MISSION: READINESS
MILITARY LEADERS FOR KIDS

Too Fat, Frail, and Out-of-Breath to Fight

Minnesota children need regular PE and real walking and biking options to maintain healthy weights and build strong bones and lungs.

A Walking-and-Biking-to-School Celebration

Sprains and broken bones outpaced combat injuries in Iraq and Afghanistan

WHO WE ARE

Shown in the photo are (left to right): Major General David M. Edgington, US Air Force (Ret.), Admiral James M. Loy, US Coast Guard (Ret.) and General Richard E. Hawley, US Air Force (Ret.) on the deck of the *Battleship Wisconsin*, in Norfolk, VA. at a Mission: Readiness news conference.

Mission: Readiness is the nonprofit, nonpartisan national security organization of more than 500 retired generals, admirals and other senior retired military leaders who work to ensure continued American security and prosperity into the 21st century by calling for smart investments in the upcoming generation of American children. It operates under the umbrella of the nonprofit Council for a Strong America.

For a full listing of our membership, please see our website at **www.missionreadiness.org**

ACKNOWLEDGMENTS

"A Walking and Biking to School Celebration" cover photo credit: U.S. Army photo by Bill Bengtson

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Summary

Our nation's military has often played a role in solving problems affecting our greater society. When malnutrition kept many young men from serving during WWII, General Lewis Hershey pushed successfully for the creation of the national school lunch program as a major force for children's health. When the Soviet Union sparked national security concerns by successfully launching Sputnik as the first satellite to circle the earth, military leaders helped inspire improvements in the teaching of mathematics in U.S. schools. Responding to military leaders' concerns about the need to move troops and supplies during an emergency, President Eisenhower—a former Army general—championed the development of the Interstate Highway System. And today, in response to an obesity crisis that disqualifies millions of young adults for military service, retired military leaders once again are leading the charge to ensure that schools are able to serve more nutritious meals to our nation's students.

Today there are new challenges that affect the health of our nation's children and the success of our military:

- Nearly one in three young Americans is too overweight to serve, one of the leading reasons why **69 percent of Minnesota's young adults cannot serve in the military;**

- **One in ten young Minnesotans currently has asthma**, which disqualifies them from serving in the military without a waiver. Obesity and lack of exercise can contribute to asthma and other respiratory problems;

- More than 60 percent of non-deployed active duty service members experience a sprain, stress fracture, or other musculoskeletal injury each year due in part to years of low calcium intake, lack of long-term exercise habits and/or excess weight. The military is spending billions treating these injuries among active duty personnel and veterans.

Photo: U.S. Army

While these challenges have been driven by a variety of factors, there are two key ways to improve both health and military readiness for generations to come.

First, community planners and builders can prioritize the creation of new transportation systems that prioritize sidewalks, trails, separate bike lanes and other longer-term built environment changes to substantially increase walking or biking to and from school and work. This will reinforce regular physical activity as a simple and rewarding way to lead a healthy life, while improving air quality and lung functioning in the process.

Second, schools can help ensure that children get at least one hour of physical activity every day—the amount recommended by experts—which will help young people maintain a healthy weight while building strong muscles, lungs and bones. Unfortunately, **in an average week, 40 percent of Minnesota ninth graders receive no physical education (PE) and less than a quarter of Minnesota high school students get the recommended hour of daily physical activity during the day.**

Finally, we must stay the course on serving healthier school meals. Children consume up to half of their daily

calories at school, and healthier meals will not only help prevent weight gain, but also provide the right nutrients that can enhance physical activity and contribute to bone and muscle growth. According to the U.S. Department of Agriculture, 94 percent of Minnesota's schools are successfully serving meals that meet updated nutrition standards.

The good news is that **Minnesota has started making important changes to encourage physical activity, such as the Twin Cities' state-of-the-art bike trail system, and is considering additional steps such as adding barriers that protect bike lanes from traffic.** Recent evidence from elsewhere shows success is possible. Childhood obesity rates have declined by more than 30 percent among students in Wisconsin's Chetek-Weyerhaeuser school district following a number of changes to help students become healthier, including expanding opportunities for physical activity throughout the school day. In the most polluted parts of Los Angeles, the number of teens with under-developed lungs has been cut in half following efforts to reduce air pollution. In Portland, Oregon and across Northern Europe, ongoing commitments to "active transportation" efforts have led to many thousands more children and adults walking or biking to and from school and work each day.

