MISSION: READINESS
MILITARY LEADERS FOR KIDS

UNFIT TO FIGHT
A Report on California

MISSION: READINESS is the organization of over 250 retired generals, admirals and other senior military leaders who support policies and investments that will help young Americans succeed in school and later in life and will enable more young adults to join the military if they choose to do so.

Summary

Many young Californians are too overweight or otherwise physically unfit to serve in the military.

America's leaders have not done enough to combat the tripling of obesity rates among school-age children. Scientists now warn that half of all adults in America could be obese by 2030. **An estimated one in four young Americans is too heavy to join the military**, and weight problems are the leading medical reason why young people cannot serve. Overall, weight problems, educational deficits, criminal histories, and other problems now keep an estimated 75 percent of young Americans from being able to enlist.

America's military has recruited some of the most talented and fit young men and women in our nation. But America's inaction in adequately addressing physical fitness hurts even the military: in one study, 14 percent of young male Army recruits had not regularly exercised or played sports even one day a week before they joined. Unfit recruits suffer far higher rates of sprains and stress fractures. **Those males who were inactive had three times the risk of being medically discharged** as those who exercised or played sports three or more times a week before joining.

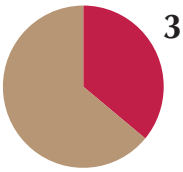
In California, more needs to be done to help young people improve their physical fitness and nutrition because on average they are as overweight as other Americans:

- **An estimated one in four young adults in California are also too heavy to join the military.**
- **Physical fitness tests show that one third of ninth-grade students lack basic aerobic capacity, almost one quarter of students lack basic upper-body strength and more than one third are overweight.**
- **Two thirds of California 12-year-olds participate in daily physical education classes (PE), but that drops to just 15 percent by age 17.**

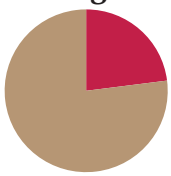
Providing students with daily PE and other opportunities for physical activity in school can help protect them from becoming obese, improve their health and even improve – not hinder – their academic achievement. That is good news for all our children and youth, whether or not they later choose to serve in the military. **The retired military leaders in MISSION: READINESS want active PE back in our schools.**

9th-grade Californians not within a basic "Healthy Fitness Zone"* because of:

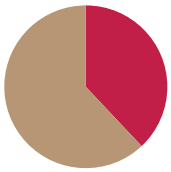
Poor Aerobic Capacity



Poor Upper-Body Strength



Unhealthy Weight



*The goal of the "Fitnessgram" is for children to reach a fitness level that reduces many health-related risks. For example, for aerobic fitness, a 16-year-old girl would need to complete a mile in 10 minutes and for upper body strength, do seven pushups. For 16-year-old boys, the figures are 8.5 minutes and 18 pushups. The percent overweight is based on Fitnessgram data but applies Centers for Disease Control and Prevention criteria on who is overweight as analyzed by the California Center for Public Health Advocacy.[1]

Introduction

The military is concerned because, almost imperceptibly to many in the American public, the proportion of American school-age children who are overweight or obese has slowly but relentlessly grown over the last three decades. For experts who follow long-term health trends, however, this has been a tsunami: America has not done enough to prevent childhood obesity rates from tripling in a mere three decades. The percentage of overweight or obese teenage males nearly quadrupled to 19 percent and the proportion of overweight or obese teen females has tripled to 17 percent.[2] Half of all adults may be obese by 2030.[3] This impacts the military's ability to recruit and retain fit recruits.

Analysis of national surveys conducted for the military and by the Centers for Disease Control and Prevention (CDC) shows that approximately one in four young Americans are unable to serve in the United States military due to being overweight.[4] When weight problems are combined with education, crime and other problems, an estimated 75 percent of young Americans cannot serve.[5]

How many young adults are overweight or unfit in California?

