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Physical Standards in an All-Volunteer Force

David S. C. Chu, Eva Norrblom, with the Assistance of
Kent Brown and Alfred MacInnes

A Report prepared for

DEFENSE ADVANCED RESEARCH PROJECTS AGENCY
AND
DIRECTOR OF DEFENSE
PROGRAM ANALYSIS AND EVALUATION

Rand
SANTA MONICA, CA. 90406

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PREFACE

This report was prepared as part of Rand's OSD Manpower, Personnel, and Training Program, sponsored by the Human Resources Research Office of the Defense Advanced Research Projects Agency, and the Office of the Director of Defense Program Analysis and Evaluation. It builds on earlier work for the then Office of the Assistant Secretary of Defense (Systems Analysis), which in early 1972 asked Rand to help assess the progress of the Military Departments in creating an all-volunteer force. The report is designed to assist both those who must decide among the available options to meet manpower accession requirements and those who would have to implement any change in current physical standards.

Five bodies of data are used to analyze physical standards: the enlistment records of the Armed Forces Entrance and Examining Stations; personnel records of enlistees in the Medically Remedial Enlistment Program; medical regulations for the armed forces of other advanced nations; medical regulations of U.S. civilian organizations; and results from the Health Interview Survey. The enlistment records help estimate the physical disqualification rate to be expected in an all-volunteer force (Sec. II) and provide a basis for calculating how changing current standards might affect the supply of volunteers (Sec. VI). The personnel records are used to compute what such changes would cost. Sections II and VI will therefore be of interest to those concerned with options to expand the supply of volunteers. The medical regulations are the basis for comparing U.S. enlistment standards with the standards set by the armed forces of other advanced nations (Sec. III) and the standards of U.S. civilian organizations (Sec. IV). The Survey data are used to analyze how chronic physical conditions affect time lost from work and health care demands (Sec. V). Taken together, Secs. III-V identify where current physical standards might be revised, and, with the supporting detail provided in Appendixes A and B, will be of particular interest to those concerned with drafting military medical regulations.

SUMMARY

In a zero-draft environment, we can expect at least 14 percent of those applying for enlistment to be disqualified for physical reasons only. This figure is based on the experience from examining 18-year-olds who were out of school and otherwise eligible for the draft in 1964-1965. It is in line with recent failure rates for all enlistees (including draft-induced volunteers), and its validity is confirmed by preliminary analysis of the records of true volunteers in FY 1972. If anything, the actual rate may be somewhat higher--perhaps on the order of 17 percent.

A comparison of U.S. enlistment standards with those in the armed services of other advanced nations and those for entry-level jobs in the civilian sector suggests that U.S. standards may be higher than necessary. This is especially true for support positions. It is a common practice in the civilian sector and in the armed forces of other nations to relate standards to job requirements. In contrast, entry standards for the U.S. armed services are the same for all enlistees, whether assigned to combat jobs or to support functions. Many enlisted assignments are support jobs, especially in the Navy and the Air Force. Presumably, standards analogous to those used in the civilian sector could be applied to some of these positions.

The conclusion that U.S. enlistment standards may be higher than necessary is reinforced by a comparison of enlistment standards with standards for retention and mobilization. It is likewise reaffirmed by analysis of data from the Health Interview Survey, which relate hospitalization and time lost from work to chronic physical conditions. Taken together, these results suggest nine promising areas for review of current enlistment standards: the gastrointestinal system, extremities and the musculoskeletal system, blood pressure, height and weight, vision, hearing, the urinary system, skin diseases, and respiratory diseases. Changes in these areas might reduce the current rate of physical disqualification by as much as 40 percent. If (as appears likely) only 570 out of every 1000 true volunteers can meet current

service standards, and if 140 of the 430 failures are for medical reasons, then a 40 percent reduction in the physical disqualification rate means a gain of 56 enlistees in every 1000 applicants, or a 10 percent increase in enlistments (56/570 = .10). A gain of this size would close a quarter of the Army's projected shortfall in FY 1974 enlistments. (The actual gain to the Army might be somewhat larger, since a 10 percent increase in desired enlistments for all services should mean a larger gain for the services with a recruiting deficit.) Moreover, this is a gain in volunteers able to meet current mental standards, thus helping to maintain a high level of mental qualification in the all-volunteer force.

A principal cost of making these kinds of changes is the increase in medical discharge rates that could result. Experience with overweight volunteers from the Medically Remedial Enlistment Program indicates that the medical discharge rate might double were physical standards relaxed. If this is true, then the marginal cost in lost training investment and in severance and disability pay would range from $152 to $236 for each additional physically successful serviceman enlisted under a program of reduced standards. (The range of the calculation reflects differences in training costs; typical Army training costs are assumed.) This compares favorably with one alternative option, increasing first-term pay. Assuming, as is likely, that the pay elasticity for new recruits is 1.5, to expand enlistments by 10 percent would require a 6.7 percent increase in first-term pay. This would cost almost $340 million, whereas the marginal cost for a similar gain by relaxing physical standards would be $5 to $7 million.

ACKNOWLEDGMENTS

For making available the mechanized Armed Forces Entrance and Examining Stations (AFEES) records, the authors wish to thank Dr. Eli Flyer of the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs). Extracts of the AFEES files were prepared by Mr. Louis T. Pales of the Human Resources Research Organization (HumRRO). Mr. Pales and Mr. Kenneth C. Scheflen also furnished certain physical examination data for Sec. II and the data on medical discharges used in Sec. VI.

For providing data on their physical standards, the authors gratefully acknowledge the cooperation of Boeing, Hughes Aircraft, Lockheed Aircraft, McDonnell-Douglas, Rockwell International, American Airlines, Braniff Airlines, Continental Airlines, Delta Airlines, Eastern Airlines, National Airlines, Pan American Airlines, Trans World Airlines, Western Airlines, the County of Los Angeles, U.S. Department of Transportation, and the U.S. Merchant Marine. Special debts are owed to S. M. Williamson, M.D., Boeing; Mr. H. B. Spielman, Hughes Aircraft; F. P. Heald, M.D., Rockwell International; W. G. Budington, M.D., American Airlines; R. H. Riordan, M.D., Trans World Airlines; J. S. Felton, M.D., Director of Occupational Health Service, County of Los Angeles; and W. Anderson, M.D., Merchant Marine Medical Center.

For assistance in interpreting the physical standards of their armed forces, thanks are due Lieutenant Colonel A. W. Reynolds (Australia); Lieutenant Colonel William J. Stacey, M.D. and Lieutenant Colonel R. S. Jackson, M.D. (Canada); Major General Pierre Jarry and Lieutenant Colonel Amiet (France); Major General Mordechai Gur and Colonel David Levin (Israel); Colonel Mayuki Ichinomiya (Japan); and Wing Commanders Michael G. P. Venn, M.D., and Ted Smith, M.D. (United Kingdom). Translation assistance was provided by Dolores Lofgren of The Rand Corporation, and by Mrs. Hadassah Spector.

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of the Center for Naval Analyses; and their Rand colleagues Richard V.L. Cooper, Adele Massell, Gary Nelson, M. A. Rockwell, and Charles R. Roll. In addition, Dr. Bernard Karpinos of HumRRO kindly provided advice on the physical disqualification data, with which he has had extensive experience. A special debt is owed to officers and men of the Los Angeles Armed Forces Examining and Entrance Station, the Los Angeles Recruiting Main Station (Army), and the United States Army Training Center, Fort Ord, for giving liberally of their time to answer the authors' questions.

A preliminary draft of the report was circulated to representatives of the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs), and to representatives of the military services. Comments were provided by Mr. Gus Lee, Acting Deputy Assistant Secretary of Defense (Manpower Research and Utilization) and Director of Procurement Policy; Mr. Paul D. Phillips, Deputy Assistant Secretary of the Army (Manpower and Reserve Affairs); Rear Admiral H. S. Etter, Acting Chief, Bureau of Medicine and Surgery, U.S. Navy; Lieutenant General Leo J. Dulacki, Deputy Chief of Staff (Manpower), U.S. Marine Corps; and Brigadier General B. F. Rogers, Deputy Director, Personnel Plans, U.S. Air Force. In addition, comments were received from Mr. Clayton N. Gompf, Deputy Assistant Secretary of the Army for Military Personnel Policy; and Captain W. S. Myers, Chief, Physical Qualifications and Medical Records Division, Bureau of Medicine and Surgery, U.S. Navy. Their frequently spirited remarks considerably enlivened the discussion.

Responsibility for any errors remain entirely the authors', and the conclusions of this study do not necessarily represent the opinions of The Rand Corporation or the Department of Defense.

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I. INTRODUCTION

The supply of enlisted volunteers is a principal issue in the effort to create an all-volunteer force. There is some concern that even with the increased rates of pay the supply will be insufficient, especially for the Army. In the first eight months after draft calls were ended (January to August 1973), the Army fell 20 percent short of its enlistment goal, and the Navy and the Marine Corps each fell short by 13 percent. Only the Air Force has been able to meet its accession requirements.* As a result, the Army and the Marines have increased the combat arms bonus substantially--from $1500 to $2500 for a four-year enlistment. If the services enforce their current mental quality standards, the General Accounting Office forecasts a one-third shortfall in Army and Marine Corps recruits during FY 1974. (GAO predicts a 7 percent shortfall for the Navy and an excess of applicants over accession requirements in the Air Force.)† Since the services can adjust mental standards on an *ad hoc* basis to regulate the flow of enlistments, these projections may not be realized. Nonetheless, it appears that some accession shortfall is likely over the next few years, especially for the Army.

To increase enlistments, the Defense Department can choose among several options: strengthening the recruiting services; increasing pay; improving the non-pecuniary benefits of military life; or accepting a higher proportion of those who now apply--that is, relaxing

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*Data provided by the Office of the Director of Defense Program Analysis and Evaluation (ODDPA&E).

†Comptroller General of the United States, *Report to the Congress: Problems in Meeting Military Manpower Needs in the All-Volunteer Force* (B-177952), Washington, D.C., May 2, 1973, p. 26. The GAO projections are based on seasonally adjusted true volunteer accession rates in the six months ending February 1973 (December 1972 for the Navy). Mental quality standards were stated by the individual services. It appears that some--but not all--of these standards were enforced in the period January-June 1973. Thus, the actual shortfall in the second half of FY 1973 is somewhat smaller than that predicted by GAO for FY 1974.

mental standards, or physical standards, or both. This report examines the physical standards option. It focuses on four questions:

1. How important is physical disqualification in a zero-draft environment?
2. Is there evidence to indicate that current standards might be relaxed, and if so, which standards should be reexamined?
3. How many enlistments would be gained if these changes were made?
4. What is the likely cost of such changes, especially compared with other options open to the Defense Department?

We know from enlistment experience in the draft era that many of those who would like to volunteer, and who are mentally qualified, are unable to do so because they cannot meet the physical standards. Exactly how large this pool will be in a zero-draft environment is not yet known, but records of the Armed Forces Entrance and Examining Stations allow us to provide some preliminary estimates. These are presented in Sec. II, together with an analysis of reasons for failure among true volunteers. Because current standards are not based on a close examination of job performance requirements, we do not know how many of those now considered unfit could function successfully in a military environment, or at least in selected military positions. Nor is there substantial previous work on this question to guide a reexamination of current standards. Rather, the issue must be approached indirectly, by comparing U.S. military standards with those of other advanced nations (Sec. III); by comparing military standards with nonmilitary medical requirements for selected similar jobs (Sec. IV); and by analyzing how chronic physical impairments affect work performance and health care demands, using survey data from the civilian sector (Sec. V). These comparisons will help us decide whether changes in current standards are feasible, and if so, which standards ought to be reviewed for possible change. In Sec. VI we estimate both the enlistment gains and the dollar costs to be expected were certain of these changes made.

II. MEDICAL DISQUALIFICATIONS OF VOLUNTEERS

The first question with which this report is concerned is the potential incidence of physical disqualification among applicants for an all-volunteer force. We use both published historical data and the mechanized records of the Armed Forces Entrance and Examining Stations (AFEES) to estimate the failure rate to be expected in a zero-draft environment. The AFEES records are for first enlistment examinations in FY 1972 (Army, Navy, Marines, and Air Force), and are based on Standard Form 88.* Before we begin analysis of the data, however, we summarize the structure of medical standards for the U.S. armed forces and outline the physical examination process that produces the AFEES records.

MEDICAL STANDARDS OF THE U.S. ARMED FORCES

The same medical standards apply to all enlistees and inductees, whether they are joining the Army, Air Force, Navy, or Marines.† These enlistment standards have applied since 1960 with only minor modification. The objective of enlistment medical standards is to exclude:‡

1. Those with contagious or infectious diseases.
2. Those with physical conditions likely to cause excessive

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*Standard Form 88 is discussed on p. 6. For a description of the AFEES records, see U.S. Army Recruiting Command (USAREC), *USAREC Mechanized Reporting System*, USAREC Regulation 680-1, Hampton, Virginia, 1 July 1972; and *Mechanized Reporting System: User's Information Guide*, USAREC Pamphlet 680-1, Hampton, Virginia, 1 July 1972. Records for men failing the physical examination, extracted from the USAREC file, were furnished us by the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs). In using the extract to prepare data for this report, we purged the file of duplicate records and of examinations for purposes other than enlistment. Although the USAREC mechanized system was started in FY 1971, FY 1972 is the first year for which records are complete.

†These are described in U.S. Department of the Army, *Standards of Medical Fitness*, Army Regulation 40-501, December 1960, and Changes 1 through 28, 1961-1972.

‡Army Regulation 40-501, p. 1-1.

time lost from duty, or medical separation from military service.

3. Those medically incapable of completing training.
4. Those incapable of worldwide assignment in a military environment.
5. Those incapable of performing their duties without aggravation of existing conditions.

Besides these "peacetime" enlistment standards, the services provide separate standards for retention, promotion, and general mobilization. In other words, some men are physically ineligible to enlist in peacetime but would be eligible under general mobilization. Likewise, some men who would be ineligible to enlist could be retained on active duty if they had once been able to meet the enlistment standards and their physical condition had since deteriorated. Differences among enlistment, retention, promotion, and mobilization standards are discussed in Sec. III.

Although enlistment standards also govern Army officer applicants, separate standards are set for Air Force, Navy, and Marine officers; for appointees to the military academies; for flying duty and other specialized training; and for physicians, dentists, and allied medical specialists. These special standards are not discussed in this report, except to compare U.S. flying duty standards with those set in other advanced nations and with those set in the civilian sector (Appendix C).

THE EXAMINATION PROCESS

Physical examinations for men entering the military services are carried out by the AFEES. The steps in the enlistment examination process are sketched in Fig. 1. If an applicant has never previously appeared at the AFEES, he is given complete physical and mental examinations. (Many applicants have been previously examined, either for the draft or for enlistment, but did not enlist.) A complete medical examination is also given to those who passed the physical more than one year ago, and (until FY 1973) to those previously disqualified for medical reasons. (The current practice is to administer only a partial

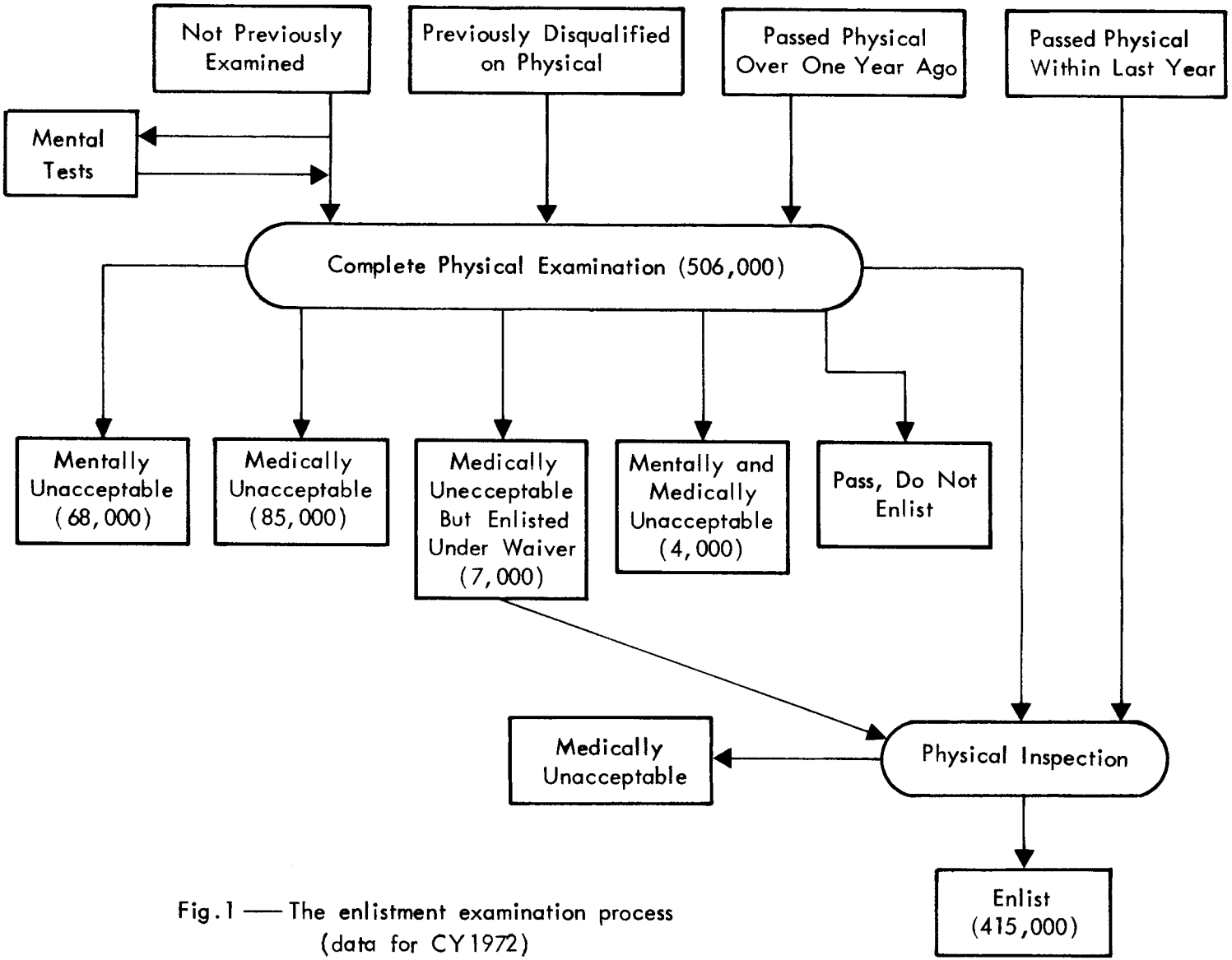

Fig. 1 — The enlistment examination process (data for CY 1972)

Sources: U.S. Department of the Army, Office of the Surgeon General, Supplement to Health of the Army 1972, Sept. 1973, pp. 75,84; Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs.

examination, based on the previous disqualification.) Since there is often a lapse of time between the complete examination and entrance into the armed forces, a simple physical inspection is made when the man actually enlists.

The complete physical examination consists of two parts. First, the applicant fills out a Report of Medical History (Standard Form 93). He is then examined by physicians and paramedical personnel, who evaluate the medical history report and the major body systems, describing abnormalities on a Report of Medical Examination (Standard Form 88). This form is also used to record laboratory findings on the applicant: urinalysis (albumin and sugar), chest X-ray, and serology. The applicant's height and weight are measured, his sitting blood pressure and pulse taken, and his distant and near vision measured. He is also given color blindness and audiometer tests. If the applicant is found not qualified for military service, the disqualifying body systems or test results are recorded.*

Medical requirements may be waived when selected disqualifying conditions are involved. The principal source of waivers is the Medically Remedial Enlistment Program (MREP), which covers 16 conditions. It requires the applicant to undergo corrective treatment. The program was begun in February 1967 as part of Project 100,000. Most MREP waivers are for the weight standards: 65 percent of the waivers granted to true volunteers in FY 1972 were for overweight, 23 percent for underweight. The next most important source of waivers were undescended testicle (3 percent) and hernia of the abdominal cavity (2 percent).†

THE DISQUALIFICATION RATE

In the most recent year for which published data are available (CY 1972), 17.8 percent of the enlistees taking the complete physical examination were rejected for medical reasons. This rate of medical

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*For more detail on the examination, see Army Regulation 40-501, Chapters 10, 11, and Appendix IX.

†These data are based on the AFEES records discussed in footnote 1, p. 3.

disqualification includes all applicants for enlistment, both true volunteers and those who were draft-induced. As draft pressure has subsided, the disqualification rate has risen: In CY 1969, 8.1 percent of the applicants for enlistment taking a complete physical were disqualified for medical reasons; in CY 1970, 9.0 percent; in CY 1971, 12.6 percent; and in CY 1972, 17.8 percent.*

The increase in the physical disqualification rate as draft pressure subsides is not unexpected. Past rates of medical disqualification included all applicants for enlistment, both true volunteers and those who were draft-induced. Among the latter were men who knew that they were physically qualified and who applied for enlistment rather than waiting to be drafted. Thus the physical disqualification rate among draft-motivated volunteers will be lower than among true volunteers. As the proportion of true volunteers rises, so will the disqualification rate.

One estimate of the physical disqualification rate to be expected in a zero-draft environment can be derived from an examination program initiated in July 1964 and terminated in December 1965. The program resulted from concern over the high mental and physical disqualification rates of American youth for military service and the high rate of unemployment and poor economic prospects of such disqualified young men. As a first step in offering them rehabilitation and training, they had to be identified. To this end, it was decided to expedite the pre-induction examination of all 18-year-olds who were not in school and who were eligible for the draft.

Because this is one of the groups from which the services will be recruiting, the 1964-1965 experience can help us estimate the physical disqualification rate among true volunteers. Between July and December 1964, 14.4 percent of the men examined under this program were found to be medically disqualified for military service; for January-December

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*Including those rejected for both medical and mental reasons. This is a small proportion of the total--5 percent of all medical failures in CY 1972. Were this "overlapping" group excluded, the physical disqualification rate would be 16.9 percent in CY 1972 and 11.9 percent in CY 1971 (no data available for earlier years). *Supplement to Health of the Army 1972*, pp. 75, 80; *1969-70*, p. 184.

1965 the rate was 13.5 percent.* If this group is representative of the enlistment pool, and if current standards are maintained, approximately 14 percent is a good estimate of the physical disqualification rate to be expected in a zero-draft environment. Preliminary analysis of AFEES records for FY 1972 confirms those results. Tabulation of results for true volunteers--men with lottery numbers greater than 240, or with no lottery number--indicates that at least 14.3 percent of those taking the examination for the first time failed for medical reasons alone.† If rough adjustments are made for possibly faulty data (inclusion of certain other examinations in the data base, and duplicate records), the medical failure rate would be 17 percent.‡ Thus, 14-17 percent appears to be the physical disqualification rate that can be expected in a zero-draft environment.

REASONS FOR DISQUALIFICATION

The primary cause of medical disqualification among true volunteers are displayed in Table 1, using the failure codes in the AFEES records, which come from the Report of Medical Examination (Standard Form 88). As described above, these codes are limited to the major body systems or tests whose results disqualify the applicant. Primary cause refers to the first disqualifying defect listed in the AFEES records; no more than three disqualifying defects are reported. Any applicant with a lottery number 241 or higher, or with no lottery number, was assumed to be a true volunteer.

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*Excluding those disqualified for both medical and mental reasons. *Supplement to Health of the Army*, 1965, p. 33.

†Distribution by lottery number of all males taking the physical examination was prepared by Messrs. Kenneth Scheflen and Louis Pales of the Human Resources Research Organization (HumRRO).

‡The HumRRO lottery number distribution was prepared from the same underlying USAREC file as was our extract of records for men failing the examination; however, it was not corrected for inappropriate and duplicate records (see footnote 1, p. 3, for a description of these problems) and may give too high a total for the number of men examined. HumRRO's total number of true volunteers examined was therefore reduced, using the proportion of duplicate records and inappropriate examinations found in the file of men failing the physical.

Table 1

PRIMARY CAUSES OF MEDICAL DISQUALIFICATION
AMONG TRUE VOLUNTEERS, FY 1972

Primary Cause	Failure Codes Included	Percent of Medical Disqualifications
Ears (excluding audiometer test)	22-23	2.7
Audiometer test	71	5.4
Eyes (excluding acuity and refraction)	24-27	3.1
Acuity and refraction	59-60	4.6
Lungs and chest (including chest X-ray)	28, 46	5.3
Heart	29	2.1
Abdomen (including hernia)	31	4.9
Genitourinary system	34	3.7
Upper extremities	35	3.5
Feet	36	3.4
Lower extremities	37	6.1
Spine and other musculoskeletal	38	2.1
Skin and lymphatics	40	5.7
Psychiatric	42	3.4
Urinalysis	45	3.7
Weight	52	27.9
Blood pressure	57	5.8
Other		6.4
Total		100.0

SOURCE: AFEES records.

The principal cause of disqualification is failure to meet the weight standards; three-quarters of such failures result from overweight. Lower extremities, blood pressure (principally high blood pressure), skin and lymphatics, the audiometer test, and lungs and chest are the next most important sources of disqualification, each accounting for about 5 percent of all medical failures.

The data in Table 1 exclude those men who fail the examination but are enlisted under a medical waiver. The principal source of waivers is the MREP program; were MREP enlistees included in the data of Table 1, the proportion of men failing for reasons of weight would rise to 35 percent, and the proportions failing in all other categories (except the genitourinary system) would decline slightly.

III. PHYSICAL STANDARDS FOR ENLISTMENT IN THE ARMED FORCES OF ADVANCED NATIONS

As noted at the start of Sec. II, one of the important considerations in setting enlistment medical standards is the ability to perform in a military environment. Unfortunately, direct evidence is lacking on the relationship between the kinds of standards now set and military job performance.* This section therefore approaches the issue indirectly.

A first approach compares enlistment standards for the U.S. armed forces with those set by other advanced nations, using the appropriate medical regulations of each country's armed forces.† If the standards of other advanced nations are less restrictive than those of the United States, this suggests that U.S. standards might be modified. At the very least, the comparisons will help identify those standards that merit more detailed medical review.

A second approach compares the separate standards maintained by the United States for enlistment, for retention and promotion, and for general mobilization.‡ Implicit in the differences among these

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*This is also the conclusion of an earlier study by the U.S. Army. See U.S. Department of the Army, *Marginal Man and Military Service: A Review*, Part 1, 1965, pp. 38-39.

†Australian Defense Forces, Joint Service Manual, *Recruit Medical Examination Procedures*, 1973; Austria, Bundesministerium für Landesverteidigung, *Richtlinien für die ärztliche Untersuchung der Wehrpflichtigen und Freiwilligen für die Aufnahme in das österreichische Bundesheer*, Vienna, January 1972; Canadian Forces Headquarters, *Medical Standards for the Canadian Forces*, CFP 154, March 1, 1967; Federal Republic of Germany, Bundesminister der Verteidigung, *Bestimmungen für die Durchführung der ärztlichen Untersuchung bei der Musterung von Wehrpflichtigen, Annahme, Einstellung und Entlassung von Soldaten*, ZDv 46/1, July 25, 1972; Great Britain, Ministry of Defence, *Assessment of Medical Fitness*, Royal Air Force Manual AP1269A, January 1969; Israeli Armed Forces, *Standards to Establish Medical Fitness for Service*, First and Second Supplements, 1969; France, Ministère des Armées, Direction Centrale du Service de Santé des Armées, *Aptitude au service dans les Armées*, N° 620-624, May 1966, and revisions; U.S. Department of the Army, Medical Services, *Standards of Medical Fitness*, AR40-501, December 1960, and Changes 1 through 28, 1961-1972.

