	.48	27.3	148	28.2	.43	27.6	71	17.4	.92	17.4
25 - 34	155	29.3	.47	28.7	155	30.2	.43	29.2	132	20.3	.85	20.3
35 - 44	98	28.2	.54	28.1	98	30.1	.48	30.2	130	21.8	.70	22.2
45 - 54	15	30.5	1.60	30.1	15	33.3	1.44	33.1	13	25.4	.76	24.9
Other												
18 - 54	197	29.4	.41	29.4	197	30.1	.36	30.3	276	18.8	.56	19.6
18 - 24	87	29.0	.64	28.8	87	29.3	.57	29.0	31	18.2	.95	19.2
25 - 34	75	29.4	.62	29.8	75	30.3	.56	30.5	92	18.8	1.13	17.5
35 - 44	31	30.6	.94	30.0	31	32.4	.85	31.8	137	19.6	.80	20.7
45 - 54	4	29.4	1.24	31.1	4	32.8	1.31	34.8	16	22.0	.78	22.5

[1]Standard Error.

Table E.2 Cont'd. Body fat using circumferences and age-adjusted circumferences for Navy and Marine Corps personnel by race and age and race and paygrade

Race and age, race and paygrade	FEMALE %BF (circumferences) N	Mean	S.E.[1]	Median	FEMALE %BF (age-adjusted circumferences) N	Mean	S.E.[1]	Median	MALE %BF (circumferences) N	Mean	S.E.[1]	Median
All races												
E1 - E6	427	29.0	.28	28.7	427	29.6	.25	29.1	306	18.6	.53	19.4
E7 - E9	52	31.0	.65	31.3	52	32.7	.60	32.6	187	21.4	.37	21.7
Officer	134	26.7	.33	26.1	134	28.4	.32	28.1	130	20.6	.56	20.7
White												
E1 - E6	264	28.8	.36	28.4	264	29.4	.32	28.9	186	18.6	.69	19.4
E7 - E9	39	30.8	.79	31.3	39	32.5	.74	32.6	98	22.3	.47	23.0
Officer	113	26.2	.35	26.0	113	28.0	.33	27.7	63	21.0	.62	20.8
Other												
E1 - E6	163	29.3	.45	29.4	163	29.9	.40	30.2	120	18.8	.67	19.6
E7 - E9	13	31.6	1.10	32.7	13	33.2	.95	33.9	89	19.5	.58	20.3
Officer	21	29.0	.91	28.2	21	30.5	.86	29.4	67	17.6	.59	17.9

[1]Standard Error.

Table E.3. A BMI comparison for Navy and Marine Corps personnel by race and age and race and paygrade

Race and age, race and paygrade	FEMALE								MALE							
	Navy				Marines				Navy				Marines			
	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median
All races																
18 - 54	395	24.1	.17	23.7	216	22.8	.17	22.7	436	26.2	.18	26.0	186	25.5	.32	25.9
18 - 24	129	24.1	.31	23.7	107	22.5	.25	22.7	50	25.3	.48	25.2	52	25.4	.43	25.9
25 - 34	154	24.4	.26	24.0	75	23.1	.26	23.1	176	26.3	.28	26.1	48	24.7	.73	25.8
35 - 44	96	23.5	.33	23.0	32	22.8	.46	23.3	187	26.2	.30	25.9	80	26.5	.57	26.1
45 - 54	16	24.5	.76	24.1	2	23.3	.79	24.4	23	26.9	.66	26.7	6	28.7	.40	28.8
White																
18 - 54	269	23.9	.21	23.4	146	22.6	.20	22.7	247	26.2	.22	26.1	99	25.3	.41	25.9
18 - 24	77	23.9	.39	23.6	72	22.4	.29	22.6	37	25.2	.56	25.3	34	25.2	.53	26.1
25 - 34	103	24.3	.33	23.8	51	23.2	.28	23.1	113	26.4	.33	26.3	19	24.3	1.04	25.9
35 - 44	76	23.2	.36	22.9	21	22.2	.60	22.5	88	26.3	.39	26.0	42	26.5	.82	26.0
45 - 54	13	24.5	.91	24.1	2	23.3	.79	24.4	9	27.2	.85	26.7	4	29.0	.42	28.8
Other																
18 - 54	126	24.6	.31	24.3	70	23.0	.32	23.0	189	26.0	.30	25.5	87	25.9	.35	25.8
18 - 24	52	24.5	.52	24.2	35	22.7	.48	22.7	13	25.3	.92	24.4	18	26.0	.46	25.8
25 - 34	51	24.7	.41	24.5	24	23.1	.52	23.8	63	26.2	.51	25.5	29	25.4	.87	24.9
35 - 44	20	24.5	.79	24.2	11	23.7	.67	23.4	99	26.0	.43	25.8	38	26.5	.43	26.5
45 - 54	3	24.5	.70	25.5	*	*	*	*	14	26.4	.91	26.1	2	26.9	.03	26.9

*No subjects in category.
[1]Standard Error.

Table E.3 Cont'd. A comparison of body mass index for Navy and Marine Corps personnel by race and age and race and paygrade

Race and age, race and paygrade	FEMALE								MALE							
	Navy				Marines				Navy				Marines			
	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median
All races																
E1 - E6	262	24.3	.21	24.1	166	22.7	.20	22.7	239	26.1	.24	25.9	67	25.3	.37	25.8
E7 - E9	35	24.5	.49	24.8	15	24.0	.53	24.4	129	26.3	.33	26.2	58	26.8	.45	26.3
Officer	98	22.6	.21	22.5	35	22.2	.27	21.7	69	26.0	.47	25.3	61	26.3	.43	26.5
White																
E1 - E6	155	24.2	.27	23.8	109	22.7	.24	22.7	150	26.1	.29	26.1	36	25.1	.49	25.9
E7 - E9	29	24.6	.55	24.9	9	23.7	.58	23.7	68	26.5	.43	26.3	30	27.1	.62	26.3
Officer	85	22.4	.21	21.8	28	21.9	.29	21.7	30	26.0	.53	26.0	33	26.3	.48	26.5
Other																
E1 - E6	107	24.6	.33	24.3	57	22.8	.35	22.9	89	26.1	.40	25.5	31	25.9	.39	25.8
E7 - E9	6	23.7	.94	22.3	6	24.5	.99	24.9	61	25.9	.38	26.0	28	26.3	.60	26.1
Officer	13	24.2	.65	24.0	7	23.0	.68	23.3	39	25.4	.37	25.3	28	25.7	.45	25.3

[1]Standard Error.

Table E.4. A %BF comparison (using circumferences) of Navy and Marine Corps personnel by race and age and race and paygrade

Race and age, race and paygrade	FEMALE								MALE							
	Navy				Marines				Navy				Marines			
	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median
All races																
18 - 54	397	29.3	.32	28.8	216	28.0	.32	27.7	436	20.8	.30	21.6	186	18.4	.60	19.4
18 - 24	127	29.0	.56	28.7	108	27.3	.48	27.2	50	17.6	.87	16.7	52	17.5	.82	18.5
25 - 34	156	29.6	.50	29.1	74	28.6	.49	28.1	176	20.9	.46	21.7	48	18.7	1.30	18.1
35 - 44	97	28.8	.56	28.4	32	29.1	.84	30.4	187	21.5	.44	21.7	80	20.7	.91	21.8
45 - 54	17	30.6	1.48	30.1	2	28.4	1.79	31.0	23	23.7	.72	23.8	6	26.3	1.11	24.9
White																
18 - 54	269	29.0	.38	28.5	147	27.6	.39	27.2	247	21.2	.36	21.8	99	18.3	.77	19.4
18 - 24	75	28.6	.71	27.9	73	27.0	.57	26.7	37	18.0	.95	18.1	34	17.3	1.01	17.4
25 - 34	104	29.5	.63	28.8	51	28.8	.53	28.1	113	21.3	.54	22.1	19	18.9	1.81	20.8
35 - 44	77	28.4	.60	28.1	21	27.4	1.16	27.0	88	22.1	.58	23.2	42	21.4	1.23	21.9
45 - 54	13	30.9	1.81	28.7	2	28.4	1.79	31.0	9	24.6	.87	25.6	4	26.7	1.24	24.9
Other																
18 - 54	128	29.8	.55	29.8	69	28.6	.59	29.1	189	19.5	.46	19.9	87	18.6	.76	19.4
18 - 24	52	29.8	.92	30.1	35	28.0	.86	27.9	13	16.1	2.03	13.2	18	18.4	1.02	19.4
25 - 34	52	29.9	.78	29.8	23	28.3	.99	29.4	63	19.6	.79	19.9	29	18.3	1.75	16.1
35 - 44	20	30.0	1.36	29.6	11	31.8	.96	30.4	99	20.1	.50	20.2	38	19.3	1.37	20.7
45 - 54	4	29.4	1.24	31.1	*	*	*	*	14	21.6	.91	22.4	2	23.7	.62	24.3

*No subjects in category.
[1]Standard Error.

Table E.4 Cont'd. A %BF comparison (using circumferences) of Navy and Marine Corps personnel by race and age and race and paygrade

Race and age, race and paygrade	FEMALE								MALE							
	Navy				Marines				Navy				Marines			
	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median
All races																
E1 - E6	261	29.6	.38	29.3	166	27.8	.37	27.5	239	20.4	.39	21.6	67	18.0	.70	19.4
E7 - E9	37	30.5	.92	30.4	15	32.0	.80	32.8	129	21.9	.46	22.0	58	20.7	.62	21.0
Officer	99	26.7	.41	26.1	35	26.6	.54	26.0	69	21.3	.78	20.4	61	20.1	.77	20.7
White																
E1 - E6	154	29.5	.49	28.8	110	27.6	.45	27.3	150	20.8	.48	21.8	36	17.8	.91	19.4
E7 - E9	30	30.7	1.05	30.9	9	31.1	.98	31.6	68	22.4	.60	23.0	30	22.1	.77	21.6
Officer	85	26.3	.43	26.1	28	26.2	.56	25.9	30	21.5	.87	20.7	33	20.6	.87	20.8
Other																
E1 - E6	107	29.9	.60	30.0	56	28.2	.65	28.0	89	19.2	.62	19.9	31	18.7	.87	19.4
E7 - E9	7	29.3	1.79	27.4	6	33.4	1.20	33.3	61	20.6	.50	20.6	28	18.5	1.03	18.8
Officer	14	29.4	1.16	29.1	7	28.3	1.41	28.2	39	18.7	.63	18.8	28	17.0	.87	17.4

[1]Standarad Error.

Table E.5. A %BF comparison (using age-adjusted circumferences) of Navy and Marine women by race and age and race and paygrade

Race and age, race and paygrade	Navy				Marines			
	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median
All races								
18 - 54	397	30.2	.29	29.7	216	28.5	.29	28.3
18 - 24	127	29.3	.50	28.9	108	27.6	.42	27.3
25 - 34	156	30.7	.45	30.0	74	29.3	.44	29.0
35 - 44	97	30.7	.50	30.5	32	30.7	.75	31.8
45 - 54	17	33.4	1.33	33.1	2	31.7	1.34	33.5
White								
18 - 54	269	30.0	.35	29.3	147	28.2	.34	27.8
18 - 24	75	28.9	.63	28.8	73	27.1	.50	26.8
25 - 34	104	30.6	.57	29.5	51	29.4	.48	29.0
35 - 44	77	30.3	.54	30.5	21	29.2	1.04	29.0
45 - 54	13	33.6	1.63	32.2	2	31.7	1.34	33.5
Other								
18 - 54	128	30.7	.49	30.7	69	29.2	.53	29.5
18 - 24	52	30.1	.81	30.5	35	28.3	.76	28.2
25 - 34	52	30.9	.70	30.7	23	29.1	.89	29.0
35 - 44	20	32.0	1.23	31.2	11	33.2	.89	31.8
45 - 54	4	32.8	1.31	34.8	*	*	*	*

[1]Standard Error.
*No subjects in category.

Table E.5 Cont'd. A %BF comparison (using age-adjusted circumferences) of Navy and Marine women by race and age and race and paygrade

Race and age, race and paygrade	Navy				Marines			
	N	Mean	S.E.[1]	Median	N	Mean	S.E.[1]	Median
All races								
E1 - E6	261	30.4	.35	29.9	166	28.2	.33	28.2
E7 - E9	37	32.2	.84	32.2	15	33.5	.77	33.8
Officer	99	28.6	.39	28.1	35	27.8	.52	27.3
White								
E1 - E6	154	30.2	.44	29.4	110	28.0	.40	27.7
E7 - E9	30	32.4	.97	32.2	9	32.7	.97	33.5
Officer	85	28.2	.41	28.0	28	27.4	.54	23.7
Other								
E1 - E6	107	30.7	.54	31.0	56	28.7	.58	28.8
E7 - E9	7	31.2	1.40	29.4	6	35.8	1.11	33.9
Officer	14	31.1	1.10	30.5	7	29.4	1.30	29.4

[1]Standard Error.