With all of this in mind, the retired admirals and generals of Mission: Readiness are leading the way to making PE a key part of every student's day and supporting Safe Routes to School projects in Minnesota and across the country. Collectively, these efforts will put more students on track for a healthy future and help those who choose that path the opportunity to serve their country in the military. When military leaders have called for important changes, Americans have listened and acted. It is time to do that again.

"Minnesota has started making important changes to encourage physical activity, such as the Twin Cities' state-of-the-art bike trail system, with one trail *USA Today* labeled "the top urban bike path in the U.S."

Minnesota, We Have a Problem

Impacts on the Military

A growing number of military recruits and service members are not only too overweight, but also too frail to fight. Many others have respiratory problems that prevent them from serving. While some physical deficiencies can be addressed once individuals enter the military, long-term military readiness is at risk unless a large-scale change in physical activity and nutrition takes place in America.

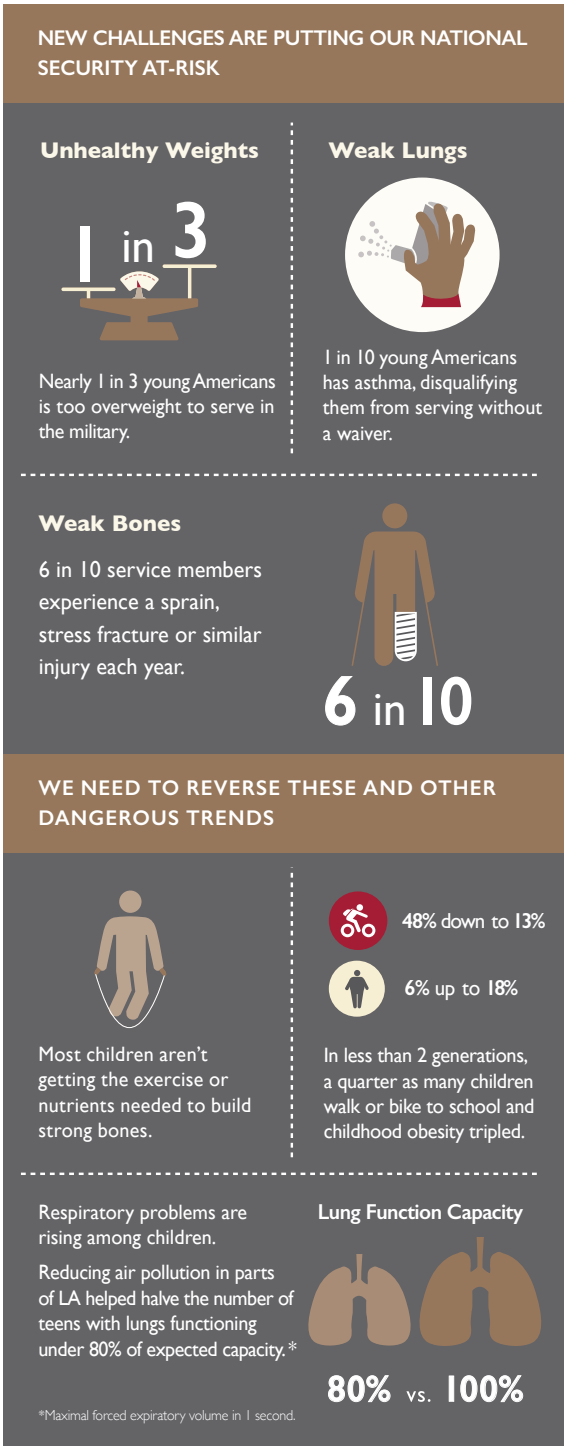
Unhealthy weights

Nearly one in three young Americans is now too heavy to serve in the armed forces, a main reason why 69 percent of Minnesota young adults cannot serve.[1] At the same time, physical inactivity is a problem even among those whose weight does not disqualify them from serving; according to one study, one out of every seven male Army recruits reported that they had not exercised or played any sports in a typical week prior to joining.[2]

Among active duty forces, obesity has risen by 61 percent since 2002. The military pays more than $1.5 billion in annual obesity-related health care spending and costs to replace unfit personnel.