There are two measures for Californians to consider. California directly measures the weight problems of its 5th-, 7th- and 9th-grade students for its "Fitnessgram," which combines a measure of body composition (weight) with different measures of physical fitness.When the California Center for Public Health Advocacy analyzed the Fitnessgram data for who is overweight, using the CDC's criteria, they found that more than a third of ninth graders were too heavy.[6] Our analysis of CDC data has determined that by the time Californians are 18 to 24 years old, **42 percent** are overweight or obese.[7] To be within a healthy weight range with a Body Mass Index (a ratio of height to weight) under 25, these young adults would have to collectively lose more than 54 million pounds – the equivalent of 453 Abrams tanks.[8]

Each military service uses its own, somewhat more lenient, cutoffs for men and women, so we cannot translate the California Fitnessgram or CDC measures directly into how many Californians cannot join. However, because the percentage of 18- to 24-year-olds in California who are overweight or obese is very similar to the national average, **we estimate that one in four young Californians would also be unable to enlist**.[9] Whatever measures are used, it is clear that far too many California children and young adults have a serious problem with excess weight or obesity.

No one blows a whistle to stop the war when a soldier goes down with a sprain or stress fracture. Being overweight and/or having muscles that are not as strong increases the risk of having a sprain or stress fracture.

Overweight young adults have impacted national security

During the recent shortfall in meeting recruitment goals, the lack of potential recruits who met the military's weight cutoffs was a problem. Congress increased the number of military recruiters, increased bonuses, and the Army experimented with letting fit, but heavier recruits in.[10] The Army found that those overweight but fit recruits were 47 percent more likely to experience a musculoskeletal injury (such as a sprain or stress fracture) and were 83 percent more likely to fail to make it through basic training with their peers – though most did successfully serve.[11] The rate of injuries is important because serious and repeated injuries or failing to pass ongoing physical fitness tests can result in a discharge. Worse, during combat, no one blows a whistle to stop the action when a soldier goes down with an injury, and **a quarter of medical evacuations from Iraq and Afghanistan to Germany were for musculoskeletal/connective tissue disorders [serious sprains and stress fractures] compared to 14 percent of medical evacuations that were due to combat injuries**.[12]

The military is not currently having problems meeting recruitment quotas, due in part to our severe recession. But, as Lieutenant General Norman R. Seip, US Air Force (Ret.), warns, "**A faltering economy is no formula for filling the ranks of a strong military. These longer-term eligibility problems are not going away.**"

But even in times when the military can find enough recruits, the problem of recruits' weight can still be an issue. Recruits are, on average, stronger in recent years: a positive sign that the military is attracting many individuals with better nutrition and physical training. But, the average recruit also has more body fat than in the past. That may help explain why, on average, they cannot finish the two mile run as quickly.[13]

Even many teens who are not overweight are physically unfit – strong thumbs are not enough

Unfit recruits, even if they are not overweight, create serious problems for the military. When young recruits without strong muscles put repeated or intense pressure on their legs or ankles, their muscles do not work well as shock absorbers to protect their tendons or bones. Weak or tired muscles transfer pressure much more directly to the recruits' tendons or bones, causing sprains or stress fractures.

These types of injuries are a major problem for the military's mission readiness: fewer recruits make it through boot camp, fewer troops are available to be deployed, and lives are at risk on the battlefield when soldiers go down from sprains or fractures and have to be rescued.

The military checks for a wide range of disqualifying problems before allowing young people to join, but it does not test for fitness before letting recruits in. So, many young people who have been mostly inactive throughout their life can and do join. **For example, in one study, 14 percent of new Army male recruits admitted they did not exercise or do any sports in a typical week.**[14]

Facing this problem head on, the military does an impressive job of helping recruits improve their muscular strength. The military can fairly quickly help new recruits develop stronger muscles to act as shock absorbers for preventing sprains or stress fractures. But it takes longer to build strong tendons and bones, in part because they have less blood flow. So, recruits who show up for basic training unfit still have more injuries:

- The male recruits who had neither done sports nor exercised in a typical week were medically discharged three times more often than the recruits who exercised or played sports three or more times a week.[15]
- **Of the men who could not do 11 pushups in one minute upon entry to Army boot camp, 45 percent did not complete boot camp.**[16]

