Requirements and the Demographic Profile of the Eligible Population:

Weight Requirements and Rising and Differential Rates of Obesity

MLDC Research Areas

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This issue paper aims to aid in the deliberations of the MLDC. It does not contain the recommendations of the MLDC.

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Abstract

Increasing rates of obesity in the United States have decreased the share of the enlistment-age population that is eligible for military service. Although this trend applies to all ages and groups, women and minorities are more likely than men and whites to be overweight and obese. Similar trends are evident among actual military recruits, with women being less likely than men to meet weight requirements. Female minority recruits, especially black women, are the most likely to be affected by the military's current weight policies. Thus, if current trends in civilian obesity continue, the armed forces can expect to have fewer recruits who meet weight standards—a trend that will cut across both genders and all race and ethnicity groups. As a result of the observed gender and racial/ethnic differences in obesity rates, more women than men and more racial/ethnic minorities than whites will be ineligible to enlist because of weight restrictions. Although obesity is a national problem that has affected military accession, it is not clear that targeting weight and body fat standards alone will have a *significant* effect on the number of eligible minority recruits. Weight and other eligibility requirements are correlated. Thus, simply relaxing obesity standards will not result in a one-for-one increase in the number of eligible minority recruits because such recruits are likely to not meet other enlistment requirements. Still, lowering weight standards will have some positive effect on the size of the eligible recruitment pool.

In the MLDC issue paper titled "How Requirements Shape the Demographic Profile of the Eligible Population," we showed that many of the Services' eligibility requirements cause the demographic mix of the eligible population to differ from that of the U.S. population. In particular, weight requirements were shown to decrease eligibility rates for some groups, especially women.

Also, several of the Services' briefings to the MLDC indicated that a key recruiting concern is the decreasing rate of eligibility for military service among the recruiting-age population. Increasing U.S. obesity rates are a primary driver of this phenomenon.[1] Of the 14,000 Military Entrance Processing Command (MEPCOM) medical disqualifications among applicants for active-duty enlisted service in 2005, the most common reason for disqualification was exceeding weight/body fat limits, which accounted for about a quarter of all medical disqualifications (Accessions Medical Standards Analysis and Research Activity, 2008). According to a recent RAND report, "Approximately 25–35 percent of young adult men and 50–60 percent of young adult women, regardless of race or ethnicity, would fail the weight standards of at least one branch of service" (Asch et al., 2009). Particularly relevant to the MLDC is the fact that existing research indicates that women and minorities are disproportionately affected by the increasing rate of obesity among both children and adults.

This issue paper provides an overview of trends in the prevalence of obesity among adults and youths in the United States, focusing on racial/ethnic and gender differences in these trends. The issue paper concludes with a discussion of how trends in obesity have influenced the pool of eligible accessions and reviews possible interventions to increase the size of that pool.

How Is Obesity Measured?

Although weight standards vary by Service, each Service has a specific formula to deter-

mine gender-specific minimum and maximum weights for new recruits. In general, the Services use a combination of height, weight, and age to create these cutoffs. These standards are designed to reflect an individual's body fat composition.

For the general population, the body mass index (BMI) is considered a reliable indicator of body fat by the Centers for Disease Control and Prevention (CDC). BMI is calculated from height and weight.[2] Among adults, the CDC defines a BMI of less than 18.5 as underweight, a BMI between 18.5 and 24.9 as normal, a BMI between 25.0 and 29.9 as overweight, and a BMI of 30.0 or higher as obese. An additional category for BMIs of 40.0 and above, defined as extremely obese, is sometimes reported. These weight status categories are standard for men and women across all race and ethnicity groups and adult ages.

The CDC also uses BMI to designate obesity among children and teens between ages 2 and 19. BMI is plotted on the CDC's BMI-for-age growth charts to obtain a percentile ranking. The ranking indicates the relative position of a child's BMI among all children of the same sex and age. A BMI below the 5th percentile is considered underweight, a BMI between the 5th and 84th percentiles is considered normal, a BMI between the 85th and 94th percentiles is considered overweight, and a BMI at or above the 95th percentile is considered obese.