Respiratory problems

Asthma is a smaller but growing problem for recruiters, rendering approximately one in ten young Minnesotans ineligible for military service.[3] In addition, approximately 600 newly enlisted recruits are discharged each year because of asthma and approximately four percent of soldiers currently have asthma.[4]



While allergens, air pollution and smoking are known to increase the risk of asthma and other respiratory problems, research shows that obesity and a lack of physical fitness are also risk factors.[5] For example, one Journal of the American Medical Association study examining a military population found that being overweight or obese was a major risk factor for asthma.[6]

Broken bones and sprains

The military is also facing an unprecedented problem with sprains, stress fractures and other orthopedic problems (also known as musculoskeletal injuries). Those injuries are now recognized as "the biggest medical threat to readiness" among service members.[7] Musculoskeletal injuries increase during wartime as a result of heavier packs and greater stressors, but research shows that poor nutrition, lack of exercise and obesity are contributing factors as well.[8]

More than 60 percent of non-deployed active duty service members experience a musculoskeletal injury each year for an annual total of more than 740,000 musculoskeletal injuries. These injuries are the leading reason why 30 percent of the Army's reserve population is non-deployable.[9] They are also the leading health-related reason for discharge from service. Discharges for these injuries have increased five-fold among males and nine-fold among females over the last three decades.[10]

> **"A study in Rochester, Minnesota found that forearm fractures increased by 32 percent among boys and 56 percent among girls from 1970 to 2000."**

There are more than two million medical encounters among service members for musculoskeletal injuries every year — greater than for any other condition.[11] There were 72 percent more medical evacuations from Afghanistan and Iraq to Germany for stress fractures, serious sprains and other musculoskeletal injuries among those deployed than for combat wounds.[12] The military pays at least $5 billion a year in medical care costs and for the salaries of service members who are on limited duty or non-deployable because of injuries — the majority musculoskeletal.[13] U.S. Department of Veterans Affairs (VA) payments to individuals partially or fully disabled by musculoskeletal injuries also topped $5 billion per year even before the Afghanistan and Iraq wars.[14] Since 2000, the average disability payment to veterans has increased by 60 percent.[15]

Declining activity and weaker bones among children

It is well-known that America is facing an obesity epidemic. A growing body of research is shedding light on one of the primary contributors to the epidemic: physical inactivity.

In less than two generations, physical activity time among adults in the U.S. has declined 32 percent and is on track to drop 46 percent by 2030.[16] Three-quarters of children receive less than an hour of physical activity daily.[17] The proportion of children who walk or bike to school dropped dramatically over the past four decades: from 48 percent in 1969 to 13 percent in 2009.[18] Meanwhile, children's diets are increasingly made up of more empty calories and fewer nutrients. For instance, in 1977, children received 13 percent of their total daily calories from milk and eight percent from sugary drinks. In 2001, by contrast, children received 17 percent of their daily calories from sugary drinks and only eight percent from milk.[19]

As a result of these trends, compared to recent generations, **children at age 10 are not only 12 pounds heavier, but many also have weaker bones.**[20]

More than one-quarter of adult bone mass is formed between the ages of nine and 15, and research on child development shows that if children miss this key window for bone growth, they can have problems the rest of their lives.[21] Yet an increasing number of

children are not getting the adequate physical activity, calcium and vitamin D that healthy musculoskeletal development requires:

- Between the ages of nine and 15, the time that children spend engaged in moderate and vigorous physical activity drops by 75 percent. By tenth grade, 70 percent of American students are not getting the recommended hour of moderate to vigorous exercise daily.[22]

- Eighty-five percent of adolescent girls and 77 percent of adolescent boys ages nine to 13 are not getting an adequate amount of calcium, and nearly half of girls and boys ages nine to 13 are not getting the vitamin D needed to build strong bones.[23]

As a result of these deficiencies, there is evidence that many children have weaker bones than previous generations. A long-term study in Rochester, Minnesota, published in the *Journal of the American Medical Association*, found that forearm fractures increased by 32 percent among boys and 56 percent among girls from 1970 to 2000, likely in part because of rising obesity rates and less-developed skeletal systems.[24] It is also possible that many children are suffering from weaker muscles and tendons due to lack of exercise; the CDC began collecting data on children's muscle strength in 2012, and research examining longitudinal trends should become available in future years.[25]

