

THE 2014 UNITED STATES REPORT CARD ON PHYSICAL ACTIVITY FOR CHILDREN & YOUTH



Presented By

NATIONAL
Physical Activity Plan.

Make the Move





Table of Contents

About the National Physical Activity Plan Alliance	4
2014 Report Card Research Advisory Committee Members	5
Objective of the 2014 United States Report Card on Physical Activity for Children and Youth	6
Methodology	7
Benefits & Guidelines for Routine Physical Activity	8
Summary of Report Card Indicators & Grades	9
Overall Physical Activity	10
Sedentary Behaviors	12
Active Transportation	14
Organized Sport Participation	16
Active Play	18
Health-Related Fitness	20
Family & Peers	24
School	26
Community & the Built Environment	28
Government Strategies & Investments	30
2014 Report Card Development & Data Sources	32
Abbreviations & Definitions	34
References	35



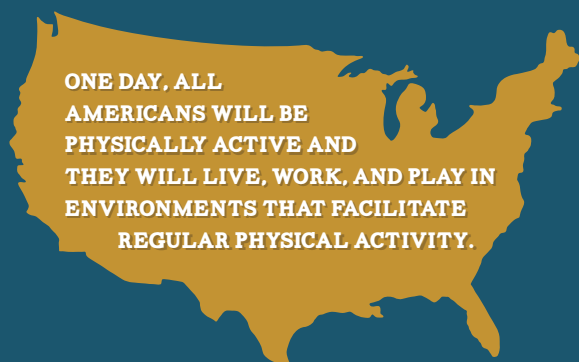
About the National Physical Activity Plan Alliance

The Report Card Research Advisory Committee responsible for developing this report is a sub-committee of the National Physical Activity Plan Alliance (The Alliance). The Alliance is a not-for-profit organization committed to ensuring the long term success of the National Physical Activity Plan (NPAP). The Alliance is a coalition of national organizations that have come together to ensure that efforts to promote physical activity in the American population will be guided by a comprehensive, evidence-based strategic plan. The Alliance is governed by a Board of Directors composed of representatives of organizational partners and at-large experts on physical activity and public health (see the NPAP's website below for a complete list of partners). The Alliance has established the following key objectives:

- Support implementation of the NPAP's strategies and tactics
- Expand awareness of the NPAP among policy makers and key stakeholders
- Evaluate the NPAP on an ongoing basis
- Periodically revise the NPAP to ensure its effective linkage to the current evidence base

ABOUT THE NPAP

The NPAP has a vision:



The NPAP is a comprehensive set of policies, programs, and initiatives that aim to increase physical activity in all segments of the American population. It is the product of a private-public sector collaborative. Hundreds of organizations are working together to change our communities in ways that will enable every American to be sufficiently physically active. The NPAP is ultimately guided by the Board of Directors for the Alliance, a 501c3 nonprofit organization. With the NPAP, The Alliance aims to create a national culture that supports physically active lifestyles. Its ultimate purpose is to improve health, prevent disease and disability, and enhance quality of life.

The NPAP is comprised of recommendations organized in eight sectors:

- Business and Industry
- Education
- Health Care
- Mass Media
- Parks, Recreation, Fitness and Sports
- Public Health
- Transportation, Land Use, and Community Design
- Volunteer and Non-Profit

Each sector presents strategies aimed at promoting physical activity. Each strategy outlines specific tactics that communities, organizations, agencies, and individuals can use to address the strategy. Recognizing that some strategies encompass multiple sectors, the NPAP has several overarching strategies and is focused on initiatives that aim to increase physical activity.

For more information on the NPAP or The Alliance, visit:

<http://www.physicalactivityplan.org>

2014 Research Advisory Committee

COMMITTEE CHAIR:

Peter T. Katzmarzyk, PhD, FACSM, FAHA
Pennington Biomedical Research Center
Baton Rouge, LA

COMMITTEE COORDINATOR/REPORT PRIMARY AUTHOR:

Kara Dentro, MPH
Pennington Biomedical Research Center
Baton Rouge, LA

COMMITTEE MEMBERS:

Kim Beals, PhD, RD, CSSD, LDN
University of Pittsburgh
Pittsburgh, PA

Scott Crouter, PhD, FACSM
The University of Tennessee
Knoxville, TN

Joey C. Eisenmann, PhD
Michigan State University
East Lansing, MI

Thomas L. McKenzie, PhD, FACSM
San Diego State University
San Diego, CA

Russell R. Pate, PhD
University of South Carolina
Columbia, SC

Brian E. Saelens, PhD
University of Washington
Seattle, WA

Susan B. Sisson, PhD, RDN, CHES
University of Oklahoma Health Sciences Center
Oklahoma City, OK

Melinda S. Sothorn, PhD, CEP
Louisiana State University Health Sciences Center
New Orleans, LA