‡Army Regulation 40-501, Chapters 3 and 6. The retention and promotion standards analyzed here apply to the Army; the Army provides

standards are judgments about which ones might be relaxed with minimum loss of mission effectiveness. The separate retention standards trade off physical fitness against training and experience. Unlike enlistment standards, they are written as guidelines, with each case to be judged on the ability of the service member to perform his duties.

Mobilization standards are explicitly designed to procure individuals "who can be expected to be productive in the military establishment."* Service applicants who can meet the mobilization but not the enlistment standards are placed in Physical Category C, which is the successor to the World War II "limited service" classification. Large numbers of Category C men were enlisted and inducted during World War II, and in 1944 many of them were assigned as replacements to infantry and armor units.† Such individuals were also enlisted and inducted in the 1950s.‡

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one set of standards for both purposes. Mobilization standards apply to all the services and are implemented by direction of the appropriate Service Secretary. They may be limited to specific categories of personnel.

*Army Regulation 40-501, p. 1-1.

†Robert R. Palmer et al., *The Army Ground Forces: The Procurement and Training of Ground Combat Troops*, Washington, D.C., Department of the Army, 1948, p. 72.

‡Because the regulations have been substantially rewritten, it is difficult to judge how different are the standards defining Category C from those in effect during World War II and the 1950s. (Compare, for example, the standards described in Bernard D. Karpinos and Grace Souther, "Limiting Defects of Army Inductees in Physical Categories B and C," *U.S. Armed Forces Medical Journal*, VII, December 1956, p. 1798; and Army Regulation 40-501, Chapter 2.) It is generally agreed that certain standards have been relaxed, principally those relating to psychiatric disorders and those relating to successful treatment of certain medical disorders (Bernard D. Karpinos, "Fitness of American Youth for Military Service," *Milbank Memorial Fund Quarterly*, XXXVIII, July 1960, pp. 218-219). The effect of these changes is to move men formerly classified as Category C into the group now considered acceptable under enlistment standards. Some men formerly classified Category C would still be so classified and thus not eligible under current enlistment standards. (Compare, for example, the vision standards described in Karpinos and Souther, "Limiting Defects," p. 1798, with those set forth in Army Regulation 40-501, p. 2-8.)

INTERNATIONAL COMPARISONS

Table 2 summarizes the comparison between U.S. enlistment standards and those of Australia, Great Britain, Canada, France, West Germany, Austria, and Israel. A "-" in Table 2 indicates that U.S. standards are less restrictive than those of other nations; a "0" indicates that they are approximately the same; and a "+" indicates that they are more restrictive. In general, the requirements set by other nations are about the same as or somewhat more restrictive than those for enlistment in the U.S. armed forces. (As might be expected, U.S. standards appear most restrictive when compared with those of Israel; Israel recruits for military service a larger fraction of its population than any other country in this comparison.)* The significant differences between U.S. standards and those of other advanced nations occur in the gastrointestinal system, the extremities, blood pressure, and height and weight. Because the details of individual standards are presented in Appendix A, the discussion of this section is focused on these most important differences.

In the case of the gastrointestinal system, the principal difference is the acceptability of recruits with ulcers or a history of ulcers. Except for the United States and Australia, all the other countries in this comparison accept enlistees with a history of ulcers if there has been no evidence of symptoms for two years. France and Germany accept applicants with peptic ulcers if their condition is not severe.

Differences in standards for the extremities occur principally where hand injuries are concerned. The United States is stricter than any other nation about loss of part of the thumb and stricter than any other nation except France and Canada with respect to injury to one or more of the remaining fingers.

Blood pressure standards are more restrictive in the United States than those of any other nation except Australia. The United States

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*3.3 percent of the Israeli population is in the military, 1.1 percent of the U.S. population. See Richard V.L. Cooper, *Military Manpower in a Volunteer Environment: Problems and Prospects*, The Rand Corporation, R-1450-ARPA (forthcoming).

Table 2

MEDICAL REQUIREMENTS FOR ENLISTMENT IN THE MILITARY SERVICES, UNITED STATES AND OTHER COUNTRIES

Item	Australia	Britain	Canada	France	Germany	Austria	Israel
Vision	-	-	+	0	-	+	0,+
Hearing	0,+	NA	0	NA	NA	NA	NA
Anemia	0	NA	0	0	0	0	0
Diabetes	0	0	0	0	0	+	+
Gastrointestinal system	0	0,+	0,+	0,+	0,+	0,+	0,+
Urinary system	0	0,+	0,+	0	0	0	NA
Heart disease	0	0,+	0	0	0	0	0
Chronic skin diseases	0	0	0	0	0	+	0
Respiratory diseases	-,0	-,0	-,0	-,0	+	0	0,+
Extremities	0,+	0,+	0,+	0,+	0,+	0,+	0,+
Blood pressure	0	+	0,+	0,+	+	NA	+
Height and weight	-,+	-,+	-,+	-,+	+	-	-,+

NOTE: + = U.S. more restrictive; - = U.S. less restrictive; 0 = U.S. similar; NA = not applicable, standards not directly comparable.

allows a maximum systolic reading of 139 millimeters for enlistees under 35 years of age. Canada and France accept enlistees with readings up to 150 mm, Great Britain and Germany 160 mm, and Israel 175 mm. Moreover, the French armed forces will accept applicants with higher readings, provided no visceral sounds or functional trouble are discovered; and Germany will accept higher readings in those cases where impairment of fitness is slight.

The United States sets 90 mm as the maximum diastolic blood pressure limit, as do Australia, Canada, and France. The diastolic maximum for Great Britain, Israel, and Germany is 100 mm. With appropriate medical examination, both Britain and France will accept candidates who have readings higher than the stated limit.

In terms of specific standards, U.S. limits on height and weight are more generous than those of most nations in this comparison. The two exceptions are Israel and Germany. However, Austria and Great Britain require that obese applicants also be assessed in terms of job performance; France accepts applicants whose weight problem is not accompanied by symptoms of disease or other defects; and Australia and

Canada indicate that their standards are guidelines and not to be administered rigidly. It is because of these differences in application of standards that both a "-" and a "+" are entered in Table 2.

The weight standards illustrate two important differences between U.S. standards and those of other advanced nations. First, the standards of other nations are more frequently written as guidelines. Rather than rejecting all applicants with a condition, as is often required by U.S. regulations, medical evaluation determines whether rejection of the applicant is warranted by the severity of the condition.*

The second difference is related to the first. In assessing a condition, medical officers of other advanced nations are more frequently instructed to consider the job to which the enlistee will be assigned. For example, Austria uses this standard in assessing the applicant's weight; Great Britain in assessing weight and bone problems; France in assessing benign tumors, heart disease, and skin disease; and Israel in assessing kidney disease.†

Not only do other nations more frequently consider job performance in setting general standards for enlistment, but a number set differential standards by job class. The comparisons in Table 2 are made

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*Besides weight standards, another example is British standards for the extremities. Whereas U.S. regulations exclude applicants with specific losses or deformities of the fingers, toes, and hands, British standards require that these be assessed according to both the cause of the loss and the remaining functioning capacity, in relation to the applicant's employment.

†A particularly good example of differential emphasis on performance is provided by the standards for hearing. Australia, Canada, and the United States use the audiometer test for setting hearing standards; applicants for enlistment must score within stated decibel loss limits on specific frequencies. In contrast, Great Britain, France, Austria, Germany, and Israel require that enlistees be able to hear the human voice from a specified distance. (For example, British recruits must be able to hear a forced whisper at ten feet.) Although the audiometer test may be an excellent method for measuring changes in hearing loss, some doubt that audiometer results can be related to job performance. The U.S. armed forces apparently share this view when it comes to setting retention standards, since U.S. regulations state that "trained and experienced personnel will not be categorically disqualified if they are capable of effective performance with a hearing aid" (Army Regulation 40-501, paragraph 3-10).

among general enlistment standards. These cover all applicants for enlistment in the U.S. armed services. However, Great Britain, Canada, Australia, and Germany accept applicants who do not meet the general enlistment standards but who are considered medically qualified to perform in specific occupations, with limitations placed on job activity. The employment rating system used by Great Britain, Canada, and Australia also indicates the geographical areas where the applicant is considered fit to serve.* In contrast, the U.S. physical profiling system is applied after the potential enlistee has met the general standards.† Moreover, enlistees accepted under enlistment standards are expected to be assignable on a worldwide basis.‡

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*For example, Great Britain's Royal Air Force uses a three-digit employment code: Factor A describes a man's flying duty limitations; factor G his ground duty limitations; and factor Z the zones to which he can be assigned. Thus, a man rated A1G1Z1 is fit for full flying duties of his branch, fit for the full ground duties of his branch, including all general service duties, and fit to serve anywhere. A man rated A4G3Z3 is fit to fly as a passenger in a normal passenger-carrying aircraft, fit for the full ground duties of his branch but for only limited general service duties, and fit to serve anywhere except in areas of high temperature and humidity.

†The U.S. physical profiling system is known as the PULHES scale (see Army Regulation 40-501, Chapter 9). It was introduced in 1944, principally to insure that the Army Ground Forces, especially the infantry, received a more equitable share of the physically fit (Palmer, *Procurement and Training*, pp. 48-86). The PULHES scale was borrowed from the Royal Canadian Army where it had been adopted in 1943. According to one author, the Canadians took the concept from contemporary industrial practice. (Eugene C. Jacobs, "PULHES," *U.S. Armed Forces Medical Journal*, IV, February 1953, p. 235.)

The PULHES scale consists of six factors (P, physical capacity or stamina; U, upper extremities; L, lower extremities; H, hearing and ear defects; E, eyes; S, psychiatric). Men are graded from 1 to 4 on each factor. A 3 on any factor disqualifies a man under current enlistment standards; a 4 disqualifies him even under mobilization standards.

In the Army, at least, assignment to specialty skill training is limited by a man's PULHES profile--that is, there is a minimum PULHES profile for each specialty. Conversations with officers responsible for assigning recruits to entry-level skill training at Fort Ord indicate that seldom is a prospective assignee unable to meet the minimum. Moreover, in cases when a man's PULHES profile is below the minimum, the requirement may be waived.

‡The insistence on worldwide assignability may reflect World War II experience; in that conflict, 87 percent of all Navy officers and

U.S. STANDARDS FOR RETENTION, PROMOTION, AND MOBILIZATION

Table 3 compares enlistment standards, retention and promotion standards, and mobilization standards. A "0" indicates that enlistment standards are about the same as retention, promotion, and mobilization standards; a "+" indicates that they are somewhat more restrictive; and a "++" indicates that they are considerably more restrictive. In general, enlistment standards appear to be more restrictive, and in some cases significantly more restrictive, than those for retention or mobilization.

Table 3

UNITED STATES MEDICAL REQUIREMENTS: ENLISTMENT, RETENTION AND PROMOTION, MOBILIZATION

Item	Retention and Promotion	Mobilization
Vision	++	++
Hearing	++	+
Anemia	0	0
Diabetes	+	+
Gastrointestinal system	++	+
Urinary system	+	+
Heart disease	+	+
Chronic skin diseases	+	+
Respiratory diseases	+	+
Extremities	+	++
Blood pressure	++	++
Height and weight	++	0

NOTE: 0 = enlistment standards identical; + = enlistment standards somewhat more restrictive; ++ = enlistment standards considerably more restrictive.

The most pronounced differences, where both retention and mobilization standards differ significantly from enlistment standards, occur in the areas of vision and blood pressure. Neither retention nor

men served at sea or overseas, and more than 90 percent of all Marines (Robert A. Bell, "Medical Screening (Physical Standards) and Its Relation to Service Requirements and to Retirement," in Leonard Carmichael and Leonard C. Mean (eds.), *The Selection of Military Manpower: A Symposium*, Washington, D.C., National Academy of Sciences, 1951, p. 85).

mobilization standards set a near vision requirement; both set less stringent distant vision standards than are required for enlistment; and mobilization standards admit individuals with only one eye. The major difference in blood pressure standards occurs in the systolic limit, which is 150 mm for mobilization and 139 mm for enlistment. There is no specific systolic limit for retention, and the diastolic limit is raised to 110 mm from the 90 mm required for both enlistment and mobilization.

There is a significant difference between mobilization and enlistment standards for the extremities. Mobilization standards are more generous with regard to missing fingers and toes, disorders involving the feet, missing limbs, and non-impairing arthritis. Significant differences between retention and enlistment standards occur in the areas of hearing, the gastrointestinal system, and height and weight. Retention standards allow the individual to wear a hearing aid. They are less strict with regard to marked hemorrhoids, hernias, and ulcers. Finally, there is no specific height and weight table for retention as there is for enlistment.

SUMMARY

There are three points worth noting from the comparison of physical standards among advanced nations and from the comparison of U.S. enlistment, retention, and mobilization standards. First, the United States sets more stringent enlistment standards than other advanced nations for the gastrointestinal system, the extremities, blood pressure, and height and weight. Retention and mobilization standards also differ markedly from current enlistment standards in these areas.

Second, the standards of other nations are more frequently written as guidelines, introducing a larger element of medical judgment into the evaluation of a potential enlistee. This difference is one of degree, since in some areas the United States, too, provides guidelines rather than specific standards. Perhaps the fact that U.S. standards were written for a draft-based armed force may help explain some of this difference; with a sufficient supply of manpower assured by the draft, detailed evaluation of individuals would be viewed as

costly and unnecessary. Most of the other nations studied rely on an all-volunteer force. U.S. retention standards are written much more as guidelines; the services are concerned about their investment in the individual's training and are therefore more willing to incur the costs of additional medical evaluation.

Third, the standards of other nations are more concerned with job performance. U.S. standards apply to all enlistees, whereas a number of other nations set differential standards for broad job categories and differential standards based on region of assignment. Again, this difference may reflect post-World War II history of the U.S. armed forces, in which a draft has usually been available to supply all necessary manpower. In contrast to enlistment standards, U.S. retention standards are much more performance-oriented and reflect the interest of the services in conserving their scarce trained manpower.

IV. PHYSICAL STANDARDS IN PRIVATE INDUSTRY AND NON-DEFENSE GOVERNMENT AGENCIES

This section continues our indirect approach to relating physical standards and job requirements, comparing U.S. enlistment standards with the entry-level medical regulations of private industry and non-defense government agencies. Selected for study were nine trunk airlines, five aerospace manufacturers, the U.S. Merchant Marine, the U.S. Department of Transportation (which sets standards for drivers in interstate commerce), and the County of Los Angeles (including safety positions such as policemen and firemen).* These organizations were chosen because the positions involved are similar to non-combat military jobs. Airline company jobs correspond broadly to Air Force support positions; the Merchant Marine provides a standard of comparison for the Navy; and the aircraft companies, the Department of Transportation, and the County of Los Angeles can be compared to support elements in all the military services.

Comparisons with civilian standards are appropriate because most of the jobs filled by enlisted personnel involve support rather than combat: more than 75 percent in the Army, 95 percent in the Navy, nearly 75 percent in the Marine Corps, and almost all enlisted jobs in the Air Force (Table 4). Of course, some support jobs are

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*County of Los Angeles, Department of Personnel, Occupational Health Service, *Manual of Policies and Procedures*, June 1972; U.S. Department of Transportation, Federal Highway Administration, Bureau of Motor Carrier Safety, *Transportation*, "Hearing Aids and Hearing Standards," MCSR Amendment Number 10E, Title 49, Chapter III, Parts 391 and 392, Washington, D.C., 1971; U.S. Department of Transportation, Federal Highway Administration, Bureau of Motor Carrier Safety, *Instructions for Examining Physicians to Determine Physical Fitness of Drivers Engaged in Interstate or Foreign Commerce*, October 1971; U.S. Department of Transportation, U.S. Coast Guard, *Merchant Marine Personnel Physical Examination*, CG-719K, 1967. Company medical guidelines by private communication (The Boeing Company, Hughes Aircraft Company, Lockheed Aircraft Corporation, McDonnell-Douglas, Rockwell International, American Airlines, Braniff Airlines, Delta Airlines, Eastern Airlines, National Airlines, Pan American Airlines, Trans World Airlines, Western Airlines) and telephone interview (Continental Airlines).

Table 4

DISTRIBUTION OF ENLISTED ASSIGNMENTS BY FUNCTIONAL AREA, JUNE 30, 1972

(percent of total)

Military Occupation	Service			
	Army	Navy	Marines	Air Force
Infantry/gun crews/seamen	22.4	4.0	26.8	1.1
Electronic equipment repairmen	12.8	17.3	7.6	14.6
Communications and intelligence specialists	3.7	12.2	8.6	6.2
Medical and dental specialists	5.9	7.1	0	3.8
Other technical and allied specialists	4.4	1.6	1.2	2.8
Administration specialists and clerks	21.2	12.7	31.9	26.3
Electronic and mechanical equipment repairmen	14.0	32.3	11.6	24.3
Craftsmen	2.6	6.0	1.6	6.7
Service, supply handlers	13.0	6.7	10.9	14.1
Total	100.0	100.0	100.0	100.0

SOURCE: Data furnished by the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs).

physically demanding--those in the service and supply handling category, for example, which includes military policemen--and many support jobs require service under difficult conditions (at sea or in remote areas) or service in or near the combat zone. Individuals assigned to these positions may have to meet high physical standards. Nonetheless, many enlisted personnel serve in positions whose requirements are similar to those for jobs in the civilian economy.

A qualification to the comparison should be noted: Military and civilian standards may diverge because of differences in the liability assumed for health care, disabling injuries, or aggravation of existing conditions. Because of the potentially sensitive legal questions involved, we did not attempt to gather data on the relationship between employer liability and entry-level physical standards, and therefore we cannot explicitly assess the effects of differential liability. Of course, to the extent that civilian employers pay some or all of

the costs of health insurance and disability plans, they will presumably consider the liability issue in formulating medical requirements, which will tend to narrow potential differences from this source.

Table 5 summarizes the comparison between U.S. enlistment standards and the entry-level medical requirements of the civilian organizations we studied. A "-" indicates that enlistment standards are less restrictive than those set in the civilian sector; a "0" indicates that they are approximately the same; and a "+" indicates that enlistment standards are more restrictive than the requirements of the civilian sector. In general, requirements for enlistment are more restrictive than the standards set in the civilian organizations we studied. The only important exception is vision. Details of individual standards are provided in Appendix B; only highlights of the most significant differences are discussed here.

Table 5

MEDICAL REQUIREMENTS FOR ENLISTMENT IN THE U.S. MILITARY SERVICES AND COMPARABLE OCCUPATIONAL GROUPS IN THE CIVILIAN SECTOR

Item	Aerospace Companies	Airline Companies	Public Agencies
Vision	-	-	-
Hearing	+	-,+	+
Anemia	+	+	+
Diabetes	+	+	+
Gastrointestinal system	+	+	+
Tumors	0,+	0,+	0,+
Urinary system	+	+	+
Heart disease	+	+	+
Chronic skin diseases	0,+	+	+
Respiratory diseases	+	+	+
Extremities and the musculoskeletal system	0,+	0,+	0,+
Blood pressure	+	+	0,+
Height and weight	+	+	+

NOTE: + = military requirements more restrictive; - = military requirements less restrictive; 0 = military requirements similar.

Audiometer standards for hearing in the civilian sector tend to be more generous than those in the military. For example, the Department of Transportation allows an average loss of 20 to 25 decibels more for the 500-2000 herz frequency range. None of the civilian organizations tests hearing at the 4000 herz frequency. All enlistees must pass the same audiometer test, but aircraft companies and the Merchant Marine evaluate the applicant's hearing in relation to the job position for which he is applying.

The principal difference in the gastrointestinal system is that applicants with active ulcers or a past history of ulcers are not acceptable under military standards, whereas in the civilian sector, ulcers that have healed and are not expected to interfere with job performance do not disqualify the applicant. Differences are more limited for inguinal hernias and severe hemorrhoids. Like the military, most civilian organizations exclude applicants with these conditions, although some are willing to accept them if the condition does not interfere with job performance.

In the urinary system the significant difference between military and civilian standards is in kidney disorders. The County of Los Angeles, the Merchant Marine, and some aircraft and airline companies accept applicants with chronic kidney disorders so long as the condition is well controlled and is not expected to interfere with job performance or cause unusual periods of absence. Absence of a kidney does not necessarily disqualify the applicant if the loss is not likely to interfere with job performance. Enlistees with these conditions are not acceptable to the military services.

Military standards disqualify applicants who suffer from chronic skin diseases that are unresponsive to treatment, but only two airline companies and one aircraft company reject applicants with chronic skin conditions. Neither the Department of Transportation nor the Merchant Marine lists any specifications regarding skin diseases.

Applicants with certain respiratory diseases--acute or chronic asthma, emphysema, bronchitis, and bronchiectasis--are not considered medically acceptable for military service. In most civilian organizations, potential employees with these afflictions are acceptable if their condition is not expected to interfere with job performance.

The military services set more stringent standards for the extremities and the musculoskeletal system than do civilian organizations. Military standards disqualify applicants who have lost various portions of their fingers or thumbs. None of the civilian organizations studied lists this as necessary grounds for rejection. Moreover, in civilian organizations, conditions of the bones or spine are cause for rejection only if they can be expected to interfere with job performance.

The maximum systolic blood pressure reading acceptable to the military services is 10 mm less than the limit set by the County of Los Angeles, 20 mm less than the requirements of the Department of Transportation, and from 10 mm to 30 mm less than the limits allowed by aircraft manufacturers. Most airlines do not set a systolic blood pressure limit; those that do are usually more generous than the military services.

Unlike the military services, few civilian organizations set specific limits on height and weight. Rather, they are concerned with the ability of the individual to perform his job and exclude the obese candidate only when his condition is likely to interfere with job performance, or when obesity is linked to other disease.

In summary, the most significant differences between military and civilian standards occur in the areas of blood pressure and height and weight. There are also important differences in the areas of hearing, the gastrointestinal system, the urinary system, chronic skin diseases, respiratory diseases, and the extremities and the musculoskeletal system. Although some of these may reflect differential liability for health care and disability costs, many of them arise from the focus on job requirements. Rather than setting a single set of standards for all employees, which may substantially reduce the pool of potential workers, civilian organizations tailor physical standards to the kind of position the individual is expected to fill. This tendency is enhanced by the more widespread use of guidelines in place of specific standards. In a draft environment, setting a single, specific set of standards for all enlistees may have been the least-cost solution to meeting military manpower requirements,

since the healthiest volunteers could be compelled to serve at the same wage rate as the less well qualified. However, maintaining the same high standards for a volunteer force may restrict the pool of potential enlistees, and therefore raise the wage the military must pay to meet its manpower requirements--or equivalently, compel the armed services to lower other standards for new accessions, especially mental standards.

V. TIME LOST FROM WORK, HEALTH CARE DEMANDS, AND CHRONIC PHYSICAL IMPAIRMENTS

We noted in Sec. II that one aim of military physical standards is to exclude those whose impairments are likely to cause excessive time lost from duty. Because the military services offer complete health care to their uniformed personnel, another concern is the medical demands of those with physical impairments. The Health Interview Survey provides us with data to analyze both issues. It allows us to test the relationship between selected impairments and workdays lost, and it also allows us to test the relationship between these impairments and short-stay hospital days.

The Health Interview Survey is a periodic sample of the non-institutional civilian population conducted by the Bureau of the Census for the National Center for Health Statistics. The data are derived from household interviews; besides indicating the presence of acute and chronic conditions, they describe the individual's personal characteristics (age, marital status, income, and so on), the number of workdays lost in the two weeks preceding the interview, and short-stay hospital days in the previous year. At the time this report was prepared, the 1969 Survey was the most recent for which individual records could be analyzed; it includes approximately 134,000 persons living in 42,000 households.*

We wish to test whether those with a particular chronic condition on average lose more time from work than those without that condition; and we wish to test whether those with a particular chronic condition on average spend more time in the hospital than those without that condition. To perform the test, the dependent variable (days lost from work (W) or short-stay hospital days (H)) is regressed on a series of dummies, one for each socioeconomic variable ($S_1 \ldots S_m$) thought to

*For an additional description of the Survey, the sampling technique, and the questionnaire used see U.S. Department of Health, Education and Welfare, "Current Estimates from the Health Interview Survey: United States--1969," *Vital and Health Statistics*, Series 10, Number 63, June 1971.

be important in determining time lost from work or hospitalization,* and one for each chronic condition ($C_1 \ldots C_n$):

$$W = a_0 + a_1S_1 + \ldots + a_mS_m + a_{m+1}C_1 + \ldots + a_{m+n}C_n \quad (1)$$

$$H = b_0 + b_1S_1 + \ldots + b_mS_m + b_{m+1}C_1 + \ldots + b_{m+n}C_n \quad (2)$$

Equations (1) and (2) describe partial analyses of variance to test differences among means. (They ignore interaction effects.) A significant coefficient on a particular dummy variable, let us say C_1 in Eq. (1), indicates that individuals with condition C_i have a significantly different number of days lost from work than those individuals without condition C_i.†

Because we are concerned with males of military age, the analysis is confined to the records of men aged 17 to 55. Since the effects of chronic conditions may differ among occupations, separate equations were run for each of five broad occupational groups: craftsmen, operatives, clerical workers, service workers, and non-farm laborers. (For example, respiratory ailments might not affect days lost from work in a sedentary occupation but might have an effect in a more strenuous job.) These occupational groups were chosen for study because their job structure corresponds broadly to support positions in the military services. The regression results are presented in Tables 6 and 7.‡

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*See, for example, Joseph P. Newhouse, "Determinants of Days Lost from Work Due to Sickness," in Herbert E. Klarman (ed.), *Empirical Studies in Health Economics*, Johns Hopkins, Baltimore, 1970.

†The comparison is with the constant term a_0, which serves as a standard of reference. As specified here, the constant term includes unmarried, non-veteran whites, not receiving welfare, age 17-25, high school graduate, with an income of less than $7000 per year--that is, the kind of individual the services would be trying to recruit. The value of a_0 is the estimated number of days this kind of individual would be expected to lose from work in a two-week period.

‡Observations were weighted using the Survey's "final basic weights" to produce population estimates, since the Health Interview Survey is based on a random sample of households, not on individuals.