Table E.6. A comparison of overweight Navy and Marine Corps personnel by race and age and race and paygrade

Race and age, race and paygrade	FEMALE				MALE			
	Navy		Marines		Navy		Marines	
	N*	Percent	N	Percent	N	Percent	N	Percent
All races								
18 - 54	396	19.8	218	6.9	435	30.4	186	20.0
18 - 24	129	22.2	107	6.6	50	21.4	52	17.2
25 - 34	155	19.7	76	7.6	175	35.9	48	10.4
35 - 44	96	13.5	33	7.0	187	27.3	80	36.0
45 - 54	16	32.0	2	0.0	23	31.3	6	87.8
White								
18 - 54	269	18.7	146	5.9	246	32.2	99	18.9
18 - 24	77	17.5	72	5.5	37	20.5	34	17.3
25 - 34	103	21.5	51	6.7	112	37.0	19	1.1
35 - 44	76	13.4	21	5.6	88	30.6	42	36.1
45 - 54	13	35.1	2	0.0	9	35.2	4	100.0
Other								
18 - 54	127	22.4	72	8.7	189	25.1	87	23.2
18 - 24	52	31.3	35	8.3	13	24.6	18	16.7
25 - 34	52	15.6	25	9.2	63	31.8	29	25.2
35 - 44	20	13.8	12	9.3	99	19.4	38	35.7
45 - 54	3	20.2	0	0.0	14	21.9	2	0.0

NOTES: Overweight is defined for men as BMI $\geq$ 27.8 kg/m^2 and for women as BMI $\geq$ 27.3 kg/m^2.
*N is sample size in age or paygrade category.

Table E.6 Cont'd. A comparison of overweight Navy and Marine Corps personnel by race and age and race and paygrade

Race and age, race and paygrade	FEMALE				MALE			
	Navy		Marines		Navy		Marines	
	N	Percent	N	Percent	N	Percent	N	Percent
All races								
E1 - E6	262	21.7	166	7.2	239	32.7	67	18.3
E7 - E9	35	19.5	15	13.3	128	27.4	58	33.8
Officer	98	9.1	35	0.0	69	24.5	61	26.2
White								
E1 - E6	155	21.1	109	6.4	150	35.0	36	16.7
E7 - E9	29	21.4	9	11.1	67	29.2	30	35.5
Officer	85	6.9	28	0.0	30	25.6	33	27.3
Other								
E1 - E6	107	22.8	57	8.6	89	26.7	31	22.6
E7 - E9	6	10.9	6	16.7	61	22.8	28	31.0
Officer	13	22.9	7	0.0	39	13.8	28	17.9

Table E.7. A comparison of Navy and MarineCorps personnel not meeting their respective branch's weight-for-height standard by race and age and race and paygrade

Race and age, race and paygrade	FEMALE				MALE			
	Navy		Marines		Navy		Marines	
	N*	Percent	N	Percent	N	Percent	N	Percent
All races								
18 - 54	396	19.0	218	36.0	436	26.2	186	21.7
18 - 24	129	20.5	107	30.8	50	17.3	52	19.6
25 - 34	155	20.8	76	43.3	176	31.3	48	11.7
35 - 44	96	10.7	33	38.0	187	24.1	80	35.7
45 - 54	16	27.7	2	61.3	23	20.4	6	87.8
White								
18 - 54	269	19.0	146	32.1	247	27.7	99	19.2
18 - 24	77	17.5	72	27.7	37	18.2	34	17.3
25 - 34	103	24.0	51	38.5	113	31.7	19	3.3
35 - 44	76	9.9	21	31.2	88	27.5	42	36.1
45 - 54	13	35.1	2	61.3	9	19.9	4	100.0
Other								
18 - 54	127	18.9	72	42.9	189	21.7	87	28.6
18 - 24	52	26.5	35	36.1	13	14.0	18	27.8
25 - 34	52	13.2	25	51.8	63	30.2	29	25.2
35 - 44	20	13.8	12	49.1	99	16.0	38	35.0
45 - 54	3	0.0	0	0.0	14	21.9	2	0.0

*N is sample size in age or paygrade category.

Table E.7 Cont'd. A comparison of Navy and Marine Corps personnel not meeting their respective branch's weight-for-height standard by race and age and race and paygrade

Race and age race and paygrade	FEMALE				MALE			
	Navy		Marines		Navy		Marines	
	N	Percent	N	Percent	N	Percent	N	Percent
All races								
E1 - E6	262	21.1	166	35.4	239	28.8	67	20.1
E7 - E9	35	17.5	15	60.0	129	23.4	58	32.4
Officer	98	7.3	35	25.7	69	18.7	61	29.3
White								
E1 - E6	155	21.4	109	32.7	150	30.6	36	16.7
E7 - E9	29	21.4	9	44.4	68	26.3	30	35.5
Officer	85	7.2	28	21.4	30	19.3	33	30.3
Other								
E1 - E6	107	20.4	57	39.7	89	24.1	31	29.0
E7 - E9	6	0.0	6	83.3	61	15.7	28	27.6
Officer	13	8.1	7	42.9	39	13.8	28	21.4

Table E.8. Navy personnel not meeting standard on %BF[1] by race and age and race and paygrade

Race and age race and paygrade	FEMALE N*	FEMALE Percent	MALE N	MALE Percent
All races				
18 - 54	398	43.7	435	45.1
18 - 24	127	43.1	50	25.1
25 - 34	157	44.3	176	47.1
35 - 44	97	42.6	186	47.2
45 - 54	17	50.6	23	76.1
White				
18 - 54	269	41.7	246	49.4
18 - 24	75	39.3	37	24.3
25 - 34	104	43.0	113	52.0
35 - 44	77	42.4	87	53.1
45 - 54	13	48.3	9	84.9
Other				
18 - 54	129	48.3	189	32.2
18 - 24	52	50.3	13	28.1
25 - 34	53	47.4	63	30.0
35 - 44	20	43.3	99	32.9
45 - 54	4	59.6	14	54.2

[1]Navy standard is 30% body fat for women and 22% body fat for men.
*N is sample size in age or paygrade category.

Table E.8 Cont'd. Navy personnel not meeting standard on %BF[1] by race and age and race and paygrade

Race and age race and paygrade	FEMALE N*	FEMALE Percent	MALE N	MALE Percent
All races				
E1 - E6	261	46.6	239	44.6
E7 - E9	37	51.1	128	50.8
Officer	99	23.5	69	40.3
White				
E1 - E6	154	44.9	150	49.4
E7 - E9	30	55.9	67	55.4
Officer	85	21.4	30	43.2
Other				
E1 - E6	107	49.9	89	31.9
E7 - E9	7	29.7	61	38.5
Officer	14	36.0	39	13.8

[1]Navy standard is 30% body fat for women and 22% body fat for men.
*N is sample size in age or paygrade category.

Appendix F

DRAFT

The Mental Health of Women in the Navy and Marine Corps: Preliminary Findings from the 1995 Perceptions of Wellness and Readiness (POWR)

(Presented in part at the Annual Meeting of the American Psychological Association, Toronto, Canada, August 1996)

The Mental Health Status of Women in the Navy and Marine Corps: Preliminary Findings from the 1995 Perceptions of Wellness and Readiness Assessment (POWR '95)

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Problem

- Navy lacks baseline data to assess the extent of mental health problems and address mental health services needs among sailors and marines.
- Mental disorders in the Navy are the second leading cause for hospitalization among both enlisted men and women.
- Some evidence suggests that women may have much higher rates than men have.

Background

- 2-4 fold differences in psychiatric hospitalization rates (excluding alcoholism) found for women
- Higher rates of personality disorder, stress, and adjustment reactions, etc. found among women in sick-call aboard Navy ships
- Female soldiers deployed during Persian Gulf War almost twice as likely as men to be diagnosed with psychiatric disorder
- Women may find military life more difficult and stressful than do men.
- Higher rates may reflect women's greater propensity to use health services
- Most studies have not controlled for known demographic, psychosocial, or service-related differences.

Objectives

- To determine the prevalence of the most commonly diagnosed mental disorders in women, as well as the prevalence of psychiatric distress symptomatology
- To examine possible risk factors associated with these rates such as life events, coping skills, quality of life, perceived stress, personality, interpersonal relations, and social support

Objectives (cont.)

- To provide an estimate of the number of untreated conditions in the active-duty population
- To provide baseline data needed for the planning of delivery of increased mental health services
- To identify high-risk subgroups for intervention and prevention measures

Methods - Sample design

- Total Survey Sample (questionnaire), 2-stage cluster sample, N= 9859
  - Stage 1 - geographic clusters
  - Stage 2 - individuals stratified by sex, race, and paygrade (rank)
- Psychiatric survey sample (telephone interview), N=3591
  - Volunteer subsample of total survey sample
  - Weighted distribution of screened, unscreened, and unknowns

Methods - Measures

- Quick Diagnostic Interview Schedule (lifetime and recent diagnoses)
  - Structured, computerized telephone version of the DIS
  - Asks minimum no. of questions to make diagnostic decision
- Screening Instruments (psychiatric symptoms in last 7 days)
  - CES-D measures depressive symptomatology
  - Hopkins-21 measures psychiatric distress symptomatology

Methods - Procedures

- 4 trained interviewers (3 lay, 1 clinician)
- Volunteers provided telephone #s and preferred times to be contacted
- Pilot tested, confidential, private interviews
- Minimum of 6 attempts to contact during day and evening hours
- Avg. interview time = 26 minutes
- Direct computer entry/automated diagnoses
- Reinterviews

Sample size, screening status and populations weights for DIS interviews, POWR '95

	Survey Population	Population weight*	Current Interviews
Met screen criteria	784	1.59	493
Did not meet criteria	2320	10.17	228
Screen status unk	487	7.98	61
Total volunteers	3591		782

Response rate=89%

* Oversampled group that met criteria on screening instrument (16 or more on the CES-D and /or 37 or more on the Hopkins-21); targeted sample sizes for those not meeting criteria or undetermined were based on est. 20% prevalence rate, 95% accuracy, 5% error rates.

Table 1. Screening test results for Quick DIS interview volunteers relative to total survey sample

Results of Screening Tests	Total Weighted Sample (N=9746) %	Volunteers for DIS Interview* (N=3547) %	Non-volunteers* (N=6199) %	Test Statistic P-Value
Met Criteria for Depression (CES-D≥16	16.4	19.1	14.9	X^2_2=3.24, p=.21
Met Criteria for Psych Distress (Hopkins-21 ≥37	16.5	19.9	14.5	X^2_2=14.7, p=.002
Met Criteria for Depression and/or Distress	21.1	23.8	19.7	X^2_2=5.64, p=.07
Male	48.6	48.4		X^2_1=0.16, p=.69
Female	51.4	51.0		

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Table 2. Test (T) - retest (R) correlations (kappas) between first and second quick DIS interviews for reliable diagnoses (N = 32)

Diagnoses	T-Absent/ R-Absent	T-Absent/ R-Present	T-Present/ R-Absent	T-Present / R-Present	Kappa*	C.I.**	
Tobacco Dependence	17	1	3	11	0.74	0.40 - 1.08	†
GAD	25	2	2	3	0.53	0.18 - 0.87	†
PTSD	20	3	2	7	0.63	0.28 - 0.97	†
Depression	18	0	0	14	1.00		
Anorexia	31	0	0	1	1.00		
Bulimia	29	1	1	1	0.47	0.12 - 0.81	†
Alcohol Dependence	24	4	1	3	0.46	0.13 - 0.79	†

*Measure of agreement that also corrects for chance agreement, ranges from 0-1

**95% Confidence Interval

†Significant at .05

Table 3. Test (T) - retest (R) correlations (kappas) between first and second quick DIS interviews for unreliable or unevaluated diagnoses (N = 32)

Diagnoses	T-Absent/ R-absent	T-Absent/ R-Present	T-Present/ R-Absent	T-Present/ R-Present	Kappa*	CI**
Panic Disorder	**29**	**0**	**3**	**0**	**-**	**-**
Agoraphobia	**28**	**2**	**2**	**0**	**0.27**	**-0.41 - 0.28**
Simple Phobia	**26**	**4**	**1**	**1**	**0.22**	**-0.09 - 0.52**
Social Phobia	**25**	**1**	**4**	**2**	**0.37**	**0.04 - 0.68**
Mania	**31**	**0**	**1**	**0**	**-**	**-**
Obsessive Disorder	**32**	**0**	**0**	**0**	**-**	**-**
Compulsive Disorder	**30**	**2**	**0**	**0**	**-**	**-**
Antisocial Personality	**29**	**2**	**1**	**0**	**0.04**	**-0.37 - 0.28**

*Measure of agreement that also corrects for chance agreement, ranges from 0-1

* *95% Confidence Interval

POWR '95

Table 4. Sensitivity and specificity of CES-D in detecting recent psychiatric disorder*

	Screening Test - CES-D (N = 615)		
DIS Diagnosis	**Met criteria†**	**Did not meet criteria**	
			K = .39 (CI = .36, .43)
Present	**200**	**54**	**Sensitivity = .51**
Absent	**187**	**272**	**Specificity = .88**

*Excludes tobacco use only.

†Criteria for depression based on cutoff of ≥16 on CES-D (symptoms in last 7 days). Note: screening tests asked about symptoms within last week , and the DIS gives recent (within the last year) and lifetime diagnoses.

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Table 5. Sensitivity and specificity of Hopkins-21 in detecting any recent psychiatric disorder*

	Screening Test - Hopkins-21 (N = 623)		
DIS Diagnosis	**Met criteria****	**Did not meet criteria**	
			K =.31 (CI = .28, .35)
Present	**163**	**91**	**Sensitivity = .64**
Absent	**180**	**279**	**Specificity = .64**

*Excludes tobacco use only.

**Criteria for psychological distress based on cutoffs point of ≥37 on Hopkins-21 (symptoms in last 7 days).

Table 6. Sensitivity and specificity of CES-D and Hopkins-21 in detecting any recent psychiatric disorder*

	Screening Test - CES-D or Hopkins (N = 606)		
DIS Diagnosis	**Met criteria†** **	**Did not meet criteria**	
			K = .38 (CI =.35, .42)
Present	**229**	**25**	**Sensitivity = .59**
Absent	**261**	**198**	**Specificity = .83**

*Excludes tobacco use only, recent = within last year.