Donna Spruijt-Metz, PhD, MFA
University of Southern California
Los Angeles, CA

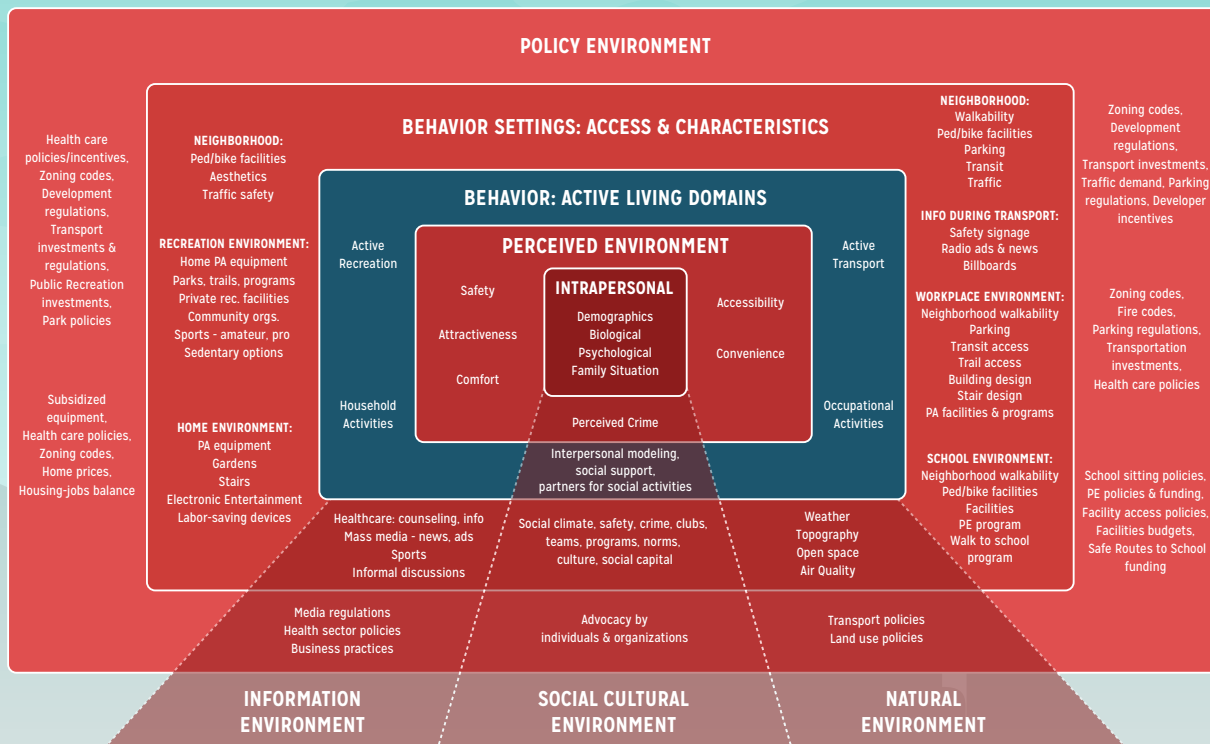


Objective of the 2014 United States Report Card on Physical Activity for Children and Youth

The primary goal of the 2014 United States Report Card on Physical Activity for Children and Youth (the Report Card) is to assess levels of physical activity and sedentary behaviors in American children and youth, facilitators and barriers for physical activity, and related health outcomes. The Report Card is an authoritative, evidence-based document providing a comprehensive evaluation of the physical activity levels and the indicators influencing physical activity among children and youth in the United States (U.S.). The Report Card takes an “ecological approach” to the problem of physical inactivity. The Ecological Model of Active Living, see Figure 1, illustrates

how policy and the environment influence active behavior, including transportation, occupation, household, and recreation. Tracking these behaviors across the multiple levels of influence (policy, behavior settings, perceived environment, and intrapersonal factors) reveals how components within each level can influence active living. Factors shown at the bottom of the model, including the information, social cultural and natural environments, affect multiple levels of influence. Recognizing and understanding how multiple levels of influence can affect behavior change toward a more active lifestyle is imperative to plan effective interventions and programs.

Figure 1. The Ecological Model of Four Domains of Active Living [1].



Source: Sallis JF, Cervero RB, Ascher W, Henderson KA, Kraft MK, Kerr J. An ecological approach to creating active living communities. *Annu Rev Public Health*. 2006;27:297-322 [1]. Reprinted, with permission, from the Annual Review of Public Health, Volume 27 © 2006 by Annual Reviews www.annualreviews.org

Furthermore, the Report Card is a resource for health statistics on children and youth in the U.S. More importantly, it is an advocacy tool which provides a level of accountability and call-to-action for adult decision makers regarding how we, as parents, teachers, health professionals, community leaders, and policy makers can help implement new initiatives, programs, and policies in

support of healthy environments to improve the physical activity levels and health of our children and youth. We hope the Report Card will galvanize researchers, health professionals, community members, and policy makers across the U.S. to improve our children's physical activity opportunities, which will improve health, prevent disease and disability, and enhance quality of life.

Methodology

The Report Card Research Advisory Committee (the Committee), a sub-committee of The Alliance, included experts in physical activity and healthy behaviors from academic institutions across the country, see page 5. The Committee was charged with the development and dissemination of the Report Card, which included determining which indicators to include, identifying the best available data sources(s) for each indicator, and assigning a letter grade to each indicator based on the best available evidence.

The Committee selected 10 indicators related to physical activity in children and youth: (1) overall physical activity; (2) sedentary behaviors; (3) active transportation; (4) organized sport participation; (5) active play; (6) health-related fitness; (7) family and peers; (8) school; (9) community and the built environment; and (10) government strategies and investments.

Data from multiple nationally representative surveys were used to provide a comprehensive evaluation of physical

activity for children and youth. See pages 32-33 for descriptions of data sources. Depending on the indicator, the Committee determined which data source was most appropriate and representative for the U.S. population of children and youth. The Committee selected the best available data source as the “primary indicator” to inform the grade, and “secondary data sources” were included to provide context and clarity. These secondary sources were not always nationally representative, but provided important information not readily available from the primary data source, such as age, ethnic, socioeconomic, and/or gender disparities. The grades for the Report Card were assigned by the Committee using the most recent, representative data available with consideration of recent published scientific literature and reports.

Each grade reflects how well the U.S. is succeeding at providing children and youth opportunities and/or support for physical activity. Table 1 presents a general rubric for determining the grade for each indicator.

Table 1. Report card grading rubric.*

GRADE	DEFINITION	BENCHMARK
A ★★★★★	We are succeeding with a large majority of children and youth.	81-100%
B ★★★★☆	We are succeeding with well over half of children and youth.	61-80%
C ★★★☆☆	We are succeeding with about half of children and youth.	41-60%
D ★★★☆☆	We are succeeding with less than half, but some, children and youth.	21-40%
F ★☆☆☆☆	We are succeeding with very few children and youth.	0-20%
INC ★☆☆☆☆	Incomplete. At the present time there is insufficient information available to establish a grade.	---

*Developed by Active Healthy Kids Canada for the Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth

Benefits & Guidelines for Routine Physical Activity

Routine physical activity, among all ages, is not just about exercising to improve your outward appearance. In addition to reducing body mass index (BMI) and body fatness, habitual physical activity is associated with improvements across many health outcomes, which may not be apparent to most individuals. Research studies have found daily physical activity among children and youth is associated with:

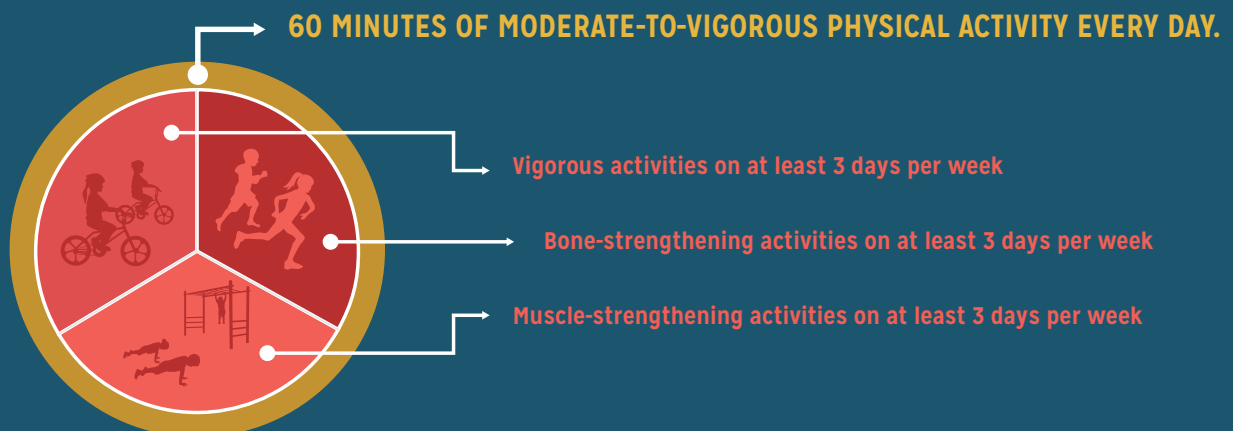
- Increased health-related fitness [2, 3]
- Improvements in cardiovascular and metabolic disease risk profiles [4-6]
- Decreased risk of cardiovascular disease in adulthood [7]
- Decreased risk of developing type 2 diabetes in childhood and adulthood [4, 7]
- Boosts in bone health and development [5, 8, 9]
- Improvements in mental health and well-being [10, 11]
- Improvements in cognitive and academic performance [3, 12, 13]
- Betterments in motor control and physical functioning [14]

The 2008 *Physical Activity Guidelines for Americans* recommends children and youth engage in a minimum of 60 minutes of moderate-to-vigorous physical activity daily, including vigorous-intensity

activity on at least 3 days per week, see Figure 2 [15]. These 60 minutes should also include muscle- and bone-strengthening activities at least 3 days per week. Moderate-to-vigorous physical activity includes activities, which make you sweat or breathe hard, such as running, swimming, and bicycling. Muscle-strengthening activities include exercises that make your muscles work harder than during daily life, such as doing push-ups, playing tug-of-war, or climbing monkey bars. Bone-strengthening exercises produce force on the bones to promote bone growth and strength, such as when your feet make contact with the ground when playing sports or jumping rope [15].

Certain lifestyle and environmental characteristics impact physical activity levels among children and youth. Although the benefits of physical activity for children and youth are similar, research shows that these two age groups are motivated and influenced to be active in different ways. In a systematic review of the correlates of physical activity, parental weight status, preference for physical activity, healthy diet, and time spent outdoors were associated with childhood physical activity levels while white ethnicity, younger age, parental support, and community sports team participation were associated with physical activity levels in youth. The only factors consistently associated with increased activity in both age groups were being male, having the intention/motivation to be active, and having a history of previous physical activity [16].

Figure 2. The 2008 *Physical Activity Guidelines for Americans* recommendations for children and youth [15].



Summary of Report Card Indicators & Grades

GRADE	INDICATOR
D- ★ ★ ★ ★ ★	OVERALL PHYSICAL ACTIVITY
D ★ ★ ★ ★ ★	SEDENTARY BEHAVIORS
F ★ ★ ★ ★ ★	ACTIVE TRANSPORTATION
C- ★ ★ ★ ★ ★	ORGANIZED SPORT PARTICIPATION
INC ★ ★ ★ ★ ★	ACTIVE PLAY
INC ★ ★ ★ ★ ★	HEALTH-RELATED FITNESS
INC ★ ★ ★ ★ ★	FAMILY & PEERS
C- ★ ★ ★ ★ ★	SCHOOL
B- ★ ★ ★ ★ ★	COMMUNITY & THE BUILT ENVIRONMENT
INC ★ ★ ★ ★ ★	GOVERNMENT STRATEGIES & INVESTMENTS

Overall Physical Activity

GRADE



PRIMARY INDICATOR:

The proportion of U.S. children and youth attaining 60 or more minutes of moderate-to-vigorous physical activity on at least 5 days per week.

The grade of D- indicates that the majority of American children and youth do not meet physical activity recommendations. According to NHANES, approximately one quarter of children and youth 6-15 y of age were at least moderately active for 60-minutes per day on at least 5 days per week [17].

2003-04 NHANES [17]

Ages 6-11y: 42.0%

Ages 12-15y: 8.0%

Roughly one quarter of U.S. children and youth 6-15 y of age meet the 2008 Physical Activity Guidelines for Americans recommendation of at least 60 minutes of moderate-to-vigorous physical activity per day [15, 17]. Data for the primary indicator were obtained objectively using accelerometers during the National Health and Nutrition Examination Survey (NHANES). In addition to these objective data, recently released results from the combined 2012 NHANES and NHANES National Youth Fitness Survey (NNYFS) corroborated these findings [18]. In the more recent report, 24.8% of youth 12-15 y of age reported obtaining 60 minutes of moderate-to-vigorous physical activity every day [18]. Meeting the recommendations differs by gender, age group, and ethnicity, with males, younger children, and non-white ethnicities being more active than their female, older, and white ethnicity counterparts, see Figures 3 and 4 [19, 20].

HEALTH BENEFITS ASSOCIATED WITH MODERATE-TO-VIGOROUS PHYSICAL ACTIVITY

Cardiovascular and metabolic health benefits associated with habitual physical activity vary across the activity intensity spectrum; higher intensity activities, such as playing basketball and jogging, are associated with greater health benefits than those at lower energy intensities, such as walking. A longitudinal study from Finland found that youth who remained active during a 6-year follow-up period had more favorable cardiometabolic risk profiles than those remaining inactive. The active boys showed significantly lower insulin and triglyceride concentrations, as well as lower adiposity and a more beneficial ratio of HDL to total cholesterol, than the inactive boys. Girls who remained active had lower triglycerides and lower adiposity