Table 6

LOST WORKDAYS REGRESSIONS

(Equation (1))

	Crafts-men	Opera-tives	Clerical	Service	Non-Farm Labor
Race (non-white=1)	-.01	.11**	-.04	-.06	.18**
Marital status (married=1)	-.03	.05	-.02	.06	.07
Veteran (veteran=1)	.04	.02	-.07	-.06*	.06
Welfare (recipient=1)	.09	.43**	.24	-.28	-.01
Age 26-35	-.01	.01	.12	-.01	.06
Age 36-45	.04	.02	.23**	.10	-.02
Age 46-55	.05	.03	.11	-.02	-.08
Less than high school graduate	.08**	.05	.04	.04	.00
College graduate	-.09	-.14	-.10	-.08	-.10
Income $7,000-$10,000	-.05	.02	-.02	-.06	-.09
Income $10,000-$15,000	-.02	.04	-.03	.05	-.09
Income $15,000+	-.07	-.03	-.11	-.08	-.14
Chronic infective/parasitic diseases (except TB)	-.08*	-.32*	-.03**	-.04	.01
Malignant neoplasms	1.79**	-.22	2.12**	-.29	--
Benign/unspecified neoplasms	.68**	.26*	.04**	.33	.33
Diabetes mellitus	.66	.44	.63**	.13	-.31
Chronic headache and migraine	.38**	.35**	1.33**	.91**	.10**
Mental disorders	.55**	.72	2.98**	.92	1.09
Heart disease (except rheumatic)	.99	.13**	1.01	.20**	-.21
Hypertension	-.14**	.82**	-.13**	1.75	-.43**
Hemorrhoids	1.98**	2.22*	3.98	-.30**	2.15
Arteriosclerosis	1.14**	-.92**	-.15	4.87	.01**
Emphysema	1.30	2.12	-.47	-.48	9.80
Asthma	-.34	.01**	-.05**	.05	-.25
Hay fever	-.17**	.85**	1.16	-.71	-.34
Chronic sinusitis	1.52	1.06**	.11	.30	--
Other chronic respiratory disease	.06**	1.70**	-.15**	-.33	.64**
Ulcer of stomach/duodenum	.65**	2.24**	3.28	.16**	2.28**
Abdominal hernia	1.82	.88*	.10	3.46**	3.82
Other chronic digestive diseases	-.12	.52**	.29**	1.94	.34
Chronic diseases of kidney/ureter	-.14	1.20	1.69	-.13	.46
Chronic/allergic skin diseases	.04**	-.07*	.01	.06**	.10*
Arthritis and chronic rheumatism	.20*	.16	.04	.61**	.23
Other chronic musculoskeletal	.11	.11**	-.09	-.44	.20
Visual impairments (except blindness)	-.19	.56	-.04	-.08	.23*
Hearing impairments	-.10	.00	.13**	.94	-1.34
Paralysis	.60	.44	2.45	-.48	-.41
Absence fingers/toes	-.15	.17**	-.04	-.18	-.29
Absence major extremities	.05	.90	-.44	-.38**	-.10
Impairments back/spine[a]	.10	.05**	-.08	.41	.22
Impairments upper extremities[a]	-.01	.34*	-.11	-.08**	.17
Impairments lower extremities[a]	.05**	.15**	.13	.33	.19
Multiple impairments limbs/back/trunk	.33**	.49**	-.27**	-.01	.31**
Other chronic conditions	.31	.38	.26	-.07	.60
Constant	.12	.07	.10	.09	.08
R^2	.048**	.062**	.139**	.139**	.127**
F	6.52	8.55	7.29	5.57	6.02
Degrees of freedom for F[b]	44/5645	44/5608	44/1938	44/1470	42/1736

[a]Excluding absence/paralysis.

[b]Based on original number of observations.

*Significant at 10 percent.

**Significant at 5 percent.

Table 7

HOSPITAL DAYS REGRESSIONS

(Equation (2))

	Crafts-men	Opera-tives	Clerical	Service	Non-Farm Labor
Race (non-white=1)	-.19	.30*	.39	-.78**	.17
Marital status (married=1)	-.78	.12**	-.25**	-1.52	.28**
Veteran (veteran=1)	.14	.29**	.64**	-.11**	.89
Welfare (recipient=1)	-.03	3.64	3.94**	6.91**	-.32*
Age 26-35	.01	-.22	-.67	3.45*	-.94
Age 36-45	.41*	.13	-.42	1.65	-.53
Age 46-55	.56**	-.07	-.41	.98	-.25
Less than high school graduate	.06	.09	.11	.47	-.50
College graduate	-.38	-.39	.39	.31	-1.02
Income $7,000-$10,000	-.05	-.12	-.02	-.10	-.39*
Income $10,000-$15,000	-.36**	-.03	-.13	.92	-.83
Income $15,000+	-.39	-.11	-.24	.43	-.60
Chronic infective/parasitic diseases (except TB)	-.36	-.16	-.65**	-1.87	.73
Malignant neoplasms	2.57**	2.05	3.80	-11.38	--
Benign/unspecified neoplasms	5.16	-.69**	-.68	-.10	2.58
Diabetes mellitus	1.18	7.40**	1.77*	.71	-.03
Chronic headache and migraine	-2.07	-2.60**	4.93	-2.67	-.49**
Mental disorders	.59**	2.14**	-1.53**	-3.06	8.50
Heart disease (except rheumatic)	3.53	5.47**	7.58**	3.40	-.76
Hypertension	-1.03	.66	.59	1.70	-2.46
Hemorrhoids	1.38**	.04**	-.59**	-.03**	2.15
Arteriosclerosis	6.12**	4.47	9.90	32.15	-.12**
Emphysema	10.33*	1.47	2.94	1.66	23.15
Asthma	-1.94	-.26	-1.04	-1.13	-1.30
Hay fever	-.32*	-.93	-.24	-3.99	-2.54
Chronic sinusitis	2.99*	1.20	-2.02	1.24	--
Other chronic respiratory diseases	-1.93	-.75**	-.79**	.48	-1.90
Ulcer of stomach/duodenum	.68**	2.61**	3.74	6.18	4.41**
Abdominal hernia	5.16**	1.93**	2.48**	-2.66	5.77
Other chronic digestive diseases	5.41	5.51**	3.34	-2.10	2.61
Chronic diseases of kidney/ureter	1.85	5.13**	-.01	-3.51	-.24
Chronic/allergic skin diseases	-.14	.59	-.19	-.45**	.02
Arthritis and chronic rheumatism	.11**	.10	-.14**	2.70*	.80
Other chronic musculoskeletal	1.18	.01	1.84	2.83	-.40
Visual impairments (except blindness)	.12	1.13**	-.54	-2.50	-.38
Hearing impairments	-.58**	9.55	.42	-3.44	-2.04
Paralysis	15.86	-1.21**	-.32**	2.86	-.87
Absence fingers/toes	-.02	2.92	2.95	-.64	-.35
Absence major extremities	-.32**	1.69	-1.76	-.80	-.88
Impairments back/spine[a]	.66	-.09**	.17	-.63	-.23
Impairments upper extremities[a]	.31	2.16**	-.32**	-1.32**	-.79**
Impairments lower extremities[a]	.11	.77**	1.17	11.37	2.27**
Multiple impairments limbs/back/trunk[a]	1.04**	1.54**	.74	3.71**	3.85
Other chronic conditions	1.38	1.61	-.76	5.07	1.12
Constant	.88	.11	.64	-.38	1.01
R^2	.061**	.098**	.077	.116**	.041
F	8.42	13.97	3.74*	4.50**	1.81
Degrees of freedom for F[b]	44/5645	44/5608	44/1938	44/1470	42/1736

[a]Excluding absence/paralysis.

[b]Based on original number of observations.

*Significant at 10 percent.

**Significant at 5 percent.

Table 8 summarizes the number of occupational groups in which each condition dummy is positive and significant. The conditions are divided into three groups: those with a significant coefficient in no more than one occupational group in either Eq. (1) or Eq. (2) (Group I); those with a significant coefficient in no more than two occupational groups (Group II); and those with more than two significant coefficients (Group III). This division helps to identify conditions that meet the objectives of minimizing health care demands and time lost from work, and--if now a bar to military service--might be areas where current standards could be relaxed. Selected in this way, the most promising conditions (Group I) are chronic infective and parasitic diseases, benign and unspecified neoplasms, asthma, other chronic respiratory diseases, chronic and allergic skin diseases, visual impairments, hearing impairments, paralysis, absence of major extremities, impairments of the back or spine, and impairments of the upper extremities. Ranked behind these in promise (Group II) are malignant neoplasms, chronic headache and migraine, hay fever, chronic sinusitis, chronic diseases of the kidney, absence of fingers or toes, and multiple and ill-defined impairments of the limbs, back, and trunk. It should be emphasized that not all of these would be suitable areas for relaxation of current requirements; rather, they are areas for review, with the evidence of Tables 6 and 7 to be considered in conjunction with other criteria.

There are two further caveats to these results. First, the Health Interview Survey contains no data on height and weight. This is most unfortunate, since U.S. enlistment standards differ markedly on this point from the standards of other advanced nations, and from standards set in the civilian sector. Second, our analysis implicitly assumes that a day lost from work at one point in time is no more costly to the services than a day lost at some other point in time. This will not be true for all military occupations, in particular those related to combat or peak load operations. If, in addition, the incidence of days lost from work varies with the stress placed on the individual, then comparisons based on a simple average may be misleading. That is, if work loss from one condition is random with respect to job

Table 8

SUMMARY COUNT OF SIGNIFICANT CONDITION DUMMIES

	Regression	
	Lost Workdays	Hospital Days
Group I: most susceptible to change		
Chronic infective/parasitic diseases (except TB)	0	0
Benign/unspecified neoplasms	1	1
Asthma	0	0
Other chronic respiratory diseases	1	0
Chronic and allergic skin diseases	0	1
Visual impairments (except blindness)	1	0
Hearing impairments	0	1
Paralysis	1	1
Absence of major extremities	1	0
Impairments back/spine (excluding paralysis/ absence)	1	1
Impairment upper extremities (excluding paralysis/absence)	1	1
Group II: moderately susceptible to change		
Malignant neoplasms	2	2
Chronic headache and migraine	1	2
Hypertension	2	0
Hay fever	2	0
Chronic sinusitis	2	1
Chronic diseases of kidney/ureter	2	1
Absence of fingers/toes	0	2
Multiple/ill defined impairments limbs, back, trunk	2	2
Group III: least susceptible to change		
Diabetes mellitus	3	1
Mental disorders	5	2
Heart disease (except rheumatic)	2	3
Hemorrhoids	4	0
Arteriosclerosis	3	4
Emphysema	3	2
Ulcer of stomach/duodenum	4	2
Abdominal hernia	4	3
Other chronic digestive	2	3
Arthritis and chronic rheumatism	4	1
Other chronic musculoskeletal	2	3
Impairments lower extremities (excluding absence/paralysis)	2	4
Other chronic conditions	4	3

environment, and work loss for another occurs more frequently under stress, then--although both may be characterized by the same average work loss--an employer who values output on stressful days more than output on normal days will prefer workers with the first condition over workers with the second. Put plainly, a man who breaks down only when the going gets rough will not be as valuable as a man who misses work on a random basis--even though the average number of days lost may be the same for both.

Some of the chronic conditions listed in Groups I and II are potentially subject to this problem. However, the extent of the problem is limited by our use of several occupational groups. Work environments differ across occupations, and the more occupations in which a condition is not significantly related to either hospitalization or work loss, the more confident we can be that this problem will not occur. If it did, we would expect the condition to be significantly related to one or both of the dependent variables in the occupation concerned.

It is therefore safe to conclude that we have an analytic basis for identifying conditions that meet the objectives of minimizing health care demands and time lost from work. The conditions listed in Group I of Table 8 rank highest on these criteria; those in Group II next; and those in Group III lowest. In the section that follows we compare these results with the promising suggestions generated by the review of standards in the armed forces of other nations and in the civilian sector. We then try to indicate the principal costs and benefits of making selected changes in current standards.

VI. PHYSICAL STANDARDS AND THE SUPPLY OF VOLUNTEERS

Present physical standards appear to be more stringent than necessary, especially for positions in support activities. Using the results of Secs. III-V, in this section we identify where changes in current standards might be considered, compute the effect of making such changes on the supply of volunteers, and give preliminary estimates of the costs involved, so that a policy of changing physical standards can be compared with other options to increase the volunteer pool.

CHANGES IN STANDARDS AND CHANGES IN SUPPLY

Areas where current regulations differ most markedly from other military standards and from standards set in the civilian sector are listed in Table 9. Analysis of data from the Health Interview Survey generally confirms that these areas merit review, although unfortunately the Survey contains no information on height and weight, and therefore no cross check is possible for this category. Four of the areas listed in Table 9 already enjoy limited relaxation of present standards, since they involve conditions that can be waived under the Medically Remedial Enlistment Program (MREP).

How would the supply of volunteers change were standards relaxed in some or all of these nine areas? To answer this question, we compute the number of true volunteers who failed only the physical examination in FY 1972 but who would pass were a particular standard changed. We use for the computation the same AFEES records on which the discussion of Sec. II is based. As in Sec. II, true volunteers are defined as men with lottery numbers greater than 240, or men too young to have a lottery number.

For blood pressure, and height and weight, the records contain specific test results that permit us to study explicit changes in the present standards. We therefore compute the effect of changing the systolic blood pressure standard from its present limit of 139 mm to a limit of 150 mm, the minimum level generally observed in the standards set by the armed forces of other nations and in the civilian sector.

Table 9

SUMMARY OF COMPARISONS: PROMISING AREAS FOR REVIEW

Area	Change Indicated by: Standards of Other Nations	Change Indicated by: Retention and Mobilization Standards	Change Indicated by: Civilian Standards	Confirmed by: HIS	Confirmed by: MREP	AFEES Failure Codes Used for Simulation
Gastrointestinal system	X	X	X	No	Yes	31--abdomen
Extremities and musculoskeletal system	X	X	X	Yes	Yes	31, 38--upper extremities, spine, and other musculoskeletal
Blood pressure	X	X	X	Yes	No	Test results used
Height and weight	X	X	X	NA	Yes	Test results used
Vision		X		Yes	No	Omitted
Hearing		X	X	Yes	No	71--audiometer test
Urinary system			X	Yes	No	34--genito-urinary system
Skin diseases			X	Yes	Yes	40--skin and lymphatics
Respiratory diseases			X	Yes	No	28, 46--lungs and chest

NOTE: NA = not available.

This change, taken by itself,* would reduce the physical disqualification rate by 2 percent. In other words, 2 percent of all true volunteers now failing the physical examination would be able to pass were the systolic blood pressure limit changed to 150 mm.

We likewise compute the number of true volunteers who would pass if the weight standards were relaxed by 5 percent. Minimum† and

*Of course, men who would pass the revised blood pressure standard but who would still fail for another reason are not counted as passing. Estimates of the effects of combining changes are provided in Table 11, below.

†One-fifth to one-quarter of those now failing the weight standards do so because they are too light, not because they are too heavy.

maximum weight standards are stratified by height; maximum weight standards are further stratified by age. A 5 percent relaxation means decreasing the minimum standard for each cell of the table by 5 percent, and increasing the maximum standard by 5 percent. This change alone, without other changes in current standards, would reduce the number of true volunteers failing the physical examination by approximately 10 percent. Were weight standards relaxed 10 percent, this would reduce the failure rate among true volunteers by almost 17 percent.

To proceed with the remaining computations, we must still overcome two problems. First, the AFEES records contain test results only for height, weight, and blood pressure. In other areas, the records simply indicate the reasons for failure using a broad two-digit code. (These are the failure codes used in Table 1.) Where test results are not available, we made an "equal ignorance" assumption: That is, we assume that current regulations could be changed such that one-half of those failing for a given reason could be enlisted.

The second problem is that the failure codes carried in the AFEES records do not correspond exactly to the system of categories used as the basis of discussion in Secs. III-V of this report. Table 9 indicates how we translate the categories used in this report into AFEES failure codes. The translation is generally conservative. For example, we confine extremities and the musculoskeletal system to failure codes 35 and 38 (upper extremities, spine, and other musculoskeletal), since these were the principal areas where differences were discovered by our comparative work. This omits failure codes 36 (feet) and 37 (lower extremities), where important differences also appeared, especially in the comparison of enlistment with mobilization and retention standards.

The results of the remaining computations are presented in Table 10, together with the estimated effects of changing weight and blood pressure standards.* It is quite clear that relaxing weight standards has the most pronounced effect on the disqualification rate, although there are also potentially significant gains from changing standards

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*Note that these changes *cannot* be computed as one-half the rate appearing in Table 1, since some applicants fail for multiple reasons.

Table 10

EFFECTS ON DISQUALIFICATION RATE OF CHANGES IN SELECTED STANDARDS

Area of Change	Percentage Change in Overall True Volunteer Disqualification Rate
Systolic blood pressure cutoff raised to 150 mm	-2.0
Weight standards relaxed 5 percent	-9.9
Weight standards relaxed 10 percent	-16.8
Lungs and chest (including X-ray)[a]	-2.5
Abdomen[a]	-2.3
Genitourinary system[a]	-1.8
Upper extremities[a]	-1.7
Spine[a]	-1.0
Skin[a]	-2.7
Audiometer[a]	-2.6

SOURCE: AFEES records.

[a]Standards changed so that one half of those failing only for these reasons could now pass. See p. 34 for a discussion of this "equal ignorance" assumption.

for blood pressure, the lungs and chest, the abdomen, the skin, and the audiometer test. Any one of these changes, taken by itself, could lower the disqualification rate by 2 percent or more.

Table 11 indicates how the disqualification rate would fall if several of the changes in Table 10 were combined.* Because overweight and elevated blood pressure are frequently related, it is not surprising that if both the blood pressure and weight standards were relaxed in the manner indicated, the current disqualification rate among true volunteers could be reduced by one-seventh to one-fifth, depending on whether weight standards were relaxed 5 or 10 percent. Were all the

*Note that in combining changes we allow those with multiple problems to enlist. This goes somewhat beyond the results of the previous section, where we did not include interaction terms in the analysis and therefore did not fully allow for the effects of multiple problems. The AFEES records indicate that only a small proportion of these enlistees had multiple problems, and if they are excluded, the entries in Table 11 would be -11.9, -18.8, -26.5, and -33.4.

Table 11

COMBINED EFFECTS OF CHANGES IN SELECTED STANDARDS

Area of Change	Percentage Change in Overall True Volunteer Disqualification Rate
Systolic blood pressure cutoff raised to 150 mm *and* weight standard relaxed 5 percent	-13.2
Systolic blood pressure cutoff raised to 150 mm *and* weight standard relaxed 10 percent	-20.3
All changes of Table 10, plus weight standard relaxed 5 percent	-28.1
All changes of Table 10, plus weight standard relaxed 10 percent	-35.3

SOURCE: AFEES records.

illustrative changes adopted, the disqualification rate could be reduced by 28 to 35 percent. An even greater reduction could be achieved if we abandoned our conservative position and fully exploited the comparative results, including in the analysis all the failure codes suggested by the findings of Secs. III-V. For example, were we to include all the failure codes suggested by comparison of enlistment, retention, and mobilization standards--adding to the list of Table 9 failure codes 36 (feet), 37 (lower extremities), and 59-60 (acuity and refraction)--the reduction in the physical disqualification rate would exceed 40 percent.*

The number of new enlistees to be gained by making these changes depends on the estimated disqualification rate in a zero-draft environment. The results of Sec. II indicate that a failure rate of 14 to 17 percent can be expected. If we use the 14 percent rate as the basis of discussion, 140 of every 1000 applicants will be turned away *only*

*These results are supported by a 1964 Presidential Task Force, which found that one out of every ten medical rejectees has a condition that can be *entirely* corrected by proper medical treatment (President's Task Force on Manpower Conservation, *One-Third of a Nation: A Report on Young Men Found Unqualified for Military Service*, Washington, D.C., 1964, p. 25).

because they cannot meet the physical standards. A reduction of 40 percent in the physical disqualification rate means that 56 of these 140 applicants would be accepted.

In the sample of 18-year-olds, which is the basis for the 14 percent estimate, only 570 out of every 1000 men examined were found to be mentally, morally, and physically qualified for enlistment.* If the number of acceptable *applicants* can be increased by 56 out of every 1000, then nearly a 10 percent gain in *enlistments* will result (56/570 = .098). Of course, were the changes in standards more modest, then the gain in enlistments would be correspondingly smaller.

One of the issues in recruiting an all-volunteer force is the mental quality of enlistees, especially for the Army. How, therefore, would the additional enlistments generated by a relaxation of physical standards be distributed on indicators of mental quality? Tables 12 and 13 answer this question for Army volunteers. In terms of scores on the Armed Forces Qualification Test (AFQT), additional Army volunteers would be distributed much as they are in the general population. Although it appears from Table 12 that they would include a higher number of Category IV personnel than the Army is currently receiving, this difference reflects enlistment policies that limit the number of Category IV accessions.† In terms of educational achievement, Table 13 indicates that the additional volunteers would be about as qualified as current Army enlistees. Thus, a 10 percent increase in enlistments from relaxing physical standards means approximately a 10 percent increase for each mental and educational category.

THE COSTS OF LOWERING PHYSICAL STANDARDS

Volunteers admitted under relaxed physical standards may be more costly than volunteers enlisted under current regulations. First, they

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**Supplement to Health of the Army, 1965*, p. 33.

†All the services set limits on the number of Category IV enlistees they will accept; for the Army this is 20 percent (see Comptroller General, *Problems in Meeting Manpower Needs*, p. 13). In addition, during the period March-June 1973, Army recruiters received no credit for Category IV enlistees. With the reinstatement of credit for this group in July, Category IV Army enlistments have returned to the 20 percent limit.

Table 12

AFQT DISTRIBUTION OF ADDITIONAL ARMY VOLUNTEERS GENERATED BY RELAXING PHYSICAL STANDARDS

(percent of total)

Standards Changed	AFQT Category			
	I	II	III	IV
Systolic blood pressure limit 150 mm and weight standards relaxed 5 percent	3	25	44	27
Systolic blood pressure limit 150 mm and weight standards relaxed 10 percent	3	25	44	28
All changes of Table 10, plus weight standards relaxed 10 percent	3	24	45	27
Expected distribution of general population[a]	8	31	38	23
Actual accessions January-June 1973	--	32 --	56	12

SOURCES: AFEES records; actual accessions data from Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs.

[a]Adjusted to exclude Category V, the lowest 10 percent of the distribution; Category V men are not eligible for military service.

Table 13

EDUCATIONAL ACHIEVEMENT OF ADDITIONAL ARMY VOLUNTEERS GENERATED BY RELAXING PHYSICAL STANDARDS

Standards Changed	Percent High School Graduates
Systolic blood pressure limit 150 mm and weight standards relaxed 5 percent	66
Systolic blood pressure limit 150 mm and weight standards relaxed 10 percent	65
All changes of Table 10, plus weight standards relaxed 10 percent	65
Actual accessions January-June 1973	69

SOURCES: AFEES records; actual accessions data from Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs.

may suffer a higher incidence of medical problems, losing more time from work as well as placing additional demands on the military health care system. Second, if their condition proves truly disqualifying for military service, they may be discharged early, before the investment in training can be recouped. Should their condition be aggravated by military service, the Defense Department would also be liable for lifetime medical costs and disability pay.

Let us first consider the possibly increased time lost from work and increased health care demands of volunteers enlisted under a relaxation of present standards. In Sec. V, we used data from the Health Interview Survey to analyze the relationship between chronic physical ailments and these kinds of costs. For most occupations studied, the areas listed in Table 9 do not involve conditions associated with above average time lost from work, or above average hospitalization. Therefore, with proper job assignment controls, volunteers enlisted under relaxed standards should prove no more costly--on this dimension--than volunteers enlisted under current regulations.

The one exception to this conclusion is the gastrointestinal system. Despite the unfavorable results from the Health Interview Survey, it was retained as a promising area for review of current standards, not only because our comparative work indicated that changes could be made, but also because several conditions in this category can be waived under MREP, indicating that the actual additional costs are acceptable to the services. Unfortunately, we cannot estimate these costs, since duty performance and work loss data for men in that program are not available.

To analyze early discharge costs, we must estimate how the medical discharge rate would change if physical standards were relaxed. (Changing physical standards should not affect early discharges for other reasons.) There are three principal types of medical discharges. A discharge for conditions existing before service (EPTS) involves no liability for medical costs or disability pay. Discharges for conditions incurred or aggravated during military service involve liability for medical care and either severance pay or a disability pension. A discharge with severance pay applies when the individual has less than

20 years of service and a disability rating of less than 30 percent. Two months severance pay is awarded for each year of service, up to a maximum of 12 years. Disability retirement applies to individuals with a disability rating of 30 percent or more and to individuals with any disability rating who have more than 20 years of service. In computing his pension, the individual may choose between a formula based on disability rating and one based on years of service.*

For those who would be admitted under more lenient weight standards (nearly one-half the enlistees to be gained if the changes of Table 9 were adopted), estimates of the expected medical discharge rate can be based on data from MREP, which grants waivers for weight standards.† Medical discharge rates for overweight and underweight MREP enlistees are presented in Table 14 and compared with the overall medical discharge rate of all male enlistees. The medical discharge rate of those enlisted under relaxed weight standards would be approximately twice that of a normal cohort. Unfortunately, because disaggregated medical discharge rates of all male enlistees are unavailable on a cohort basis, it is not possible to make comparisons by type of medical discharge. In the cost comparisons that follow, we will make the conservative assumption that in the first two years of service the discharge rate for all male enlistees consists entirely of EPTS discharges.‡

Table 14 is limited to the first 24 months of service, because data for longer periods are not available. Almost all EPTS discharges take place within this period of time; in fact, most take place within the first six months. The lack of extended disability discharge data is more serious and may mean that we will underestimate the costs of relaxing physical standards. However, Table 14 does suggest that,

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*For further details on disability separations, including the calculation of pension benefits, see U.S. Department of Defense, "Disability Separation," DOD Pamphlet PA-1A, 21 July 1966.

†The weight limits allowed by MREP are more generous than the changes proposed by Table 9.

‡The effect of this assumption is to minimize the early discharge cost of normal volunteers, since EPTS discharges involve the smallest cost to the government (see below).

Table 14

MEDICAL DISCHARGE RATES

(percent of cohort)

	Months from Enlistment Until Medical Discharge					
	0-3	4-6	7-12	12-18	18-24	0-24
MREP overweight						
EPTS	1.50	3.28	.60	.11	0	5.49
Disability-severance pay	0	.01	.15	.06	.09	.31
Disability-retired pay	0	.01	.03	.06	.09	.19
All medical	1.50	3.30	.78	.28	.18	5.99
MREP underweight						
EPTS	1.53	2.29	.60	.38	0	4.80
Disability-severance pay	0	0	.05	.03	.22	.30
Disability-retired pay	0	0	.05	.23	0	.28
All medical	1.58	2.29	.70	.64	.22	5.38
All male enlistees	1.42	.53	.52	(.15)	(.34)	2.96

SOURCES: Kenneth C. Scheflen and Louis Pales, "Attrition from Service of FY 71 and FY 72 Medically Remedial Enlistment Program Accessions," Consulting Report CR-D7-73-77, Human Resources Research Organization (HumRRO), August 1973; and data compiled by HumRRO from DOD enlisted personnel files.

NOTE: EPTS = discharge for conditions existing prior to service, no disability pay involved; disability-severance pay = disability rating of less than 30 percent, eligible for severance pay; disability-retired pay = disability rating of 30 percent or more, eligibile for retired pay; ( ) = not strictly comparable.

after the first few months of service, the overall medical discharge rate for MREP enlistees is about the same as the rate for all male accessions. If that is true, it may be safe to ignore discharge rates beyond the first two years, assuming, in effect, that MREP enlistees and normal volunteers will have the same types and rates of discharge after that point. Thus, cost differences between the two groups will be a function only of differences in medical discharge rates during the first 24 months of service.