By diverting the least-fit recruits to a pre-boot camp fitness program, the Army found it could decrease the percent of unfit male recruits who did not make it through boot camp. But it still had 12 percent of these initially unfit recruits who failed to make it through boot camp compared to 8 percent who failed among recruits who were at least somewhat fit when they arrived the first day.[17]

The extra training and the continued loss of personnel due to poor initial fitness takes a toll. Musculoskeletal injuries, such as sprains and stress fractures, are not just an issue during boot camp. As reported above, one quarter of medical evacuations from Afghanistan and Iraq are for musculoskeletal injuries. According to Maj. Gen. Richard Stone, deputy surgeon general for mobilization, **the Army treats more than 1 million soldiers for musculoskeletal injuries each year. Those injuries are the leading reason that soldiers cannot be deployed when their units ship out.**[18]

A quarter of medical evacuations from Iraq and Afghanistan are for sprains, stress fractures and other musculoskeletal injuries – more than the 14 percent of evacuations for combat injuries. Being overweight or less fit increases the chances of having a sprain or stress fracture.

Over a billion dollars a year

America's inaction in solving the problem of poor fitness and excess weight causes the military to pay more and work much harder to recruit and retain enough qualified men and women who can effectively serve our country. However, the real expense comes, as in civilian life, from the cost of people not being able to do their jobs, and the cost of obesity-related health care that the military must pay for.

The large number of soldiers on limited duty in the Army on any given day because of musculoskeletal injuries is costing the Army half a billion dollars just for health care expenses, without even factoring in the salaries paid to soldiers who cannot perform their duties.[19] **Worse, they cannot be deployed if their units ship out.**

Another analysis looked at the costs of excess weight for the military. **The military's TRICARE insurance system spends well over $1 billion a year on treating weight-related diseases** among active duty personnel, their dependents and veterans: costs that could be largely avoided if America becomes more proactive in helping all its citizens to routinely become more active and eat less calories.[20] That figure is likely to rise as more adults become obese.

California is not doing enough

California is definitely not doing enough to help its children and young people become fit. The Fitnessgram tests show that 36 percent of ninth graders have poor aerobic capacity and 23 percent have poor upper-body strength.

There are many reasons why, but three are crucial:

- **Nationally, only 22 percent of high school seniors are provided with daily PE and, in California, only 15 percent of 17-year-olds are participating in daily PE.**[21]

- **Young Americans now average a stunning seven hours a day consuming electronic media with TV, video-games, computers (not counting homework), cell phones, etc.[22] We all need to work together with parents to change this.**

- **Many California communities are not providing safe, adequately supervised places for children to play, or safe ways for them to walk or ride their bikes to school.**

What can be done to help prevent excess weight and increase fitness?

To avoid becoming obese, the key is to help kids to never put on the extra weight in the first place. **Experts at the National Institutes of Health**, and others, have concluded that to promote good health, it is **recommended that children achieve 60 minutes of moderate-to-vigorous physical activity daily,** along with reducing calorie intake from unhealthy, high-calorie foods and beverages.[23]

Because children spend so many of their waking hours at school, experts also maintain that school is the logical place to achieve at least half of those minutes.[24]

There is solid evidence from elsewhere in the country and in California that real progress is possible from efforts to change children's nutrition and exercise habits. For example:

- **PE and other physical activity at school alone can help:** There is some indication that exercise alone may not always be enough to turn the epidemic around.[25] But a study following over 8,000 first graders, including children from California, up to the fifth grade showed that boys and girls who received the recommended recess time as they grew up gained significantly less weight than those who did not have enough recess time. Boys (though not girls) who had the recommended PE time also gained significantly less weight than their peers who did not have enough PE.[26]

- Success with **a combined approach** in the Matanuska Valley, Alaska: The school district serving the Matanuska Valley, outside Anchorage, has for a number of years combined comprehensive efforts to improve school nutrition with efforts to increase physical activity, both as part of the regular school day and in the after-school hours through intramural sports and other activities. **The district has seen the proportion of children with excess BMI scores drop from 32 percent in 2003 to 26 percent in 2010**. [27]