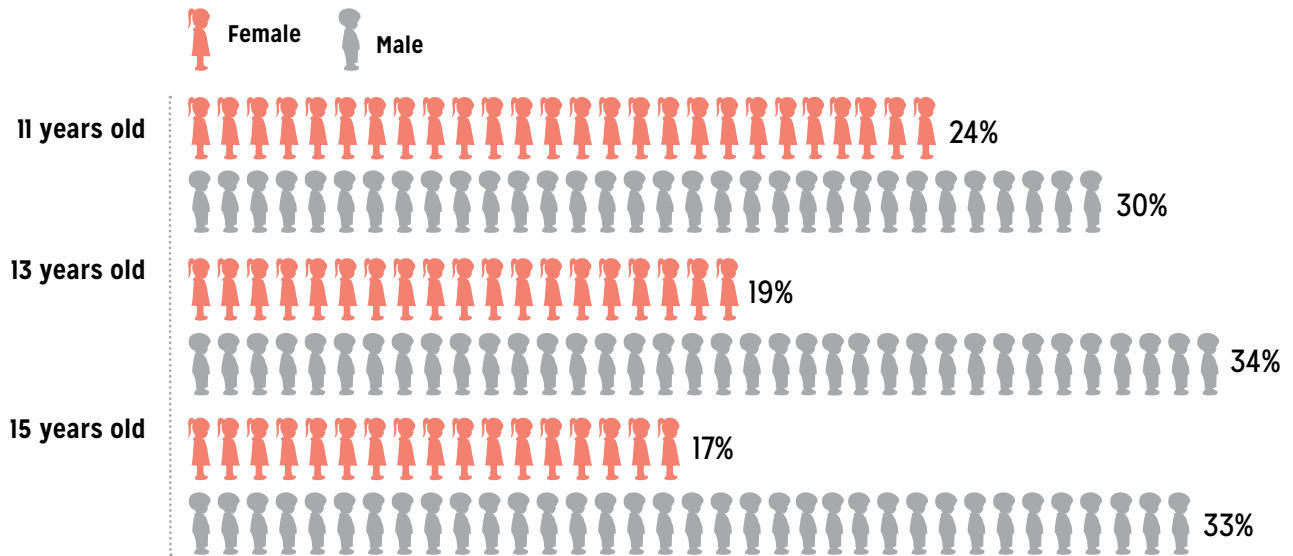
than the inactive girls [21]. Results from The European Youth Heart Study also showed significant correlations between physical activity and cardiovascular and metabolic disease risk factors, including higher fitness, and lower adiposity, waist circumference, systolic and diastolic blood pressure, glucose, insulin, cholesterol, triglycerides, and insulin resistance [4].

WHAT ABOUT LIGHTER INTENSITY ACTIVITIES?

As discussed above, moderate-to-vigorous physical activity is associated with numerous health benefits in children and youth, but lower intensity activities still convey health benefits and are important for inactive children just beginning a physical activity routine, especially for those overweight or obese. According to data from the 2003-06 NHANES, among youth ages 12-19 y, light-intensity physical activities were associated with more favorable cardiometabolic health markers, including lower diastolic blood pressure and higher HDL cholesterol [6]. The data also reflect that youth spend more time engaged in lighter intensity activities rather than moderate-to-vigorous physical activity. On average, the youth spent only 19 minutes per day in moderate-to-vigorous physical activity, but significantly more time, approximately 350 minutes per day, engaged in light-intensity physical activities [6]. Though greater health benefits are seen in youth participating in higher intensity physical activities, the health benefits associated with lighter intensity activities and the time differential between time spent in MVPA versus light activities warrant greater emphasis on how light activity can complement moderate-to-vigorous physical activity throughout childhood.

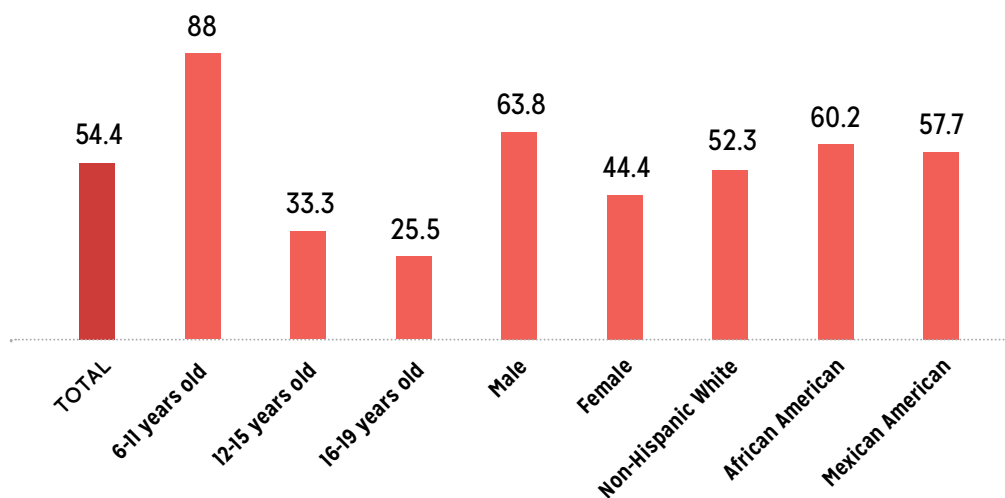
SECONDARY INDICATORS:

Figure 3. Percentages of 11, 13, and 15 year old U.S. youth reporting at least 1 hour of moderate-to-vigorous physical activity daily [20].



Source: Health Behaviour in School-Aged Children Survey. Currie C et al. eds, Social determinants of health and well-being among young people, in Health Behaviour in School-aged Children (HBSC) study: international report from the 2009/2010 survey. 2012, WHO Regional Office for Europe (Health Policy for Children and Adolescents No. 6); Copenhagen [20].

Figure 4. Average number of accelerometer minutes U.S. children and youth ages 6-19 y spent engaging in moderate-to-vigorous physical activity per day [19].



Source: 2003-2006 National Health and Nutrition Examination Survey. Belcher, B.R., et al., Physical activity in US youth: effect of race/ethnicity, age, gender, and weight status. Med Sci Sports Exerc, 2010, 42(12): p. 2211-21 [19].

Sedentary Behaviors

GRADE

D



PRIMARY INDICATOR:

The proportion of U.S. youth engaging in 2 hours or less of screen time per day.

Currently, there are no national guidelines for limiting total sedentary time, but the National Heart, Lung, and Blood Institute and American Academy of Pediatrics (AAP) issued recommendations for television viewing and screen time, indicating that children should be limited to 2 hours or less screen time per day [22-25]. Overall, approximately half of American children and youth aged 6 to 11 y meet the guidelines for screen time. However, significant ethnic disparities exist in screen time. African American youth are much less likely to meet screen time guidelines than white or Hispanic youth [26]. The grade of D reflects this disparity.