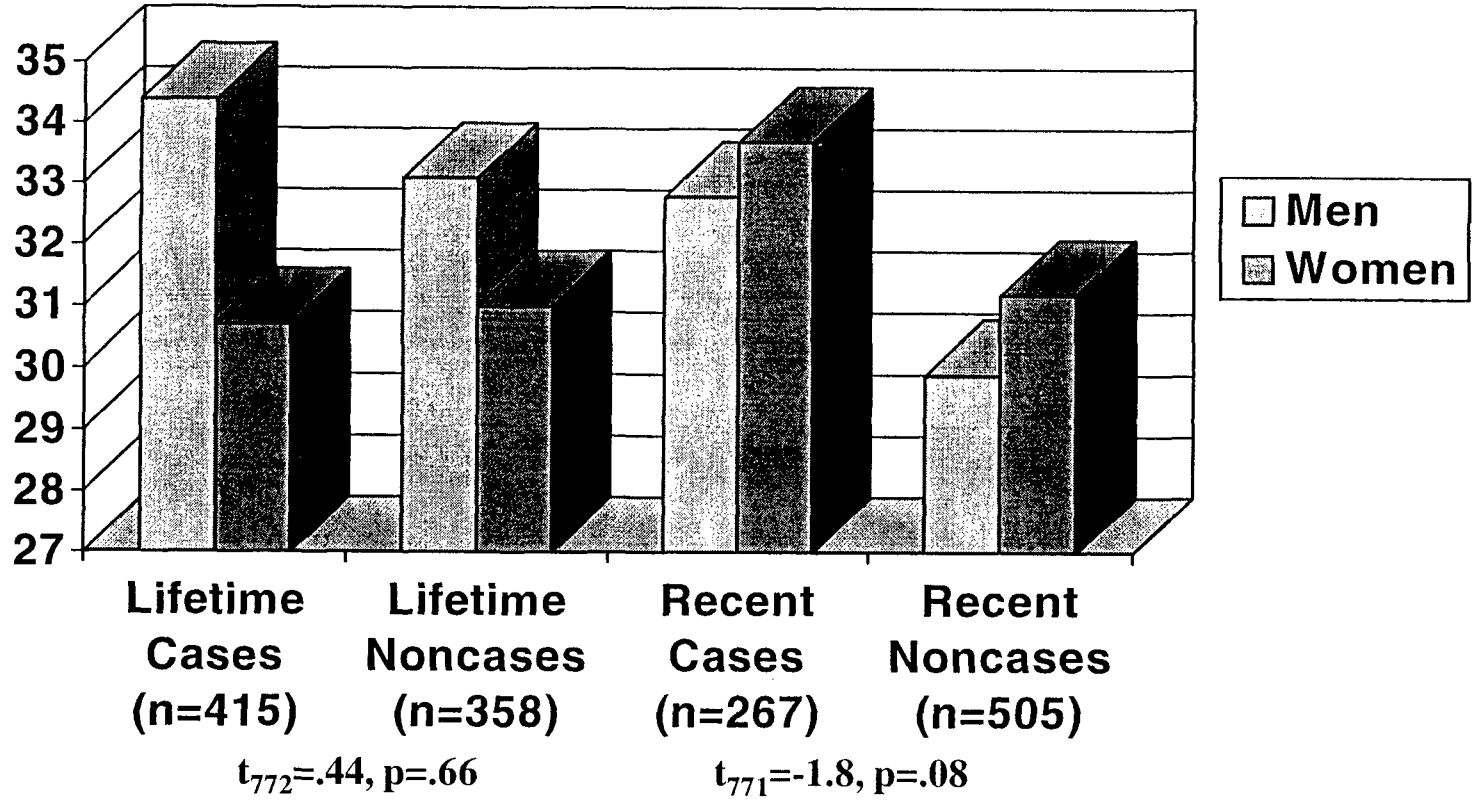
**Criteria for psychological distress based on cutoffs point of ≥37 on Hopkins-21 or ≥16 on CES-D (symptoms in last 7 days).

Table 7. Cormorbidity of lifetime and recent diagnoses among U.S. Navy and Marine Corps volunteers with any diagnosis*

	Lifetime		Recent	
# Diagnosis	Frequency	Percent	Frequency	Percent
1	180	56.45	131	59.60
2	112	22.54	83	23.74
3	52	10.65	28	10.81
4	43	6.50	12	3.59
5	24	3.85	10	2.24

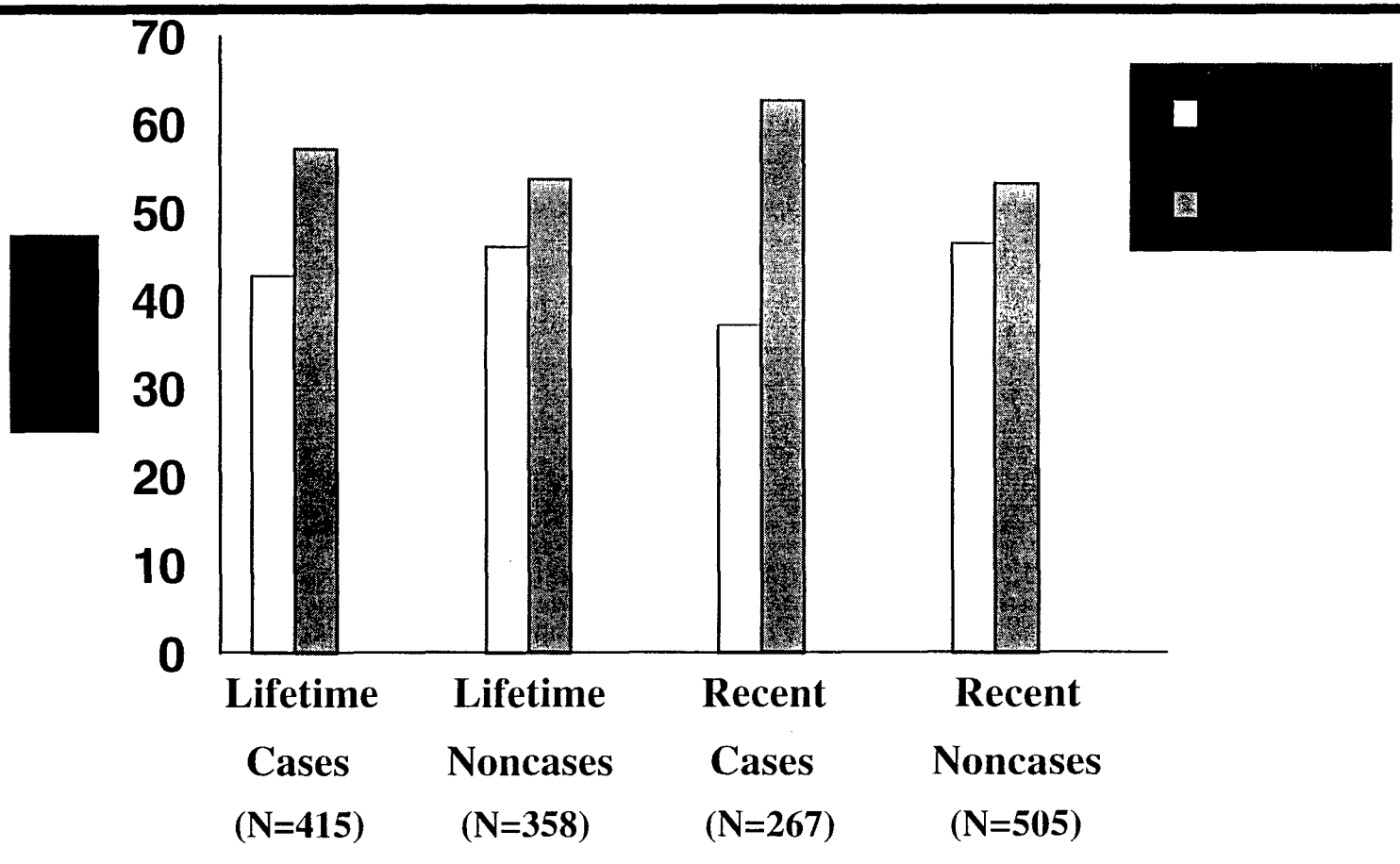
*Excludes tobacco dependence; based on 15 diagnoses assessed with the Quick DIS.

Figure 1. Percent distribution of lifetime and recent psychiatric cases* by mean age



*with any psychiatric diagnosis

Figure 2. Distribution of lifetime and recent psychiatric cases* by sex

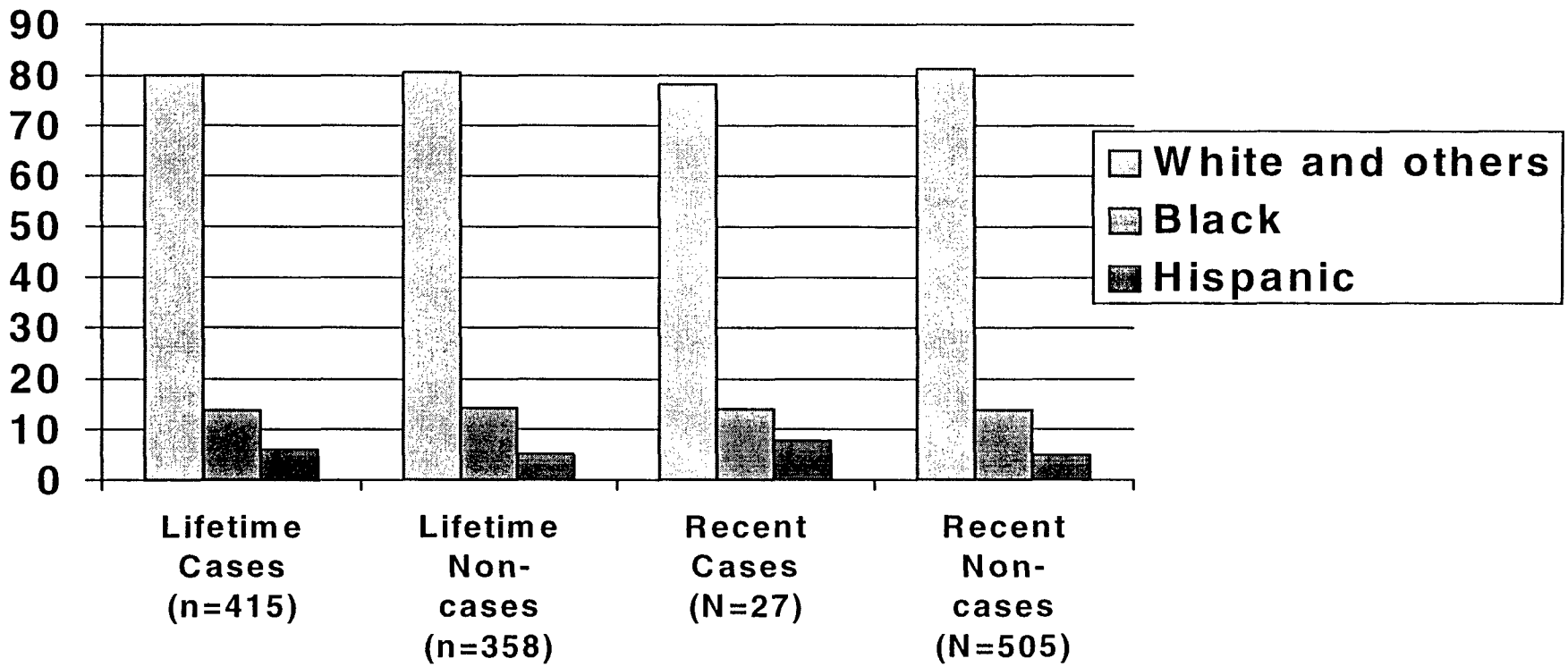


$X^2_1 = .51, p = 0.47$ $X^2_1 = 3.29, p = 0.07$

POWR '95

*with any psychiatric diagnosis

Figure 3. Percent distribution of lifetime and recent psychiatric cases* by ethnicity