- An intensive effort to work with schools, parents and the whole community in El Paso, Texas also showed it is possible to reduce the number of children who were overweight or obese by changing diets and increasing exercise. But when funding ended, the children's BMI's, as measured among fourth graders, started coming back up. This reinforces the point that there is no one-dose solution for this dangerous epidemic.[28]

PE can help academic performance

These days, the primary argument against PE is that it will cut into essential time for academic subjects. Studies have shown that, on the contrary, physical activity can assist students by enhancing their concentration and attention to their academic work.[33] A 2010 analysis of 14 studies reviewed by the Centers for Disease Control and Prevention looked into whether PE hurt academics. It found that, "Increasing or maintaining time dedicated to physical education may help, and does not appear to adversely impact, academic performance."[34] Other research shows that "more physically active and fit students have better grades and achievement test scores."[35]

Sources: Perceptual Motor Skills, 1990; Centers for Disease Control and Prevention, 2010; West Ed, 2003; Journal of Exercise Physiology, 2005

Innovative efforts to increase physical activity in California

California is on the cutting edge of many efforts to confront the epidemic of childhood obesity. The California Endowment has initiated a policy-driven and locally-based approach to prevent obesity among children and adults in six low-income communities. It is called **Healthy Eating, Active Communities (HEAC).** The HEAC goal is to start building community-wide support for access to healthful eating and physical activity in schools, after school settings, neighborhoods, workplaces and families.

For example, in Santa Ana, a primarily Latino community in Orange County, the initiative helped improve nutrition in the schools. After the efforts, "fewer students reported eating chips and drinking soda and sports drinks at school in 2010, and more students reported eating fruit and drinking 100 percent fruit juice at school."[29]

HEAC helped Santa Ana improve their physical education and physical activity efforts. Four additional PE teachers were hired and many elementary schools adopted the **Coordinated Approach to Child Health (CATCH)** curriculum to improve nutrition and increase the fun and activity levels during PE. In 2010, schools in the district averaged over 50 percent of their PE time doing moderate to vigorous physical activity. In science classes, the students learned to develop and monitor their own physical fitness regimes. Santa Ana saw reported increases in children's activity levels, reductions in television time and improvements in students' fitness scores.[30] HEAC stands as an example of what all communities in the state should be doing to encourage more physical activity and better nutrition.

Beyond PE in the schools

This report focuses on the national security imperative for more and better physical education classes in our schools, but that is hardly the only thing schools and communities should be doing. They should also be working to develop, improve and promote:

- **Safe walking and biking routes to and from school**
- **Recess**
- **Physical activity breaks during class**
- **Kinetic learning (learning by doing)**
- **Physical activity clubs (such as running clubs)**
- **Interscholastic sports**
- **Intramurals**
- **More activity in after-school programs**
- **Joint-use agreements (to encourage use of underutilized fields and gyms for more activities)**

Federal, state and local governments should be doing much more to encourage more physical activity in our communities.

Another team, led by Jim Sallis from San Diego State University, has developed a physical activity program for elementary school kids, **Sports, Play, and Active Recreation for Kids, (SPARK)**, and a program for middle school kids, Middle-School Physical Activity and Nutrition (M-SPAN). Research has proven these programs can increase physical activity among school children.[31]

SPARK is being widely adopted across the United States. Sallis and other researchers on physical activity need to keep testing approaches to work with kids of different ages and find what works best with either girls or boys because often a particular effort works better with one group than another. We know from the research that, while it is not always easy or assured, it is possible to increase children's physical fitness and also that combining exercise with better nutrition can deliver results.

State Superintendent of Public Instruction, Tom Torlakson, has just initiated a new effort, **Team California for Healthy Kids**, to increase children's access to water and fresh foods and to ramp up physical activity every day in the schools. He will be enlisting major California sports figures to help bring this effort to schools across the state.[32]

Despite these innovative and encouraging efforts, the epidemic of childhood obesity keeps spreading to new children every day.