2009-10 NHANES [26]: 53.5%

Ages 6-8 y: 59.1%	African American: 36.7%	Hispanic: 61.7%
Ages 9-11 y: 47.8%	White: 55.4%	

Sedentary behavior is emerging as an important, independent chronic disease risk factor. A recent publication defined sedentary behavior as “any waking behavior characterized by an energy expenditure \leq 1.5 metabolic equivalents (METs) while in a sitting or reclining posture” [27]. Operationally, sedentary behavior has been defined as the amount of time spent at low activity counts on an accelerometer, such as <100 counts/min [28]. Estimates from NHANES indicate that children and youth spend over 7 hours per day engaged in sedentary activities, and children become more sedentary as they get older, see Table 2 [19]. Research is limited; thus, many researchers use proxy measures of sedentary behavior such as television viewing and screen time with ‘screen time’ being limited to video games, television and computer time [29]. Currently, there are no evidence-based guidelines for overall sedentary behavior; therefore, this is a research priority. Furthermore, current measures of ‘screen time’ or ‘small screen recreation’ have not caught up to the proliferation of smart phones, tablet computers and other screens in the daily lives of children and youth.

SCREEN TIME RECOMMENDATIONS

Given the lack of a specific guideline for overall sedentary behavior, the Committee relied on screen time as the primary indicator of sedentary behavior. For many years, the AAP has recommended that children should watch no more than 2 hours of quality television programming each day [30]. In 2011, the National Heart, Lung, and Blood Institute and the AAP reaffirmed this recommendation, expanding the scope from television to include all ‘screen

time’ [22, 23, 25]. This is the guideline used in this year’s Report Card. A more recent report from the AAP has recommended that physicians should counsel parents to limit television viewing to less than 1 to 2 hours per day, which is a more flexible recommendation [31]. However, given the difficulty in reconciling this new recommendation with prior established research, the Committee retained the original definition of no more than 2 hours per day of screen time.

According to the Youth Risk Behavior Surveillance System (YRBSS), over half of U.S. high school students met the AAP guidelines for screen time both by watching television and using computers, see Figures 5 and 6 [20, 32]. Objective measurements using accelerometers indicate American children and youth spent a large percentage of their day; approximately 50% of waking hours, engaged in sedentary pursuits, see Table 2 [19].

Sedentary behaviors include both those done during leisure time (e.g., watching television or playing a screen-based video game) and productive time (e.g., reading or using a computer for homework). High levels of leisure time sedentary behavior, such as TV viewing, have been shown to be associated with higher overweight/obesity prevalence and increased cardiometabolic disease risk, regardless of meeting physical activity guidelines [33]. One study found the odds of an adolescent having metabolic syndrome, a clustering of risk factors for future cardiovascular disease and/or type 2 diabetes, increased in a dose-response manner with each additional hour of television watched per day, independent of physical activity levels [34]. No such

association has been observed with productive sedentary behaviors [33]. Future studies should ensure that productive sedentary behavior is examined independently of leisure time sedentary behavior. Further research is also needed to inform the development of sedentary behavior guidelines or recommendations for children and youth.

SECONDARY INDICATORS:

Table 2. Number of minutes and hours per day U.S. children and youth spend in sedentary pursuits as measured by accelerometer (<100 counts per minute) [19].

MINUTES PER DAY SPENT SEDENTARY	
	minutes (hours)
Overall	424.7 (7.1)
6-11 years	351.0 (5.9)
12-15 years	462.6 (7.7)
16-19 years	499.0 (8.3)
Male	415.1 (6.9)
Female	434.7 (7.2)
White	420.9 (7.0)
African American	445.9 (7.4)
Hispanic	418.1 (7.0)

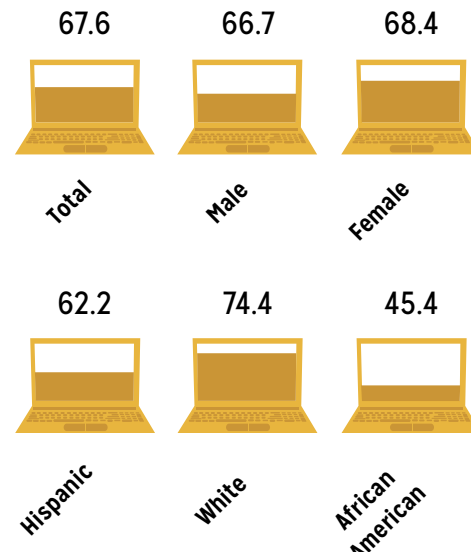
Source: National Health and Nutrition Examination Survey. Belcher, B.R., et al., *Physical activity in US youth: effect of race/ethnicity, age, gender, and weight status*. Med Sci Sports Exerc, 2010. 42(12): p. 2211-21 [19].

Figure 5. Prevalence (%) of U.S. high school students self-reporting meeting screen time guidelines for television [32].



Source: 2011 Youth Risk Behavior Surveillance System. Eaton, D.K., et al., Youth risk behavior surveillance - United States, 2011. MMWR Surveill Summ, 2012. 61(4): p. 1-162 [32].

Figure 6. Prevalence (%) of U.S. high school students self-reporting meeting screen time guidelines for computers/computer games [32].



Source: 2011 Youth Risk Behavior Surveillance System. Eaton, D.K., et al., Youth risk behavior surveillance - United States, 2011. MMWR Surveill Summ, 2012. 61(4): p. 1-162 [32].

PRIMARY INDICATOR:

The percentage of U.S. children and youth who usually walk or bike to school.

The U.S. receives a grade of F for active transportation because the vast majority of American children and youth do not travel to school by active means, such as walking or biking. Since 1969, the proportion of elementary and middle school students walking or biking to school fell 35 percentage points, from 47.7% to 12.7%, see Figure 7 [35].