Respiratory problems often develop in childhood

In just over three decades, the proportion of the U.S. population with asthma has tripled—from around three percent in 1980 to nine percent in 2013.[26] Asthma prevalence is slightly higher among young adults ages 18 to 24.[27] Meanwhile, CDC data show that the proportion of Americans ages 12 to 15 with adequate levels of cardiorespiratory fitness dropped by 20 percent between 2000 and 2012.[28]

There is no single cause of asthma or other respiratory problems, but physical inactivity and pollution

Increasing walking and biking can reduce air pollution near schools.

contribute to these issues.[29] Lung development is nearly complete by the age of 18 and, therefore, "children with lung deficits are likely to have diminished lung function for the rest of their lives."[30] Research shows that children exposed to nitrogen dioxide and fine particulate matter—both prevalent in traffic pollution—experience an increase in daily symptoms of troubled breathing as well as a substantial decrease in lung function and growth.[31] Another study found that children with elongated exposure to these pollutants throughout the first eight years of life have an increased risk of developing asthma.[32]

There is promising evidence that reducing air pollution can strengthen children's lungs. According to a recent study, neighborhoods in Los Angeles that experienced meaningful decreases in air pollution over 13 years also saw the percent of children with smaller lungs and lower lung functioning cut in half over the same time period. Specifically, teens with lung function below 80 percent of expected lung function capacity—a cutoff used to indicate concern—fell from eight percent to four percent.[33]

Other research shows that children in schools in high air pollution areas have more respiratory problems.[34] A return to substantial numbers of children walking and biking to and from school will not only help them get more exercise, but it will also help reduce the number of cars and buses idling outside their schools.[35]

Three Solutions to Strengthen the Next Generation

Photo: Minnesota Department of Health and the Minneapolis Health Department

A Walking School Bus at the Lyndale Community School in Minnesota.

Photo: "Cyclists on the Sabo Bridge", Creative Commons from Kris.Layon

USA Today labeled Minneapolis' Midtown Greenway trail "the top urban bike path in the U.S."

1 Build physical activity back into communities

Research shows that simply walking or biking to and from school can supply children with 16 additional minutes of moderate or vigorous physical activity per day, just over one-quarter of the daily amount recommended by experts.[36] Unfortunately, only 13 percent of children walk or bike to school.[37]

Within the past decade, Safe Routes to School and walking school bus programs in Minnesota have helped 180 schools (serving 10 percent of students in the state) increase the number of children actively commuting to and from school by improving sidewalks, bicycle paths, intersections, traffic signals and other infrastructure, as well as by enlisting parents to participate.[38]

Six participating schools are located in the Robbinsdale school district in the northwest suburbs of Minneapolis. They have used Safe Routes to School funds to install bike racks, paint crosswalks and install traffic control devices such as road signs and speed boards. The schools have also informed and involved parents through kickoff events, walk-to-school days and mailings. Since the initiative began in 2010, the district has reported an increase in active transportation among both students and staff in participating schools. In one participating school, Northport Elementary, the number of children biking to school more than doubled, rising from two percent to five percent within two years (from 2012 to 2014). Meanwhile, the number of

> **“40 percent of ninth graders in Minnesota report having no PE in an average week, which helps to explain why less than one-quarter of high school students in the state get the recommended hour of physical activity daily.”**

children being driven to school dropped by the same amount. This is the first step towards important change.[39]

Other regions of Minnesota are also benefiting from the Safe Routes to School program. For example, to combat childhood obesity, the Fond du Lac Reservation is using Safe Routes to School funds to build a two-mile bike and pedestrian trail that will connect residential areas to the local K-12 school.[40] Meanwhile, in Duluth, parents' concerns about safe paths to school helped spur the district's participation in Safe Routes to School in 2006. Since then, schools have used the funds for both safety and infrastructure improvements and additions to the curriculum that educate students about safe ways to walk or bike to and from school.[41]