The early discharge cost (EDC) of any group of enlistees equals the sum of lost training investment (LTI),* the present discounted

*LTI is not discounted, because we are concerned only with basic and entry-level skill training, which is usually completed in the first six months of service.

value of disability pay (PAY), and the present discounted value of post-discharge medical costs (MED):

$$EDC = LTI + PAY + MED \tag{1}$$

Because the requisite data are unavailable, no attempt will be made to estimate MED, although we will discuss its possible effects (p. 48, below). To simplify the calculations of LTI, we assume that the military earns no return on its training investment during the first two years of service.* As noted above, the available data will confine our calculations to the first two years of service, but we believe that losses after that point will be approximately the same for MREP and normal volunteers, so this assumption will not affect our estimate of how costs would change if physical standards were relaxed.

Only the LTI cost element applies to EPTS discharges. For those EPTS discharges that occur before training is completed, an even distribution over the training period is assumed. Using this assumption:

$$LTI_{EPTS} = (.5 \times T \times E \times P_{EPTS1}) + (T \times E \times P_{EPTS2}) \tag{2}$$

where LTI_{EPTS} = the lost training investment of EPTS discharges,
T = the cost of training,
E = the number of enlistees,
P_{EPTS1} = the probability that an enlistee will receive an EPTS discharge before completing training,
P_{EPTS2} = the probability that an enlistee will receive an EPTS discharge after completing training, but within the first two years of service (before the military can earn any return on its training investment).

The factor .5 embodies the assumption that EPTS discharges are spread evenly over the training period; hence, the average failure occurs midway through training.

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*In other words, after training is completed, the wage rate exactly equals the individual's marginal value product.

Table 14 indicates that most disability discharges take place after the first six months of service, when formal training is largely completed. This fact simplifies the calculation of LTI for severance and disability pension discharges (LTI_{SEV} and LTI_{PEN});

$$LTI_{SEV} = T \times E \times P_{SEV} \tag{3}$$

$$LTI_{PEN} = T \times E \times P_{PEN} \tag{4}$$

where P_{SEV} and P_{PEN} are defined in a manner analogous to P_{EPTS2}.

To compute severance pay costs (PAY_{SEV}) it is assumed that the average discharge takes place at the E3 pay grade, and that the average individual is eligible for four months pay, or $1511:*

$$PAY_{SEV} = \$1511 \times E \times P_{SEV} \tag{5}$$

Severance pay is not discounted in these calculations, because we are ignoring discharges beyond the first two years of service; hence, all severance payments are made within 24 months of accession.

To compute disability pension costs (PAY_{PEN}), it is assumed that the average discharge takes place at pay grade E3, and that the individual is eligible for a 50 percent pension,† or $2266 per year, that he has a life expectancy of 50 years beyond discharge, and that the discount rate is 7 percent.‡ Under these assumptions:

$$PAY_{PEN} = \$31,272 \times E \times P_{PEN} \tag{6}$$

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*Based on pay rates effective 1 October 1973.

†In practice, most individuals discharged with a pension during the early years of service are first placed on the Temporary Disability Retired List. During this period, their minimum pension is 50 percent. Within five years a decision is made whether the disability is permanent, and if so, they are given a permanent disability retirement. The pension awarded with this retirement can range from 30 to 75 percent. A "typical" figure of 50 percent therefore seems appropriate for these calculations.

‡This is approximately the current rate on government obligations.

We would like to state early discharge costs in terms of dollars per medically fit soldier (one who is physically able to complete two years of service), in order to have a common basis for comparing the cost of volunteers admited under relaxed standards with the cost of those enlisted under current regulations. The number of enlistees and the number of physically successful soldiers (S) are related by the overall probability of medical discharge (P):

$$S = (1 - P) \times E \tag{7}$$

$$P = P_{EPTS1} + P_{EPTS2} + P_{SEV} + P_{PEN} \tag{8}$$

Using (2) through (7) to restate (1):

$$EDC/S = \frac{1}{(1 - P)} \left\{ \left[\left(\frac{P_{EPTS1}}{2} + P_{EPTS2} + P_{SEV} + P_{PEN} \right) \times T \right] + \$1511\ P_{SEV} + \$31{,}272\ P_{PEN} \right\} \tag{9}$$

Equation (9) is used to compare the early discharge cost of enlistees admitted under relaxed physical standards with the cost of those admitted under current regulations. Medical discharge probabilities are taken from Table 14. For MREP enlistees we use the rates for overweight volunteers, defining P_{EPTS1} as the EPTS discharge rate in the first 6 months, P_{EPTS2} as the EPTS discharge rate in the 7-24 month period, P_{SEV} as the severance discharge rate in the first 24 months, and P_{PEN} as the pension discharge rate in the first 24 months. For normal volunteers, we define P_{EPTS1} equal to the overall discharge rate in the first 6 months and P_{EPTS2} equal to the overall discharge rate in the 7-24 month period. As discussed above (p. 41), it is assumed that P_{SEV} and P_{PEN} are zero for normal volunteers.

Since the cost of a volunteer is partly a function of the training he receives, two training costs are used in applying Eq. (9): one for a specialty with a short training period (Army infantry soldier), and one for a specialty with a longer training period (Army field radio

mechanic). Training costs (T) for these two specialties are $4680 and $9470.*

From Eq. (9), we estimate that the cost of an overweight volunteer from the MREP program is $248 if he becomes an Army infantry soldier, and $430 if he becomes a field radio mechanic. The costs for a normal volunteer would be $96 and $194. Thus the additional cost of a volunteer admitted under relaxed weight standards would be $152 or $236, depending on the specialty for which he is trained. The components of these calculations are summarized in Table 15.

The calculations use medical discharge rates for overweight MREP volunteers because the size of cohorts for other types of waivers granted under MREP is much smaller, and therefore the rates are less reliable. Table 14 indicates that the medical discharge experience of underweight volunteers is about the same as that of overweight volunteers, and this also appears to be true of volunteers who enlisted under MREP waivers for other conditions.† Thus the cost calculations for overweight volunteers may be taken as a guide to the cost of relaxing physical standards more generally.

If this is true, the cost of additional volunteers from relaxing physical standards is substantially less than the $2500 that the Army and the Marines are currently paying as a bonus to enlist men in the combat arms. Moreover, $2500 understates the marginal cost of the bonus program, since the bonus must be paid to every four-year combat arms enlistee, including those who would have enlisted without a bonus. In preliminary calculations, when a $3000 bonus was being discussed, the Army estimated that to obtain 20,000 additional soldiers‡ would cost $170 million--$8500 per soldier. Adjusted for the additional

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*Training costs furnished by the Office of the Director of Defense Program Analysis and Evaluation.

†Scheflen and Pales, "Attrition from Service."

‡A 10 percent gain in enlistments, the gain we forecast from the changes proposed in Table 9, would give the Army about 31,300 additional volunteers, using as a base for the calculation the 313,000 true volunteers it received in FY 1972. (True volunteer totals were compiled from records of the U.S. Army Recruiting Command by Gary Nelson of The Rand Corporation.)

Table 15

MEDICAL DISCHARGE COST COMPONENTS

(dollars per enlistee)

Cost Component[a]	Normal Volunteer		Overweight MREP Volunteer	
	Infantry Training	Field Radio Mechanic Training	Infantry Training	Field Radio Mechanic Training
LTI^*_{EPTS}	93	188	145	293
LTI^*_{SEV}	0	0	15	29
LTI^*_{PEN}	0	0	9	18
PAY^*_{SEV}	0	0	5	5
PAY^*_{PEN}	0	0	59	59
$LTI^* + PAY^*$	93	188	233	404
$\frac{1}{(1 - P)}$	1.031	1.031	1.064	1.064
$EDC/S = \frac{1}{(1 - P)} \times [LTI + PAY]$	96	194	248	430

[a] $LTI^*_{EPTS} = LTI_{EPTS}/E$; similarly for other components.

man-years generated by a four-year (rather than a three-year) enlistment, and for medical attrition, the marginal cost of an additional soldier using a $3000 bonus is approximately $6575.*

Using a general pay raise to increase enlistments is even more expensive. We have estimated that a reasonable reduction in physical standards would yield a 10 percent gain in enlistments. The cost to procure an equivalent gain using instead an increase of pay depends

*This is an undiscounted cost estimate, assuming that the bonus is paid in the first year of service and that an additional man-year three years from now is valued the same as an additional man-year today. The calculation also assumes that in the absence of a bonus no one would have enlisted in the combat arms for more than three years. This is unduly conservative and biases the cost estimate downward.

on the pay elasticity assumed. If the first-term pay elasticity is 1.5, a commonly accepted value,* then a 6.7 percent pay increase would be required to produce an equivalent 10 percent gain in enlistments. This implies a pay raise of nearly $340 million, based on strength figures and average base pay of first-term servicemen for FY 1973.† Assuming that a 10 percent increase in enlistments produces 31,300 volunteers‡ the cost per additional medically fit soldier would exceed $10,000.

SUMMARY

Analysis of results from comparing U.S. enlistment standards with standards for retention and mobilization, for the armed services of other advanced nations, and in the civilian sector indicates that enlistment standards may be higher than necessary in nine areas. There is an impressive degree of accord in the comparative results where these areas are concerned. Moreover, in most occupations studied all but one of these areas involve no significant association between a chronic condition and either hospitalization or time lost from work, according to data from the Health Interview Survey. Conditions in four of the areas are already subject to waiver under the Medically Remedial Enlistment Program.

Records of the Armed Forces Entrance and Examining Stations suggest that reasonable changes in the standards for eight of these nine areas would reduce the failure rate on the physical examination for military service by 35 percent, and that with more generous changes this reduction might exceed 40 percent. A reduction of 40 percent in

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*See, for example, Burton C. Gray, "Supply of First-Term Military Enlistees: A Cross-Section Analysis," and Alan Fechter, "Impact of Pay and Draft Policy on Army Enlistment Behavior," Studies prepared for the President's Commission on an All-Volunteer Force, Vol. I, November 1970.

†$365 per month. This understates the required pay increase somewhat, since the elasticity is estimated using base pay plus other military compensation.

‡Based on FY 1972 accessions of 313,000 true volunteers (data from records of the U.S. Army Recruiting Command, compiled by Gary Nelson of The Rand Corporation).

the failure rate would yield approximately 10 percent more enlistments. In terms of mental quality, the additional enlistments would be distributed in the same manner as current accessions.

Estimates of the marginal costs of relaxing standards in this manner range from $152 to $236 per additional physically successful soldier, one who can complete two years of service without being discharged for medical reasons. This estimate is based on the experience with overweight soldiers awarded waivers under MREP. It excludes any liability for lifetime medical costs in the event of a disability discharge, as no data are available on which to base an estimate. However, because the disability discharge rate is quite low, even if the medical costs per disability discharge were $1000 per year, this would add only $70 to the cost estimate.

These cost estimates compare favorably with a program currently being used by the Army and the Marines to increase enlistments, the $2500 combat arms bonus. Because the bonus must be paid to all combat arms volunteers enlisting for four years, the cost of an *additional* volunteer under the program is much higher than $2500--perhaps twice as great. Likewise, the estimated marginal cost of volunteers from relaxing physical standards is much lower than the marginal cost using a general increase in first-term pay. If the pay elasticity is 1.5, then the marginal cost of a pay increase would exceed $10,000 per volunteer.

VII. CONCLUSIONS

From 14 to 17 percent of all true volunteer applicants, mentally and morally qualified for military service, are unable to enlist because they cannot meet the physical standards of the U.S. armed forces. The conditions that disqualify them vary considerably, but more than one-quarter of the total fail because of inability to meet the height and weight standards.

A review of physical standards in the armed forces of other advanced nations and in the U.S. civilian sector suggests that U.S. enlistment requirements may be more stringent than is necessary. This conclusion is reinforced by a comparison of U.S. enlistment standards with the standards set for retention and mobilization. With the help of data from the Health Interview Survey, we have identified nine promising areas for review: the gastrointestinal system, extremities and the musculoskeletal system, blood pressure, height and weight, vision, hearing, the urinary system, skin diseases, and respiratory diseases. Standards in four of these areas are already subject to waiver under the Medically Remedial Enlistment Program. Moreover, an independent study by the Denver Research Institute, focusing on Navy job requirements, recommends reducing standards in several of these areas, including weight and blood pressure.*

Relaxing enlistment standards in these nine areas might cut the current physical disqualification rate by as much as 40 percent. If (as appears likely) only 570 out of every 1000 true volunteers can meet current service standards, and if 140 of the 430 failures are for medical reasons, then a 40 percent reduction in the physical disqualification rate means a 10 percent gain in enlistments (56/570 = .10). A 10 percent gain would close one-quarter of the enlistment shortfall that the GAO predicts for the Army in FY 1974. Moreover, in terms of mental quality, this gain in enlistments would be distributed in much the same way as current accessions, thus helping to maintain high mental standards in the all-volunteer force.

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*West et al. (1973, p. 3).

There are two possibly significant costs from relaxing physical standards. First, men admitted under reduced standards may suffer more time lost from work, or demand more medical care, than the normal volunteer. Second, if their condition proves truly disqualifying for military life, they may be discharged early, before the services can recoup the training investment. If their condition is aggravated by military service, the government will also be liable for disability pay and lifetime medical care.

With proper job assignment controls, costs of the first type can be avoided. Using data from the Health Interview Survey, we analyzed how chronic physical conditions affect hospitalization and time lost from work. Five occupational groups were chosen for study on the basis of their broad similarity to the job structure of support activities: craftsmen, operatives, service workers, clerical workers, and non-farm laborers. For most of these occupational groups, men with conditions in the nine areas we have identified had hospitalization histories and work loss histories no worse than the normal individual. The gastro-intestinal system is the only exception to this generalization.

To estimate the likely magnitude of the second type of costs, those resulting from increased rates of medical discharge, we make four assumptions:

1. Differences in the medical discharge rate will be concentrated in the first two years of service. Beyond that point, volunteers enlisted under relaxed standards will have the same medical discharge profile as enlistees under current standards.
2. Training is completed in the first six months, and medical discharges that occur during training are spread evenly over the training period.
3. The services earn no return on their training investment in the first two years of military life.
4. Medical discharge rates under a general relaxation of standards can be approximated by the rates for overweight MREP volunteers. (Overweight individuals would constitute a large

proportion of additional volunteers derived from reducing standards generally.)

Using typical Army training costs, we place the marginal cost of an additional volunteer obtained by relaxing standards at $152 to $236, depending on the size of the training investment.* These figures exclude the present discounted value of possible lifetime medical costs of those receiving disability discharges. Because the disability discharge rate is low, even if such costs were $1000 per year for each such individual, this would add only $70 to our estimates. The estimates compare favorably with the cost of expanding the supply of volunteers using enlistment bonuses, or using a first-term pay increase. If the first-term pay elasticity is 1.5, the latter would cost more than $10,000 for each additional recruit. Thus, to expand enlistments 10 percent by relaxing physical standards would cost $5 to $7 million, whereas a similar increase in enlistments using a general pay increase would cost nearly $340 million.

We therefore conclude that relaxing physical standards is a promising option to help meet the accession requirements of an all-volunteer force. It is an option in use elsewhere--Israel, with perhaps the highest proportion of its population in the military, sets the lowest physical standards of any nation studied in this report. It is also an option the United States has used in the past: Limited servicemen were enlisted during World War II, and many of them were assigned to the combat arms. The military services already recognize this option by setting less stringent standards for mobilization than they do for "peacetime" enlistment.

Were physical standards relaxed, two approaches could be considered:

1. *Standards could be reduced across the board for all enlistees.* We have identified nine areas where this may be possible, and the Assistant Secretary of the Army (Manpower and Reserve Affairs) is currently conducting a study of standards in five areas that together

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*If the first assumption is wrong, this calculation underestimates the early discharge cost of relaxing physical standards. However, both the second and third assumptions are conservative and bias the estimated cost upward.

account for more than one-half of all volunteers rejected.* One simple across-the-board reduction would be to substitute mobilization standards for current enlistment standards, and in addition relax the weight requirements by 10 percent.

2. *Standards could be reduced for certain classes of jobs.* This would help minimize any increase in medical care demands or time lost from work from relaxing standards, since data from the Health Interview Survey indicate that the effect of chronic physical conditions on these variables differs across occupations. This change would tie standards more closely to job requirements, in the manner of most other advanced nations and organizations in the civilian sector. Presumably one reason for the high entry-level standards set by the United States is that all recruits go through a physically demanding period of basic training. It may be that certain elements of this training are unnecessary for men assigned to support positions. Moreover, for many support activities mental qualifications are more important than physical qualifications. Reducing physical standards would increase the supply of mentally qualified enlistees. Where hard-to-fill positions are involved, the principle of setting physical standards on a job class basis could be extended to further relax standards for men of high mental qualification.†

These approaches need not be mutually exclusive. All could be adopted simultaneously--that is, an overall reduction of standards could be coupled with a policy of placing physical requirements on a job class basis, with special standards applying to men of high mental qualification. Or any one approach could be adopted independently. The choice depends on expected accessions under current policies. If accessions are inadequate, then the services may wish to consider one or both approaches. Because the first builds on existing regulations, it could be implemented immediately.

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*Weight, hypertension, defective hearing, defects of the joints and skin, and lymphatic conditions (memorandum from Lieutenant General Robert C. Taber, Principal Deputy Assistant Secretary of Defense (Manpower and Reserve Affairs), to the assistant Secretaries of the Military Departments (Manpower and Reserve Affairs), Subject: Medical Standards in the Volunteer Environment, 11 June 1973).

†Also a recommendation of West et al. (1973, p. 33).

Appendix A

GENERAL MEDICAL REQUIREMENTS FOR ENLISTMENT: THE UNITED STATES AND OTHER ADVANCED NATIONS

Section III summarized the significant differences between medical standards for general enlistment in the U.S. armed forces and those set by the armed forces of other advanced nations. This appendix presents tables on which that section was based.*

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*Australian Defense Forces, Joint Service Manual, *Recruit Medical Examination Procedures*, 1973; Austria, Bundesministerium für Landesverteidigung, *Richtlinien für die ärztliche Untersuchung der Wehrpflichtigen und Freiwilligen für die Aufnahme in das österreichische Bundesheer*, Vienna, January 1972; Canadian Forces Headquarters, *Medical Standards for the Canadian Forces*, CFP 154, March 1, 1967; Federal Republic of Germany, Bundesminister der Verteidigung, *Bestimmungen für die Durchführung der ärztlichen Untersuchung bei der Musterung von Wehrpflichtigen, Annahme, Einstellung und Entlassung von Soldaten*, ZDv 46/1, 25 July 1972; France, Ministère des Armées, Direction Centrale du Service de Santé des Armées, *Aptitude au service dans les Armées*, No. 620-624, May 1966; Great Britain, Ministry of Defence, *Assessment of Medical Fitness*, Royal Air Force Manual AP1269A, January 1969; Israeli Armed Forces, *Standards to Establish Medical Fitness for Service*, First and Second Supplements, 1969; U.S. Department of the Army, *Standards of Medical Fitness*, AR40-501, December 1960, and Changes 1 through 28, 1961-1972.

Table A-1

VISION

Country	Distant Vision		Near Vision
	Corrected	Uncorrected	Corrected
United States	20/40 (better eye) 20/70 (other eye) OR 20/30 (better eye) 20/100 (other eye) OR 20/20 (better eye) 20/400 (other eye)		20/40 (better eye).
Great Britain	20/30 (each eye)	20/200 (each eye)	Spherical correction: Between -7 and +8 diopters. Astigmatic correction: 6 diopters (each eye).
Canada	20/30 (better eye) 20/200 (other eye)		Spherical correction: Between -7 and +8 diopters.
Australia	20/40 (each eye)	20/400 (each eye)	Refraction limits: Myopia: -5.0 diopters (each eye). Hypermetropia: +7.0 diopters (each eye).
France	20/40 (better eye) 20/50 (other eye) OR 20/33 (better eye) 20/66 (other eye) OR 20/29 (better eye) 20/100 (other eye)		Refraction limits: Myopia: 6 diopters. Hypermetropia: 4 diopters.
Israel	20/80 (each eye) OR 20/60 (better eye) 20/80 (other eye) OR 20/40 (better eye) 20/200 (other eye)		Spherical correction: Between -12 and +9 diopters (one eye). Refraction limits: 6.5 diopters (better eye) Any applicant needing a spherical correction stronger than -12 to +9 diopters to correct the better eye to 20/40 is not acceptable if he requires glasses stronger than 6.5 diopters.
Austria	20/60 (better eye) 20/120 (other eye) OR 20/80 (each eye)		Refraction limits: Myopia: -10 diopters (with signs of advance). Astigmatism: ±4 diopters.
Germany	20/20 (better eye) 20/200 (other eye) OR 20/40 (each eye)		20/20 (better eye) 20/200 (other eye) OR 20/40 (each eye) Spherical correction: Between +8, -10 diopters. Cylinder correction: +4.0 diopters.

Table A-2

HEARING

Country	Cycles per Second	Acceptable Decibel Loss
United States	500	30 db (better ear)
	1000	25 db (better ear)
	2000	25 db (better ear)
	4000	35 db (better ear)
		(Other ear may be totally deaf.)
	OR	
	500	(30 db average loss with no single frequency
	1000	exceeding 35 db.)
	2000	
	4000	55 db (each ear)
Great Britain	Forced whisper must be heard at approximately 10 feet (each ear).	
Canada	500	30 db
	1000	30 db
	2000	30 db
	4000	30 db
		(The applicant may not be deaf in one ear.)
Australia	500	35 db
	1000	35 db
	2000	35 db
	4000	50 db
France	Whispered voice must be heard at approximately 10 feet by the better ear and at 3 feet by the other ear.	
Israel	Whispered voice must be heard at a distance of approximately 3-1/4 feet. If the applicant is deaf in one ear: Whispered voice must be heard in the better ear at a distance of approximately 6-1/2 feet.	
Austria	Ordinary speech must be heard at approximately 3-1/4 feet in both ears or at 13 feet in the better ear.	
Germany	Ordinary speech must be heard at approximately 6-1/2 feet in the better ear (the other ear may be totally deaf).	

Table A-3

BLOOD PRESSURE

Country	Age Group	Systolic (maximum)	Diastolic (maximum)
United States	35 & under	139	90
	Over 35	149	90
Great Britain	Range according to age	105-160 (160 mm HG is acceptable if diastolic is between 70 and 90 and there is no evidence of cardiovascular or renal disease.)	60-109 (110 mm Hg is rejected but a consultant's opinion is required. Further investigation is also required when the diastolic reading is 100 mm Hg or over.)
Canada	All ages	150	90
		(If the applicant is of less than normal size and has a history of vertigo or syncope, he may be disqualified if the systolic reading is less than 100 or the diastolic is less than 60.)	
Australia	Under 20	100-130	60-90
	20-35	100-140	60-90
	35 or over	100-150	60-90
France	All ages	150	90
		(Readings greater than these may be accepted if no visceral sounds or functional trouble is found.)	
Israel	All ages	175	100
		(Temporary deferments are granted for a diastolic reading over 95 mm.)	
Austria		Hypertensive disease disqualifies the applicant.	
Germany		100-160	100
		(Blood pressure readings over 160 mm systolic or 100 mm diastolic are acceptable if impairment of fitness is slight.)	

Table A-4

HEIGHT AND WEIGHT

Country	Height	Weight: Minimum All Ages	Weight: Maximum 16-20 Years	21-24 Years	25-30 Years	31-35 Years	36-40 Years	41 Years and Over
United States	5'0"	100	163	173	173	173	168	164
	5'2"	103	174	178	178	177	173	169
	5'6"	107	191	196	197	196	190	185
	6'0"	131	225	231	232	230	224	216
	6'2"	139	237	246	246	243	236	229
	6'4"	147	248	260	260	257	250	241
	6'6"	153	260	275	273	271	263	254
	6'8"	166	273	288	286	284	276	267
Great Britain	Applicants who are 25 percent over the normal height and weight combinations are not acceptable. Acceptance also depends on the effect the deviation from normal weight is expected to have on job performance.							
Canada	5'2"	114				152		
	5'6"	127				171		
	6'0"	150				202		
	6'2"	159				213		
	6'4"	169				225		
		Applicants who fall out of the above ranges are acceptable if the deviation is due to a small or large frame. The above standards are not applied rigidly.						
Australia	5'0"	95				143		
	5'2"	102				153		
	5'6"	112				170		
	6'0"	133				199		
	6'2"	139				209		
	6'4"	144				216		
		The above standards are not applied rigidly.						
France	5'1"	Simple and nonexcessive obesity is permissible if there are no accompanying symptoms of disease or defects. Applicants must be robust enough to undertake most employments in the services. (Applicants who are 17-19 years of age and have not achieved full growth are acceptable if they are 5'0" or over.)						
Israel	4'7"					149		
	4'10"					161		
	5'0"					168		
	5'2"					179		
	5'4"					202		
	5'6"					211		
	6'0"					250		
	6'2"					264		
	6'4"					278		
	6'6"					293		
	6'7"					299		
		(For each year over 25 years of age, add .55 pounds to the maximum acceptable weight. A temporary deferment is granted to applicants whose weight is less than 88 pounds if it appears they will not be able to stand the strain.)						

Austria		20 Years Small Frame	20 Years Medium Frame	20 Years Large Frame	25 Years Small Frame	25 Years Medium Frame	25 Years Large Frame	30 Years and Over Small Frame	30 Years and Over Medium Frame	30 Years and Over Large Frame
	4'11"									
	5'1"	105	117	131	109	121	136	112	125	142
	5'2"	108	119	136	111	123	141	114	128	143
	5'6"	122	136	152	126	142	156	128	143	161
	6'0"	145	161	181	151	168	188	156	173	194
	6'2"	152	171	190	161	179	201	168	185	208

Height of 4'11" is acceptable if the applicant has a moderately strong build, good development, and good performance capacity.
Moderate obesity is acceptable if the condition is not expected to interfere with job performance.
Severe overweight with great reduction of physical performance capability is acceptable as long as cardiac capability is not affected.

Germany		17-19 Years	20-24 Years	25-29 Years	30 Years and Over
	4'11"	82-156	88-172	93-176	88-183
	5'0"	84-163	90-174	95-179	97-185
	5'2"	88-172	95-183	101-190	104-194
	5'6"	101-190	106-198	112-207	115-212
	6'0"	121-220	126-229	130-234	134-220
	6'2"	128-231	130-238	139-249	141-254
	6'4"	132-240	139-249	143-256	150-267
	6'6"	139-251	143-256	152-271	159-282
	6'7"	143-256	148-262	156-279	165-289

Weights above or below these standards are acceptable if the applicant has adequate physical capabilities that permit classification in certain functions.