2009 NHTS [35]: 12.7%

Ages 5-11 y: 13.1%

Ages 12-14 y: 11.8%

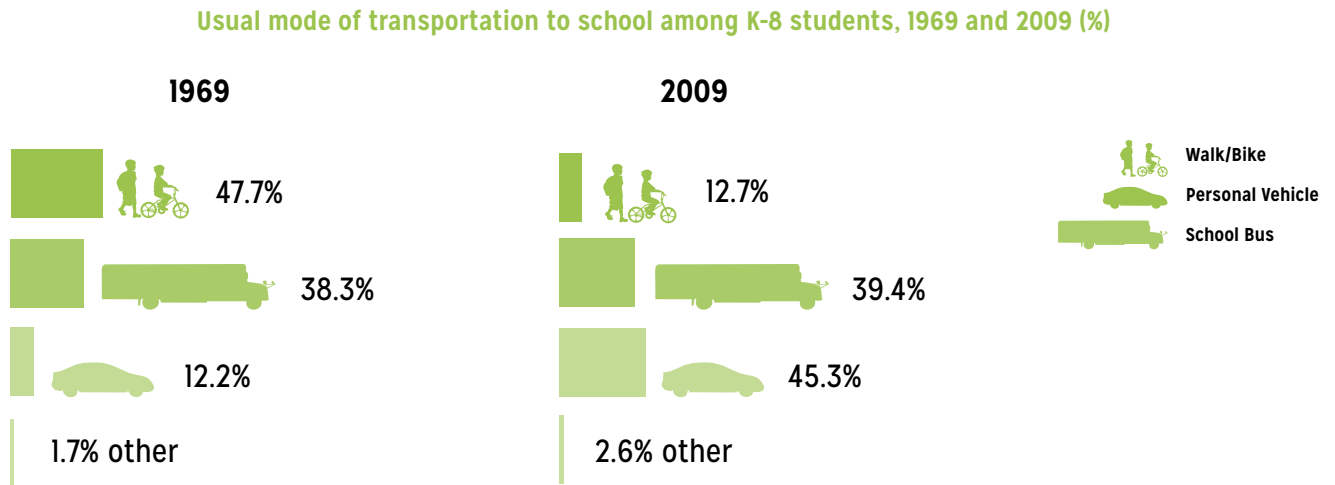
In 1969, the majority of U.S. children and youth walked or biked to school, whereas in 2009 the majority traveled by personal vehicle, see Figure 7 [35]. The distance from a child's home to school is a strong determinant of active transportation. Children living within a quarter mile of their school are 14 times more likely to walk to school than are children living greater than 1 mile away from their school, see Figure 8 [35]. Unfortunately, many students face long trips not possible by active means. According to the 2009 National Household Travel Survey (NHTS), nearly half (49.8%) of U.S. students live farther than 2 miles away from their school [35]. The community and neighborhood environment can facilitate active transportation to school and other nearby locations through the presence of neighborhood schools, sidewalks, bike lanes, and traffic calming mechanisms, such as crosswalks and traffic signals [36].

School-aged children and youth who travel to school by active means accumulate more physical activity and have better cardiorespiratory, metabolic, and muscular fitness profiles than those who travel by passive means [37-39]. Data from the 2003-04 NHANES indicate that U.S. students would accumulate an extra 4.5 minutes of moderate-to-vigorous physical activity each day if they spent 30 minutes per day actively traveling to and from school [37]. In addition to the physical activity benefits per se, studies documented that children who walked to school had greater odds of having a smaller waist circumference and higher HDL cholesterol, lower BMI and adiposity, and higher muscular endurance and cardiorespiratory fitness than passive travelers [38, 39].

SCHOOL-AGED CHILDREN AND YOUTH WHO TRAVEL TO SCHOOL BY ACTIVE MEANS ACCUMULATE MORE PHYSICAL ACTIVITY AND HAVE BETTER CARDIORESPIRATORY, METABOLIC, AND MUSCULAR FITNESS PROFILES THAN THOSE WHO TRAVEL BY PASSIVE MEANS [37-39].

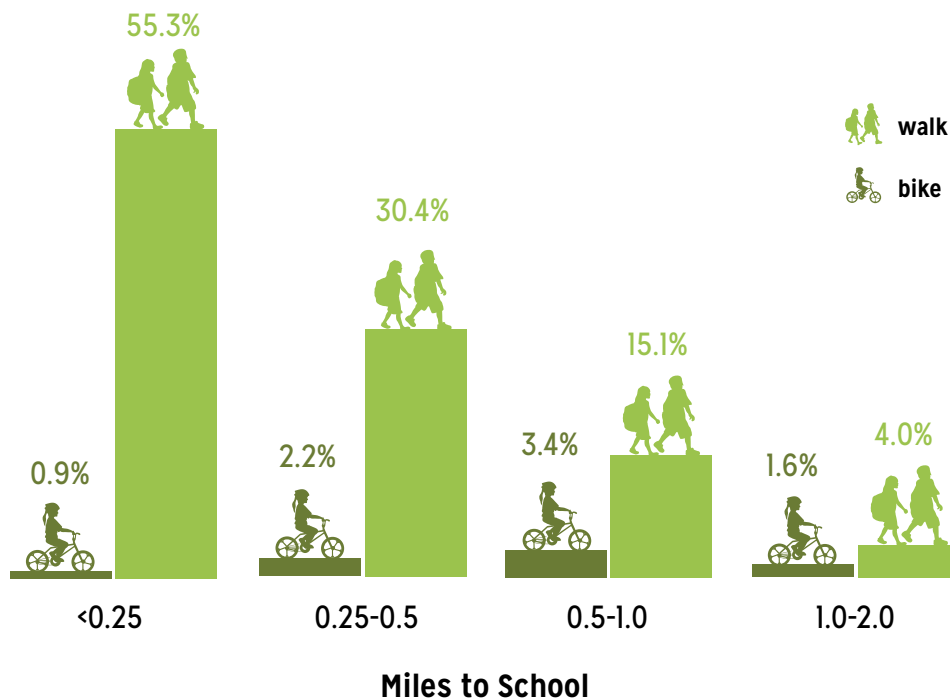
SECONDARY INDICATORS:

Figure 7. Mode of travel to school among U.S. children and youth, by type and year [35].



Source: 1969, 2009 National Household Travel Survey. McDonald, N.C., et al., U.S. school travel, 2009 an assessment of trends. Am J Prev Med, 2011. 41(2): p. 146-51 [35].

Figure 8. Percentages of U.S. children and youth ages 5-14 years who walk or bike to school, by distance from home to school [35].



Source: 2009 National Household Travel Survey. McDonald, N.C., et al., U.S. school travel, 2009 an assessment of trends. Am J Prev Med, 2011. 41(2): p. 146-51 [35].

Organized Sport Participation

GRADE

C-
★★★★★

PRIMARY INDICATOR:

The proportion of U.S. high school students participating on at least 1 school or community sports team.

According to the YRBSS, more than half of U.S. youth participate on at least 1 organized sports team. The prevalence of sports participation among females is significantly lower than that among males. Organized sport participation also differs across ethnic groups, see Figure 9 [32]. The grade of C- was selected because of these disparities.

2011 YRBSS [32]: 58.4%

Male: 64.0% ; Female: 52.6%



Participating on a community or school sports team is an opportunity that can increase physical activity and the prevalence of children and youth who meet physical activity guidelines. The available data to inform the grade for sports participation were obtained from a representative sample of high school students [32]. Organized sport participation is generally higher in younger children and decreases as they become older [40]. Sports participation also differs across ethnic groups, see Figure 9 [32].