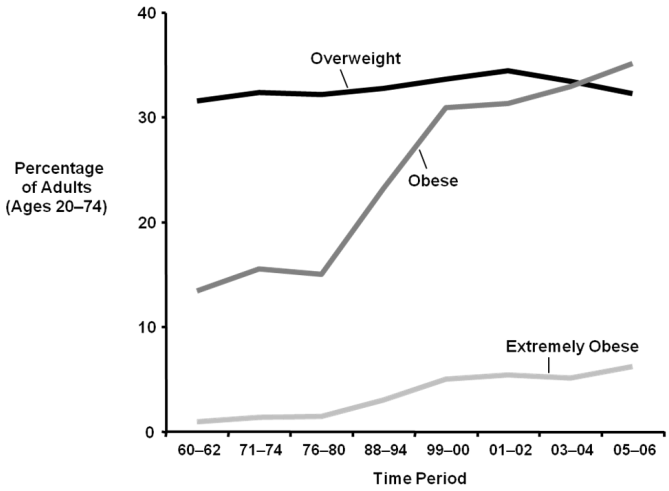
What Are the Trends in Adult Obesity?

The National Health and Nutrition Examination Survey (NHANES) is a nationally representative sample of the civilian, noninstitutionalized U.S. population. The survey routinely assesses the health and nutritional status of adults and children in the United States. Interviews are conducted in participants' homes, where standardized physical assessments, such as height and weight, are recorded. Figure 1 shows survey results for multiple years going back to the 1960–1962 round of data collection. Results from the 2005–2006 NHANES, the most recent available survey, show that, among adults ages 20 to 74, 32.2 percent of the population was overweight, 35.1 percent was obese, and 6.2 percent was extremely obese. Among these three weight categories, obesity experienced the most dramatic rise over the period covered.

Beyond the overall trends, we are interested in how those trends break out by gender and race/ethnicity; these data are shown in Figure 2. The rightward skewing of the lines in the figure shows that obesity rates are increasing for all groups. However, obesity rates among women are higher than they are among men, which is reflected in the fact that the lines for women always extend more to the right than those for men. According to the 2005–2006 NHANES, which is not shown in Figure 2, 33.3 percent of all men and 35.3 percent of all women over the age of 20 were obese.

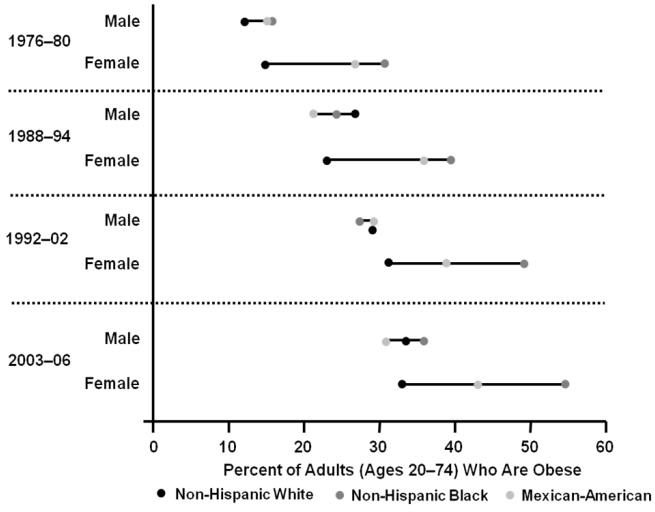
Obesity rates were also higher among minorities than whites. According to the 2003–2004 NHANES, 30.6 percent of non-Hispanic whites, 45.0 percent of non-Hispanic blacks, and 36.8 percent of Mexican Americans were obese (Ogden et al., 2006).[3] The prevalence of obesity among men did not differ significantly by race or ethnicity, but it did among women, as reflected in the short length of the male lines and the longer length of the female lines in Figure 2. Non-Hispanic white women had significantly lower obesity rates than non-Hispanic black and Mexican American women. This pattern is consistent over time: The rates for non-Hispanic white women were always lower than those for Mexican American women, which, in turn, were always lower than those for non-Hispanic black women.