California's record: Still much more to do

In 1866, California became the first state in the nation to mandate PE.[36] In the early 1990's, California revised its standards for PE. Then in 1996, the state mandated weight and physical fitness tests for all fifth, seventh, and ninth graders.[37] In 1999, California established the first state Safe Routes to School program to promote walking and bicycling to school.[38] In 2001, California set an example for the nation by taking the crucial step of limiting junk food and high-calorie beverages in its schools, and improving the nutrition of the meals served at schools.[39]

California has not only started reforms in its own state, it has also played a national role in improving student exercise and nutrition with advocates such as Sallis; U.C. Berkeley Researcher Lorenne Ritchie; former Governor Arnold Schwarzenegger; as well as The California Endowment and many others.

Unfortunately, in California, while three quarters of middle and high schools are meeting the state's PE requirements, only half of elementary schools are meeting these requirements:[40]

California PE	Recommended[a]	Required by the State[b]	Not Compliant?[c]
Elementary	30 min/day	20 min/day	**48 percent of schools not compliant**
Middle	45 min/day	40 min/day	**24 percent not compliant**
High School	45 min/day, each year	**40 min/ day, just for 2 years**	**24 percent not compliant**

a. The National Institute of Health (NIH) recommends 60 minutes a day of exercise, and the National Association for Sports and Physical Education (NASPE) has recommended that roughly half of that come from physical education at school. To accommodate administrative and other delays, that would necessitate a 45 minute period.
b. Required by the California Department of Education.
c. Based on data reported by the California Center for Public Health Advocacy that looked at over 70 school districts throughout California, though the sample was not necessarily representative of all schools in the state.

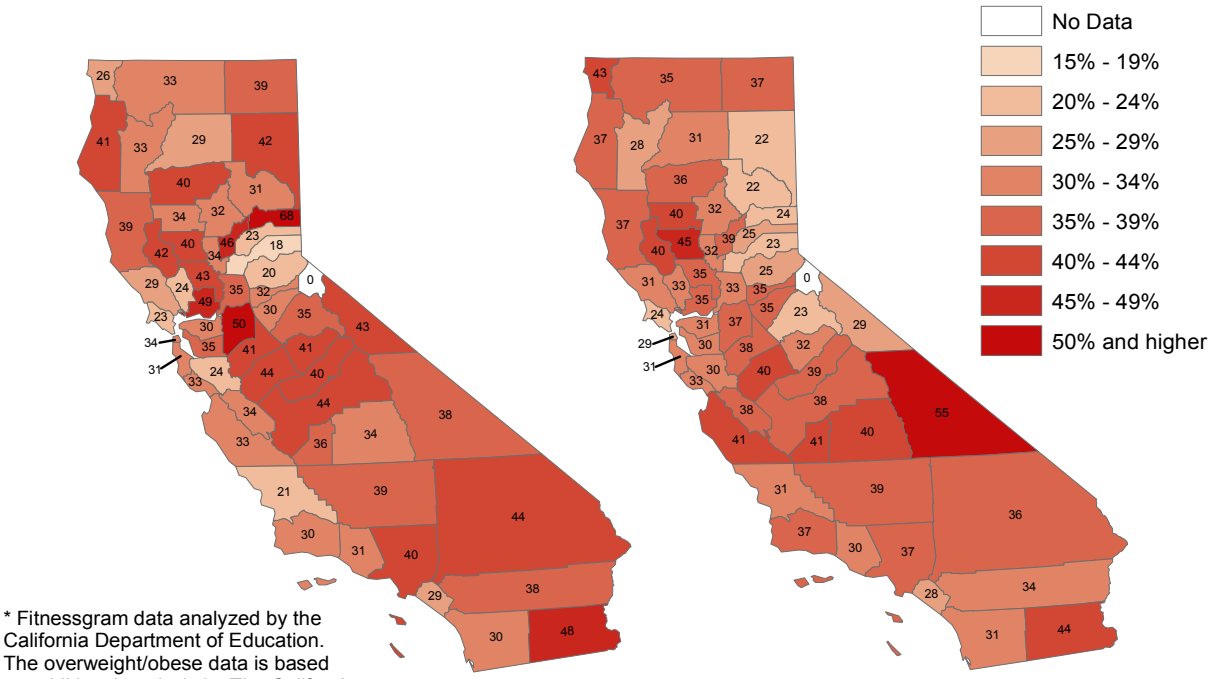
By the time California students are seniors, only 15 percent are participating in daily PE thanks to the 2-year exemption for high school students allowed in 1978.[41] That is not the only problem. Meeting the minutes per day goal does not necessarily mean the students are spending the recommended 50 percent of class time actually engaged in moderate-to-vigorous activity.[42] **A survey of California high school students showed they spent, on average, 22 minutes per day during their PE class in moderate-to-vigorous activity; the middle school students spent 16 minutes per day;**