Table A-5

GASTROINTESTINAL SYSTEM

Country	Condition
	Hernias
United States, Canada	Hernias, other than small asymptomatic umbilical or hiatal, disqualify the applicant until surgically corrected.
Great Britain	Hernias disqualify the applicant until the condition has been corrected, but mild cases may not disqualify the applicant.
Australia, Israel	Hernias disqualify the applicant until corrected.
France, Germany	Minor, reducible and controllable inguinal hernias do not disqualify the applicant.
Austria, Germany	Small hernias that are easily corrected do not disqualify the applicant.
	Hemorrhoids
United States, Canada	External hemorrhoids producing marked symptoms or internal hemorrhoids, if large or accompanied by hemorrhage or protruding, disqualify the applicant.
Great Britain, Australia, France, Israel, Austria, Germany	Severe hemorrhoids disqualify the applicant until the condition has been corrected.
	Ulcers
United States, Australia	Ulcers or a history of ulcers disqualifies the applicant.
Great Britain	Peptic ulcers or gastro-duodenal disabilities within the last 2 years disqualify the applicant. Chronic ulcers complicated by hemorrhage disqualify the applicant. Surgical correction for an ulcer does not disqualify an applicant if one year has passed since the operation. Abdominal surgery involving extensive intervention or excision of any organ disqualifies the applicant.
Canada	A history of gastric or duodenal ulcers within the past 2 years disqualifies the applicant. Surgical correction for a gastric duodenal ulcer disqualifies the applicant.
France	Active ulcers disqualify the applicant. Peptic ulcers do not disqualify the applicant if the condition is not severe.
Israel	Duodenal ulcers, bleeding ulcers or surgery for ulcers within the past 2 years disqualifies the applicant.
Austria	Ulcers healed without complications do not disqualify the applicant.
Germany	Acute or chronic gastric and duodenal ulcers that severely impair general health, require special diet, and create considerable functional disturbances disqualify the applicant.

Table A-6

BLOOD AND BLOOD-FORMING TISSUE DISEASES

Country	Disease
	Anemia
United States, Canada, Israel	Hemolytic anemia, unless cause can be eliminated, aplastic anemia, primary refractory anemia, blood loss anemia, and deficiency anemia unless controlled by medication disqualify the applicant.
Great Britain	No specific requirements.
Australia, Germany	Pernicious anemia and other chronic blood disorders disqualify the applicant.
France	Secondary anemia may not disqualify the applicant, depending on the cause. Primary anemia disqualifies the applicant.
Austria	All serious, chronic diseases of the blood-building organs that reduce capabilities disqualify the applicant.

Table A-7

ENDOCRINE AND METABOLIC DISORDERS

Country	Disease
	Diabetes
United States, Great Britain, Canada, Australia, Germany	Diabetes insipidus and diabetes mellitus disqualify the applicant.
France	Diabetes insipidus disqualifies the applicant. Applicants with diabetes mellitus who require a diet for control are not acceptable.
Israel	Diabetes insipidus, accompanied by extreme disturbance, disqualifies the applicant. Diabetes mellitus that requires a special diet, is accompanied by complications, or needs treatment disqualifies the applicant. Diabetics in need of balancing are given a one year deferment.
Austria	All serious chronic diseases of the endocrine glands that reduce capabilities disqualify the applicant.

Table A-8

EXTREMITIES AND THE MUSCULOSKELETAL SYSTEM

Country	Condition
	Extremities (major limbs)
United States, Great Britain,[a] Canada, Australia, France, Israel, Austria, Germany	Absence of a limb or limitation of motion that interferes with job performance disqualifies the applicant.
	Extremities (feet)
United States, Great Britain,[a] Canada, Australia, France, Israel, Austria, Germany	Stiffness or absence of toes or part of a foot or other disorders that interfere with walking, running, marching, or jumping disqualify the applicant.
	Extremities (hands)
United States, Great Britain,[a] Canada, Australia, France, Israel, Austria, Germany	Absence of a hand disqualifies the applicant.
	Extremities (thumbs)
United States	Absence of greater than 1/3 of the distal phalanx of a thumb disqualifies the applicant.
Canada	Absence of greater than 1/2 of the distal phalanx of a thumb, if function is limited, disqualifies the applicant.
Great Britain,[a] France, Germany	Absence of a thumb disqualifies the applicant.
Australia	Loss of a thumb or part of a thumb incompatible with the performance of duties disqualifies the applicant.
Israel	Absence of 2 thumbs or hardening or shrinkage of 2 thumbs disqualifies the applicant.
Austria	Absence of thumbs with severe impairment of the ability to handle weapons disqualifies the applicant.
	Extremities (fingers)
United States, Canada, France	Absence of more than the distal and middle phalanx of an index, middle, or ring finger or absence of more than the distal phalanx of 2 fingers (index, middle, or ring) disqualifies the applicant.
Great Britain[a]	Loss of either a middle or index finger does not disqualify the applicant. Loss of both an index and a middle finger may not disqualify the applicant.
Australia, Germany	Loss of fingers incompatible with the performance of duties disqualifies the applicant.
Israel	Absence of 4 fingers on the right hand disqualifies the applicant. Hardening or shrinkage of 4 fingers on both hands disqualifies the applicant.
Austria, Germany	Absence of fingers with severe impairment of the ability to handle weapons disqualifies the applicant.
Germany	Absence of both index fingers disqualifies the applicant.
	Joints
United States, Great Britain, Canada, Australia, France, Austria, Germany	Degenerative joint diseases and arthritis disqualify the applicant if the condition is expected to interfere with job performance.
United States, Canada	Limitation of motion greater than 15 degrees in the shoulder, elbow, wrist, and hand joints disqualifies the applicant. Hip flexion less than 90 degrees and extension less than 10 degrees disqualifies the applicant. Full flexion of the knee is required.
Great Britain, France	All joints must have a normal, painless range of movement. Slight limitation of motion without symptoms does not disqualify the applicant.
Israel	80 to 100 percent limitation of movement in the upper limbs disqualifies the applicant. Hardening of the shoulder, elbow, or hand joint disqualifies the applicant. Limitation of movement of the hip greater than 25 percent, or greater than 50 percent in one pivot, disqualifies the applicant.

Table A-8--continued

Country	Condition
Austria	Fully healed joint rheumatism, inflammation of joints with residual alterations, or severe reduction of function does not disqualify the applicant.
	Bones
United States	Osteomyelitis, active or recurrent within the last 2 years, disqualifies the applicant. Chronic osteo-arthritis that interferes with full physical capacity disqualifies the applicant.
Great Britain, Canada, France, Austria, Germany	Any disease of the bone, healed with rigidity, that impairs function to such a degree that it interferes with military service disqualifies the applicant. Chronic osteo-arthritis of more than a minimal degree that interferes with full physical activity disqualifies the applicant.
Australia	A history of osteomyelitis disqualifies the applicant.
Israel	Any disease or injury of the bone, such as osteo-arthritis, that limits movement in a major joint by more than 50 percent disqualifies the applicant.
	Muscles
United States	Muscle atrophies and dystrophies are disqualifying if progressive or of sufficient degree to interfere with military service.
Canada	Muscle atrophies and dystrophies of any type disqualify the applicant.
Great Britain, Australia, France, Austria, Germany	Muscle wasting that interferes with function or progressive muscular disorders disqualify the applicant.
Israel	Any disease of the muscle that limits use of limbs disqualifies the applicant if the condition is not expected to improve.
	Spine
United States, Great Britain, France, Canada	Any disease or injury of the spine that has kept the applicant from following a physically active life disqualifies him.
Australia	Limitation of spinal movement, chronic backache, significant spinal deformity, or a history of spinal operation disqualifies the applicant.
Israel	Defects of the spine that have existed for more than one year and limit activity disqualify the applicant if the condition is progressive.
Austria	Injury, disease, or malformations of the spine without great discomfort or severely impaired mobility does not disqualify the applicant.
Germany	Disease or injury to the spinal column that still permits classification in certain functions does not disqualify the applicant.

[a]Absence or deformities of fingers, toes, and hands are assessed according to the cause of the loss and functioning capacity of parts remaining in relation to the applicant's employment.

For officers, in some cases, absence of a hand or part of an arm, foot, or leg below the knee is acceptable.

Table A-9

URINARY SYSTEM

Country	Condition
	Kidney disease
United States, Great Britain, Canada, France, Austria, Germany	Acute chronic kidney disease or infection disqualifies the applicant.
Australia	Acute chronic kidney disease or infection disqualifies the applicant unless there have been no signs, symptoms, or abnormal findings for 5 years.
Israel	Acute chronic kidney disease or infection disqualifies the applicant if no improvement in the condition is expected.
	Absence of a kidney
United States, Great Britain, Canada, Australia, France, Austria, Germany	Absence of a kidney disqualifies the applicant.
Israel	Absence of a kidney does not disqualify the applicant if the remaining kidney is normal.
	Renal calculus
United States, Great Britain, Canada, Australia, France	A history or clinical diagnosis of renal calculus disqualifies the applicant.
Israel, Austria	Renal calculus disqualifies the applicant if the condition is not curable.
Germany	Renal calculus without kidney changes does not disqualify the applicant.
	Albuminuria
United States	Albuminuria, if persistent or recurrent, including orthostatic albuminuria, disqualifies the applicant.
Great Britain, Canada, France, Austria, Germany	Albuminuria, other than orthostatic albuminuria, disqualifies the applicant.
Australia	Albuminuria disqualifies the applicant.
Israel	No specified requirements.

Table A-10

HEART AND VASCULAR DISEASES

Country	Condition
United States, Great Britain, Canada, Australia, France, Israel	The following conditions disqualify the applicant: Any major vascular disease; coronary disease such as angina pectoris or myocardial infarction; history of pericarditis, myocarditis, or endocarditis, or recurrent attacks of paroxysmal tachycardia.
United States, Australia, Canada	Congenital or acquired lesions of the aorta and major vessels disqualify the applicant.
Great Britain	Congenital or organic lesions disqualify the applicant, but certain congenital cardial lesions that have been successfully corrected by surgery are acceptable.
France, Germany	Congenital or acquired lesions of the aorta and major vessels disqualify the applicant unless the problem is minimal and the applicant is found acceptable by a specialist.
Israel	Insufficient closing of the main vein with diastolic blood pressure 50-mm Hg or less disqualifies the applicant.
United States	Organic valvular disease of the heart, including those corrected by surgery, disqualifies the applicant.
Great Britain, Canada, France, Israel, Germany	Organic valvular disease of the heart disqualifies the applicant.
United States	Hypertrophy or dialation of the heart disqualifies the applicant.
Great Britain, France, Germany	Unexplained cardial enlargement (but not athlete's heart) disqualifies the applicant.
Israel	An enlarged heart with high blood pressure disqualifies the applicant.
Austria, Germany	Heart disease, disease of the large arteries or of the pericardium and sequelae to these, with substantially impaired functional capabilities disqualify the applicant. Temporary and slight circulatory disturbances without symptoms of cardial valve or cardiac muscle disease during full capacity performance does not disqualify the applicant.

Table A-11

NEUROLOGICAL DISORDERS

Country	Condition
United States, Canada, Great Britain, Australia, France	A history or clinical diagnosis of epilepsy, disturbance of consciousness, or convulsive disorder disqualifies the applicant.
Israel	All forms of epilepsy with clinical proof of a mental condition disqualify the applicant.
Austria, Germany	All incidence of epileptic type disease disqualifies the applicant if attacks cannot be arrested.

Table A-12

SKIN AND CELLULAR TISSUE DISEASES

Country	Condition
United States, Canada, Australia, Israel	Chronic eczema, psoriasis, or any chronic skin disorder that is unresponsive to treatment or disfigures the skin and makes the individual objectionable in ordinary social relationships disqualifies the applicant.
Great Britain, Germany	Chronic or frequently recurring attacks of a skin disease of an incapacitating nature disqualify the applicant. Acute skin diseases disqualify the applicant until cured.
France	Chronic dermatitis, allergic dermatitis, disfigurements, and contagious conditions of the skin disqualify the applicant. Acne does not disqualify the applicant. Eczema and psoriasis do not disqualify the applicant unless the condition is severe.
Austria	Acute and chronic skin disease with only moderate impairment of physical performance capability, unaccompanied by disfigurement, does not disqualify the applicant.

Table A-13

RESPIRATORY AND CONTAGIOUS DISEASES

Country	Condition
	Asthma, emphysema, bronchitis, and bronchiectasis
United States	Chronic asthma, bronchitis, bronchiectasis, and emphysema disqualify the applicant.
Great Britain, Canada, France, Australia, Israel	Severe asthma or hay fever or emphysema disqualifies the applicant.
Great Britain, Canada, France, Australia, Israel, Austria	Chronic bronchitis, emphysema, and bronchiectasis disqualify the applicant. Applicants with acute bronchitis are not acceptable until it is apparent that recovery will occur without disqualifying sequela.
Austria	Severe allergic ailments disqualify the applicant. Allergic reactions with severe reduction in performance capabilities, but without substantial organic changes, do not disqualify the applicant. Sequelae after ailments of the lungs and bronchial tract, without impairment of respiratory functions, do not disqualify the applicant.
Germany	Severe asthma and hay fever that appear only seasonally and permit classification in certain military functions do not disqualify the applicant. Acute allergic conditions that require treatment disqualify the applicant. Acute bronchitis without permanent disturbance to respiratory function does not disqualify the applicant. Emphysema and bronchiectasis do not disqualify the applicant if classification in certain military functions is possible.
	Tuberculosis
United States	Tuberculosis, active at any time within the past 2 years, or a history of one or more relapses of pulmonary tuberculosis, disqualifies the applicant.
Great Britain	Tuberculosis, active at any time within the past 4 years, disqualifies the applicant.
Canada, France	Active pulmonary tuberculosis within the last 5 years disqualifies the applicant.
Australia, Israel, Austria	Active tuberculosis disqualifies the applicant until the condition has been fully resolved.
Germany	Inactive, slight forms of tuberculosis do not disqualify the applicant if there has been no tendency toward change in the symptoms or clinical findings of the disease for 2 years and classification for certain military functions is possible.
	Venereal disease
United States, France, Israel, Austria	Venereal disease does not disqualify the applicant if it is expected that the condition will respond to treatment.
Great Britain, Australia, Germany	Venereal disease disqualifies the applicant until effective treatment has cured the condition.
Canada	Applicants with primary or secondary syphilis are not acceptable until 6 months after the date of effective treatment. Applicants with acute gonorrhea are not acceptable until the condition has been effectively treated.
Austria	Moderate complications from previous infections do not disqualify the applicant.

Table A-14

TUMORS

Country	Condition
	Malignant
United States, Great Britain, Australia, Germany	Malignant tumors, even though removed, disqualify the applicant.
Canada, France, Israel, Austria	Malignant tumors of any kind disqualify the applicant.
	Nonmalignant
United States, Canada	Benign tumors that are likely to enlarge, interfere with the performance of duty, or become malignant disqualify the applicant.
Great Britain, Australia, Austria	Abdominal surgery involving extensive intervention or excision of any organ disqualifies the applicant.
France, Austria, Germany	Nonmalignant tumors do not disqualify the applicant if the degree of diminution of function is not extensive and the condition is not expected to interfere with job performance.
Israel	Applicants with benign tumors who need prolonged and extensive treatment are not acceptable. Applicants with an operable nonmalignant tumor are given a 6 month deferment.

Appendix B

GENERAL MEDICAL REQUIREMENTS: MILITARY AND CIVILIAN

Section IV summarized the significant differences between military and civilian medical standards for general employment. This appendix presents tables that compare enlistment standards of the U.S. armed forces with the general employment standards set by selected non-defense organizations, including companies in the private sector. The comparisons are based on the medical guidelines or regulations of each company or public agency.* Private companies are identified by industry and letter (for example, Aircraft Company A) rather than by name, to protect the privacy of individual organizations. The standards listed under the heading "Department of Transportation" are standards set by the U.S. Department of Transportation for drivers in interstate commerce.

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*County of Los Angeles, Department of Personnel, Occupational Health Service, *Manual of Policies and Procedures*, June 1972; U.S. Department of the Army, *Standards of Medical Fitness*, Army Regulation 40-501, December 1960, and Changes 1 through 28, 1961-1972; U.S. Department of Transportation, Federal Highway Administration, Bureau of Motor Carrier Safety, *Transportation*, "Hearing Aids and Hearing Standards," Title 49, Chapter III, Parts 391 and 392, 1971; U.S. Department of Transportation, Federal Highway Administration, Bureau of Motor Carrier Safety, *Instructions for Examining Physicians to Determine Physical Fitness of Drivers Engaged in Interstate or Foreign Commerce*, October 1971; U.S. Department of Transportation, U.S. Coast Guard, *Merchant Marine Personnel Physical Examination*, 1967. Company medical guidelines by private communication (The Boeing Company, Hughes Aircraft Company, Lockheed Aircraft Corporation, McDonnell-Douglas, Rockwell International, American Airlines, Braniff Airlines, Delta Airlines, Eastern Airlines, National Airlines, Pan American Airlines, Trans World Airlines, Western Airlines) and telephone interview (Continental Airlines).

Table B-1

VISION

Organization	Distant Vision		Near Vision	
	Corrected	Uncorrected	Corrected	Uncorrected
U.S. armed services	20/40 (better eye) 20/70 (other eye) OR 20/30 (better eye) 20/100 (other eye) OR 20/20 (better eye) 20/400 (other eye)		20/40 (better eye)	
Aircraft companies				
(A)	20/50 (better eye)		20/30 (better eye)	
(B)	20/35 (both eyes)		20/35 (both eyes)	
(C)	20/40 (each eye)	If these requirements are not met, acceptance is based on the acuity required for a specific job.	20/40 (each eye)	If these requirements are not met, acceptance is based on the acuity required for a specific job.
(D)	Visual acuity is checked only if the examiner detects extremely poor uncorrected vision: with uncorrected vision, 20/200 (one eye); corrected must be 20/40 (both eyes).			
(E)	20/40 (both eyes)		20/40 (both eyes)	
Airline companies				
(A)	20/50 (each eye)	20/400 (each eye)	20/40 (each eye)	
(B)	20/30 (both eyes)	20/100 (both eyes)	20/30 (both eyes)	20/100 (both eyes)
(C)	20/30 (each eye)		20/30 (each eye)	
(D)	20/20 (each eye)	20/100 (each eye)	20/40 (both eyes)	
(E)	20/20 (each eye)	20/100 (each eye)	20/40 (both eyes)	
(F)	20/20 (each eye)	20/100 (each eye)	20/40 (both eyes)	
(G)	20/20 (each eye)		20/30 (each eye)	
(H)	20/30 (each eye)		No specific requirements.	No specific requirements.
(I)	20/30 (better eye) OR 20/50 (both eyes)		20/40 (both eyes)	
Merchant Marines			No specific requirements.	No specific requirements.
Engine department and tankerman	20/30 (better eye) 20/50 (other eye)	20/40 (better eye) 20/70 (other eye)		
Able seaman	20/20 (better eye) 20/40 (other eye)	20/40 (better eye) 20/70 (other eye)		
County of Los Angeles	20/40 (better eye)		20/40 (better eye)	
Safety positions	20/30 (each eye)	20/70 (each eye)		
Harbor patrol		20/40 (each eye)		
Department of Transportation (drivers)	20/40 (each eye)		No specific requirements.	No specific requirements.

Table B-2

HEARING[a]

Organization	Cycles per Second	Acceptable Decibel Loss (db)
U.S. military services	500	30 db (better ear)
	1000	25 db (better ear)
	2000	25 db (better ear)
	4000	35 db (better ear)
		(Other ear may be totally deaf.)
	OR	
	500	(30 db average loss with no single
	1000	frequency exceeding 35 db.)
	2000	
	4000	55 db (each ear)
Aircraft companies		
(A)		Hearing must be adequate for conversational speech.
(B)		Applicants are evaluated in relation to job position.
(C)		Hearing must be adequate for conversational speech.
(D)		Applicants are evaluated in relation to job position.
Airline companies		
(A)	500	35 db
	1000	30 db
	2000	30 db
(B,C,D,E,F,I)	500	25 db
	1000	25 db
	2000	25 db
(G)		Applicants are evaluated in relation to job position.
(H)	500	25 db (better ear); 40 db (other ear)
	1000	25 db (better ear); 40 db (other ear)
	2000	25 db (better ear); 40 db (other ear)
Merchant Marines		Applicants are evaluated in relation to job position.
County of Los Angeles	500	(Sum of the loss in the three fre-
	1000	quencies must not exceed 100 db.)
	2000	
Safety positions	500	(20 db average loss in each ear with
	1000	no single frequency exceeding 35 db)
	2000	(uncorrected hearing)
	3000	
Department of Transportation (drivers)	500	(50 db average loss in the better ear)
	1000	(corrected hearing)
	2000	

[a]International Standards Organizations standards.

Table B-3

BLOOD PRESSURE

Organization	Age Group	Systolic (maximum)	Diastolic (maximum)
U.S. armed services	35 and under	139	90
	Over 35	149	90
Aircraft companies			
(A)	18-40	160	90
	41-60	170	100
	61-65	190	100
(B)	All	160	100
(C)	All	170	104
	Acceptable with limitations on job activity		
	All	200	110
(D)	All	150	100
Airline companies			
(A)	20-29	140	88
	30-39	145	92
	40-49	155	96
	50 up	160	98
(B, G)	All	150	90
(C, D, E, F, H)	No specific requirements	No specific requirements	No specific requirements
(I)	Range according to age	110-140	70-90
Merchant Marines	No specific requirements	No specific requirements	No specific requirements
County of Los Angeles	Under 35	150	90[a]
	Over 35	160	100[a]
Department of Transportation	All	160	90

[a]A reading of 110 mm diastolic disqualifies the applicant. Between 100 and 110 mm HG, the applicant will be hired and retained if the condition is cleared up within six weeks.

Table B-4

HEIGHT AND WEIGHT

Organization	Height	Weight: Minimum All Ages	Weight: Maximum 16-20 Years	21-24 Years	25-30 Years	31-35 Years	36-40 Years	41 Years and Over
U.S. armed services	5'0"	100	163	173	173	173	168	164
	5'2"	103	174	178	178	177	173	169
	5'6"	107	191	196	197	196	190	185
	6'0"	131	225	231	232	230	224	216
	6'2"	139	237	246	246	243	236	229
	6'4"	147	248	260	260	257	250	241
	6'6"	153	260	275	273	271	263	254
	6'8"	166	273	288	286	284	276	267
			Maximum					
Aircraft companies								
(A)	5'0"		155					
	5'2"		163					
	5'6"		183					
	6'0"		219					
	6'2"		233					
	6'4"		248					
	6'5"		256					
			Obesity alone unaccompanied by a disease or serious ailment does not disqualify the applicant.					
(B)	5'0"		172					
	5'2"		176					
	5'6"		189					
	6'0"		214					
	6'2"		224					
	6'4"		234					
	6'6"		244					
			An applicant who is 50 pounds overweight is not acceptable. The above weights are approximate.					
(C, D)			Applicants who are overweight are acceptable but limitations may be placed on job activity.					
Airline companies								
(A, B)			Obesity alone unaccompanied by a disease or serious ailment does not disqualify the applicant.					
(B, C, D, E, F, H)			Any defect or limitation that is expected to make the applicant unable to perform his duties safely disqualifies him.					
			Small Frame	Medium Frame	Large Frame			
(G)	5'2"		150	161	176			
	5'6"		166	179	195			
	6'0"		197	212	230			
	6'2"		209	225	245			
	6'4"		219	237	255			
			Maximum					
(I)	5'2"		169					
	5'6"		187					
	6'0"		221					
	6'2"		233					
	6'4"		245					
Merchant Marines	No specific requirements	No specific requirements	No specific requirements					
County of Los Angeles								
Safety positions	5'7"		135-168					
	6'0"		160-197					
	6'2"		170-209					
	6'4"		180-221					
	6'6"		190-233					
	6'7"		195-239					
Harbor patrol	5'6"		130-163					
	6'0"		160-197					
	6'2"		170-209					
	6'4"		180-221					
			15-19 Years	20-24 Years	25-29 Years	30 Years and Over		
Other positions	5'0"		88-147	96-160	100-167	103-172		
	5'2"		93-154	101-168	104-173	107-179		
	5'6"		105-175	113-188	117-195	119-199		
	6'0"		126-211	134-223	139-232	143-239		
	6'2"		134-224	142-236	148-247	153-255		
	6'4"		142-237	150-249	156-260	161-268		
	6'6"		150-248	159-260	165-264	170-281		
	6'11"		170-282	180-292	188-297	193-321		
Department of Transportation (drivers)	No specific requirements	No specific requirements	No specific requirements					

Table B-5

GASTROINTESTINAL SYSTEM

Organization	Hernias	Hemorrhoids	Ulcers
U.S. armed services	Hernias, other than small asymptomatic umbilical or hiatal, disqualify the applicant.	External hemorrhoids producing marked symptoms, or internal hemorrhoids, if large or accompanied by hemorrhage or protruding, disqualify the applicant.	Ulcers or a history of ulcers disqualifies the applicant.
Aircraft companies	(A) Hernias must be corrected before the applicant is accepted. (B) Inguinal hernias disqualify the applicant. (C) Inguinal or large umbilical hernias do not disqualify the applicant but limitations may be placed on job activity. (D) Hernias that are severe enough to interfere with job performance disqualify the applicant.	(A) No specified requirements. (B, C) Hemorrhoids that are severe enough to interfere with walking or sitting disqualify the applicant. (D) Hemorrhoids that are severe enough to interfere with job performance disqualify the applicant.	(A) No specified requirements. (B) Active ulcers disqualify the applicant. (C) Ulcers do not disqualify the applicant, but limitations may be placed on job activities. (D) Ulcers that are severe enough to interfere with job performance disqualify the applicant.
Airline companies	(A, G, I) Hernias must be corrected before the applicant is accepted. (B) Hernias that are severe enough to interfere with job performance disqualify the applicant. (C, D, E, F, H) Any defect that may be expected to interfere with job performance within two years disqualifies the applicant.	(A) Hemorrhoids disqualify the applicant. (B) Hemorrhoids that are severe enough to interfere with job performance disqualify the applicant. (C, D, E, F, H) Any defect that may be expected to interfere with job performance within two years disqualifies the applicant. (G) Hemorrhoids that are asymptomatic do not disqualify the applicant. (I) No specified requirements.	(A, B, I) Ulcers that have healed do not disqualify the applicant. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant. (G) Ulcers, if successfully treated with no evidence of recurrence for two years, do not disqualify the applicant.
Merchant Marines	Any defect that may be expected to interfere with job performance disqualifies the applicant.	Any defect that may be expected to interfere with job performance disqualifies the applicant.	Any defect that may be expected to interfere with job performance disqualifies the applicant.
County of Los Angeles	Hernias that are severe enough to interfere with job performance disqualify the applicant. (Safety Position) Hernias disqualify the applicant.	Any defect that may be expected to cause unusual periods of absence disqualifies the applicant.	Any chronic condition that may be expected to cause unusual periods of absence disqualifies the applicant.
Department of Transportation (drivers)	Any condition that may be expected to interfere with the safe operation of a motor vehicle disqualifies the applicant.	Any condition that may be expected to interfere with the safe operation of a motor vehicle disqualifies the applicant.	Any condition that may be expected to interfere with the safe operation of a motor vehicle disqualifies the applicant.

Table B-6

BLOOD AND BLOOD-FORMING TISSUE DISEASE

Organization	Standard
U.S. armed services	Anemia, including deficiency anemia that is not controlled by medication, disqualifies the applicant.
Aircraft companies	(A, B) No specific requirements. (C) Anemia, if moderately severe or associated with serious organic pathology, disqualifies the applicant. (D) Anemia that is under control does not disqualify the applicant.
Airline companies	(A) No specific requirements. (B, G, I) Anemia that is under control does not disqualify the applicant. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.
Merchant Marines	Any defect that may be expected to interfere with job performance disqualifies the applicant.
County of Los Angeles	Any chronic condition that may be expected to cause unusual periods of absence disqualifies the applicant.
Department of Transportation (drivers)	Any condition that may be expected to interfere with the safe operation of a motor vehicle disqualifies the applicant.