Figure 1. Age-Adjusted Trends in Obesity Prevalence Among U.S. Adults, Ages 20–74



SOURCE: NHANES (National Health and Nutrition Examination Survey, various years).

Figure 2. Age-Adjusted Trends in Obesity Prevalence, by Gender and Race/Ethnicity, Among U.S. Adults, Ages 20–74



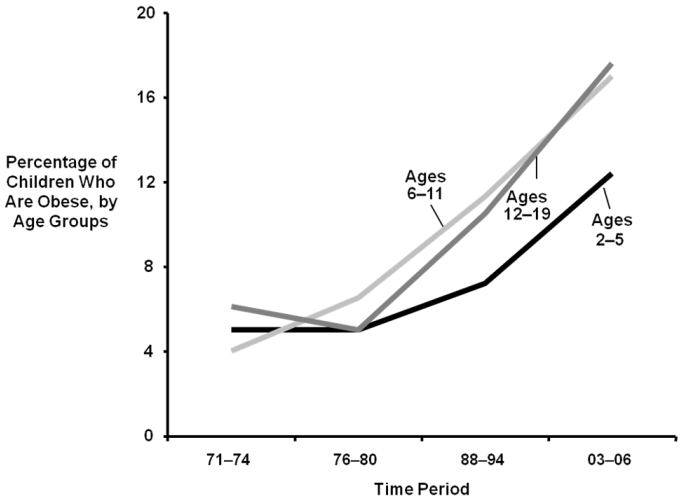
SOURCE: NHANES (National Health and Nutrition Examination Survey, various years).

What Are the Trends in Childhood Obesity?

Results from the 2003–2006 NHANES show that 12.4 percent of children and youths ages 2–5 were obese, 17 percent of those ages 6–11 were obese, and 17.6 percent of those ages 12–19 were obese (Figure 3). As shown in the figure, the rates have increased dramatically since the 1976–1980 period.

Childhood obesity is also more prevalent among minorities. Data from the 2003–2006 NHANES indicate that, among males between the ages of 12 and 19, 17.3 percent of non-Hispanic whites, 18.5 percent of non-Hispanic blacks, and 22.1 percent of Mexican Americans were obese. For females of the same age, 14.5 percent of non-Hispanic whites, 27.7 percent of non-Hispanic blacks, and 19.9 percent of Mexican Americans were obese (Figure 4). As the lengths of the lines for the 2003–2006 period show, racial/ethnic differences in obesity were greater for young females than for young males; this was also true in the 1976–1980 and 1998–1994 periods. Looking over time, the data for young females show the same pattern by race/ethnicity that was seen for adult females: The rates for non-Hispanic whites were always lower than those for Mexican Americans, which, in turn, were always lower than those for non-Hispanic blacks.

Figure 3. Trends in Childhood Obesity Prevalence, by Age, Ages 2–19



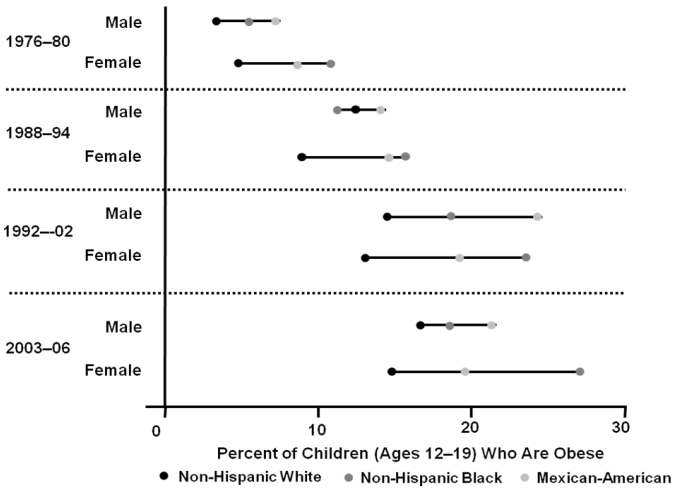
SOURCE: NHANES (National Health and Nutrition Examination Survey various years); sex- and age-specific BMI ≥ 95th percentile based on CDC growth charts.