California's Ninth Graders

Percent With Poor Aerobic Capacity*

Percent Who Are Overweight or Obese*

(The California Center for Public Health Advocacy)



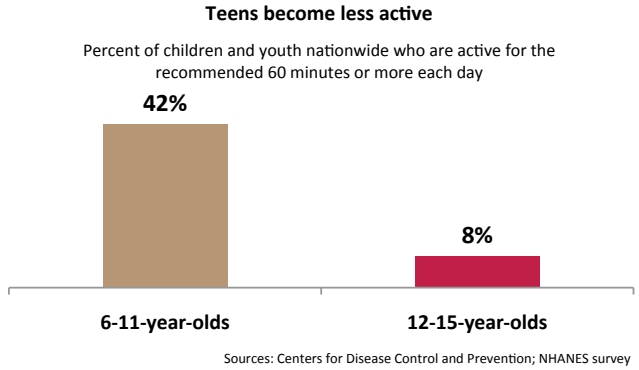
* Fitnessgram data analyzed by the California Department of Education. The overweight/obese data is based on additional analysis by The California Center for Public Health Advocacy.

and the elementary school students spent just 9 minutes per day. The rest of the time they were getting ready, taking attendance or essentially just standing around.[43]

Getting and *keeping* kids active

The good news is that most young children are active. **The challenge is to get *all* young children active *enough, and* to teach them the skills and fun ways to exercise and do sports so they become and stay active for the rest of their lives.** That is important because children establish eating and exercise habits early on, but most active children quit being as active as teens.

Making regular PE and recess available can ingrain good routines in young children, and ongoing PE, organized sports, intramural teams, and active after-school programs can help ensure that teens maintain exercise and sports as a routine part of their lives.



Sources: Centers for Disease Control and Prevention; NHANES survey

Some important signs of progress, but California's children are still too unfit and too overweight

Making progress against the epidemic of obesity and poor fitness is hard, but the Fitnessgram measurements seem to show real progress is beginning to happen in California:

- The proportion of ninth graders with poor aerobic capacity has dropped from more than half to about a third from 1999 to 2010;
- Poor upper-body strength has gone from 40 percent to 23 percent during that same period; and

Using physical activity to enhance learning

Ms. Norma Arteaga, a sixth-grade teacher in Almond Tree Middle School/Delano Unified School District, choreographs lesson plans to keep her students moving – and learning – in her classroom. Her students running through their vocabulary or multiplication drills will perform an assigned action with each answer: they might tug their earlobe or touch the opposite elbow. If they get the answer right, they hop five times. If they get the answer wrong, they hop twice.

By seamlessly incorporating movement into her classroom instruction, Ms. Arteaga ensures that her students get the physical activity that they need to stay engaged in her classroom. By purposefully including hand and body movements that cross the midline of the body, she encourages both the right and left sides of their brains to work together - a developmental necessity for activities such as reading and learning.

The extra physical activity may even be enhancing academic performance.

Last year, Almond Tree Middle School gained 48 points on their Academic Performance Index (API) score, bringing them to a total score of 768.[44]

- While the percent of ninth graders who were overweight has not gone up since 2005, it has not yet dropped appreciably either.[45]

It is impossible to say how much of that progress in fitness is due to simply highlighting the problem by measuring it, how much is due to increased PE, or what role increasing education and awareness in society has played. But one thing is certain: **much more progress is still needed to turn around this ocean liner of an epidemic of childhood obesity in California.** The efforts initiated so far are clearly not adequate to reverse the tripling of childhood obesity.