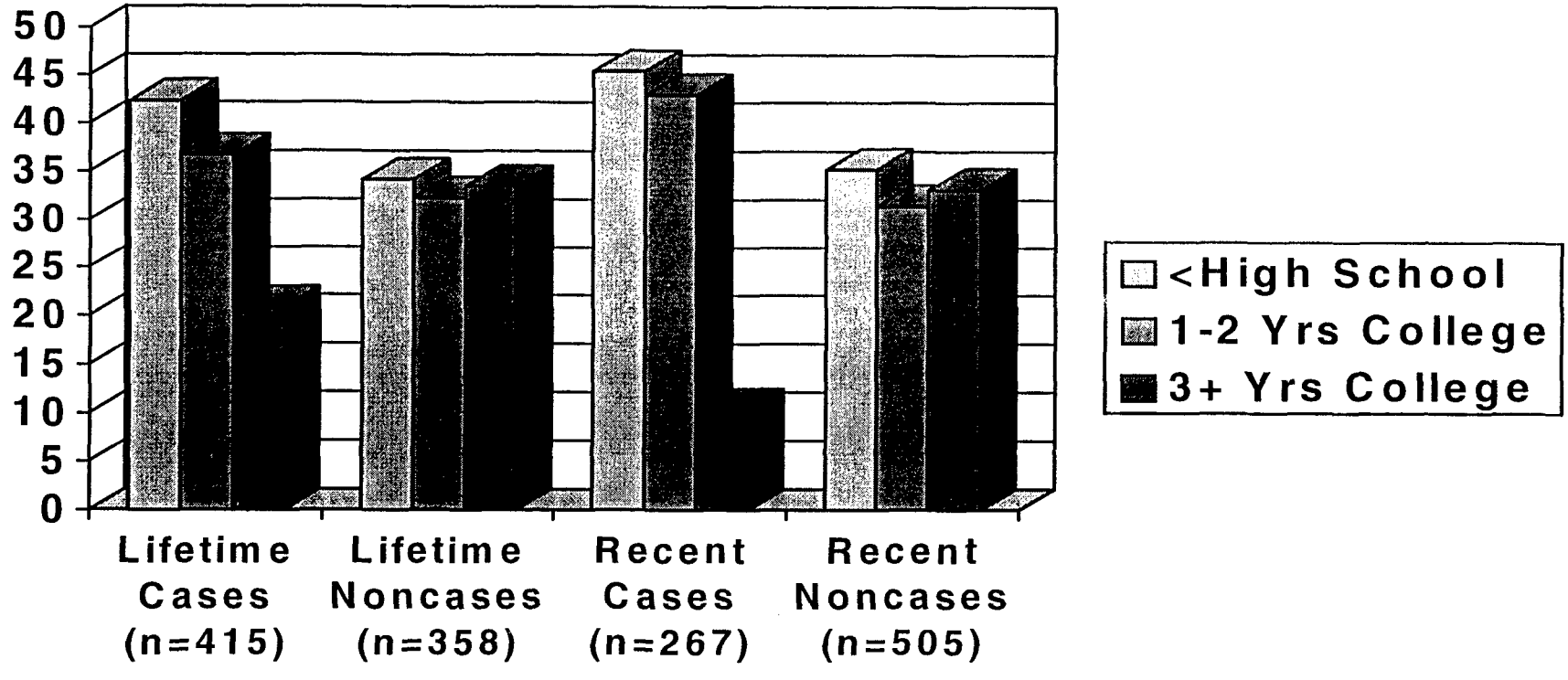


X^2_2=0.23, p=0.89

X^2_2=1.32, p=0.52

POWR '95

Figure 4. Percent distribution of lifetime and recent psychiatric cases* by highest education level

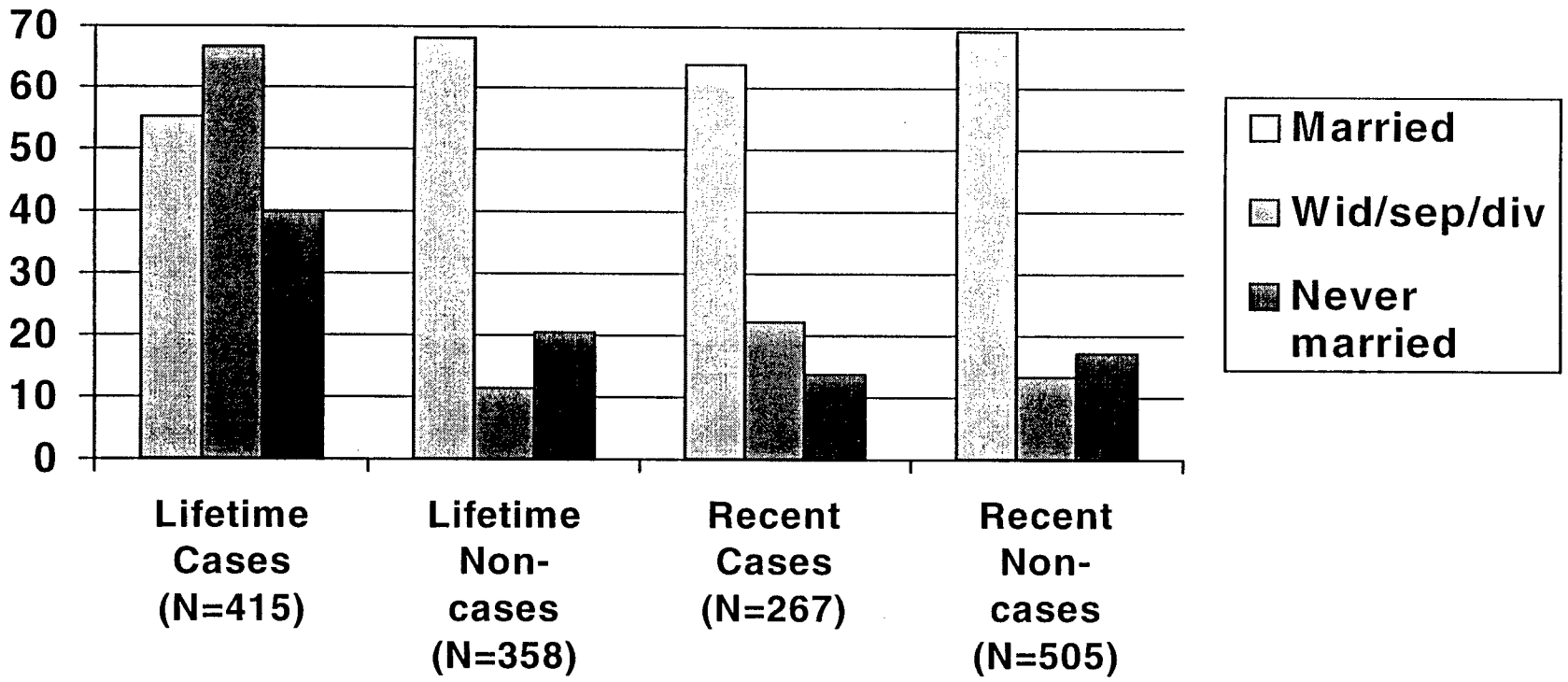


$X^2_2 = 9.1$ p = 0.01

$X^2_2 = 36.1$, p = 0.000

*with any psychiatric diagnosis

Figure 5. Percent distribution of lifetime and recent psychiatric cases* by marital status



X^2_2=15.71, p=.0004

X^2_2=4.84, p=.09

*with any psychiatric diagnosis

Table 8. Lifetime Prevalence* of Anxiety Disorders among Navy and Marine Corps Volunteers, POWR '95

Diagnosis	Men (n=325) % (SE)	Women (n=457) % (SE)	Both (n=782) % (SE)	T-Test Statistic/ P-Value*
Panic Disorder	2.3 (1.0)	1.4 (0.3)	1.8 (0.5)	-0.8, .40
GAD	2.9 (0.8)	4.3 (0.9)	3.6 (0.6)	1.1, .26
Agoraphobia	2.6 (0.9)	5.7 (1.2)	4.3 (0.8)	2.0, .04*
Social Phobia	4.0 (1.3)	5.5 (1.3)	4.8 (0.9)	0.8, .42
Simple Phobia	6.9 (1.7)	8.3 (1.5)	7.7 (1.1)	0.6, .55
PTSD	4.8 (1.4)	17.3 (2.1)	11.7 (1.4)	4.9, .00*

POWR '95

*Per 100 - weighted to volunteer population, p=≤.05

Table 9. Lifetime Prevalence* of Depression and Other Disorders among Navy and Marine Corps Volunteers, POWR '95

Diagnosis	Men % (SE)	Women % (SE)	Both % (SE)	T-Test/ P-Value
Depression	8.9 (1.5)	21.8 (2.3)	16.0 (1.5)	4.7, .00
Mania	0.2 (0.1)	0.6 (0.2)	0.4 (0.1)	1.4, .15
Anorexia	0.0 (0.0)	0.5 (0.5)	0.3 (0.3)	1.0, .32
Bulemia	0.9 (0.6)	2.1 (0.6)	1.6 (0.5)	1.3, .21
Alcohol Abuse/ Dependence	22.0 (2.9)	9.2 (1.7)	14.9 (1.6)	-3.8, .00*
Tobacco Dependence	28.9 (3.2)	21.9 (2.6)	25.1 (2.0)	-1.7, .09

*Per 100 - weighted to volunteer population, p=≤.05

Table 10. Lifetime Prevalence of Personality Disorders and Any Diagnosis Among Navy and Marine Corps Volunteers, POWR '95

Diagnosis	Men	Women	Both	T-Test Statistic/ P-Value
	% (SE)	% (SE)	% (SE)	
Obsessions	2.3 (1.1)	0.2 (0.1)	1.2 (0.5)	-1.8, .06
Compulsions	0.2 (0.1)	1.7 (0.7)	1.0 (0.4)	1.9, .06
Antisocial Personality	3.9 (1.1)	0.6 (0.2)	2.1 (0.5)	-2.9, .00*
Overall (Any diagnosis)	38.0 (3.4)	41.2 (3.0)	40.0 (2.3)	0.7, .47

*Per 100 - weighted to volunteer population, p=≤.05

Table 11. Current Prevalence* of Anxiety Disorders among Navy and Marine Corps Volunteers, POWR '95

Diagnosis	Men (n=325) % (SE)	Women (n=457) % (SE)	Both (n=782) % (SE)	T-Test Statistic/ P-Value*
Panic Disorder	1.2 (0.6)	1.0 (0.3)	1.1 (0.3)	-0.2, .82
GAD	1.5 (0.4)	3.2 (0.8)	2.4 (0.5)	1.9, .05
Agoraphobia	1.3 (0.6)	3.4 (1.0)	2.4 (0.6)	1.9, .06
Social Phobia	2.5 (1.0)	3.4 (0.9)	3.0 (0.7)	0.7, .49
Simple Phobia	5.6 (1.6)	5.2 (1.2)	5.4 (1.0)	-0.2, .83
PTSD	2.4 (1.1)	8.1 (1.4)	5.5 (0.9)	3.2, .00*

POWR '95

*Per 100 - weighted to volunteer population, p=≤.05

Table 12. Current Prevalence* of Depression and Other Disorders Among Navy and Marine Corps Volunteers, POWR '95

Diagnosis	Men % (SE)	Women % (SE)	Both % (SE)	T-Test/ P-Value
Depression	5.4 (1.0)	12.0 (1.6)	9.0 (1.0)	3.5, .00*
Mania	0.1 (0.1)	0.5 (0.2)	0.3 (0.1)	1.7, .08
Anorexia	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	n/a
Bulemia	0.9 (0.6)	1.4 (0.6)	1.2 (0.4)	0.6, .56
Alcohol Abuse/ Dependence	3.3 (1.1)	1.3 (0.7)	2.2 (0.6)	-1.6, .11
Tobacco Dependence	15.6 (2.4)	13.9 (2.1)	14.7 (1.6)	-0.5, .60

*Per 100 - weighted to volunteer population, p=≤.05

Table 13. Lifetime Prevalence of Personality Disorders and Any Diagnosis Among Navy and Marine Corps Volunteers, POWR '95

Diagnosis	Men	Women	Both	T-Test Statistic/ P-Value
	% (SE)	% (SE)	% (SE)	
Obsessions	0.4 (0.2)	0.2 (0.1)	0.3 (0.1)	-1.0, .30
Compulsions	0.2 (0.1)	1.6 (0.7)	1.0 (0.4)	-1.0, .31
Antisocial Personality	0.4 (0.2)	0.2 (0.1)	0.3 (0.1)	-1.0, .31
Overall (Any diagnosis)	17.1 (2.4)	23.3 (1.8)	20.5 (1.7)	1.8, .07

*Per 100 - weighted to volunteer population, p=≤.05

Table 14. Odds Ratios (OR) and confidence intervals (CI) for significant gender differences* in selected lifetime and recent psychiatric diagnoses

	Lifetime		Recent (in last 12 months)	
Diagnosis	**OR**	**(95% CI)**	**OR**	**(95% CI)**
PTSD	**4.14**	**(2.12, 8.08)**	**3.62**	**(1.33, 9.86)**
Depression	**2.85**	**(1.81, 4.48)**	**2.41**	**(1.49, 3.88)**
Alcohol	**0.36**	**(0.21, 0.61)**	**Not evaluated**	
Antisocial Personality	**0.24**	**(0.11, 0.55)**	**Not evaluated**	
Agoraphobia	**2.26**	**(1.00, 5.14)**	**Not evaluated**	
Overall (any diagnosis)	**1.15**	**(0.79, 1.67)**	**1.47**	**(0.96, 2.23)**

*Male = 0, Female = 1

Table 15. Distribution of qualifying trauma among lifetime* PTSD cases by gender, POWR '95

TRAUMA	MALES	FEMALES	TOTAL
	No. (%)	No. (%)	No. (%)
Rape	0	60 (52.4)	60 (42.8)
Seeing someone hurt /killed	7 (22.7)	10 (4.7)	17 (8.0)
Being attacked	4 (19.3)	15 (8.9)	19 (10.8)
News of sudden death	2 (15.2)	13 (16.7)	15 (16.4)
All Others	10 (42.8)	17 (17.3)	27 (22.0)

$X^2_4=14.9$, p=.005

*Distribution similiar for current cases but smaller n's.

Conclusions

- Combination of screening instruments and/or their cutpoints may need modification to optimize sensitivity and specificity and detect the range of psychiatric conditions in military community
- Quick DIS appears more reliable for major disorders and less reliable for diagnosing phobias and personality disorders.
- Navy and Marine Corps women appear to be at higher risk for depression and PTSD, men at higher risk for alcohol abuse/dependence

Appendix G

DRAFT

Occupational Exposure and Reproductive Health in the U.S. Navy and Marine Corps: Preliminary Findings from the 1995 Perceptions of Wellness and Readiness (POWR) Assessment

(Prepared for the Annual Meeting of the American Public Health Association, New York, NY, November 1996)

Occupational Exposure and Reproductive Health in the U.S. Navy and Marine Corps: Preliminary Findings from the 1995 Perceptions of Wellness and Readiness Assessment (POWR '95)

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Division of Health Sciences
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Background

- Majority of military women are at peak of their reproductive years
- Reproductive issues are becoming more important to military leaders as percent of women increase in military
- Lack of baseline health, reproductive, and risk factor data relevant to women's new and non-traditional duties

Research Questions

- What is the reproductive status of military women and their satisfaction with military Ob/Gyn services?
- To what extent are Navy and Marine Corps women being exposed to potential reproductive health hazards?
- What exposures may be associated with adverse reproductive outcomes?