The proportion of practice and game time spent engaged in physical activity versus sedentary pursuits and the type of sport are important determinants of the benefits of sports participation [41]. Data demonstrate that youth sports can be a significant source of physical activity, contributing 23 to 60% of daily moderate-to-vigorous activity [42, 43]. One study showed the odds of high school students meeting the physical activity guidelines for moderate-to-vigorous, vigorous, and muscle-strengthening activities, were 1.74, 1.92, and 1.53 times higher, respectively, among those who participated on at least 1 sports team during the previous year compared to those

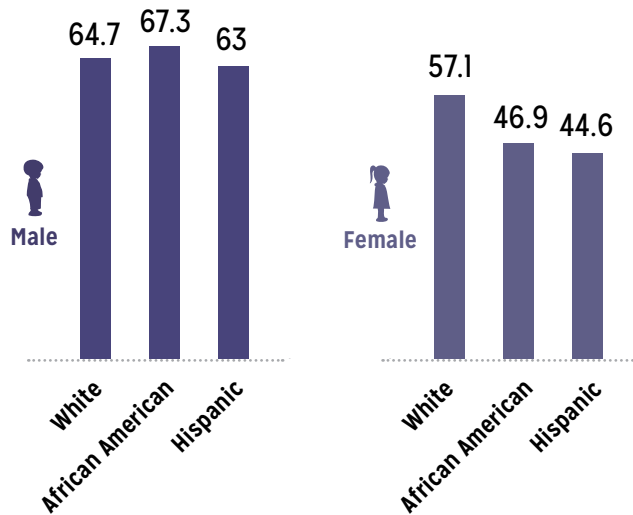
who did not participate on any sports team, see Table 3 [41, 44].

Youth sports participants, on average, obtain 45 minutes of moderate-to-vigorous physical activity during practices, but research suggests not all sports contribute equally to providing physical activity, see Figure 10 for a listing of sports programs favored by students. Youth seem to spend more time engaged in physical activity, especially vigorous activity, when playing soccer rather than other sports, such as baseball, softball, and hockey [41, 45]. Leek and others found that soccer players spent approximately 14 more minutes in moderate-to-vigorous physical activity and 17 more minutes engaged in vigorous physical activity during practice than baseball and softball players [41]. Additionally, many participants spent only about half of practice time engaged in moderate-to-vigorous physical activity with 27 to 43% of the practice spent in more sedentary pursuits and light activity, such as awaiting a turn to practice or receiving instructions from the coach [41, 45]. Sports programs could impact the physical activity lives of the children and youth who participate even more if practices and game times were designed to be more active and less sedentary.

DATA DEMONSTRATE THAT YOUTH SPORTS CAN BE A SIGNIFICANT SOURCE OF PHYSICAL ACTIVITY, CONTRIBUTING 23 TO 60% OF DAILY MODERATE-TO-VIGOROUS ACTIVITY [42, 43].

SECONDARY INDICATORS:

Figure 9. Percentages of U.S. high school students who participated on at least 1 community or sports team, by gender and ethnicity [32].



Source: 2011 Youth Risk Behavior Surveillance System. Eaton, D.K., et al., Youth risk behavior surveillance - United States, 2011. MMWR Surveill Summ, 2012. 61(4): p. 1-162 [32].

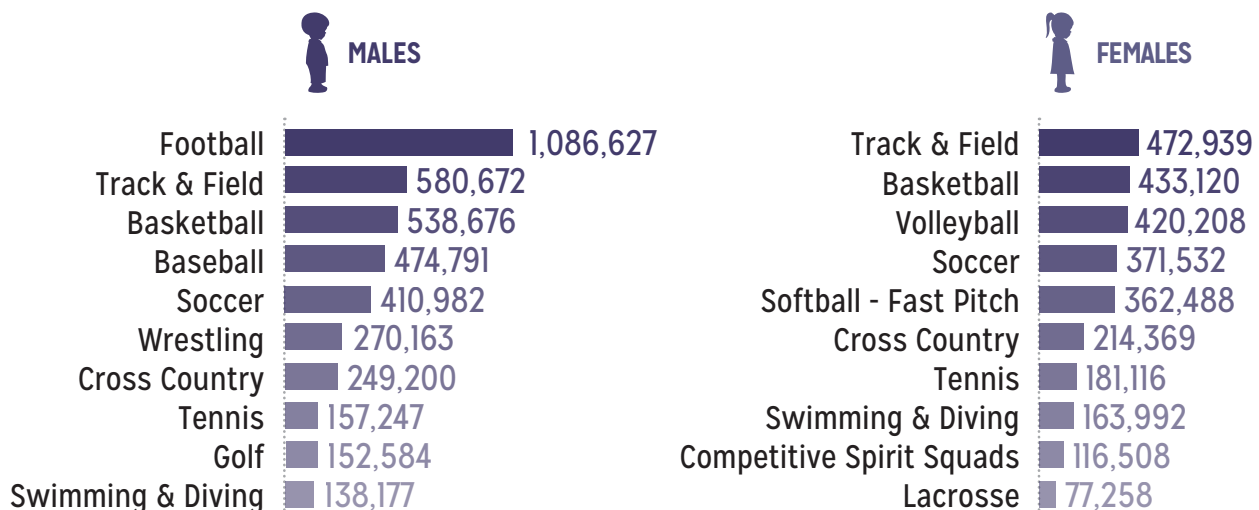
Table 3. Associations between sports team participation and U.S. high school students meeting the 2008 Physical Activity Guidelines [44].

Sports Participation (≥1 team in the past 12 months)	
Meeting guidelines for...	OR
MVPA (≥ 60 min/day, 7 days/week)	1.74**
VPA (≥ 20 min/day, ≥ 3 days/week)	1.92**
Muscle-strengthening activities (≥ 3 days/week)	1.53**

OR: odds ratio, adjusted for gender, ethnicity, grade, and other PA correlates. MVPA: moderate-to-vigorous physical activity. VPA: vigorous physical activity. **P value < 0.001

Source: 2010 National Youth Physical Activity and Nutrition Study. Lowry, R., et al., Obesity and other correlates of physical activity and sedentary behaviors among US high school students. J Obes, 2013. 2013: p. 276318 [44].

Figure 10. Most prominent school sport programs among U.S. high school students, by gender [46].



Source: National Federation of State High School Associations. 2012-13 High School Athletics Participation Survey Results [46].