What should California policy makers start working on?

At the **state and local level**, policymakers should:

- Continue efforts to improve the nutritional **quality of food** reaching our children inside and outside of school;
- See that the state requirements on **PE minutes** are met in more schools;
- Begin work on removing the routine exemptions from PE for older high school students;
- Encourage schools to measure and act on whether their PE and recess times include **enough moderate-to-vigorous activity**. Schools can adopt PE curricula such as SPARK or CATCH that focus on increasing the fun and activity levels of PE;
- Continue to strive for **trained PE teachers, adequate class sizes and adequate facilities and equipment** – all of which have been shown to improve the quality of PE.[46] The lack of these factors may help explain why fitness levels in poor or minority schools are often lower;[47] and
- Explore ways to **highlight and reward schools** for making positive changes.

At the **national level**, California Members of Congress should:

- Support efforts to encourage states to develop a standard way of accurately **measuring whether PE is offered** in their schools, and **whether it is active PE** with enough moderate-to-vigorous physical activity; and
- Support efforts to encourage states to implement a statewide **fitness measure** such as Fitnessgram, so parents, schools, communities and the states are aware of how they are doing at addressing our national epidemic of obesity.

Conclusion

Obviously, these reforms will not happen overnight. But until California children, youth and adults **have the serious support they need to make physical activity a routine and expected part of their lives – something to always include, like brushing their teeth or taking a shower** – we are not going to make real progress against this epidemic of obesity and poor fitness. That epidemic is hurting our country and making too many of us sick. These common-sense reforms will help.

This is not the first time that military leaders have asked policymakers to address the needs of our youth as a matter of national security. After World War II, the military expressed concern that it was difficult to find fit recruits because so many young adults were malnourished. As a result, the President and Congress passed the National School Lunch Program. Today, we are sounding the alarm again because so many of our young people, both in California and nationwide, are too unfit to fight. They need much more help to become fit and healthy.

When both our children's health and our national security are at stake, it is time for decisive action.

Endnotes

1 California Department of Education. (n.d.). *Glossary – Physical fitness test – Report definitions.* Sacramento, CA: Author. Retrieved on September 14, 2011 from http://data1.cde.ca.gov/dataquest/PhysFitness/gls_pft_tasks.asp; Babey, S.H., Wolstein, J., Diamant, A.L., Bloom, A. & Goldstein, H. (2011). *A patchwork of progress: Changes in overweight and obesity among California 5th, 7th and 9th graders, 2005-2010.* San Francisco, CA: California Center for Public Health Advocacy.

2 Ogden, C.L., Carroll, M.D., Curtin, L.R., Lamb, M.M. & Flegal, K.M. (2010). Prevalence of high body mass index in US children and adolescents, 2007-2008. *JAMA, 303*(3), 242-249; Ogden, C.L., Flegal, K.M., Caroll, M.D. & Johnson, C.L. (2002). Prevalence and trends in overweight among US children and adolescents, 1999-2000. *JAMA, 288*(14), 1728-1732.

3 Wang, Y.C., McPherson, K., Marsh, T., Gortmaker, S.L. & Brown, M. (2011). Health and economic burden of the projected obesity trends in the USA and the UK. *Lancet, 378,* 815-25.

4 Center of Accessions Research (CAR), United States Army Accessions Command, Fort Knox, KY. Data provided by Lt. Colonel Gregory Lamm, Chief, Marketing and Research Analysis Division, February 25, 2010; Cawley, J. & Maclean, J.C. (2010). *Unfit for service: The implications of rising obesity for US Military recruitment.* Cambridge, MA: National Bureau of Economic Research. The Accession Command's estimate that 27 percent of 17- to 24-year-old Americans are too heavy to join is based in part on a survey done for them by the Lewin Group in 2005. The National Bureau on Economic Research (NBER) study is an analysis of data from the National Health and Nutrition Examination Survey (NHANES) study. The NBER analysis looks at eligibility rates for males and females based on BMI and body fat and exclusion criteria broken out for the different services. Based on the NBER analysis, we conclude that approximately 23 percent of adults eligible by age would not be able to join the Army because of excess body fat. Taking both studies into account – the NBER analysis of NHANES data and the Accessions Command's analysis – we conclude that approximately one quarter of young Americans would be too heavy to join the military if they chose to do so.