Table B-7

ENDOCRINE AND METABOLIC DISORDERS

Organization	Standard
U.S. armed services	Diabetes insipidus and diabetes mellitus disqualify the applicant.
Aircraft companies	(A) Diabetes mellitus does not disqualify the applicant who is under good control and has had no coma or insulin shock in the past year. (B, C, D) Controlled diabetics are acceptable.
Airline companies	(A) Diabetes disqualifies the applicant. (B, I) Diabetics who are well controlled and stable are acceptable. (C, D, E, F, H) A history or clinical diagnosis of diabetes mellitus that requires medication for control disqualifies the applicant. (G) Diabetics are evaluated individually in relation to job requirements.
Merchant Marines	Any disease that may be expected to interfere with job performance disqualifies the applicant.
County of Los Angeles	Diabetics who are medically controlled are considered individually in relation to job position.
Department of Transportation (drivers)	Any history or clinical diagnosis of diabetes that requires medication for control disqualifies the applicant.

Table B-8

EXTREMITIES AND THE MUSCULOSKELETAL SYSTEM

Organization	Extremities	Joints	Bones	Muscles	Spine
U.S. armed services	Absence of a limb or limitation of motion that interferes with the performance of military duty disqualifies the applicant. Absence of greater than 1/3 of the distal phalanx of the thumb disqualifies the applicant. Absence of the distal and middle phalanx of the index, middle, or ring fingers disqualifies the applicant. Absence of more than the distal phalanx of two fingers (index, middle or ring) disqualifies the applicant. A shortening of a lower extremity resulting in a limp to a noticeable degree disqualifies the applicant.	Any disease of the joint that impairs function to such a degree that it interferes with military duty disqualifies the applicant. Active or subacute arthritis, traumatic arthritis of a major joint, or rheumatoid arthritis disqualifies the applicant.	A clinical diagnosis or history of osteomyelitis, unless successfully treated without recurrence for two years, disqualifies the applicant. Chronic osteoarthritis disqualifies the applicant.	Muscular atrophies and dystrophies disqualify the applicant if progressive or of sufficient degree to interfere with military service.	Any disease or injury of the spine that has prevented the following of a physically active vocation in the civilian sector disqualifies the applicant.
Aircraft companies	(A, B, C, D) Limitation of motion, if sufficient to interfere with job performance, disqualifies the applicant. (A, C, D) Applicants with crippling deformities may be limited to sedentary work.	(A, B, C, D) Limitation of motion of a major joint, if sufficient to interfere with job performance, disqualifies the applicant. (A) Applicants with rheumatoid arthritis may be limited to sedentary work. (B) Debilitating arthritic disease disqualifies the applicant. (C) Any progressive disease of the joint where total disability may be expected within three years disqualifies the applicant.	(A, D) Applicants with crippling deformities such as osteoarthritis may be limited to sedentary work. (B) Any debilitating disease of the bone disqualifies the applicant. (C) A history of clinical diagnosis of active osteomyelitis within the past ten years disqualifies the applicant.	(A, D) A history of neuromuscular diseases, dystrophies, or multiple sclerosis may limit job activity but does not disqualify the applicant. (B) Applicants with recurrent or progressive muscular diseases are not acceptable. (C) Any progressive disease of the muscle where disability from work may be expected within three years disqualifies the applicant.	(A) Applicants who have had back injuries or surgery are acceptable for nonstrenuous work if they have been symptom free and fully active for six months. (B) A history of recurrent back injury disqualifies the applicant. (C) Applicants who have had spinal surgery within the last year are not acceptable. A history of mild back distress does not disqualify the applicant. (D) Applicants with a disease or injury of the spine may be limited to sedentary work.

Table B-8--continued

Organization	Extremities	Joints	Bones	Muscles	Spine
Airline companies	(A, B, C, D, E, F, G, H, I) Limitation of motion, if sufficient to interfere with job performance, disqualifies the applicant.	(A, B, C, D, E, F, G, H, I) Limitation of motion or active disease of joints, if sufficient to interfere with job performance, disqualifies the applicant.	(A) Any active disease of the bone disqualifies the applicant. (B) Any disease of the bone that may be expected to interfere with job performance disqualifies the applicant. (C, D, E, F, H, I) Any disease or defect that may be expected to interfere with job performance within two years disqualifies the applicant. (G) Chronic osteomyelitis disqualifies the applicant.	(A) Atrophy of the muscles, if progressive, disqualifies the applicant. (B, G) Muscle atrophy disqualifies the applicant if the condition may be expected to interfere with job performance. (C, D, E, F, H) Any disease or defect that may be expected to interfere with job performance within two years disqualifies the applicant. (I) No specified requirements.	(A) A history or clinical diagnosis of intervertebral disc disorders disqualifies the applicant. (B, G) A spinal disease that is incapacitating disqualifies the applicant. Spinal abnormalities without symptoms are evaluated individually. (C, D, E, F, H) Any disease, defect, or limitation that may be expected to interfere with job performance within two years disqualifies the applicant. (I) No specific requirements.
Merchant Marines	Any defect that may be expected to interfere with job performance disqualifies the applicant.	Any defect that may be expected to interfere with job performance disqualifies the applicant.	Any defect or disease that interferes with job performance disqualifies the applicant.	Any defect or disease that interferes with the ability to carry out duties disqualifies the applicant.	Any defect or disease that interferes with the ability to carry out duties disqualifies the applicant.
County of Los Angeles	Applicants with physically limiting conditions that are compatible with the demands of a job are acceptable.	Applicants with physically limiting but not disabling conditions that are compatible with the demands of a job are acceptable.	Applicants with physically limiting but not disabling conditions that are compatible with the demands of a job are acceptable.	Applicants with physically limiting but not disabling conditions that are compatible with the demands of a job are acceptable.	Applicants with physically limiting but not disabling conditions that are compatible with the demands of a job are acceptable.
Department of Transportation (drivers)	Any loss of, or impairment in, the use of extremities that is likely to interfere with the ability to drive a motor vehicle safely disqualifies the applicant.	A medical history or clinical diagnosis of rheumatic or arthritic disease that interferes with the ability to operate a motor vehicle safely disqualifies the applicant.	A medical history or clinical diagnosis of an orthopedic condition that interferes with the ability to operate a motor vehicle safely disqualifies the applicant.	A medical history or clinical diagnosis of muscular or neuromuscular disease that interferes with the ability to operate a motor vehicle safely disqualifies the applicant.	A medical history or diagnosis of an orthopedic condition that interferes with the ability to operate a motor vehicle safely disqualifies the applicant.

Table B-9

URINARY SYSTEM

Organization	Kidney Disease	Albuminuria
U.S. armed services	Absence or acute, chronic infection of a kidney disqualifies the applicant. A history or clinical diagnosis of renal calculus disqualifies the applicant.	Albuminuria, if persistent or recurrent, including orthostatic albuminuria, disqualifies the applicant.
Aircraft companies	(A) Chronic disease of the kidney does not disqualify the applicant, but limitations may be placed on job activity. (B, C) Severe chronic disease or disorder of the kidney disqualifies the applicant. (C) A history of acute kidney disorders that have been cured and are without residuals does not disqualify the applicant. (D) Chronic disease of the kidney does not disqualify the applicant if the condition is not expected to interfere with job performance.	(A) No specific requirements. (B) Albuminuria due to renal damage is acceptable if kidney function is normal. (C, D) Albuminuria disqualifies the applicant, but orthostatic albuminuria does not.
Airline companies	(A, I) Any infection or chronic disease of the kidney disqualifies the applicant. (B) Chronic kidney disease or infection does not disqualify the applicant if the condition is well controlled. Absence of a kidney does not disqualify the applicant. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant. (G) A history of kidney disease of a chronic or progressive nature disqualifies the applicant.	(A, B, G) Albuminuria disqualifies the applicant. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant. (I) Orthostatic albuminuria does not disqualify the applicant unless accompanied by a serious kidney disease.
Merchant Marines	Any defect that interferes with job performance disqualifies the applicant.	Any defect that interferes with job performance disqualifies the applicant.
County of Los Angeles	Any chronic disease or its complications that may be expected to cause unusual periods of absence disqualifies the applicant.	Any defect that can be expected to cause unusual periods of absence disqualifies the applicant.
Department of Transportation (drivers)	Acute infections disqualify the applicant.	Albuminuria disqualifies the applicant.

Table B-10

THE HEART AND VASCULAR SYSTEM

Organization	Heart and Vascular Diseases	Rheumatic Fever and Chorea
U.S. armed services	The following conditions disqualify the applicant: All organic valvular diseases of the heart including those improved by surgery. Coronary artery disease or myocardial infarction, old or recent, or angina pectoris at any time. History or finding of pericarditis, endocarditis, or myocarditis. Hypertrophy or dialation of the heart. Tachycardia, persistent, with a resting pulse rate of 100 or more, regardless of cause. Congenital or acquired lesions of the aorta and major vessels. Peripheral vascular disease.	A history of rheumatic fever or chorea within the previous two years or recurrent attacks or evidence of residual cardial damage disqualifies the applicant.
Aircraft companies	(A, C, D) Congenital valvular and rheumatic heart disease do not disqualify the applicant but limitations may be placed on job activity. (A) Past myocardial infarction cases will be accepted for sedentary work if one year has passed since the last attack and residual heart damage is not evident. (B) Significant organic heart disease disqualifies the applicant. (C) Coronary heart disease, vascular disease or mild cases of organic heart disease do not disqualify the applicant, but limitations may be placed on job activity. Heart surgery does not disqualify the applicant if six months to one year have passed since surgery. (D) Any heart disease or defect disqualifies the applicant if the condition is expected to interfere with job performance.	
Airline companies	(A) The following conditions disqualify the applicant: Serious valvular disease of the heart. Angina pectoris or other evidence of coronary heart disease. Evidence of past or active pericarditis, endocarditis, or myocarditis. Hypertrophy or dialation of the heart. Vascular heart disease. (B) Congenital, organic, or vascular heart disease disqualifies the applicant if the condition is expected to interfere with job performance. (C, D, E, F, H) A history or diagnosis of myocardial infarction or angina pectoris or other evidence of coronary heart disease disqualifies the applicant. (G) A history of heart failure or coronary artery disease disqualifies the applicant. Congenital heart disease or rheumatic heart disease disqualifies the applicant unless the size of the heart is normal. (I) No specific requirements.	(G) A history of rheumatic fever with residual heart involvement disqualifies the applicant.
Merchant Marines	Any defect that is expected to interfere with job performance disqualifies the applicant.	
County of Los Angeles	Applicants with a diagnosed chronic disease or its complications that can be expected to cause unusual periods of absence are not acceptable.	
Department of Transportation (drivers)	Myocardial infarction, angina pectoris, coronary insufficiency or any other cardiovascular disease that is known to be accompanied by syncope, dyspnea, collapse, or congestive cardiac failure disqualifies the applicant.	

Table B-11

NEUROLOGICAL DISORDERS

Organization	Standard
U.S. armed services	A history or clinical diagnosis of epilepsy, disturbances of consciousness, or convulsive disorder disqualifies the applicant.
Aircraft companies	(A) Epileptics who have been free of seizures for one year and are medically controlled may be qualified for nonhazardous work. (B) Applicants with a history of epilepsy are acceptable for sedentary work if they are medically controlled and have been free of seizures for five years. (C, D) Applicants with epilepsy are acceptable for sedentary work if they are medically controlled and have had relatively few attacks.
Airline companies	(A, C, D, E, F, H, I) Epilepsy or a history of seizures or convulsions disqualifies the applicant. (B) Epileptics who are well controlled are acceptable. (G) Applicants with epilepsy are acceptable if they have been free of seizures for ten years.
Merchant Marines	Epilepsy disqualifies the applicant.
County of Los Angeles	A history or clinical diagnosis of convulsive seizures or recurrent fainting does not automatically disqualify the applicant. Each applicant is evaluated on the basis of the requirements of each job, the medical control program, and the history of the disease.
Department of Transportation (drivers)	A history or clinical diagnosis of epilepsy, or any other condition that is likely to cause loss of consciousness or loss of ability to control a motor vehicle, disqualifies the applicant.

Table B-12

SKIN AND CELLULAR TISSUE DISEASE

Organization	Standard
U.S. armed services	Chronic eczema that is unresponsive to treatment or a history or diagnosis of psoriasis or any chronic skin disorder that severely disfigures the skin and makes the individual objectionable in ordinary social relationships disqualifies the applicant.
Aircraft companies	(A, C, D) A history or diagnosis of a chronic skin disease does not disqualify the applicant but limitations may be placed on job activity. (B) A malignant or contagious condition or chronic eczema disqualifies the applicant until the condition has been effectively treated. (C) Applicants with severe and permanently disfigured skin are not acceptable.
Airline companies	(A, B) A malignant skin disease or a skin disease requiring medical care disqualifies the applicant. Applicants with a chronic, noncontagious skin disease such as psoriasis are acceptable for positions where no public contact is required. (C, D, E, F, H) No specific requirements. (G) A history of eczema does not disqualify the applicant if he has been free of symptoms for five years. (I) Any serious chronic skin disease such as psoriasis or eczema disqualifies the applicant.
Merchant Marines	No specific requirements.
County of Los Angeles	Any defect that can be expected to cause unusual periods of absence disqualifies the applicant.
Department of Transportation (drivers)	No specific requirements.

Table B-13

RESPIRATORY AND CONTAGIOUS DISEASES

Organization	Asthma, Emphysema, Bronchitis, and Bronchiectasis	Tuberculosis	Venereal Disease
U.S. armed services	Asthma, bronchitis, bronchiectasis, and emphysema disqualify the applicant.	Tuberculosis, active at any time within the past two years, or a history of one or more relapses of pulmonary tuberculosis disqualifies the applicant.	Venereal disease does not disqualify the applicant if it is expected that the condition will respond to treatment.
Aircraft companies	(A, C, D) Applicants with severe asthma, emphysema, and bronchiectasis are acceptable but limitations may be placed on job activity. (B) Acute or chronic pulmonary disease disqualifies the applicant. A serious allergy does not disqualify the applicant but limitations may be placed on job activity.	(A, D) Active tuberculosis disqualifies the applicant until full recovery has been achieved. (A) Applicants with a history of tuberculosis are acceptable if pulmonary function is good and the condition has been cleared up for one year. (B) Acute or active pulmonary disease disqualifies the applicant. Chronic pulmonary disease disqualifies the applicant unless evidence of normal pulmonary function is found. (C) Applicants with a history of tuberculosis are acceptable if the condition has been inactive for three years.	(A) Venereal disease disqualifies the applicant until full control has been achieved. (B, D) Active venereal disease disqualifies the applicant. (C) Acute or active venereal disease disqualifies the applicant.
Airline companies	(A) Bronchiectasis or any congenital defect interfering with the function of the lungs disqualifies the applicant. (B, I) Asthma, emphysema, or bronchiectasis, if severe enough to cause excessive absenteeism, disqualifies the applicant. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant. (G) A history of asthma does not disqualify the applicant if the condition has not been present for five years. Acute bronchitis disqualifies the applicant until the condition has been cleared up. Emphysema and bronchiectasis disqualify the applicant.	(A, B, G, I) Active pulmonary tuberculosis disqualifies the applicant. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.	(A) Any acute or chronic infection that could result in incapacity disqualifies the applicant. (B, G, I) Any acute infection disqualifies the applicant. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.
Merchant Marines	Any disease or defect that may be expected to interfere with job performance disqualifies the applicant.	Any defect that may be expected to interfere with job performance disqualifies the applicant.	Acute venereal disease disqualifies the applicant.
County of Los Angeles	Emphysema or asthma of sufficient degree to interfere with job performance disqualifies the applicant. Any chronic disease or its complications that may be expected to cause unusual periods of absence disqualifies the applicant.	Applicants with a history of tuberculosis are acceptable if the disease is inactive.	Any acute infectious disease disqualifies the applicant until the condition has been cleared up.
Department of Transportation (drivers)	A history or clinical diagnosis of a respiratory dysfunction that is likely to interfere with job performance disqualifies the applicant.	A history or clinical diagnosis of a disease that may be expected to interfere with the ability to drive a motor vehicle safely disqualifies the applicant.	Any disease that may be expected to interfere with the ability to control a motor vehicle disqualifies the applicant.

Table B-14

TUMORS

Organization	Tumors
U.S. armed services	Malignant tumors, even though removed, disqualify the applicant. Benign tumors that are likely to enlarge or interfere with job performance disqualify the applicant.
Aircraft companies	(A) Malignant tumors, if successfully treated with no evidence of recurrence for one year, do not disqualify the applicant. (B) Malignant tumors, if successfully treated with no evidence of recurrence for five years, do not disqualify the applicant. (C) Malignant tumors, if successfully treated with no evidence of recurrence for two years, do not disqualify the applicant. (D) Malignant tumors, if successfully treated with no evidence of recurrence for three years, do not disqualify the applicant.
Airline companies	(A) Malignant tumors, or tumors that interfere with job performance, disqualify the applicant. (B) Tumors disqualify the applicant unless they have been successfully corrected. (C, D, E, F, H) Any disease or defect that may be expected to make the applicant unable to perform his duties within two years disqualifies the applicant. (G) Malignant tumors, even though successfully removed, disqualify the applicant. Benign tumors that have been successfully treated do not disqualify the applicant. (I) Applicants with a history of malignant tumors are evaluated individually according to date of onset, location, and type of tumor. A history of benign tumors does not disqualify the applicant.
Merchant Marines	Any disease or defect that may be expected to interfere with job performance disqualifies the applicant.
County of Los Angeles	Malignant tumors that have been successfully treated with no evidence of recurrence for five years do not disqualify the applicant.
Department of Transportation (drivers)	Any condition that may be expected to interfere with the safe operation of a motor vehicle disqualifies the applicant.

Appendix C

FLYING DUTY AND FLYING-RELATED MEDICAL REQUIREMENTS

Few medical requirements are job specific for entrance into the U.S. Armed Forces. The principal exception to this rule involves flying duty and those who fly frequently (for example, aerial observers and aircraft mechanics). This appendix compares flying duty and flying-related standards set by the U.S. Armed Forces with those set by the armed forces of other advanced nations, and with those set in the civilian sector. The comparisons are based on the medical regulations that apply to each armed service,* company,† or public agency.‡

PILOTS, AIR CREW, AND AIRCRAFT SUPPORT: REQUIREMENTS OF THE U.S. ARMED FORCES AND OF OTHER ADVANCED NATIONS

Differences in these standards parallel differences in enlistment standards across countries (see Sec. III and Appendix A). The

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*Australian Defense Forces, Joint Service Manual, *Recruit Medical Examination Procedures*, 1973; Canadian Forces Headquarters, *Medical Standards for the Canadian Forces*, CFP 154, March 1, 1967; France, Ministère des Armées, Direction Centrale du Service de Santé des Armées, *Aptitude au service dans les Armées*, No. 620-624, May 1966; Great Britain, Ministry of Defence, *Assessment of Medical Fitness*, Royal Air Force Manual AP1269A, January 1969; U.S. Department of the Army, *Standards of Medical Fitness*, Army Regulation 40-501, December 1960, and Changes 1 through 28, 1961-1972.

†For U.S. airline companies, standards for flying personnel are set by the Federal Aviation Administration (U.S. Department of Transportation, Federal Aviation Administration, *Federal Aviation Regulations*, "Medical Standards and Certification," Part 67, 1965 and Amendment 67-69, 1972). Nonflying standards obtained by private communication with American Airlines, Braniff Airlines, Delta Airlines, Eastern Airlines, National Airlines, Pan American Airlines, Trans World Airlines, and Western Airlines; and by telephone interview with Continental Airlines. To protect the privacy of individual organizations, companies are identified by letter in the tables at the end of this appendix.

‡County of Los Angeles, Department of Personnel, Occupational Health Service, *Manual of Policies and Procedures*, June 1972 (standards are for helicopter pilots).

principal exceptions are vision and hearing (Tables C-1 through C-7).*

The distant visual acuity (Table C-6) required by the United States, Australia, and France for inexperienced pilots is more restrictive than the requirements followed by Canada and Great Britain.† Great Britain accepts applicants with an uncorrected visual acuity of 20/30 in each eye and Canada accepts 20/20 in the better eye and 20/30 in the other eye, but the United States, Australia, and France require inexperienced aviators to have 20/20 vision in each eye.

Experienced pilots in the United States and Great Britain are required to have a corrected visual acuity of 20/20 in each eye, Canada allows 20/20 in the better and 20/30 in the other eye, and Australia accepts 20/30 in each eye. With the exception of France, requirements for uncorrected vision are more restrictive in the United States than in other advanced nations.

For inexperienced aircrew, all the countries except Canada require corrected vision to be 20/20 in each eye. For experienced aircrew, the United States, Great Britain, and France require an uncorrected distant visual acuity of 20/20 in each eye separately, and Canada and Australia require only 20/30 in each eye. The standards followed for uncorrected visual acuity for both experienced and inexperienced aircrew are less restrictive in the United States than in other countries.

The United States is the only country that requires 20/20 distant vision in each eye for aircraft support crew. Both Great Britain and Australia accept 20/30 in each eye; France allows 20/30 in each eye or 20/25 in both eyes; and Canada specifies 20/30 for the better eye and 20/200 for the other eye. Most of the countries examined require an uncorrected visual acuity of 20/200 in each eye for aircraft support crew.

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*Standards for areas of only limited differences are compared in Tables C-1 through C-5.

†Tables will be found at the end of this appendix.

Acceptable hearing loss (Table C-7) in the 500-2000 herz frequency range for inexperienced aviators in the United States is more restrictive than the standards followed by France and Canada and less restrictive than Australia's requirements. At the 4000 herz frequency level, the standards set by the United States are less restrictive than the requirements followed by Australia and more restrictive than those set by France. The United States is the only country that requires hearing loss to be tested in each ear separately. For all applicants, Great Britain specifies only that the whispered voice must be heard at a certain distance.

Requirements for experienced pilots are less restrictive in the United States than in Canada or Australia and similar to the requirements followed by France for the 500-2000 herz frequency range. The standards set by the United States are also less stringent in that no tests in the 3000 or 4000 herz frequency levels are required.

In general, hearing requirements in the United States for aircrew and aircraft support crew are less rigorous than the standards followed by other advanced nations.

PILOTS: REQUIREMENTS OF THE U.S. ARMED SERVICES, COMMERCIAL AIRLINES (FAA), AND THE COUNTY OF LOS ANGELES*

Requirements for distant and near visual acuity in the military services (Table C-8) are more restrictive than in the civilian sector. Military aviators must have an uncorrected distant visual acuity of 20/20 whereas aviators in the civilian sector are required to have an uncorrected visual acuity of only 20/100, correctable to 20/20. For near vision, military aviators are required to have an uncorrected visual acuity of 20/20 in each eye. Commercial airline pilots are medically qualified if they have a corrected visual acuity of 20/40 in each eye, and County of Los Angeles helicopter pilots qualify if the visual acuity for both eyes combined is correctable to 20/40.

Hearing standards (Table C-9) for medical qualification as a military aviator approximate the specifications set for commercial

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*Standards for the County of Los Angeles for helicopter pilots only.

airline pilots and County of Los Angeles helicopter pilots. The military services, however, require that a test for hearing at the 4000 hz frequency level be passed; no test at this frequency level is required in the civilian sector.

The military's required blood pressure readings (Table C-10) are more restrictive than those for commercial airline pilots and County of Los Angeles helicopter pilots. Additionally, the lower limits specified by military standards for systolic and diastolic readings are not required by the Federal Aviation Administration or the County of Los Angeles. The maximum systolic reading allowed by the military ranges from approximately 1 mm to 10 mm less than the limits accepted in the civilian sector. For military aviators 35 years of age and under, the diastolic reading allowed is similar to the standards for civilian pilots. For pilots over 35 years of age, the military sets the maximum blood pressure reading acceptable at 90 mm diastolic, and the County of Los Angeles allows up to 100 mm.

The military requires that aviators meet specific height and weight requirements (Table C-11). The FAA sets no specific height-weight ranges for commercial airline pilots. Instead, applicants are considered individually and are disqualified only if the deviation from average weight is associated with clinical findings or if the obesity of the applicant is expected to interfere with job performance.

The military does not accept candidates with inguinal hernias, marked symptoms of external hemorrhoids or internal hemorrhoids or ulcers or a past history of ulcers (Table C-12). The County of Los Angeles and the FAA reject applicants with the above defects or limitations only if it is expected that the condition is likely to interfere with job performance.

Malignant tumors (Table C-13) even though removed, and benign tumors that are likely to enlarge or interfere with job performance, disqualify candidates for flying duty under military regulation. The County of Los Angeles accepts applicants for the position of helicopter pilot if a tumor has been successfully treated and a five year period has passed without evidence of recurrence. For commercial airline pilots, the FAA disqualifies the applicant only if the condition or disease may be expected to interfere with job performance.

Applicants with anemia (Table C-14), including deficiency anemia that is not controlled by medication, are not acceptable under military standards. The FAA and the County of Los Angeles reject applicants with anemia if it is expected that the condition will interfere with job performance or cause unusual periods of absence.

Applicants with diabetes (Table C-15) are not considered medically acceptable by either the military services or the County of Los Angeles. The FAA disqualifies applicants for the position of commercial airline pilot if they have a history or clinical diagnosis of diabetes mellitus requiring medication for control.

Any disease or defect of the extremities or musculoskeletal system that results in less than full strength or range of motion disqualifies candidates applying for flying duty in the military services (Table C-16). This includes the loss of various portions of fingers or thumbs or the shortening of a lower limb resulting in a limp of noticeable degree. Neither the FAA nor the County of Los Angeles disqualifies applicants with physically limiting conditions, provided these are compatible with job demands.

Absence or acute chronic infection of a kidney, albuminuria, or a history or clinical diagnosis of renal calculus disqualifies an applicant for military flying (Table C-17). The FAA and the County of Los Angeles reject applicants with these ailments only if the condition or its complications are expected to interfere with job performance or cause unusual periods of absence.

Applicants with a history or clinical diagnosis of heart disease are not accepted by either the military or the civilian sector (Table C-18).

Candidates for military aviator, commercial airline pilot, or County of Los Angeles helicopter pilot are not considered medically acceptable if they have a history or clinical diagnosis of epilepsy or other convulsive disorder (Table C-19). The military services also disqualify applicants who have suffered a craniocerebral injury followed by unconsciousness of greater than two hours in duration, amnesia of greater than four hours in duration, craniotomy, or migraines. The FAA rejects applicants who have had an unexplained disturbance of

consciousness or whose condition is expected to interfere with job performance within two years.

Chronic skin diseases (Table C-20) that are unresponsive to treatment, or a history or diagnosis of any chronic skin disorder that severely disfigures the skin, disqualifies applicants under military standards. The FAA does not specify any grounds for rejection based on skin disorders, and the County of Los Angeles rejects applicants only if the defect or disease is expected to cause unusual periods of absence.

Candidates for military aviation are disqualified if there is any evidence of bronchial asthma, bronchiectasis, or emphysema (Table C-21). The County of Los Angeles and the FAA disqualify applicants with these afflictions only if they are sufficient to interfere with job performance.