POWR '95

- **Purpose: To provides baseline prevalence and risk factor information on a representative sample of active-duty Navy and Marine Corps personnel worldwide and to provide relevant comparative data with civilian populations**

Sample

- Total shore-based probability 2-stage cluster survey sample, N= 9859; Physical measurements subsample, N=1292; Psychiatric survey subsample (telephone interview), N=784
- Stratification by geographic location, sex, race, and paygrade

Methods

- Self-report questionnaire examining medical /nutritional, reproductive, psychosocial, lifestyle, occupational/ environmental, and health care factors; subsamples participating in cardiovascular and physical measurements and clinically-based diagnostic telephone interviews
- 3 waves of data capture, response rate = 40%

Measures

- Adverse Reproductive Outcomes: problems becoming pregnant, pregnancy complications, miscarriage, stillbirth, childbirth problems, post-partum complication in last year
- Occupational exposures: any exposure to 38 known health hazards in last year including radiation, heavy metals, chemicals, dust, noise, job stress, etc.

Measures (cont.)

- Demographics: age, race, marital status, education, occupation, rank, time in service, branch of service
- Reproductive Status: currently pregnant (planned vs. unplanned), pregnant in last year, pregnant since active duty
- Satisfaction with and access to military Ob/Gyn services

Demographic Distribution of Navy and Marine Corps Women, POWR '95 (n=5070)

Age (mean)	29.4	Marital status (%)	
Race (%)		Married/Liv	54.99
White	61.57	Single	28.51
Black	21.16	Sep/Div/Wid	15.68
Other	9.52	Rank (%)	
Education (%)		Enlisted	82.46
High/trade school	30.50	Officer	17.15
Some college	41.74	Service (%)	
College grad +	23.94	Navy	84.17
Yrs in service (mean)	8.51	Marine Corps	15.83

NHRC - POWR '95

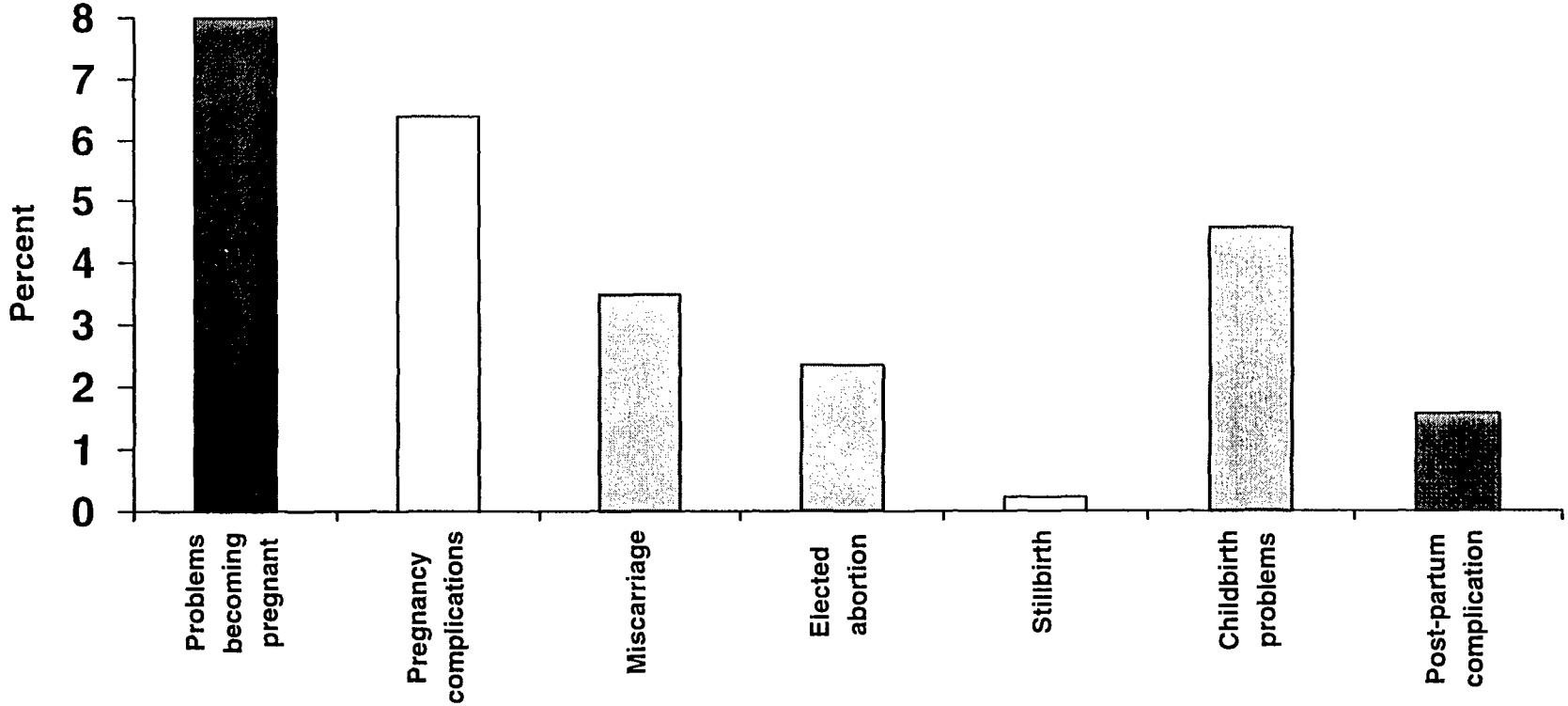
Reproductive History of Navy and Marine Corps Women, POWR '95 (n=5,070)

	Number	Percent
Currently pregnant	294	6.14
Planned	194	65.40
Unplanned	98	33.84
Pregnant in last year	872	18.34
Pregnant since active duty	2670	53.20
Mean No. pregnancies	1.32	
Mean No. live births	.80	

Percent Distribution of Female-Specific Conditions During the Past Three Months Among Navy and Marine Corps Women, POWR '95

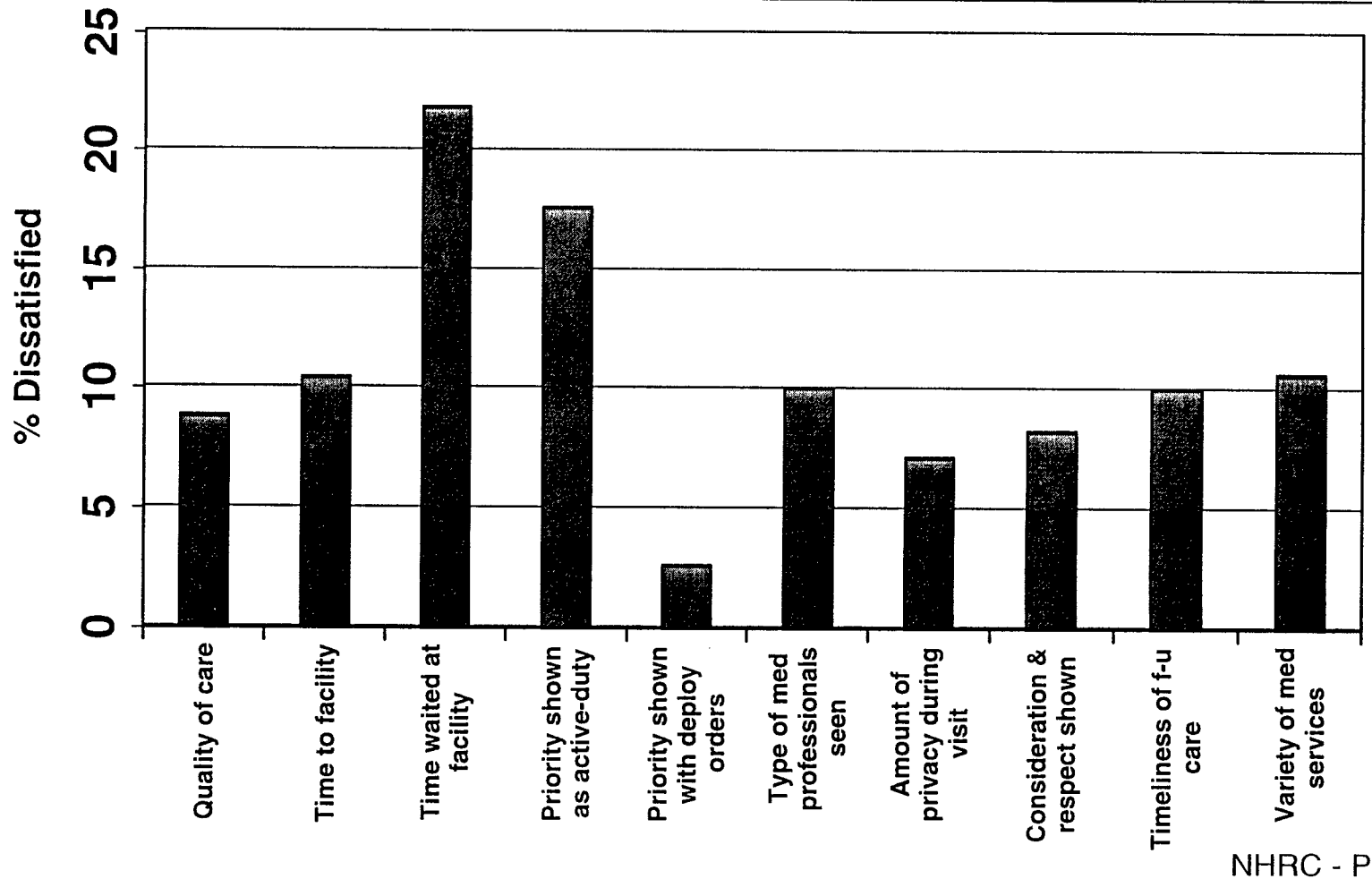
	Number	Percent
Menstrual disorders	3144	62.23
Abdominal pain (due to cysts or unknown cause)	1280	25.64
Endometriosis	118	2.39
Discharge from breast	281	5.66
Breast lump	273	5.18
Premenstrual symptoms	2853	56.20
Vaginal rash	481	9.34
Yeast or vaginal infection	1119	22.92
Problems with uterus	148	3.02

Prevalence of Adverse Reproductive Outcomes Within Last Year Among Navy and Marine Corps Women, POWR '95 (n=5070)



NHRC - POWR '95

Satisfaction with OB/GYN Services Among Navy and Marine Corps Women, POWR '95 (n=5070)



NHRC - POWR '95

Percent Distribution of Risk Factors* in Currently Pregnant Navy and Marine Corps Women, POWR '95

	Currently Pregnant (n-294)		Total Women (n=5070)	
	Number	Percent	Number	Percent
Paygrade				
Enlisted	252	87.66	4070	82.46
Officer	41	11.96	981	17.15
Age (mean)		25.20		29.40
Parity (mean)		.56		.80
Current smokers	37	11.97	1155	22.62
Tobacco smoke in living area*	41	15.46	960	18.54
Tobacco smoke in work area*	24	8.28	350	7.23
Alcohol (mean drinks in last mo)		1.38		1.74
Job stress score (mean)		14.81		15.31

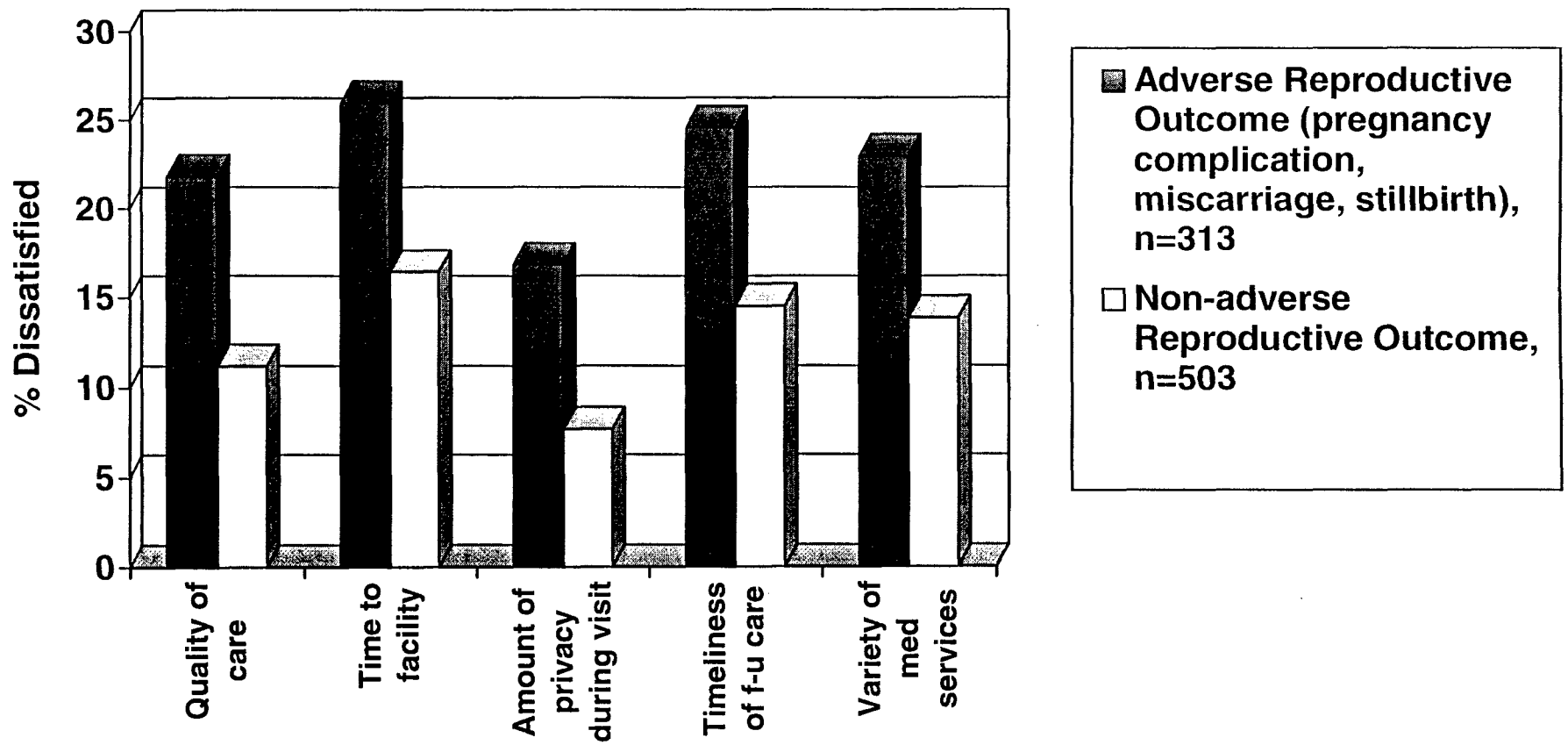
*exposed for an hour or more a day in last 30 days