Minneapolis and St. Paul have made important progress and are considering additional transportation investments that could greatly increase walking and biking. The Bike Walk Twin Cities initiative, which included 75 miles of new sidewalks and bike paths throughout the area and slow-speed streets that give bikes priority over cars, coincided with an increase in the number of individuals who bike to work in Minneapolis from 2.5 percent to 4.5 percent between 2006 and 2012.[42] *USA Today* labeled one of Minneapolis' bike trails, the Midtown Greenway, as "the top urban bike path in the U.S."[43] The trail is lit at night like a road and plowed when it snows. Data show that "several thousand people use the Greenway each spring, summer, or fall day, and hundreds of hearty cyclists and runners use it each winter day no matter how cold or snowy."[44]

Walking and Biking Can Be Serious Transportation

Portland's Safe Routes to School program reports that approximately 42 percent of its students now walk or bike to school, and in Malmo, Sweden—as in much of bike-friendly Northern Europe—half of students bike or walk to school.

Photo: Creative Commons from La Citta Vita

A barge for parking bikes in Malmo, the third-largest city in Sweden.

2 Build physical activity into the school day

Physical education (PE) is an important source of physical activity for children. Yet PE is now absent from many schools and limited in others. Forty percent of ninth graders in Minnesota report receiving no PE in an average week, which helps to explain why less than one-quarter of high school students in the state get the recommended hour of daily physical activity.[45]

Increasing physical activity during the school day can improve students' health, fitness and even their academic performance. Studies have found that PE curricula that emphasize total participation and health and nutrition education, such as the *SPARK* and *CATCH* programs, can substantially increase children's physical fitness and endurance.[46] Other rigorous studies have found that increasing physical activity during the school day can improve bone growth in prepubescent children.[47] Meanwhile, a randomized trial of another program, *Physical Activity Across the Curriculum*, found that incorporating more physical activity into the school day

Active Physical Education can reduce weight gain while building strong bones and lungs.

improved test scores among students at participating schools compared to those in the control group.[48]

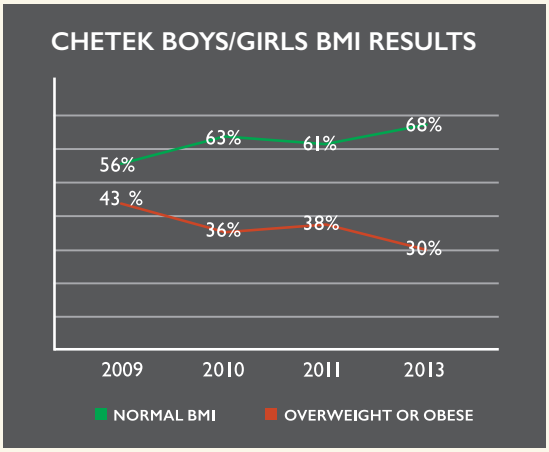
The connection between physical activity and brain functioning helps to explain this boost in test scores. Research shows that physical activity increases neural activity and affects areas of the brain that are associated with learning in children.[49] For example, one randomized study of an afterschool program that provided children with 70 minutes of physical activity per day for nine months found significant improvements in working memory (important for learning, reasoning and comprehension) among participants compared to children in the control group.[50]

3 Do not retreat on healthier school meals

As a result of updated national nutrition standards for school meals that went into effect in 2012, 94 percent of schools in Minnesota are now serving healthier meals that have more fruits, vegetables, whole grains and lean proteins.[52] Schools struggling to meet the updated standards have received support from the U.S. Department of Agriculture (USDA), which has awarded more than $185 million in grants to fund new school kitchen equipment nationwide since 2009 and continues to provide training to school nutrition professionals to help schools serve healthy meals for students. The Department also announced the nationwide expansion of its *Team Up for School Nutrition Success* program, which allows the schools still working to meet the standards to pair up and learn best practices from schools that are already successfully serving healthier meals. USDA has also provided appropriate flexibility on issues such as transitioning to whole grain products.[53]

Accomplishing Real Change

Student obesity rates in the Chetek-Weyerhaeuser School District in Wisconsin are declining faster than almost any other location nationwide. In just four years, from 2009 to 2013, the percent of students who were overweight or obese dropped from 43 percent to 30 percent. The lower obesity rates have coincided with dramatic improvements in physical activity and meals served in district schools. For example, the district purchased exercise equipment such as a climbing wall, skates, snowshoes, kayaks, cross-country skis, mountain bikes, treadmills and elliptical and weight lifting machines. They also updated school meals standards to include more fruits and vegetables, whole grains and low-fat milk and enhanced health and nutrition education during classes.[51]