Under military regulations, applicants with tuberculosis (Table C-21), active at any time within the past two years, or a history of one or more relapses of pulmonary tuberculosis, are not acceptable. The County of Los Angeles does not disqualify applicants with a history of tuberculosis if the disease is inactive. The FAA specifies only that applicants with any disease that may be expected to make them unable to perform their duties within the next two years are not acceptable.

Venereal disease (Table C-21) disqualifies candidates for flying duty in the military services until the condition has been effectively treated with no evidence of recurrence or complications for one year. The FAA and the County of Los Angeles accept applicants with an acute infectious disease as soon as the condition has been treated and resolved.

AIR TRAFFIC CONTROLLERS AND FLIGHT INSTRUCTORS: REQUIREMENTS OF THE U.S. ARMED SERVICES AND THE FAA

The requirements set by the military and the FAA for acceptable distant visual acuity are identical (Table C-22). For near vision, however, the military requires an uncorrected visual acuity of 20/100, correctable to 20/20 in each eye, while the FAA requires near visual acuity correctable to only 20/40 in the better eye.

FAA requirements for hearing (Table C-23) are more rigorous than the military's standards. The military allows a decibel loss of approximately 5 db more in each frequency for the better ear and 10 db to 25 db for the other ear.

Very limited ranges for systolic and diastolic blood pressure readings are allowed by the military services (Table C-24). The FAA does not specify any requirements for blood pressure readings.

Minimum and maximum limits for height and weight are set by the military services (Table C-25). The FAA does not set any specific standard for air traffic controllers or flight instructors.

Applicants with inguinal hernias, external hemorrhoids producing marked symptoms, or internal hemorrhoids, if large or protruding, are not considered to be medically acceptable by the military services (Table C-26). Applicants with ulcers, or past surgical operations for ulcers, are acceptable until after review by the appropriate Surgeon General. For these kinds of conditions, the FAA rejects applicants only if the candidate may be unable to safely perform his duties within the next two years.

Applicants with anemia (Table C-27), including deficiency anemia that is not controlled by medication, are not acceptable under military standards. The FAA does not set specific guidelines for applicants with anemia.

The military disqualifies applicants with diabetes insipidus and diabetes mellitus (Table C-28). Candidates for the position of air traffic controller or flight instructor are medically qualified under FAA regulations if their disease or condition will not interfere with the safe performance of their duties in the next two years.

Any disease or defect of the extremities or musculoskeletal system (Table C-29) that results in less than full strength or range of motion disqualifies candidates applying to the military services. This includes the loss of various portions of fingers or thumbs or the shortening of a lower limb resulting in a noticeable limp. The FAA does not disqualify applicants unless the condition is expected to interfere with the safe performance of their duties within two years.

Applicants with acute chronic infection of the kidney, or absence of a kidney (Table C-30) are not acceptable under military standards. A history or clinical diagnosis of renal calculus disqualifies the applicant unless no congenital or acquired anomaly is found, renal function is normal, and there is no evidence of concretion in the kidney, ureter, or bladder. Similarly, albuminuria, if persistent or recurrent, including orthostatic albuminuria, disqualifies an applicant for the military service. The FAA rejects applicants with these ailments if the condition is expected to interfere with job performance within two years.

Candidates applying for the position of air traffic controller or flight instructor do not qualify under either FAA or military standards if there is any evidence of heart disease or a heart defect (Table C-31) that is expected to interfere with the safe performance of duties. In addition, the military services reject applicants with a history of rheumatic fever within the previous five years, evidence of chorea within the past two years, or recurrent attacks of chorea. The FAA does not specify requirements for applicants who have suffered attacks of chorea or rheumatic fever.

Both the FAA and the military services reject applicants with a history or clinical diagnosis of epilepsy (Table C-32). The FAA also disqualifies the applicants who have experienced any unexplained disturbance of consciousness or any convulsive disorder or other condition that is expected to interfere with job performance within two years. The military services disqualify all applicants who have suffered any disturbance of consciousness or convulsive disorder. Military regulations require that applicants who have suffered unconsciousness from depressed fractures of two hours or more in duration, penetrating injuries, amnesia lasting several hours, prolonged unconsciousness, neurological findings, or craniotomy must serve one year of ground duty in the military services.

Chronic eczema or other skin disorder that is unresponsive to treatment or a history or diagnosis of any chronic skin disorder that severely disfigures the skin disqualifies the applicant under military standards (Table C-33). The FAA does not specify skin conditions as grounds for rejecting applicants.

Applicants with asthma, emphysema, bronchitis, and bronchiectasis are not accepted by the military services (Table C-34). Any evidence of active tuberculosis, a past history of tuberculosis within the last two years, or a history of one or more relapses of tuberculosis also disqualifies the applicant. The FAA rejects applicants with any disease that may be expected to make them unable to perform their duties within the next two years.

An applicant with venereal disease (Table C-34) is not considered to be medically acceptable by the military services until the condition has been effectively treated with no evidence of recurrence or complications for one year. The FAA does not specify any guidelines for applicants with venereal disease, except that they do not consider an applicant to be medically acceptable if a condition exists that may be expected to interfere with job performance within two years.

Standards for tumors (Table C-35) do not differ significantly between the U.S. armed services and the civilian sector.

AIRCRAFT SUPPORT CREW: REQUIREMENTS OF THE U.S. ARMED SERVICES AND PRIVATE AIRLINE COMPANIES*

The distant and near visual acuity (Table C-36) required by the military services is as rigorous as or more rigorous than that required in the civilian sector. The military and five of the airline companies require distant acuity correctable to 20/20 in each eye. Specifications of the other airline companies vary from a corrected vision of 20/30 for each eye to 20/50 for the better eye only. For near vision, the military services require aircraft support crew to have corrected visual acuity of 20/20 in each eye. Specifications of the private airlines range from visual acuity correctable to 20/30 in each eye, to visual acuity correctable to 20/40 for both eyes combined.

For hearing loss (Table C-37), the requirements set by most of the airline companies are more restrictive than those set by the military.

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*Class 3 medical standards apply to those "who participate in regular and frequent aerial flights as . . . nonrated personnel not engaged in the actual control of aircraft, such as . . . aircraft mechanics" (Army Regulation 40-501, p. 4-1).

Both the military and most airlines disqualify applicants with a history of diabetes, heart disease, or epilepsy (Tables C-38, C-39, and C-40).

In other areas of concern--height and weight, the gastrointestinal system, tumors, blood and blood-forming tissue diseases, endocrine and metabolic disorders, the extremities and the musculoskeletal system, the urinary system, skin and cellular tissue diseases, and respiratory and contagious diseases--the armed services set specific standards, whereas the airlines either provide general standards (rejecting those conditions likely to interfere with job performance) or set no standards at all (Tables C-39, C-41, C-42, C-43, C-44, C-45, C-46, and C-47).

Standards for blood pressure and the urinary system do not differ significantly between the military and civilian sectors (Tables C-48 and C-49).

Table C-1

BLOOD PRESSURE: INTERNATIONAL COMPARISONS

Country	Age Group	Systolic (maximum)	Diastolic (maximum)
U.S. military services	35 & under Over 35	90-139 90-149	60-90 60-90
Great Britain	Range according to age	105-160 (160 mm Hg is acceptable if diastolic is between 70 and 90 and there is no evidence of cardiovascular or renal disease.)	60-109 (110 mm Hg is rejected but a consultant's opinion is required. Further investigation is also required when the diastolic reading is 100 mm Hg or over.)
Canada	All ages	150 (If the applicant is of less than normal size and has a history of vertigo or syncope, he may be disqualified if the systolic reading is less than 100 or the diastolic is less than 60.)	90 (If the applicant is of less than normal size and has a history of vertigo or syncope, he may be disqualified if the systolic reading is less than 100 or the diastolic is less than 60.)
Australia	Under 20 20-35 35 or over	100-130 100-140 100-150	60-90 60-90 60-90
France, except Army aviation	All ages	150 (Readings greater than these may be accepted if no visceral sounds or functional trouble is found.)	90 (Readings greater than these may be accepted if no visceral sounds or functional trouble is found.)
France, Army aviation	Less than 25 Over 25	150 160	90 90

Table C-2

HEIGHT AND WEIGHT: INTERNATIONAL COMPARISONS

		Weight						
		Minimum	Maximum					
Country	Height	All Ages	16-20 Years	21-24 Years	26-30 Years	31-35 Years	36-40 Years	41 Years and Over
United States	5'0"	100	137	143	146	148	151	152
	5'2"	103	147	153	156	158	160	161
	5'4"	105	156	162	165	167	169	170
	5'6"	107	165	171	173	175	177	178
	5'8"	115	173	179	182	184	186	187
	5'10"	123	180	186	189	191	193	194
	6'0"	131	187	193	196	198	200	201
	6'2"	139	193	199	202	204	206	207
	6'4"	147	198	204	207	209	211	212
Pilots	5'4"-6'4"							
Aircrew and aircraft support crew	5'2"-6'4"							
Great Britain	Obesity is defined to exist when the applicant is 25 percent or more over the accepted average for height and age. Acceptance is based on a diagnosis of an abnormality such as hypertension or endocrine disorder. For some trades such as aircraft mechanics or engineers where endurance is necessary and dexterity and obesity or loss of mobility affects job performance, the applicant is disqualified if he is overweight.							
Canada	5'2"	114	152					
	5'4"	119	161					
	5'6"	127	171					
	6'0"	150	202					
	6'2"	159	213					
	6'4"	169	225					
		Applicants who fall out of the above ranges are acceptable if the deviation is due to a small or large frame. The above standards are not applied rigidly.						
Australia	5'4"	114-154						
	5'6"	120-162						
	6'0"	141-191						
	6'2"	148-201						
	6'4"	153-207						
France	5'1"	Applicants who are 17-19 years of age and have not achieved full growth are acceptable if they are 5'0" or over. Simple and nonexcessive obesity is permissible if there are no accompanying symptoms of disease or defects. Applicants must be robust enough to undertake most employments in the services.						

Table C-3

NEUROLOGICAL DISORDERS: INTERNATIONAL COMPARISONS

Country	Condition
	Epilepsy
United States, Great Britain, Canada, Australia, France	A history or clinical diagnosis of epilepsy, disturbance of consciousness or convulsive disorder disqualifies the applicant.
	Other Disorders
United States	
Inexperienced pilots	A craniocerebral injury, followed by unconsciousness of greater than two hours in duration, amnesia of greater than four hours, craniotomy, or migraines disqualify the applicant.
Experienced pilots, aircrew, and aircraft support crew	Unconsciousness from depressed fractures of two hours in duration or multiple episodes of two hours in combined duration disqualifies the applicant. A craniocerebral injury requires that the applicant serve one year of ground duty.
Great Britain	A history of severe head injury, depending on the duration of the memory defect and period of loss of consciousness disqualifies the applicant. A single attack of migraines disqualifies the applicant.
France	A history or clinical diagnosis of epilepsy, disturbance of consciousness, or convulsive disorder disqualifies the applicant.

Table C-4

RESPIRATORY AND CONTAGIOUS DISEASES: INTERNATIONAL COMPARISONS

Country	Condition
	Asthma, Emphysema, Bronchitis, and Bronchiectasis
United States	Asthma, emphysema, bronchitis, and bronchiectasis disqualify the applicant.
Canada, Australia, France	Severe asthma or hay fever or emphysema disqualifies the applicant. Applicants with acute bronchitis are not acceptable until it is apparent that recovery will occur without disqualifying sequlae. Chronic bronchitis, emphysema, and bronchiectasis disqualify the applicant.
Great Britain	A history of asthma or hay fever disqualifies an applicant for flying duty. Ground duty applicants are assessed in light of the frequency of attacks and controllability of the condition. A history of bronchitis disqualifies the applicant unless he has been free from infection since puberty. A single mild attack of bronchitis does not disqualify the applicant. Chronic bronchitis, emphysema, and bronchiectasis disqualify the applicant.
	Venereal Disease
United States	Venereal disease disqualifies the applicant until effectively treated with no evidence of recurrence or complications for one year.
Great Britain, Australia	Venereal disease disqualifies the applicant until effective treatment has cured the condition.
Canada	Applicants with primary or secondary syphilis are not acceptable until six months after the date of effective treatment. Applicants with acute gonorrhea are not acceptable until the condition has been effectively treated.
France	Venereal disease does not disqualify the applicant if it is expected that the condition will respond to treatment.

Table C-5

GASTROINTESTINAL SYSTEM: INTERNATIONAL COMPARISONS

Country	Condition
	Hernias
United States	Hernias of any variety, except small umbilical, disqualify the applicant.
Great Britain, Australia	Hernias disqualify the applicant until the condition has been corrected.
Canada	Hernias, other than small asymptomatic or hiatal, disqualify the applicant.
France	Minor, reducible inguinal hernias do not disqualify the applicant.
	Ulcers
United States	
Inexperienced pilots	Ulcers or a past history of ulcers disqualifies the applicant.
Experienced pilots, aircrew, and aircraft support crew	Applicants with ulcers or a past history of ulcers are not acceptable until reviewed by the Surgeon General.
Great Britain	
Aircraft support crew	Ulcers that are expected to be incapacitating disqualify the applicant. Applicants with a history of ulcers who have not had any symptoms for one year are acceptable.
Canada	A history of a gastric or duodenal ulcer within the past two years disqualifies the applicant as does a surgical procedure for gastric or duodenal ulcers.
Australia	Ulcers or a past history of ulcers disqualifies the applicant.
France	Active ulcers disqualify the applicant.

Table C-6

VISION: INTERNATIONAL COMPARISONS

Country	Distant Vision		Near Vision	
	Corrected	Uncorrected	Corrected	Uncorrected
Inexperienced Pilots				
United States		20/20 (each eye)	Myopia: -.25 diopters Astigmatism: .75 diopters	20/20 (each eye)
Great Britain	20/20 (each eye)	20/30 (each eye)	Hypermetropia: 2.25 diopters Astigmatism: -, ± 1.5 diopters	
Canada		20/20 (better eye) 20/30 (other eye)		
Australia		20/20 (each eye)	No myopia allowed Hypermetropia: 1.75 diopters Astigmatism: .75 diopters	
France		20/20 (each eye)	No myopia allowed Hypermetropia: 1.50 diopters Astigmatism: .75 diopters	
Experienced Pilots				
United States	20/20 (each eye)	20/100 (each eye)	20/20 (each eye)	20/100 (each eye)
Great Britain	20/20 (each eye)	20/40 (each eye) If less than this, serving airmen are sent to a Medical Review Board	Hypermetropia: 2.25 diopters Astigmatism: -, + 1.50 diopters	
Canada	20/20 (better eye) 20/30 (other eye)	20/60 (both eyes) OR 20/40 (better eye) 20/100 (other eye)	Spherical correction: between -7 and +7 diopters	
Australia	20/30 (each eye)	20/40 (better eye) 20/80 (other eye)	Myopia: 1 diopter (better eye) Hypermetropia: 5.0 diopters (both eyes)	
France		20/20 (each eye)	No myopia allowed Hypermetropia: 5.0 diopters (both eyes) Astigmatism: .75 diopters	
Inexperienced Aircrew				
United States	20/20 (each eye)	20/200 (both eyes)	20/20 (each eye)	20/100 (both eyes)
Great Britain	20/20 (each eye)	20/40 (each eye)	Hypermetropia: 2.25 diopters Astigmatism: 1.5 diopters	
Canada	20/20 (better eye) 20/30 (other eye)	20/60 (each eye) OR 20/40 (better eye) 20/100 (other eye)		
Australia	20/20 (each eye)	20/40 (each eye)	No myopia allowed Hypermetropia: 2.25 diopters Astigmatism: .75 diopters	
France	20/20 (each eye)	20/25 (each eye)	Hypermetropia: 2.50 diopters	

Table C-6--continued

Country	Distant Vision		Near Vision	
	Corrected	Uncorrected	Corrected	Uncorrected
		Experienced Aircrew		
United States	20/20 (each eye)	20/100 (both eyes)	20/20 (each eye)	20/100 (both eyes)
Great Britain	20/20 (each eye)	20/60 (each eye)	Hypermetropia: 2.25 diopters Astigmatism: 1.5 diopters	
Canada	20/30 (each eye)	20/200 (each eye)	Spherical correction: between -7 and +7 diopters	
Australia	20/30 (each eye)	20/40 (better eye) 20/80 (other eye)	Myopia: -1 diopter (both eyes) Hypermetropia: +5 diopters (both eyes)	
France	20/20 (each eye)	20/40 (each eye)		
		Inexperienced Air Traffic Controllers		
United States	20/20 (each eye)	20/100 (both eyes)	20/20 (each eye)	20/100 (each eye)
Great Britain	20/20 (each eye)	20/200 (each eye)	Spherical correction: between -7 and +8 diopters Astigmatism: 6 diopters	
Canada	20/20 (each eye)	20/60 (each eye) OR 20/40 (better eye) 20/100 (other eye)		
Australia	20/20 (each eye)	20/40 (each eye)	Astigmatism: 1 diopter Myopia: -1 diopter Hypermetropia: 2.5 diopters	
France	20/20 (each eye)	20/40 (each eye) OR 20/35 (better eye) 20/50 (other eye)	Myopia: 2 diopters Astigmatism: 1.5 diopters	
		Experienced Air Traffic Controllers		
United States	20/20 (each eye)	20/100 (both eyes)	20/20 (each eye)	20/100 (each eye)
Great Britain	20/30 (each eye)	20/200 (each eye)	Spherical correction: between -7 and +8 diopters Astigmatism: 6 diopters	
Canada	20/20 (better eye) 20/30 (other eye)	20/60 (each eye) OR 20/40 (better eye) 20/100 (other eye)	Spherical correction: between +7 and -7 diopters (better eye)	
Australia	20/30 (each eye)	20/200 (each eye)	Myopia: -4.0 diopters Hypermetropia: 5 diopters (both eyes)	
France	20/20 (each eye)	20/40 (each eye) OR 20/35 (better eye) 20/50 (other eye)	Myopia: 2 diopters Astigmatism: 1.5 diopters	
		Aircraft Support Crew		
United States	20/20 (each eye)	20/200 (each eye)	20/20 (each eye)	20/100 (each eye)
Great Britain	20/30 (each eye)	20/200 (each eye)	Spherical correction: between -7 and +8 diopters Astigmatism: 6 diopters	
Canada	20/30 (better eye) 20/200 (other eye)	20/200 (each eye)	Spherical correction: between -7 and +7 diopters (better eye)	
Australia	20/30 (each eye)	20/200 (each eye)	Myopia: -4.0 diopters Hypermetropia: 5 diopters (each eye)	
France	20/40 (each eye) OR 20/25 (both eyes)	20/65 (both eyes)		

Table C-7

HEARING: INTERNATIONAL COMPARISONS

(Standards of the International Standards Organization)

Country	Position	Cycles per Second	Acceptable Decibel Loss	
United States	Inexperienced pilots	500	30 db (each ear)	
		1000	25 db	
		2000	25 db	
		4000	45 db	
			Better Ear	Other Ear
	Experienced pilots	500	35 db	35 db
		1000	30 db	50 db
		2000	30 db	50 db
	Air traffic controllers	500	35 db	35 db
		1000	30 db	50 db
		2000	30 db	50 db
	Aircrew	500	35 db (better ear)	
		1000	30 db (better ear)	
		2000	50 db (better ear)	
	Aircraft support crew	500	35 db (better ear)	
		1000	50 db (better ear)	
		2000	50 db (better ear)	
Great Britain	Inexperienced pilots	Forced whisper must be heard at approximately 20 feet.		
	Experienced pilots	Forced whisper must be heard at approximately 20 feet.		
	Air traffic controllers	Forced whisper must be heard at approximately 20 feet.		
	Aircrew	Forced whisper must be heard at approximately 20 feet.		
	Aircraft support crew	Forced whisper must be heard at approximately 10 feet.		
Canada	Inexperienced pilots	500-3000 range	30 db (the applicant may not be deaf in one ear)	
	Experienced pilots	500-3000 range	30 db (the applicant may not be deaf in one ear)	
	Air traffic controllers	500-3000 range	30 db (the applicant may not be deaf in one ear)	
	Aircrew	500-3000 range	30 db (the applicant may not be deaf in one ear)	
	Aircraft support crew	500-2000 range	30 db (better ear)	

Table C-7--continued

Country	Position	Cycles per Second	Acceptable Decibel Loss
Australia	Inexperienced pilots	500	25 db
		1000	25 db
		2000	25 db
		4000	25 db
	Experienced pilots	500	35 db
		1000	35 db
		2000	35 db
		4000	50 db
	Experienced air traffic controllers	500	35 db
		1000	35 db
		2000	35 db
		4000	50 db
	Inexperienced air traffic controllers	500	25 db
		1000	25 db
		2000	25 db
		4000	25 db
	Experienced aircrew and aircraft support crew	500	35 db
		1000	35 db
		2000	35 db
		4000	50 db
	Inexperienced aircrew and aircraft support	500	25 db
		1000	25 db
		2000	25 db
		4000	25 db
France	Inexperienced pilots	250	30 db
		500	30 db
		1000	30 db
		2000	30 db
		3000	40 db
		4000	50 db
	Experienced pilots	250	40 db
		500	40 db
		1000	40 db
		2000	40 db
		3000	50 db
		4000	60 db
	Air traffic controllers	250	30 db
		500	30 db
		1000	30 db
		2000	30 db
		3000	40 db
		4000	50 db
	Experienced aircrew and aircraft support crew	250	40 db
		500	40 db
		1000	40 db
		2000	40 db
		3000	50 db
		4000	60 db
	Inexperienced aircrew and aircraft support crew	250	30 db
		500	30 db
		1000	30 db
		3000	40 db
		4000	50 db

Table C-8

VISION: PILOTS

Organization	Distant Vision		Near Vision	
	Corrected	Uncorrected	Corrected	Uncorrected
U.S. armed services		20/20 (each eye)		20/20 (each eye)
Commercial airlines	20/20 (each eye)	20/100 (each eye)	20/40 (each eye)	
County of Los Angeles (helicopter)	20/20 (both eyes)	20/100 (both eyes)	20/40 (both eyes)	

Table C-9

HEARING: PILOTS

(Standards of the International Standards Organization)

Organization	Cycles per Second	Acceptable Decibel Loss
U.S. armed services	500	30
	1000	25
	2000	25
	4000	45
Commercial airlines	500	25
	1000	25
	2000	25
County of Los Angeles (helicopter)	500	(Sum of loss in 3 frequencies must not exceed 100 db.)
	1000	
	2000	

Table C-10

BLOOD PRESSURE: PILOTS

Organization	Age Group	Systolic (Range)	Diastolic (Range)	Systolic (Maximum)	Diastolic (Maximum)
U.S. armed services	35 & under	90-139	60-90		
	Over 35	90-149	60-90		
Commercial airlines	20-29			140	88
	30-39			145	92
	40-49			155	96
	50 & over			160	98
	Applicants over 35 years of age whose cardiac and kidney conditions are normal are acceptable if their readings are not over:				
	30-39			155	98
	40-49			165	100
	Over 50			170	100
County of Los Angeles (helicopter)	Under 35			150	90
	Over 35			160	100

Table C-11

HEIGHT AND WEIGHT: PILOTS

Organization	Height	Weight						
		Minimum	Maximum					
		All Ages	16-20 Years	21-24 Years	26-30 Years	31-35 Years	36-40 Years	41 Years and Over
U.S. armed services	5'4"	105	156	162	165	167	169	170
	5'6"	107	165	171	173	175	177	178
	5'8"	115	173	179	182	184	186	187
	5'10"	123	180	186	189	191	193	194
	6'0"	131	187	193	196	198	200	201
	6'2"	139	193	199	202	204	206	207
	6'4"	147	198	204	207	209	211	212
Commercial airlines	Any defect or limitation that is expected to make the applicant unable to safely perform his duties disqualifies him.							
County of Los Angeles (helicopter)	5'7"	135-168						
	6'0"	160-197						
	6'2"	170-209						
	6'4"	180-221						
	6'6"	190-233						
	6'7"	195-239						

Table C-12

GASTROINTESTINAL SYSTEM: PILOTS

Organization	Hernias	Hemorrhoids	Ulcers
U.S. armed services	Hernias of any variety, except small umbilical, disqualify the applicant.	External hemorrhoids producing marked symptoms or internal hemorrhoids, if large or accompanied by hemorrhage or protruding, disqualify the applicant.	Ulcers or a history of ulcers disqualifies the applicant.
Commercial airlines	Any defect that may be expected to interfere with job performance within two years disqualifies the applicant.	Any defect that may be expected to interfere with job performance within two years disqualifies the applicant.	Any disease or defect that may be expected to interfere with job performance within two years disqualifies the applicant.
County of Los Angeles (helicopter)	Hernias that interfere with job performance disqualify the applicant.	Any defect that may be expected to cause unusual periods of absence disqualifies the applicant.	Any disease or defect that may be expected to cause unusual periods of absence disqualifies the applicant.

Table C-13

TUMORS: PILOTS

Organization	Tumors
U.S. armed services	Malignant tumors, even though removed, disqualify the applicant. Benign tumors that are likely to enlarge or interfere with job performance disqualify the applicant.
Commercial airlines	Any disease or defect that may be expected to interfere with job performance within two years disqualifies the applicant.
County of Los Angeles (helicopter)	Malignant tumors that have been successfully treated with no evidence of recurrence for five years do not disqualify the applicant.

Table C-14

BLOOD AND BLOOD-FORMING TISSUE DISEASES: PILOTS

Organization	Anemia	Sickle Cell
U.S. armed services	Anemia, including deficiency anemia that is not controlled by medication, disqualifies the applicant.	Sickle cell trait or sickle cell disease disqualifies the applicant.
Commercial airlines	Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.	Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.
County of Los Angeles (helicopter)	Any chronic condition that may be expected to cause unusual periods of absence disqualifies the applicant.	Sickle cell disease disqualifies the applicant.

Table C-15

ENDOCRINE AND METABOLIC DISORDERS: PILOTS

Organization	Diabetes
U.S. armed services	Diabetes insipidus and diabetes mellitus disqualify the applicant.
Commercial airlines	A history or clinical diagnosis of diabetes mellitus that requires medication for control disqualifies the applicant.
County of Los Angeles (helicopter)	Diabetes mellitus disqualifies the applicant.

Table C-16

EXTREMITIES AND THE MUSCULOSKELETAL SYSTEM: PILOTS

Organization	Extremities	Joints	Bones	Muscle	Spine
U.S. armed services	Absence of a limb or less than full strength and range of motion disqualifies the applicant. Absence of greater than 1/3 of the distal phalanx of the thumb disqualifies the applicant. Absence of the distal and middle phalanx of the index, middle or ring fingers disqualifies the applicant. Absence of more than the distal phalanx of two fingers (index, middle or ring) disqualifies the applicant. A shortening of a lower extremity resulting in a noticeable limp disqualifies the applicant.	Any disease or defect of the joint that results in less than full strength and range of motion disqualifies the applicant. Active or subacute arthritis, traumatic arthritis of a major joint or rheumatoid arthritis disqualifies the applicant.	A clinical diagnosis or history of osteomyelitis, unless successfully treated without recurrence for two years, disqualifies the applicant. Chronic osteoarthritis disqualifies the applicant.	Muscular atrophies and dystrophies disqualify the applicant if progressive or of sufficient degree to interfere with military service.	Any disease or injury of the spine that has prevented the following of a physically active vocation in the civilian sector disqualifies the applicant.
Commercial airlines	Any disease, defect or limitation that may be expected to make the applicant unable to safely perform his duties within two years disqualifies him.	Any disease, defect or limitation that may be expected to make the applicant unable to safely perform his duties within two years disqualifies him.	Any disease or defect that may be expected to interfere with job performance within two years disqualifies the applicant.	Any disease or defect that may be expected to interfere with the safe performance of duties disqualifies the applicant.	Any disease, defect or limitation that may be expected to interfere with job performance within two years disqualifies the applicant.
County of Los Angeles (helicopter)	Applicants with physically limiting conditions that are compatible with the demands of a job are acceptable.	Applicants with physically limiting conditions that are compatible with the demands of a job are acceptable.	Applicants with physically limiting, but not disabling conditions that are compatible with the demands of a job are acceptable.	Applicants with physically limiting, but not disabling conditions that are compatible with the demands of a job are acceptable.	Applicants with physically limiting, but not disabling conditions that are compatible with the demands of a job are acceptable.