What Is the Impact of Obesity on Military Accessions?

Given recent trends in obesity, especially among women and minorities, the percentage of potential recruits who are eligible for service has decreased, particularly among minority groups. A number of reports have supported this finding.

Using height and weight data from administrative records collected by Military Entrance Processing Stations (MEPS)[4] between 1993 and 2006, Hsu et al. (2007) found that the crude rate of overweight and obesity among 18-year-old applicants rose from 25.6 percent in 1993 to 33.9 percent in 2006. Among potential male enlistees, the percentage of overweight and obese rose from 27.2 percent to 35.3 percent, and, among potential female enlistees, the percentage of overweight and obese rose from 16.5 percent to 27.9 percent. The authors also calculated obesity prevalence by race/ethnicity: Among potential white enlistees, the percentage of overweight or obese increased from 25.5 percent to 33.9 percent; among blacks, the percentage increased from 25.4 percent to 31.3 percent; and, among individuals in the "other" race/ethnicity category, the percentage increased from 27.4 percent to 36.2 percent.[5]

Figure 4. Trends in Childhood Obesity Prevalence by Gender and Race/Ethnicity, Ages 12–19



SOURCE: NHANES (National Health and Nutrition Examination Survey, various years).

Using data on 17–42-year-olds from the 2001–2004 NHANES survey, Yamane (2007) reported that 17.9–54.4 percent of men and 20.8–54.9 percent of women were not eligible for enlistment, depending on the Service.[6] Among men in the 17–19-year-old and 20–24-year-old age groups—those age groups most likely to enlist—17.9–33.3 percent were not eligible due to failure to fall within the maximum weight standards. Among women in those same age groups, 20.8–53.7 percent were not eligible because of weight. In terms of race/ethnicity, the author found no consistently higher prevalence of obesity by race/ethnicity for men, but obesity rates were higher for black and Mexican American women than for white women.[7]

Using the 1998–2001 waves of the National Health Interview Survey (NHIS), a nationally representative survey of health and demographic characteristics, a recent RAND report found that Mexican American males between the ages of 18 and 30 are the least likely to meet the weight requirements (Asch et al., 2005, 2009). Sixty to 70 percent of Mexican American males met at least one Service's weight standard.[8] Among non-Hispanic white males, over

70 percent were eligible, and non-Hispanic black males fell somewhere between white and Mexican American males. Among women, non-Hispanic black females were most likely to fail weight standards. Fewer than 40 percent of non-Hispanic black women met weight standards for at least one Service. Roughly 50 percent of non-Hispanic white women and 41–45 percent of Mexican American women were eligible based on weight.

Asch et al. (2005, 2009) report that a substantial proportion of men and women are within 10 pounds of the upper limit of at least one Service's weight requirement. For example, 19 percent of all Hispanic men between the ages of 18 and 25 were five or fewer pounds overweight, and 37 percent were 10 or fewer pounds overweight. Among non-Hispanic black men, 15 percent were within 5 pounds of an acceptable weight, and 26 percent were within 10 pounds. For non-Hispanic white men, the percentages were 16 percent and 30 percent for 5 or fewer pounds and 10 or fewer pounds, respectively. Trends were similar for women: 14 percent and 27 percent of all Hispanic women, 11 percent and 23 percent of non-Hispanic black women, and 15 percent and 27 percent of non-Hispanic white women were within 5 or 10 pounds, respectively, of an acceptable weight. Thus, if obesity were the *only* obstacle for enlistment, small changes in weight requirements could have important implications for female and racial/ethnic minority representation in the enlisted component.