NHRC - POWR '95

Percent Distribution of Current Medical Conditions in Currently Pregnant Navy and Marine Corps Women, POWR '95

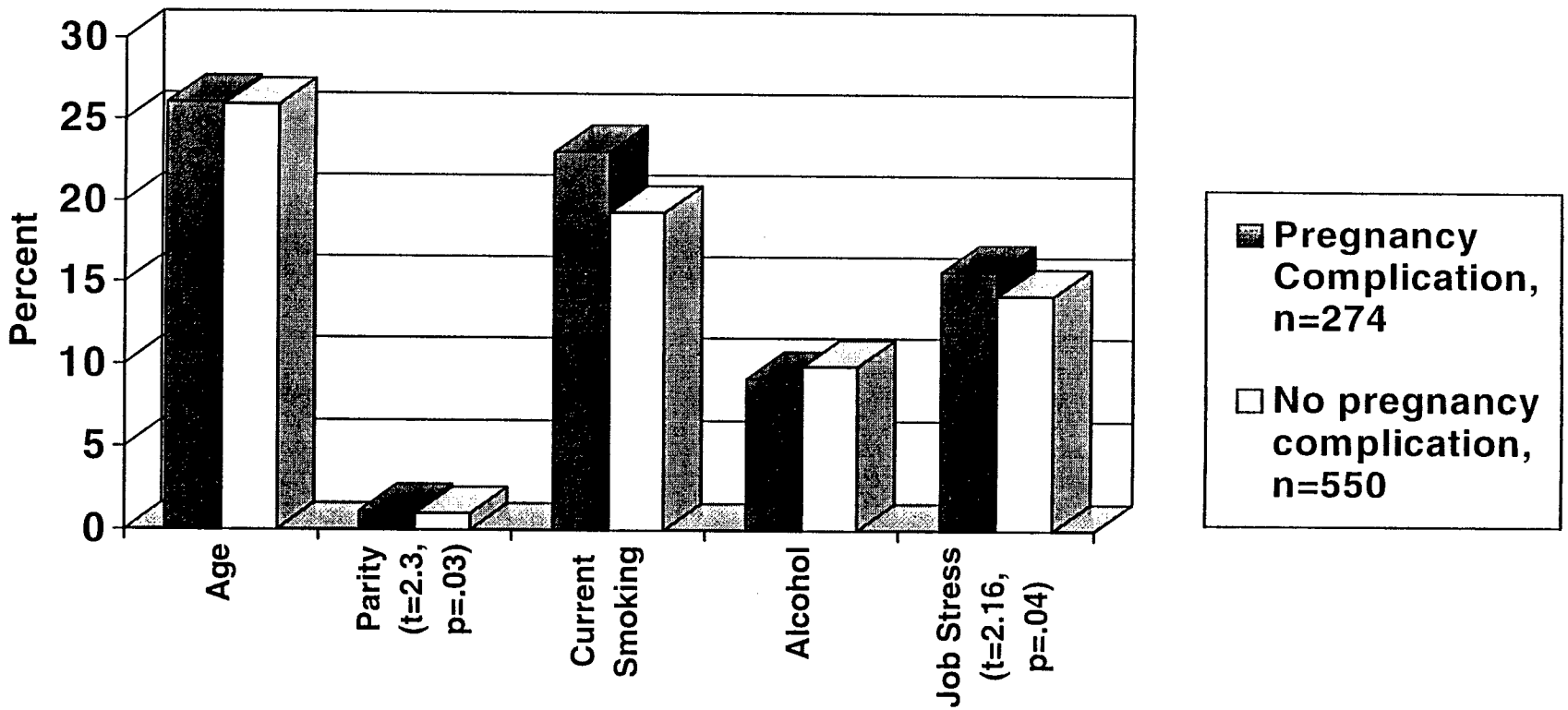
Current Medical Condition	Currently Pregnant (n=294)		Total Women (n=5070)	
	Number	Percent	Number	Percent
Anemia	29	10.37	294	6.03
Chlamydia	1	0.21	8	0.18
Gonorrhea/Syphilis	0	0	1	0.04
Herpes/Genital warts	16	6.00	228	4.51
Hypertension	3	1.15	89	1.79
Pelvic Inflammatory Disease	1	0.21	17	0.27
Urinary Tract Infection	5	1.32	58	1.23
Yeast or Vaginal Infection (in past 3 months)	79	28.32	1119	22.92

Satisfaction with Military OB/GYN Services by Reproductive Outcome in Recently Pregnant Navy and Marine Corps Women , POWR '95



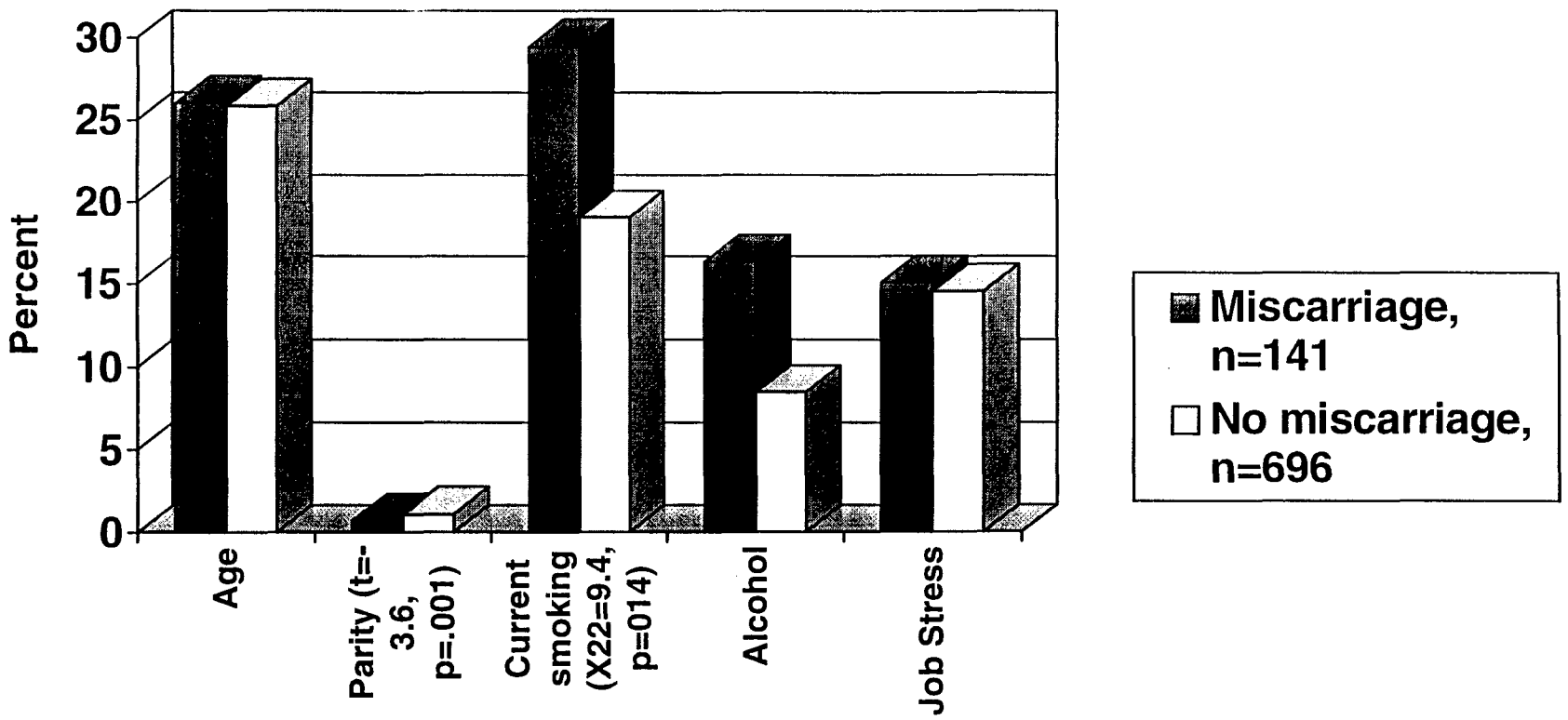
NHRC - POWR '95

Distribution of Pregnancy Complications by Risk Factors* in Recently Pregnant Navy and Marine Corp Women



*Alcohol=avg.no. of drinks in past mo., job stress= avg. score on House Job Stress scale

Distribution of Miscarriages by Risk Factors* in Recently Pregnant Navy and Marine Corp Women



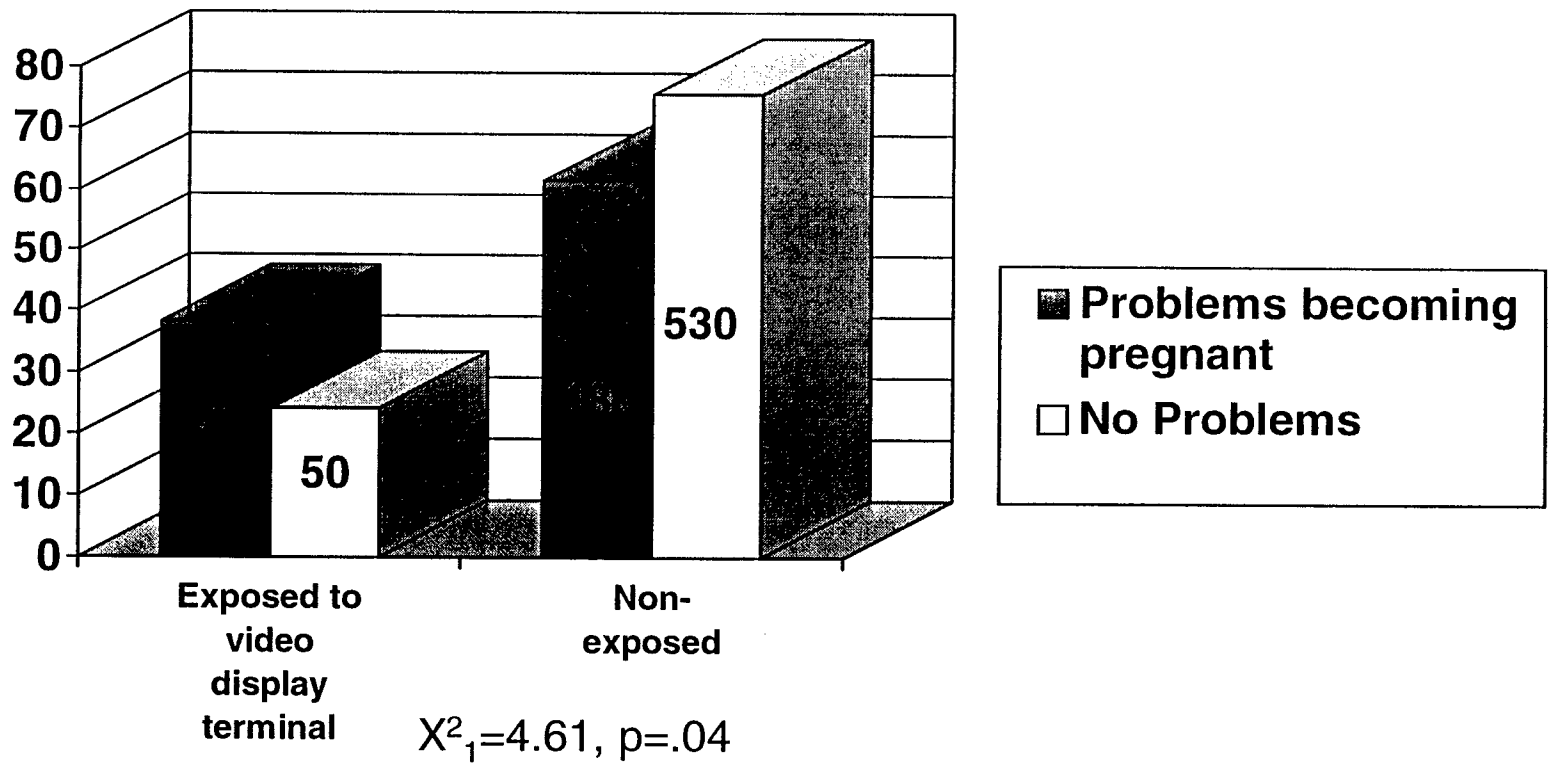
*Alcohol=avg.no. of drinks in past mo., job stress= avg. score on House Job Stress scale

Occupational Exposure Profile for Currently Pregnant, Recently Pregnant and Total Sample of Navy and Marine Corps Women, POWR '95