Table C-17

URINARY SYSTEM: PILOTS

Organization	Kidney Disease	Albuminuria
U.S. armed services	Absence or acute chronic infection of a kidney disqualifies the applicant. A history or clinical diagnosis of renal calculus disqualifies the applicant. Applicants with a history of a single unilateral attack of renal calculus are acceptable if no congenital or acquired anomaly is found, renal function is normal, and there is no evidence of concretion in the kidney, ureter, or bladder.	Albuminuria, if persistent or recurrent, including orthostatic albuminuria, disqualifies the applicant.
Commercial airlines	Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.	Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.
County of Los Angeles (helicopter)	Any chronic disease or its complications that may be expected to cause unusual periods of absence disqualifies the applicant.	Any disease or its complications that may be expected to cause unusual periods of absence disqualifies the applicant.

Table C-18

HEART AND VASCULAR SYSTEM: PILOTS

Organization	Heart and Vascular Diseases	Rheumatic Fever and Chorea
U.S. armed services	The following conditions disqualify the applicant: All organic valvular diseases of the heart including those improved by surgery. Coronary artery disease or myocardial infarction, old or recent, or angina pectoris at any time. History of finding of pericarditis, endocarditis, or myocarditis. Hypertrophy or dialation of the heart. Tachycardia, persistent, with a resting pulse rate of 100 or more regardless of cause. Congenital or acquired lesions of the aorta and major vessels. Vascular heart disease.	A history of rheumatic fever within the previous five years disqualifies the applicant. Evidence of chorea within the past two years, or evidence of recurrent attacks, disqualifies the applicant.
Commercial airlines	A history or diagnosis of myocardial infarction or angina pectoris or other evidence of coronary heart disease disqualifies the applicant. Any organic, functional or structural disease, defect or limitation that may be expected to make the applicant unable to safely perform his duties within two years disqualifies him.	No specific requirements.
County of Los Angeles (helicopter)	Any history of heart disease disqualifies the applicant.	No specific requirements.

Table C-19

NEUROLOGICAL DISORDERS: PILOTS

Organization	Epileptic and Other Seizures
U.S. armed services	A medical history or clinical diagnosis of epilepsy, disturbance of consciousness, convulsive disorder or any degenerative disorder, disqualifies the applicant. A craniocerebral injury, followed by unconsciousness of greater than two hours duration, amnesia of greater than four hours in duration, craniotomy or migraines disqualify the applicant.
Commercial airlines	An established medical history or clinical diagnosis of epilepsy, or an unexplained disturbance of consciousness disqualifies the applicant. Any convulsive disorder, disturbance of consciousness, or neurological condition that is expected to interfere with job performance within two years disqualifies the applicant.
County of Los Angeles (helicopter)	Convulsive seizures disqualify the applicant.

Table C-20

SKIN AND CELLULAR TISSUE DISEASES: PILOTS

Organization	Skin Disease
U.S. armed services	Chronic eczema that is unresponsive to treatment or a history or diagnosis of psoriasis or any chronic skin disorder that severely disfigures the skin disqualifies the applicant.
Commercial airlines	No specific requirements.
County of Los Angeles (helicopter)	Any defect that may be expected to cause unusual periods of absence disqualifies the applicant.

Table C-21

RESPIRATORY AND CONTAGIOUS DISEASES: PILOTS

Organization	Asthma, Emphysema, Bronchitis, and Bronchiectasis	Tuberculosis	Venereal Disease
U.S. armed services	Asthma, bronchitis, bronchiectasis, and emphysema disqualifies the applicant.	Tuberculosis, active at any time within the past two years, or a history of of one or more relapses of pulmonary tuberculosis disqualifies the applicant.	Venereal disease disqualifies the applicant until the condition has been effectively treated with no evidence of recurrence or complications for one year.
Commercial airlines	Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.	Any disease that is expected to interfere with job performance within two years disqualifies the applicant.	Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.
County of Los Angeles (helicopter)	Emphysema or asthma of sufficient degree to interfere with job performance disqualifies the applicant. Any chronic disease or its complications that may be expected to cause unusual periods of illness disqualifies the applicant.	A history of tuberculosis does not disqualify the applicant if the disease is inactive.	Any acute infectious disease disqualifies the applicant until the condition has been cleared up.

Table C-22

VISION: CONTROLLERS AND FLIGHT INSTRUCTORS

	Distant Vision		Near Vision	
Organization	Corrected	Uncorrected	Corrected	Uncorrected
U.S. armed services	20/20 (each eye)	20/100 (each eye)	20/20 (each eye)	20/100 (each eye)
FAA	20/20 (each eye)	20/100 (each eye)	20/40 (better eye)	

Table C-23

HEARING: CONTROLLERS AND FLIGHT INSTRUCTORS

(Standards of the International Standards Organization)

		Acceptable Decibel Loss	
Organization	Cycles per Second	Better Ear	Other Ear
U.S. armed services	500	35	35
	1000	30	50
	2000	30	50
FAA	500	25	
	1000	25	
	2000	25	

Table C-24

BLOOD PRESSURE: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Age Group	Systolic (Range)	Diastolic (Range)
U.S. armed services	35 & under	90-139	60-90
	Over 35	90-149	60-90
FAA	Any defect or limitation that is expected to make the applicant unable to safely perform his duties disqualifies him.		

Table C-25

HEIGHT AND WEIGHT: CONTROLLERS AND FLIGHT INSTRUCTORS

		Weight						
			Maximum					
Organization	Height	Minimum All Ages	16-20 Years	21-24 Years	26-30 Years	31-35 Years	36-40 Years	41 Years and Over
U.S. armed services	5'0"	100	137	143	146	148	151	152
	5'2"	103	147	153	156	158	160	161
	5'6"	107	165	171	173	175	177	178
	6'0"	131	187	193	196	198	200	201
	6'2"	139	193	199	202	204	206	207
	6'4"	147	198	204	207	209	211	212
FAA	Any defect or limitation that is expected to make the applicant unable to safely perform his duties disqualifies him.							

Table C-26

GASTROINTESTINAL SYSTEM: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Hernias	Hemorrhoids	Ulcers
U.S. armed services	Hernias of any variety, other than small umbilical, disqualify the applicant.	External hemorrhoids producing marked symptoms or internal hemorrhoids, if large or accompanied by hemorrhage or protruding, disqualify the applicant.	Applicants with ulcers or past surgical operations for ulcers are not acceptable until reviewed by the Surgeon General.
FAA	Applicants with any defect that may be expected to make them unable to perform their duties within two years are not acceptable.	Applicants with any defect that may be expected to make them unable to perform their duties within two years are not acceptable.	Applicants with any disease or defect that may be expected to make them unable to perform their duties within two years are not acceptable.

Table C-27

BLOOD AND BLOOD-FORMING TISSUE DISEASES: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Anemia
U.S. armed services	Anemia, including deficiency anemia that is not controlled by medication, disqualifies the applicant. Sickle cell trait or sickle cell disease disqualifies the applicant.
FAA	Applicants with any defect or disease that may be expected to make them unable to perform their duties within two years are not acceptable.

Table C-28

ENDOCRINE AND METABOLIC DISORDERS: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Diabetes
U.S. armed services	Diabetes insipidus and diabetes mellitus disqualify the applicant.
FAA	Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.

Table C-29

EXTREMITIES AND THE MUSCULOSKELETAL SYSTEM: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Extremities	Joints	Bones	Muscles	Spine
U.S. armed services	Absence of a limb or any limitation of motion that might compromise flying safety disqualifies the applicant. Absence of greater than 1/3 of the distal phalanx of the thumb disqualifies the applicant. Absence of the distal and middle phalanx of the index, middle or ring fingers disqualifies the applicant. Absence of more than the distal phalanx of two fingers (index, middle or ring) disqualifies the applicant. A shortening of a lower extremity resulting in a noticeable limp disqualifies the applicant.	Any disease or defect of the joint that results in less than full strength and range of motion disqualifies the applicant. Active or subacute arthritis, traumatic arthritis of a major joint or rheumatoid arthritis disqualifies the applicant.	A clinical diagnosis or history of osteomyelitis, unless successfully treated without recurrence for two years, disqualifies the applicant. Chronic osteoarthritis disqualifies the applicant.	Muscular atrophies and dystrophies disqualify the applicant if progressive or of sufficient degree to interfere with military service.	Any disease or injury of the spine that has prevented the following of a physically active vocation in the civilian sector disqualifies the applicant.
FAA	Any disease, defect or limitation that may be expected to make the applicant unable to safely perform his duties within two years disqualifies him.	Any disease, defect or limitation that may be expected to make the applicant unable to safely perform duties within two years disqualifies him.	Any disease or defect that may be expected to interfere with job performance within two years disqualifies the applicant.	Any disease, defect or limitation that may be expected to interfere with job performance within two years disqualifies the applicant.	Any disease, defect or limitation that may be expected to interfere with job performance within two years disqualifies the applicant.

Table C-30

URINARY SYSTEM: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Kidney Disease	Albuminuria
U.S. armed services	Absence or acute chronic infection of a kidney disqualifies the applicant. A history or clinical diagnosis of renal calculus disqualifies the applicant unless no congenital or acquired anomaly is found, renal function is normal and there is no evidence of concretion in the kidney, ureter, or bladder.	Albuminuria, if persistent or recurrent, including orthostatic albuminuria, disqualifies the applicant.
FAA	Any disease or defect that may be expected to interfere with job performance within two years disqualifies the applicant.	Any disease or defect that may be expected to interfere with job performance within two years disqualifies the applicant.

Table C-31

HEART AND VASCULAR SYSTEM: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Heart and Vascular Diseases	Rheumatic Fever and Chorea
U.S. armed services	The following conditions disqualify the applicant: All organic valvular diseases of the heart including those improved by surgery. Coronary artery disease or myocardial infarction, old or recent, or angina pectoris at any time. History or finding of pericarditis, endocarditis or myocarditis. Hypertrophy or dialation of the heart. Tachycardia, persistent, with a resting pulse rate of 100 or more regardless of cause. Congenital or acquired lesions of the aorta and major vessels. Peripheral vascular disease.	A history of rheumatic fever within the previous five years disqualifies the applicant. Evidence of chorea within the past two years, or evidence of recurrent attacks, disqualifies the applicant.
FAA	A history or diagnosis of myocardial infarction or angina pectoris or other evidence of coronary heart disease disqualifies the applicant. Any organic, functional or structural disease, defect or limitation that may be expected to interfere with job performance within two years disqualifies the applicant.	No specific requirements.

Table C-32

NEUROLOGICAL DISORDERS: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Epileptic and Other Seizures
U.S. armed services	A history or clinical diagnosis of epilepsy, disturbance of consciousness or convulsive disorder disqualifies the applicant. Unconsciousness from depressed fractures of two hours or more in duration or multiple episodes of less than two hours in duration, penetrating injuries, amnesia lasting several hours, prolonged unconsciousness, neurological findings or a craniotomy will require that the applicant serve one year of ground duty.
FAA	An established medical history or clinical diagnosis of epilepsy or an unexplained disturbance of consciousness disqualifies the applicant. Any convulsive disorder, disturbance of consciousness, or neurologic condition that is expected to interfere with job performance within two years disqualifies the applicant.

Table C-33

SKIN AND CELLULAR TISSUE DISEASES: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Skin Disease
U.S. armed services	Chronic eczema that is unresponsive to treatment or a history of diagnosis of psoriasis or any chronic skin disorder that severely disfigures the skin disqualifies the applicant.
FAA	No specific requirements.

Table C-34

RESPIRATORY AND CONTAGIOUS DISEASES: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Asthma, Emphysema, Bronchitis, and Bronchiectasis	Tuberculosis	Venereal Disease
U.S. armed services	Asthma, bronchitis, bronchiectasis, and emphysema disqualify the applicant.	Tuberculosis, active at any time within the past two years, or a history of one or more relapses of pulmonary tuberculosis disqualifies the applicant.	Venereal disease disqualifies the applicant until effectively treated with no evidence of recurrence or complications for one year.
FAA	Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.	Any disease that may be expected to interfere with job performance disqualifies the applicant.	Any disease that may be expected to interfere with job performance disqualifies the applicant.

Table C-35

TUMORS: CONTROLLERS AND FLIGHT INSTRUCTORS

Organization	Tumors
U.S. armed services	Applicants with malignant or benign tumors are not acceptable until reviewed by the Surgeon General.
FAA	Applicants with any disease that may be expected to make them unable to perform their duties within two years are not acceptable.

Table C-36

VISION: SUPPORT CREW

Organization	Distant Vision		Near Vision	
	Corrected	Uncorrected	Corrected	Uncorrected
U.S. armed services	20/20 (each eye)	20/200 (each eye)	20/20 (each eye)	20/100 (each eye)
Commercial airlines				
(A)	20/30 (each eye)	20/200 (each eye)	20/40 (each eye)	
(B)	20/30 (both eyes)	20/100 (both eyes)	20/30 (both eyes)	
(C)	20/20 (each eye)	20/100 (each eye)	20/40 (both eyes)	
(D)	20/20 (each eye)	20/100 (each eye)	20/40 (both eyes)	
(E)	20/20 (each eye)	20/100 (each eye)	20/40 (both eyes)	
(F)	20/20 (each eye)	20/100 (each eye)	20/40 (both eyes)	
(G)	20/20 (each eye)	If these requirements are not met, acceptance is based on the acuity required for a specific job.	20/30 (each eye)	
(H)	20/30 (each eye) OR 20/50 (each eye)		No specific requirement.	
(I)	20/30 (better eye) 20/50 (other eye)		20/40 (both eyes)	

Table C-37

HEARING: SUPPORT CREW

(Standards of the International Standards Organization)

Organization	Cycles per Second	Acceptable Decibel Loss
U.S. armed services	500	35 db (better ear)
	1000	30 db (better ear)
	2000	50 db (better ear)
Commercial airlines		
(A)	500	35 db
	1000	30 db
	2000	30 db
(B,C,D,E,F,I)	500	25 db
	1000	25 db
	2000	25 db
(G)		Applicants are evaluated individually in relation to job requirements.
(H)	500	Average loss for the three frequencies must not exceed 55 decibels for the better ear.
	1000	
	2000	

Table C-38

ENDOCRINE AND METABOLIC DISORDERS: SUPPORT CREW

Organization	Diabetes
U.S. armed services	Diabetes insipidus and diabetes mellitus disqualify the applicant.
Commercial airlines	
(A, B)	Diabetes disqualifies the applicant.
(C, D, E, F, H)	A history or clinical diagnosis of diabetes mellitus that requires medication for control disqualifies the applicant.
(G)	Diabetics are evaluated individually in relation to job requirements.
(I)	Diabetics who are well controlled and stable are acceptable.

Table C-39

HEART AND VASCULAR SYSTEM: SUPPORT CREW

Organization	Heart and Vascular Diseases	Rheumatic Fever and Chorea
U.S. armed services	The following conditions disqualify the applicant: All organic valvular diseases of the heart including those improved by surgery. Coronary artery disease or myocardial infarction, old or recent, or angina pectoris at any time. History or finding of pericarditis, endocarditis, or myocarditis. Hypertrophy or dialation of the heart. Tachycardia, persistent, with a resting pulse rate of 100 or more, regardless of cause. Congenital or acquired lesions of the aorta and major vessels. Peripheral vascular disease.	A history of rheumatic fever within the previous five years disqualifies the applicant. Evidence of chorea within the past two years, or evidence of recurrent attacks, disqualifies the applicant.
Commercial airlines	(A) The following conditions disqualify the applicant: Serious valvular disease of the heart. Angina pectoris or other evidence of coronary heart disease. Evidence of past or active pericarditis, endocarditis, or myocarditis. Hypertrophy or dialation of the heart. Vascular heart disease. (B) Congenital, organic, or vascular heart disease disqualifies the applicant if the condition is expected to interfere with job performance. (C, D, E, F, H) A history or diagnosis of myocardial infarction or angina pectoris or other evidence of coronary heart disease disqualifies the applicant. (G) A history of heart failure or coronary artery disease disqualifies the applicant. Congenital heart disease or rheumatic heart disease disqualifies the applicant unless the size of the heart is normal. (I) No specific requirements.	(G) A history of rheumatic fever with residual heart involvement disqualifies the applicant.

Table C-40

NEUROLOGICAL DISORDERS: SUPPORT CREW

Organization	Epileptic and Other Seizures
U.S. armed services	A history or clinical diagnosis of epilepsy, disturbance of consciousness, or convulsive disorder disqualifies the applicant. Unconsciousness from depressed fractures of two hours or more in duration or multiple episodes of less than two hours in duration, penetrating injuries, amnesia lasting several hours, prolonged unconsciousness, neurological findings, or a craniotomy will require that the applicant serve one year of ground duty.
Commercial airlines	(A, C, D, E, F, H, I) Epilepsy or a history of seizures or convulsions disqualifies the applicant. (B) Epileptics who are well controlled are acceptable. (G) Applicants with epilepsy are acceptable if they have been free of seizures for ten years.

Table C-41

HEIGHT AND WEIGHT: SUPPORT CREW

Organization	Height	Weight: Minimum All Ages	Weight: Maximum 16-20 Years	21-24 Years	25-30 Years	31-35 Years	36-40 Years	41 Years and Over
U.S. armed services	5'2"	103	147	153	156	158	160	161
	5'6"	107	165	171	173	175	177	178
	6'0"	131	187	193	196	198	200	201
	6'2"	139	193	199	202	204	206	207
	6'4"	147	198	204	207	209	211	212
Commercial airlines								
(A)		Obesity alone, unaccompanied by a disease or serious ailment, does not disqualify the applicant.						
(B, C, D, E, F, H)		Any defect or limitation that is expected to make the applicant unable to safely perform his duties disqualifies him.						

		Small Frame	Medium Frame	Large Frame
(G)	5'2"	150	161	176
	5'6"	166	179	195
	6'0"	197	212	230
	6'2"	209	225	242
	6'4"	219	237	255

		Maximum
(I)	5'2"	169
	5'6"	187
	6'0"	221
	6'2"	233
	6'4"	245

Table C-42

GASTROINTESTINAL SYSTEM: SUPPORT CREW

Organization	Hernias	Hemorrhoids	Ulcers
U.S. armed services	Hernias of any variety, other than small umbilical, disqualify the applicant.	External hemorrhoids producing marked symptoms or internal hemorrhoids, if large or accompanied by hemorrhage or protruding, disqualify the applicant.	Applicants with ulcers or past surgical operations for ulcers are not acceptable until reviewed by the Surgeon General.
Commercial airlines	(A, G, I) Hernias must be corrected before the applicant is accepted. (B) Hernias that are severe enough to interfere with job performance disqualify the applicant. (C, D, E, F, H) Any defect that may be expected to interfere with job performance within two years disqualifies the applicant.	(A) Hemorrhoids disqualify the applicant. (B) Hemorrhoids that are severe enough to interfere with job performance disqualify the applicant. (C, D, E, F, H) Any defect that may be expected to interfere with job performance within two years disqualifies the applicant. (G) Hemorrhoids that are asymptomatic do not disqualify the applicant. (I) No specific requirements.	(A, B, I) Ulcers that have healed do not disqualify the applicant. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant. (G) Ulcers, if successfully treated with no evidence of recurrence for two years, do not disqualify the applicant.

Table C-43

BLOOD AND BLOOD-FORMING TISSUE DISEASES: SUPPORT CREW

Organization	Anemia
U.S. armed services	Anemia, including deficiency anemia that is not controlled by medication, disqualifies the applicant. Sickle cell trait or sickle cell disease disqualifies the applicant.
Commercial airlines	
(A)	No specific requirements.
(B, G, I)	Anemia that is under control does not disqualify the applicant.
(C, D, E, F, H)	Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.

Table C-44

EXTREMITIES AND THE MUSCULOSKELETAL SYSTEM: SUPPORT CREW

Organization	Extremities	Joints	Bones	Muscles	Spine
U.S. armed services	Absence of a limb or limitation of motion that interferes with the performance of military duty disqualifies the applicant. Absence of greater than 1/3 of the distal phalanx of the thumb disqualifies the applicant. Absence of the distal and middle phalanx of the index, middle or ring fingers disqualifies the applicant. Absence of more than the distal phalanx of two fingers (index, middle or ring) disqualifies the applicant. A shortening of a lower extremity resulting in a noticeable limp disqualifies the applicant.	Any disease or defect of the joint that results in less than full strength and range of motion disqualifies the applicant. Active or subacute arthritis, traumatic arthritis of a major joint or rheumatoid arthritis disqualifies the applicant.	A clinical diagnosis or history of osteomyelitis, unless successfully treated without recurrence for two years, disqualifies the applicant. Chronic osteoarthritis disqualifies the applicant.	Muscular atrophies and dystrophies disqualify the applicant if progressive or of sufficient degree to interfere with military service.	Any disease or injury of the spine that has prevented the following of a physically active vocation in the civilian sector disqualifies the applicant.
Commercial airlines	(A, B, C, D, E, F, G, H, I) Limitation of motion, if sufficient to interfere with job performance, disqualifies the applicant.	(A, B, C, D, E, F, G, H, I) Limitation of motion or active disease of joints, if sufficient to interfere with job performance, disqualifies the applicant.	(A) Any active disease of the bone disqualifies the applicant. (B) Any disease of the bone that may be expected to interfere with job performance disqualifies the applicant. (C, D, E, F, H, I) Any disease or defect that may be expected to interfere with job performance within two years disqualifies the applicant. (G) Chronic osteomyelitis disqualifies the applicant.	(A) Atrophy of the muscles, if progressive, disqualifies the applicant. (B, G) Muscle atrophy disqualifies the applicant if the condition may be expected to interfere with job performance. (C, D, E, F, H) Any disease or defect that may be expected to interfere with job performance within two years disqualifies the applicant. (I) No specific requirements.	(A) A history or clinical diagnosis of intervertebral disc disorders disqualifies the applicant. (B, G) A spinal disease that is incapacitating disqualifies the applicant. Spinal abnormalities without symptoms are evaluated individually. (C, D, E, F, H) Any disease, defect or limitation that may be expected to interfere with job performance within two years disqualifies the applicant. (I) No specific requirements.

Table C-45

SKIN AND CELLULAR TISSUE DISEASES: SUPPORT CREW

Organization	Skin Disease
U.S. armed services	Chronic eczema that is unresponsive to treatment or a history or diagnosis of psoriasis or any chronic skin disorder that severely disfigures the skin disqualifies the applicant.
Commercial airlines	(A, B) A malignant skin disease or a skin disease requiring medical care disqualifies the applicant. Applicants with a chronic, noncontagious skin disease such as psoriasis are acceptable for positions where no public contact is required. (C, D, E, F, H) No specific requirements. (G) A history of eczema does not disqualify the applicant if he has been free of symptoms for five years. (I) Any serious chronic skin disease such as psoriasis or eczema disqualifies the applicant.

Table C-46

RESPIRATORY AND CONTAGIOUS DISEASES: SUPPORT CREW

Organization	Asthma, Emphysema, Bronchitis, and Bronchiectasis	Tuberculosis	Venereal Disease
U.S. armed services	Asthma, bronchitis, bronchiectasis, and emphysema disqualify the applicant.	Tuberculosis, active at any time within the past two years, or a history of one or more relapses of pulmonary tuberculosis disqualifies the applicant.	Venereal disease disqualifies the applicant until the condition has been cleared up.
Commercial airlines	(A) Bronchiectasis or any congenital defect interfering with the function of the lungs disqualifies the applicant. (B, I) Asthma, emphysema or bronchiectasis, if severe enough to cause excessive absenteeism, disqualifies the applicant. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant. (G) A history of asthma does not disqualify the applicant if the condition has not been present for five years. Acute bronchitis disqualifies the applicant until the condition has been cleared up. Emphysema and bronchiectasis disqualify the applicant.	(A, B, G, I) Active pulmonary tuberculosis disqualifies the applicant. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.	(A) Any acute or chronic infection that could result in incapacity disqualifies the applicant. (B, G, I) Any acute infection disqualifies the applicant until the condition has been treated and resolved. (C, D, E, F, H) Any disease that may be expected to interfere with job performance within two years disqualifies the applicant.

Table C-47

TUMORS: SUPPORT CREW

Organization	Tumors
U.S. armed services	Applicants with malignant or benign tumors are not acceptable until reviewed by the Surgeon General.
Commercial airlines	(A) Malignant tumors, or tumors that interfere with job performance disqualify the applicant. (B) Tumors disqualify the applicant unless they have been successfully corrected. (C, D, E, F, H) Any disease or defect that may be expected to make the applicant unable to perform his duties within two years disqualifies the applicant. (G) Malignant tumors even though successfully removed disqualify the applicant. Benign tumors that have been successfully treated do not disqualify the applicant. (I) Applicants with a history of malignant tumors are evaluated individually according to date of onset, location, and type of tumor. A history of benign tumors does not disqualify the applicant.

Table C-48

BLOOD PRESSURE: SUPPORT CREW

Organization	Age Group	Systolic (Maximum)	Diastolic (Maximum)
U.S. armed services	35 & under	90-139	60-90
	Over 35	90-149	60-90
Commercial airlines			
(A)	20-29	140	88
	30-39	145	92
	40-49	155	96
	50 & over	160	98
(B, G)	All ages	150	90
(C, D, E, F, H)	No specific requirements	No specific requirements	No specific requirements
(I)	Range according to age	110-140	70-90

Table C-49

URINARY SYSTEM: SUPPORT CREW

Organization	Kidney Disease	Albuminuria
U.S. armed services	Absence or acute, chronic infection of a kidney disqualifies the applicant. A history or clinical diagnosis of renal calculus disqualifies the applicant unless no congenital or acquired anomaly is found, renal function is normal, and there is no evidence of concretion in the kidney, ureter, or bladder.	Albuminuria, if persistent or recurrent, including orthostatic albuminuria, disqualifies the applicant.
Commercial airlines	(A, I) Any infection or chronic disease of the kidney disqualifies the applicant. (B) Chronic kidney disease or infection disqualifies the applicant. Absence of a kidney disqualifies the applicant. (C, D, E, F, H) Any disease which may be expected to interfere with job performance within two years disqualifies the applicant. (G) A history of kidney disease of a chronic or progressive nature disqualifies the applicant.	(A, B, G) Albuminuria disqualifies the applicant. (C, D, E, F, H) Any disease which may be expected to interfere with job performance within two years disqualifies the applicant. (I) Orthostatic albuminuria does not disqualify the applicant unless accompanied by a serious kidney disease.

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