5 Gilroy, C. (March 3, 2009). *Prepared statement of Dr. Curtis Gilroy, Director of Accession Policy in the Office of the Under Secretary of Defense for Personnel & Readiness.* Before the House Armed Services Personnel Subcommittee "Recruiting, Retention and End of Strength Overview."

6 California Department of Education. (2011*). Physical fitness testing results.* Sacramento, CA: Author. Retrieved on October 24, 2011 from http://www.cde.ca.gov/ta/tg/pf/pftresults.asp; Babey, S.H., Wolstein, J., Diamant, A.L., Bloom, A. & Goldstein, H. (2011). *A patchwork of progress: Changes in overweight and obesity among California 5th, 7th and 9th graders, 2005-2010.* San Francisco, CA: California Center for Public Health Advocacy.

7 Data from the Center for Disease Control's *Behavioral Risk Factor Surveillance System (BRFSS)* was used to estimate three-year weighted averages of the proportion of 18 to 24-year-olds in California who are overweight and obese according to the standard Body Mass Index cutoffs of 25.0 for overweight and 30.0 for obesity. We used three-year weighted averages to obtain an acceptable sample size. Centers for Disease Control and Prevention. (2011). *Behavioral Risk Factor Surveillance System – Prevalence trends and data.* Atlanta, GA: Author. Retrieved on September 19, 2011 from http://apps.nccd.cdc.gov/BRFSS/page.asp?cat=OB&yr=2010&state=All#OB

8 This calculation of the excess pounds 18- to 24-year-old American women and men would have had to lose to be of healthy weight (below a BMI of 25) in each state and nationally was calculated by the CDC's epidemiologist who processes BRFSS data, Liping Pan, and was provided in a table to Mission: Readiness in a personal communication, March 18, 2010 and was originally reported in our national *Too Fat to Fight* report. Other findings for this survey can be found at: National Center for Chronic Disease Prevention & Health Promotion. (2009). *Prevalence and trends data – Overweight and obesity. Behavioral Risk Factor and Surveillance System.* Washington, D.C.: U.S. Department of Health and Human Services. Retrieved on April 1, 2010 from http://apps.nccd.cdc.gov/BRFSS/list.asp?cat=OB&yr=2008&qkey=4409&sta te=All. The tank estimate is from: M1 Abrams main battle tank. Retrieved on March 29, 2011 from http://www.globalsecurity.org/military/systems/ground/m1-specs.htm One tank equals 60 tons, or 120,000 lbs. 54.3 million pounds that must be lost equals 453 tanks.

9 The difference in those young adults who are overweight or obese is 42.5% nationally vs. 41.1% for California. Center of Accessions Research (CAR), United States Army Accessions Command, Fort Knox, KY, data provided by Lt. Colonel Gregory Lamm, Chief, Marketing and Research Analysis Division, February 25, 2010; Cawley, J. & Maclean, J.C. (2010). *Unfit for service: The implications of rising obesity for US Military recruitment.* Cambridge, MA: National Bureau of Economic Research. The Accession Command's estimate that 27 percent of 17- to 24-year-old Americans are too heavy to join is based in part on a survey done for them by the Lewin Group in 2005. The National Bureau on Economic Research (NBER) study is an analysis of data from the National Health and Nutrition Examination Survey (NHANES) study. The NBER analysis looks at eligibility rates for males and females based on BMI and body fat and exclusion criteria for the different services. Based on the NBER analysis, we conclude that approximately 23 percent of adults eligible by age would not be able to join the Army because of excess body fat. Taking both studies into account, the NBER analysis of NHANES data and the Accessions Command's analysis, we conclude that approximately one quarter of young Americans would be too heavy to join the military if they chose to do so.

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