Reported Exposure* in Past Yr	Currently Pregnant (n = 294)	Pregnant in Past Yr (n =872)	Tot Women (n = 5070)
Microwave oven (within 3 ft)	55.0	55.7	55.0
Lifting (25+ lbs)	46.8	43.9	44.2
Loud noise (jets, etc)	24.7	26.4	29.3
Video display unit	26.5	25.3	31.7
Dust particles	22.0	22.3	23.0
High temp (above 95 F)	23.3	22.5	26.6
Engine fuel/exhaust	42.1	35.6	36.0
Paint/thinner/scrapings	23.7	25.6	26.0
Solvents/degreasers	17.4	16.3	14.7
Radar/transmitting antennas	7.2	7.3	8.7
Carbon monoxide	9.0	9.9	9.2

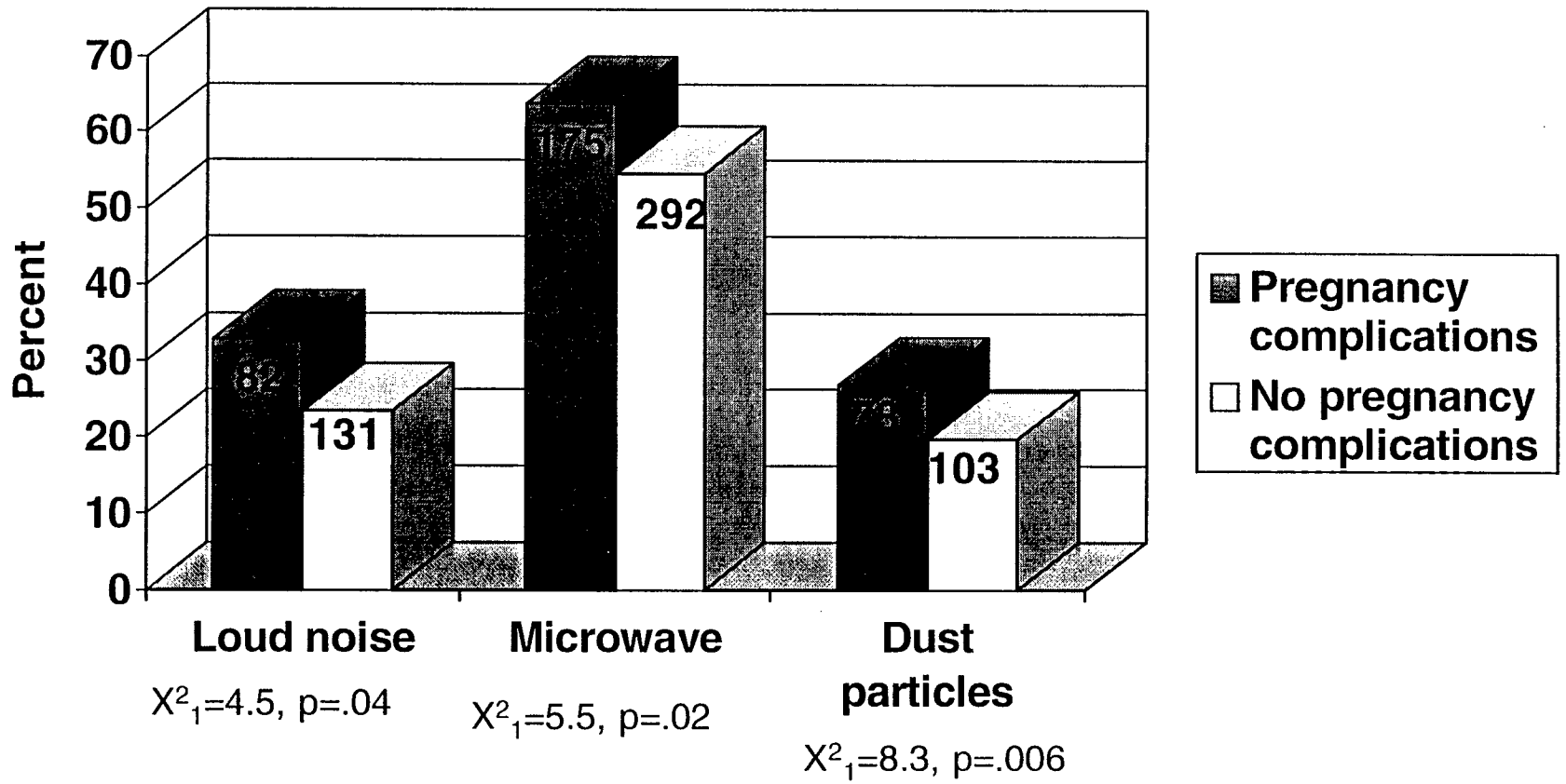
*Exposures associated with any adverse outcome at bivariate level

Problems Becoming Pregnant by Exposure to Video Display Terminals in Navy and Marine Corp Women, POWR '95



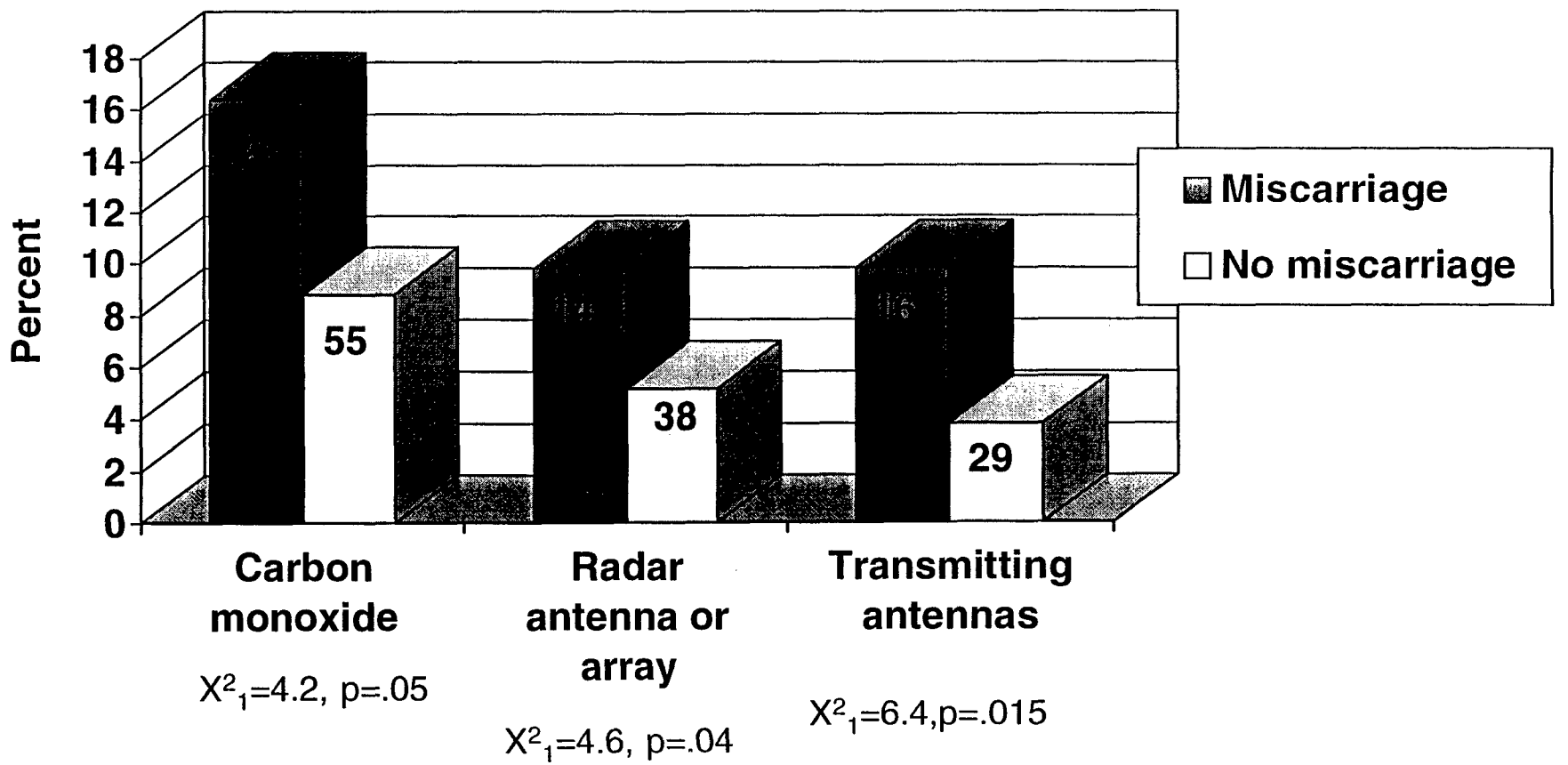
$X^2_1=4.61$, p=.04

Pregnancy complications and associated occupational/environmental exposures among Navy and Marine Corp women, POWR '95



NHRC - POWR '95

Miscarriage and associated occupational/environmental exposures among Navy and Marine Corp women, POWR '95



NHRC - POWR '95

Adjusted regression models* for risk of pregnancy complications and miscarriage by occupational/environmental exposures among Navy and Marine Corps Women, POWR '95

Outcome = Pregnancy Complications			Outcome = Miscarriage		
Predictor	Odds Ratio	95% C.I.	Predictor	Odds Ratio	95% C.I.
Parity	1.16	1.00-1.36	Parity	0.60	0.40-0.92*
Job stress	1.01	1.00-1.03	Current smoking	2.08	1.26-3.43*
Dust particles	1.41	1.04-1.91*	Carbon monoxide	2.02	1.29-3.39*
Loud noise	1.49	0.97-2.30	Radar antenna	2.00	1.22-3.28*
Microwave	1.38	0.95-2.00	Transmitting antenna	2.77	1.60-4.80*

*Control variables entered into equation first, followed by individual exposure variables in separate models, C.I.= confidence interval, p<.05

Conclusions

- **Potential issues among Navy and Marine Corps shore-based women that require further investigation include:**
  - » **A high level of unplanned pregnancies and pregnant smokers**
  - » **Dissatisfaction with waiting time and priority shown at OB/GYN services**
  - » **Statistical association between adverse reproductive outcomes and dissatisfaction with certain aspects of military OB/GYN care**
  - » **High levels of recent yeast or vaginal infections in currently pregnant women**

Conclusions (cont.)

- **After controlling for parity and job stress, only exposure to dust particles remains a potential risk factor for pregnancy complications.**
- **After controlling for parity and smoking, only exposure to carbon monoxide, radar and transmitting antennas remain potential risk factors for miscarriage in shore-based Navy and Marine Corps women**

Appendix H

Selected Preproposals for Phase Two Analytic Analyses

PREPROPOSAL

Title: **Persian Gulf Health: Findings from the 1995 Perceptions of Wellness and Readiness Assessment (POWR '95)**

Principle Investigator: Laurel Lockwood Hourani, Ph.D., M.P.H.
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Project Duration: January 1, 1997- January 1, 1998

Funds Requested: 100% GS-13 Epidemiologist - $70K, 50% Contractor Ph.D. Statistician - S60K, Travel (consultation/briefings) - $3K, SUDAAN licence renewal - $2K. Total - $135K

Project Description:

Most of the Persian Gulf War Syndrome studies have utilized self-selected subjects (as in the Gulf War Registry), clinical or hospitalization data, veterans who have since left the Service, or other specialized or convenience samples. The limitations of these samples in epidemiologic investigations are well-known and are responsible in part for the lack of definitive findings in this research area. Further, many of the current studies lack sufficient data on women to examine potential gender differences in Gulf War-related physical and mental disorders. In collaboration with the "Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors" being conducted at the Naval Health Research Center, the present proposal will address these issues.

The 1995 Perceptions of Wellness and Readiness Assessment (POWR '95) is a population-based comprehensive health survey of 10,000 active-duty Navy and Marine Corps personnel worldwide. Funded through the Defense Women's Health Research Program and patterned after the large National health surveys, such as NHANES, the purpose of this survey was to provide baseline data on a wide range of physical and mental health conditions and risk factors in military men and women. In addition to an extensive self-report questionnaire, that included numerous standardized measures for comparison to civilian and other military populations, physical measurements (i.e., body fat, blood pressure, heart rate, etc.), and clinically-based psychiatric telephone interviews were obtained on subsamples of the population. As the largest population-based health survey of active-duty naval personnel undertaken, the complex sampling strategy involved the selection of two and three-stage probability cluster samples

without replacement. Stratification was used to control the sample distribution with respect to organizational and demographic characteristics and the SUDAAN software was obtained to provide the appropriate adjusted variance estimates and support weighting to the full shore-based populations of the Navy and Marine Corps. Data collection from this study was completed August 31, 1996 and data cleaning and preliminary analyses are underway. Such a database offers the unique opportunity to conduct a population-based investigation of Persian Gulf War-related health conditions and risks factors.