Conclusion

Increasing rates of obesity in the United States have decreased the share of the enlistment-age population that is qualified for military service. Overall, rates of obesity in the civilian population have been increasing among both adults and children, and these trends apply to both genders and all race/ethnicity groups. However, women and minorities are more likely than men and whites to be overweight and obese. Similar trends are evident among military recruits, among whom women are less likely than men to meet weight requirements. Female minority recruits, especially black women, are the most negatively affected by current weight policies in the military. Thus, if current trends in civilian obesity continue, the armed forces can expect to have fewer recruits who meet weight standards—a trend that will cut across both genders and all race/ethnicity groups. As a result of the observed gender and racial/ethnic differences in obesity rates, more women than men and more racial/ethnic minorities than whites will continue to be ineligible to enlist because of weight restrictions.

However, a word of caution is warranted. Although obesity is a national problem that has affected military accession, it is not clear that targeting weight and body fat standards alone will have a *significant* effect on the number of eligible minority recruits. Weight and other eligibility requirements are correlated. That is, obese recruits also score lower on the Armed Forces Qualification Test on average, and they are more likely to have not completed high school (Asch et al., 2005, 2009). Thus, simply lowering obesity standards will not result in a one-for-one increase in the number of eligible minority recruits because such recruits are likely not to meet other enlistment requirements (see endnote 1). Still, lowering weight standards will have some positive effect on the size of the eligible recruitment pool.

Possible Interventions

The following policy recommendations have been compiled from the work reviewed above:

- Reevaluate existing military body fat standards. Minor changes in weight requirements may have a large impact on the size of the pool of eligible applicants, assuming that recruits face no other obstacle for enlistment.
- Vary weight requirements by job without altering fitness or strength requirements. However, this may be problematic if recruits are not sure of their occupational specialty at the time of entry.
- Place new recruits who are near weight cutoffs in special weight-loss programs. Eventual enlistment would be conditional on meeting a specific weight-loss goal.
- Increase military support for population-based anti-obesity campaigns. These programs could be targeted to geographic regions (e.g., the South) where obesity and enlistment rates have traditionally been the highest.
- Recruit from healthier populations. Obesity and education are inversely correlated: Individuals with higher levels of education, especially those with some college education, are less likely to be obese. Similarly, noncitizens are less likely to be obese; thus, programs to fast-track their citizenship may increase the recruitment of healthy individuals, especially Hispanics.
- Focus on retaining weight-qualified female and minority enlisted service members and on reenlisting weight-qualified individuals with previous military experience.

Notes

[1]Other drivers are (1) changes in high-school graduation and General Educational Development attainment rates, (2) propensity to join the military, and (3) changes in the prevalence of other physical health conditions and moral character issues, such as substance use.

[2]The standard BMI formula (in pounds) is

$$BMI = \left(\frac{weight\ (lbs)}{height\ (ins)^2} \right) \times 703$$

The formula to convert BMI into percent body fat is 1.2 * BMI + 0.23 * age – 5.4. Subtract an additional 10.8 for males only (adapted from Jackson et al., 2002).

[3]Ogden et al. (2006) use three categories of race/ethnicity in their study: non-Hispanic white, non-Hispanic black, and Mexican American. The NHANES, which Ogden et al. use, makes a distinction between Hispanic Americans of Mexican descent (i.e., Mexican Americans) and Hispanic Americans of other Latino decent. Because persons of Hispanic origin other than Mexican Americans were entered into the sample with different selection probabilities that are not nationally representative of the total U.S. Hispanic population, they are generally not used in analysis of the NHANES data.

[4]MEPS are where applicants to the U.S. enlisted military service are screened for basic service requirements.

[5]Hsu et al. (2007) do not indicate whether their data include Hispanic individuals within the three race categories.

[6]This wide variation is a result of different maximum weight standards established by each Service. For men, the Air Force was the most restrictive, while the Marine Corps was the least restrictive. For women, the Army was the most restrictive, while the Air Force was the least restrictive.

[7]Using the NHANES, Yamane (2007) also has three racial/ethnic groups: white, black, and Mexican American. Hispanics of non-Mexican decent are included in an "other" race category.

[8]Where possible, Asch et al. (2005, 2009) differentiate between Mexican Americans and all-Hispanic. The authors were able to do this because they used the NHIS rather than the NHANES. The percentage of all-Hispanic males and females who meet weight requirements was similar to that of Mexican American males and females.

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