It is important to keep making progress on healthier meals because children consume up to half of their daily calories at school, and healthier meals will not only help prevent weight gain, but also provide the right nutrients that can enhance physical activity and healthier bone and muscle growth.[54]

Conclusion

Throughout America's history, when military leaders have said it is time for a major change, the country has stepped forward to take action. Too many children are overweight and have weak bones or underdeveloped lungs. Prioritizing changes in schools and communities that promote physical education and activity are the right steps for Minnesota's future. National security is at stake. It is time to act.

The crew of the USS Minnesota at its commissioning in September 2013.

Appendix

Minnesota Data by County on Physical Activity and Obesity

	Adult obesity rate (%)	Adults who report getting no physical activity (%)	Population without adequate access to locations for physical activity (%)		Adult obesity rate (%)	Adults who report getting no physical activity (%)	Population without adequate access to locations for physical activity (%)
Statewide	26	19	15	Mahnomen	31	29	47
Aitkin	27	25	50	Marshall	28	24	67
Anoka	30	21	7	Martin	28	28	28
Becker	29	23	38	Meeker	29	24	50
Beltrami	29	23	30	Mille Lacs	29	25	47
Benton	27	20	46	Morrison	29	23	51
Big Stone	28	21	39	Mower	30	25	31
Blue Earth	26	21	19	Murray	33	23	48
Brown	30	22	18	Nicollet	28	18	25
Carlton	29	19	25	Nobles	28	26	35
Carver	26	16	13	Norman	31	31	68
Cass	28	22	30	Olmsted	22	19	7
Chippewa	30	31	30	Otter Tail	26	23	47
Chisago	28	22	32	Pennington	26	22	30
Clay	30	24	19	Pine	27	23	46
Clearwater	32	25	52	Pipestone	29	23	31
Cook	25	19	1	Polk	32	25	46
Cottonwood	29	27	24	Pope	28	26	50
Crow Wing	27	21	45	Ramsey	25	18	1
Dakota	25	16	3	Red Lake	32	22	51
Dodge	33	20	32	Redwood	30	22	37
Douglas	26	19	27	Renville	33	23	36
Faribault	28	26	29	Rice	27	20	18
Fillmore	25	22	6	Rock	27	23	35
Freeborn	31	25	26	Roseau	34	23	51
Goodhue	30	20	10	St. Louis	26	19	26
Grant	29	24	46	Scott	25	18	7
Hennepin	22	17	1	Sherburne	30	22	19
Houston	26	24	0	Sibley	28	27	39
Hubbard	27	22	45	Stearns	28	19	31
Isanti	30	17	50	Steele	26	20	21
Itasca	29	22	35	Stevens	30	21	35
Jackson	31	22	38	Swift	29	31	53
Kanabec	25	22	60	Todd	28	24	64
Kandiyohi	28	23	29	Traverse	30	27	37
Kittson	31	26	43	Wabasha	30	22	0
Koochiching	27	23	49	Wadena	28	22	58
Lac qui Parle	27	27	58	Waseca	30	26	25
Lake	30	22	33	Washington	25	18	7
Lake of the Woods	29	25	53	Watonwan	29	25	27
Le Sueur	30	20	32	Wilkin	29	24	41
Lincoln	29	24	54	Winona	27	21	2
Lyon	29	19	19	Wright	28	18	23
McLead	32	21	22	Yellow Medicine	28	20	42

Source: County Health Rankings & Roadmaps, Robert Wood Johnson Foundation

Particulate Air Pollution in Major Cities

The average daily density of fine particulate matter in micrograms per cubic meter (PM2.5). Less than 12.4 PM2.5 is considered good by U.S. standards.

Allegheny County (Pittsburgh)	14
Cook County (Chicago)	13.1
Hennepin County (Minneapolis)	12.4
Ramsey County (St. Paul)	12.3
Milwaukee County	12.3
St. Louis City	11.9
New York City	10.8
Los Angeles County	8.1

Source: Robert Wood Johnson Foundation 2015 County Health Rankings, 2011 data.

Endnotes

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