This proposal seeks to examine these extensive extant data in search of evidence of Gulf War-associated physical, mental, and reproductive conditions. Four main comparison groups will consist of the following: 1000 (representing 34,000) sailors and marines who reported serving in Desert Storm or Desert Shield only, a control group of 300 (representing 16,000) sailors and marines who served in Somalia, Bangladesh or Haiti only, a control group of 600 (representing 22,000) sailors and marines who served both in the Gulf War and in another foreign theater and a third control group (approx. 6000, representing 163,000) who did not serve in any foreign operation. The first three groups will be further divided by ship vs. shore duty. Main outcome variables will include: Lifetime and current prevalence of 50 medical and psychological disorders, Current symptoms and help-seeking behavior, and adverse gynecologic conditions and reproductive outcomes (women only). Other covariates and control variables to be examined include: Recent use of 15 medications/vaccines (including pyridostigmine), Perceived general health and psychosocial status, depressive symptomatology (CES-D), psychosocial distress (Hopkins Checklist-21), Perceived quality of life, Perceived stress and coping (MOS), Health care utilization in past year, Lifestyle and health behaviors (smoking, alcohol intake, diet, exercise), Social support (Berkman), Life, job and marital satisfaction (SAS), Self-esteem (Rosenberg), History of life events/abuse/combat, violence, disaster exposure, Job stress (House Job Scales), Personality/temperament (Spielberger), Lifetime and recent exposure to 30 known environmental and occupational health hazards, and Sociodemographics (sex, age, race, rank, occupation, education, etc.). Two main sets of analyses are planned: (1) A descriptive comparison of the prevalence and risk factors between Gulf War and comparison groups on all study variables. Prevalence rates of significant medical and psychological conditions will be calculated and compared to civilian rates. (2) An analytic multivariate investigation of the interrelationships between variables with special focus on the relationship between physical, social, environmental, and psychological variables. Multivariate logistic modeling will be used to examine potential mediating and/or moderating effects of covariates on medical, psychological and reproductive outcomes, controlling for sociodemographic variables.

The 1995 Perceptions of Wellness and Readiness Assessment (POWR): Prevalence, Risk Factors, and Recommended Interventions for Tobacco and Alcohol Dependence among Navy and Marine Corps Women

As military women move into more competitive occupational positions with military men, will their health risks begin to mirror those of men as well? In order to maximize the effectiveness of preventive health programs, a baseline for understanding mental health conditions of active-duty Navy and Marine corps women must be established. This study will concentrate on the psychiatric diagnoses of tobacco and alcohol abuse and dependence for women in the United States Navy and Marine Corps, diagnoses traditionally more prevalent among men than women. Analyses will be based on data from the 1995 Perceptions of Wellness and Readiness Assessment (POWR), a population-based self-report survey of 10,000 active-duty Navy and Marine Corps members, specifically focusing on a subsample of respondents who completed the telephone version of the Quick Diagnostic Interview Schedule (DIS) III-R (n=783). From the DIS, lifetime and recent (within the last year) diagnoses for tobacco and alcohol abuse or dependence is made based on DSM-III criteria.

The purpose of this study is three-fold: (1) to determine if women in the Navy and Marine Corps have a higher prevalence of tobacco and alcohol dependence when compared with civilian female populations, (2) to determine if specific psychosocial indicators would predict these outcomes and (3) to recommend intervention strategies based on these risk factor data. Potential predictors include: depressive symptomatology (Center for Epidemiologic Studies-Depression Scale score), psychosocial distress (Hopkins 21 checklist score), measures of anxiety and personality (Spielberger), self-esteem (Rosenberg), social support (Social Network Index) , family/work environment (Social Adaptation Scale and House's job pressures & stresses & satisfaction scales), and global measures of life stress and quality. Demographic characteristics are taken into account in order to partial out these confounding effects.

Standardized telephone interviews have recently been shown to be a cost-effective means of population-based data collection in the military. With the addition of the DIS to the expansion of POWR in the Army, Air Force, and Reserves in FY97, prevalence and risk factor data would be available DOD-wide not only on tobacco and alcohol dependence diagnoses but also for other psychiatric diagnoses of interest.

The Epidemiology of Post-traumatic Stress Disorder in Navy and Marine Corps Men and Women

Mental disorders, including posttraumatic stress disorder (PTSD), are the second most frequent reason for hospitalization (following the International Diagnosis Code - ICD-9 category for accidents, poisoning and violence) among enlisted personnel in the Navy. Mental disorders are responsible for the largest number of hospital admissions in shore facilities abroad and are approximately equal to accidents, poisonings, and violence among shipboard populations. Although a few studies have noted differences in rates by ethnicity and occupation, for adequate screening and diagnosis, identification of risk factors, and ultimately intervention program planning, Navy medical decision-makers must have access to appropriate diagnostic tools and basic psychiatric epidemiologic data, including reliable diagnosis-specific rates by demographic categories and basic risk factor data to better target high-risk groups for mental health promotion and prevention efforts.

The proposed study will validate screening and diagnostic instruments and obtain and evaluate age-, sex-,and race-adjusted prevalence rates for DSM-III-based diagnoses of posttraumatic stress disorder. Further, it will identify major risk factors associated with this disorder and the qualifying trauma needed to meet diagnostic criteria.

The aim of this study is to validate the Hopkins-21 and the Center for Epidemiological Studies-Depression scale (CES-D)as psychological distress screening instruments in a population-based military sample, and the clinically-based structured interview, the Quick Diagnostic Interview Schedule (DIS) for obtaining reliable diagnosis of PTSD, to provide specific diagnostic, adjusted prevalence rates and match these data with risk factor information to identify major correlates of these disorders in the Navy. The main hypotheses to be tested are: (1) the Hopkins-21, and the CES-D, in conjunction with the Quick DIS provide an efficient valid, and reliable method of diagnosing PTSD in large military populations, (2) the lifetime and recent (within one year) rates of PTSD vary significantly by age, sex, race, occupation and grade, and (3) major risk factors include family and personal history of disorder, lack of social support, recent life event(s), perceived poor health status and quality of life.

This study will utilize data obtained from the 1995 Perceptions of Wellness and Readiness Assessment (POWR), a population-based survey of 10,000 Navy and Marine Corps personnel worldwide that includes the CES-D, Hopkins_21, and Quick DIS. Crude and adjusted odds ratios and confidence intervals will be calculated to evaluate the association between risk factors and diagnosis. Multivariate logistic regression will be used to model these relationships controlling for sociodemographic factors.

Prevalence and Risk Factors for Hypertension Among U.S. Navy and Marine Corps Women

The Department of the Navy lacks baseline epidemiological data to adequately assess the health of Navy women. The 1995 Perceptions of Wellness and Readiness Assessment (POWR '95) was designed to obtain a wide range of information on medical history, mental health, nutritional status, physical fitness, lifestyle factors, and anthropometry. The POWR '95 data are now collected and computerized. The specific focus of the proposed research is to analyze the POWR '95 data to determine the prevalence of hypertension among U.S. Navy and Marine Corps women and to identify any associated risk factors or behaviors that correspond to medical conditions typically associated with the disease.

Elevated diastolic and systolic blood pressure levels have been identified with certain medical conditions involving complications or damage to the eyes, brain, heart and arteries, and kidneys. Hypertension is recognized as a serious problem in the U.S. population, occurring at a rate of 17.7 percent (NHANES II). Recent prevalence rates for the military are only slightly lower, 14.4% for the Navy and 11.4% for the Marine Corps (1995 DoD Survey of Health Related Behaviors Among Military Personnel). Hypertension is especially important to document in military populations because it can jeopardize the readiness of the forces. Knowing the extent to which hypertension exists in the military population and how it interacts with other risk behaviors such as cigarette smoking to produce untoward medical conditions will prove useful in designing effective strategies for its prevention and treatment.

This research proposal has three main objectives. The first objective is to provide baseline information on the prevalence of hypertension among various subgroups of military women. The second objective is to compare these rates of hypertension within the military with those of civilian populations. The third objective is to explore the potential health consequences of high blood pressure and other known risk factors.

The two components of POWR '95 which are relevant to this proposal include a self-report questionnaire which was mailed to approximately 25,000 randomly-sampled active-duty Navy and Marine Corps personnel and a physical measurement study which was taken on 1,300 subjects who participated in the survey. The self-report data include medical condition, alcohol consumption, cigarette smoking, exercise, and dietary habits. The physical measurement study includes height, weight, body mass index, percent body fat, resting heart rate, and blood pressure.

Descriptive and bivariate analyses will address the first two objectives of the study. Comparisons will be made for selected subgroups including military men and women, white, black and other race women, women of different age groups, enlisted and officer women, and Navy and Marine Corps women. Comparisons between military and civilian populations will be made for gender, race, and age. Multivariate regression analyses will be conducted to examine the relationship between hypertension and physical health. The analysis will control for age, sex, and race and will include certain known risk factors such as alcohol consumption, exercise, body composition, and dietary habits.

Abstract

Findings from the POWR Assessment: Prevalence and Predictors of Alcohol and Tobacco Use Among Military Women and Men

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Past research has shown that military personnel have higher rates of cigarette and alcohol use than their civilian counterparts (Bray et al, 1991; 1995). For example, Bray et al. (1991) found the rate of heavy alcohol use in the past 30 days to be 20.8% among military personnel compared to 11.0% among civilians and the rate of cigarette use to be 44.0% among military personnel and 39.4% among civilians. Research has also shown that alcohol use and smoking patterns differ among sociodemographic groups (Bray et al., 1995). For example, drinking tends to be more common and heavier among younger persons, males, enlisted personnel, and the less well-educated. Cigarette smoking is more prevalent among personnel who are male, white, and unmarried. It is also negatively correlated with level of education, age, and pay grade (Bray et al, 1995).

Although these prior studies have provided important and useful information about the prevalence of alcohol and tobacco use among the military, little research has been conducted that examines these behaviors for military women and men and that has investigated factors beyond demographic characteristics that may underlie these behaviors. The in-progress analyses of POWR (Perceptions of Wellness and Readiness) data begin to address this gap in understanding. Specifically, the POWR assessment allows us to explore the relationship of a number of psychosocial constructs to drinking and smoking behavior. The analyses will draw on two unique features of the POWR data for Navy and Marine Corps women and men: (1) a wide range of psychosocial constructs measuring a number of dimensions that may be important in explaining smoking and drinking behavior and (2) a large sample of military women and men that permit in-depth analyses to be conducted (particularly for military women).

The goals of our analyses are to provide baseline prevalence rates, illustrate differences in rates among subgroups, and begin to examine the relationships between psychosocial constructs and substance use. For example, with the POWR data, we can examine how stress, job pressure, and job satisfaction influence smoking or drinking behaviors. Given these goals, the key research questions to be addressed by these analyses include:

- What are the rates of heavy alcohol use and cigarette use among Navy and Marine Corps women and men?

- How do prevalence rates compare among selected demographic subgroups (branch of service, ethnicity, pay grade, education, and age) of military women and men?

- What psychosocial constructs (as measured by the scales in POWR) are related alcohol and cigarette use among military women and men?

As an initial step in addressing the questions, prevalence rates (and their standard errors) will be calculated for cigarette use and heavy drinking. Rates of use will be compared for military women and men and other demographic subgroups, and differences will be tested for statistical significance. Knowledge about the prevalence of alcohol and tobacco use in this population is an integral step in the process of linking substance use with the psychosocial constructs in POWR.

As part of the preliminary analyses, key constructs will be identified and scores for each of them will be calculated. Cut points for the scores will be determined based on current literature and distributions of scores. These criterion levels will be used to categorize the respondents along the dimensions of interest (e.g., low levels of self-esteem versus high levels of self-esteem; depressed versus not depressed). A correlation matrix will be computed to identify zero-order relationships of the constructs and cigarette and alcohol use and will provide guidance about constructs to include in additional analyses.

Findings from preliminary analyses will be used to guide decisions about variables to include in logistic regression analyses that will examine predictors of cigarette and heavy alcohol use. The focus of primary interest will be to examine the impact of selected psychosocial constructs on smoking and heavy drinking. This will be done by including these constructs in the models a independent or predictor variables. Demographic variables will also be included in the models, but treated primarily as control variables. Dependent measures for the logistic regressions will be (0,1) dichotomous indicators of heavy drinking, any smoking, and heavy smoking. Findings will identify constructs that are related to smoking and drinking, and examine the nature and strength of these relationships. Additionally, they will broaden our understanding of how and whether the constructs may play a role in affecting smoking and drinking behavior.

Results of these analyses should provide valuable substance abuse prevention and possibly intervention information vital to efforts targeting military personnel and their unique issues. The results may have implications for the array of services offered to military personnel in an attempt to reduce the prevalence of smoking and drinking.

References

Bray RM, Marsden ME, & Peterson MR (1991). Standardized Comparisons of the Use of Alcohol, Drugs, and Cigarettes Among Military Personnel and Civilians. American Journal of Public Health 1991;81(7):865-869.

Bray RM, Kroutil LA, Wheeless SC, Marsden ME, Bailey SL, Fairbank JA, Harford TC. 1995 Department of Defense Survey of Health Related Behaviors Among Military Personnel, Research Triangle Park, NC: Research Triangle Institute, 1995.

DEPARTMENT OF THE ARMY
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REPLY TO
ATTENTION OF:

MCMR-RMI-S (70-1y) 9 Mar 98

MEMORANDUM FOR Administrator, Defense Technical Information Center, ATTN: DTIC-OCP, Fort Belvoir, VA 22060-6218

SUBJECT: Request Change in Distribution Statement

1. The U.S. Army Medical Research and Materiel Command has reexamined the need for the limitation assigned to technical reports written for the following contracts. Request the limited distribution statement for these contracts be changed to "Approved for public release; distribution unlimited." These reports should be released to the National Technical Information Service.

Contract Number	Accession Document Number
DAMD17-94-J-4407	ADB224557
DAMD17-95-1-5048	ADB230013
DAMD17-95-C-5006	ADB219041
95MM5508	ADB227588
95MM5522	ADB229897
95MM5537	ADB227721
95MM5596	ADB229924
96MM6652	ADB220033
96MM6653	ADB221466
96MM6654	ADB222409

2. Point of contact for this request is Ms. Betty Nelson at DSN 343-7328 or email: betty_nelson@ftdetrck-ccmail.army.mil.

FOR THE COMMANDER:

Phyllis Rinehart

PHYLLIS M. RINEHART
Deputy Chief of Staff for
Information Management

completed
2-8-2000
BW