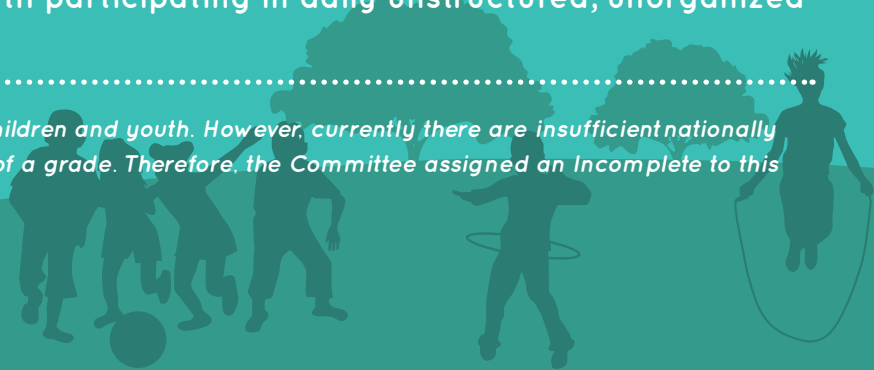
PRIMARY INDICATOR:

The proportion of U.S. children and youth participating in daily unstructured, unorganized active play.

Active play is an important health indicator among children and youth. However, currently there are insufficient nationally representative data available to inform the selection of a grade. Therefore, the Committee assigned an Incomplete to this indicator.

DATA SOURCE: N/A

Male: N/A | Female: N/A



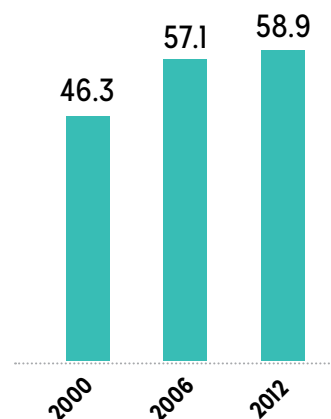
Active play is a product of children's natural inclination to be active, creative, and imaginative. It can take many forms, such as using playground equipment at school or parks and playing active games with friends at recess. When children engage in active play they are free to move in ways they select on their own without formal structure from adults. Research provides evidence that children may engage in more moderate-to-vigorous intensity activity during free play than during organized physical activities [47-49]. One study reported that children's moderate-to-vigorous physical activity levels during outdoor organized activities were, on average, 55% lower than when children were engaged in unorganized outdoor activities. Children spent approximately 53% of free play time and 20% of organized play time engaged in moderate-to-vigorous activity [47].

Regular school recess provides a unique opportunity to increase active play and physical activity among school-aged children. During a 15-minute recess, students may accumulate approximately 7 minutes of their recommended daily physical activity. Research indicates that modifying existing playgrounds and recess spaces with colored concrete markings or sports equipment can increase the amount of physical activity students engage in during recess [50, 51]. A recent review, which aimed to quantify the increase in physical activity resulting from school-based policy and environment interventions, found modifying recess areas by adding playground equipment or pavement markings for games significantly increased moderate-to-vigorous physical activity levels among students by 5 minutes per day, for a total recess contribution of approximately 12 minutes


each day recess is offered [50-53]. Studies indicate that requiring daily recess time during the day could increase the physical activity levels of the 34.7 million children enrolled in U.S. elementary and middle schools, but currently only 59% of U.S. school districts require elementary schools to provide regularly scheduled recess, see Figure 11 [54-56]. This is an improvement over levels reported in 2000 (46.3%).

SECONDARY INDICATORS:

Figure 11. Percentage of U.S. school districts requiring elementary schools to provide regularly scheduled recess, 2000-2012 [54, 56].



Source: 2012 School Health Policies and Practices. Centers for Disease Control and Prevention., School Health Policies and Practices Study 2012: Results from the School Health Policies and Practices Study 2012. 2013, U.S. Department of Health and Human Services.: Atlanta [54]. Source: 2006 School Health Policies and Practices. Centers for Disease Control and Prevention., School Health Policies and Programs Study: Changes Between 2000 and 2006. Atlanta: U.S. Department of Health and Human Services, 2007 [56].



RESEARCH PROVIDES EVIDENCE THAT CHILDREN MAY ENGAGE IN MORE MODERATE-TO-VIGOROUS INTENSITY ACTIVITY DURING FREE PLAY THAN DURING ORGANIZED PHYSICAL ACTIVITIES [47-49].

PRIMARY INDICATOR:

The proportion of U.S. youth meeting physical fitness standards.

Health-related fitness is an important health indicator among children and youth. However, currently there are insufficient nationally representative data available to inform the selection of a grade. Therefore, the Committee assigned an Incomplete to this indicator.

DATA SOURCE: N/A

Male: N/A ; Female: N/A

According to the Bouchard and Shephard model, “health-related fitness refers to those components of fitness that are affected favorably or unfavorably by habitual physical activity and are related to health status” [57]. The 5 components of health-related fitness are metabolic, morphological, motor, muscular, and cardiorespiratory [57]. See Figure 12 for more information on the factors measured to assess each of the components. All 5 components are important for children to maintain optimal health throughout their lifetimes and the components of fitness tend to track from childhood into adulthood [57].

CARDIORESPIRATORY FITNESS

Regular physical activity is associated with higher cardiorespiratory fitness and a better risk factor profile in children and youth [58]. According to data from the 1999-02 NHANES, cardiorespiratory fitness in youth 12-19 y of age as measured by estimated maximal oxygen uptake (VO_{2max}) was higher in males (mean = $46.4 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$) than females (mean = $38.7 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$), but did not differ across white, African American, or Mexican American ethnic groups [59].

METABOLIC FITNESS

Metabolic fitness, including glucose tolerance, insulin sensitivity, and lipid metabolism, is improved by regular physical activity, and improvements are associated with better cardiometabolic disease risk profiles [57, 60, 61]. Among U.S. children, 8% had elevated total cholesterol levels, and 0.7% of males and 3.7% of females had elevated fasting blood glucose levels as classified by American Heart Association (AHA) cutpoints, see Table 4 [60]. These children may be at increased risk for developing metabolic

syndrome and cardiovascular disease. In a sample of Danish children from The European Youth Heart Study, physical activity was negatively associated with metabolic syndrome (risk score computed from insulin, glucose, HDL cholesterol, triglycerides, the sum of four skinfolds, and blood pressure [61]). However, the relationship between physical activity and metabolic risk was modified by cardiorespiratory fitness and no longer significant after adjusting for fitness [61].

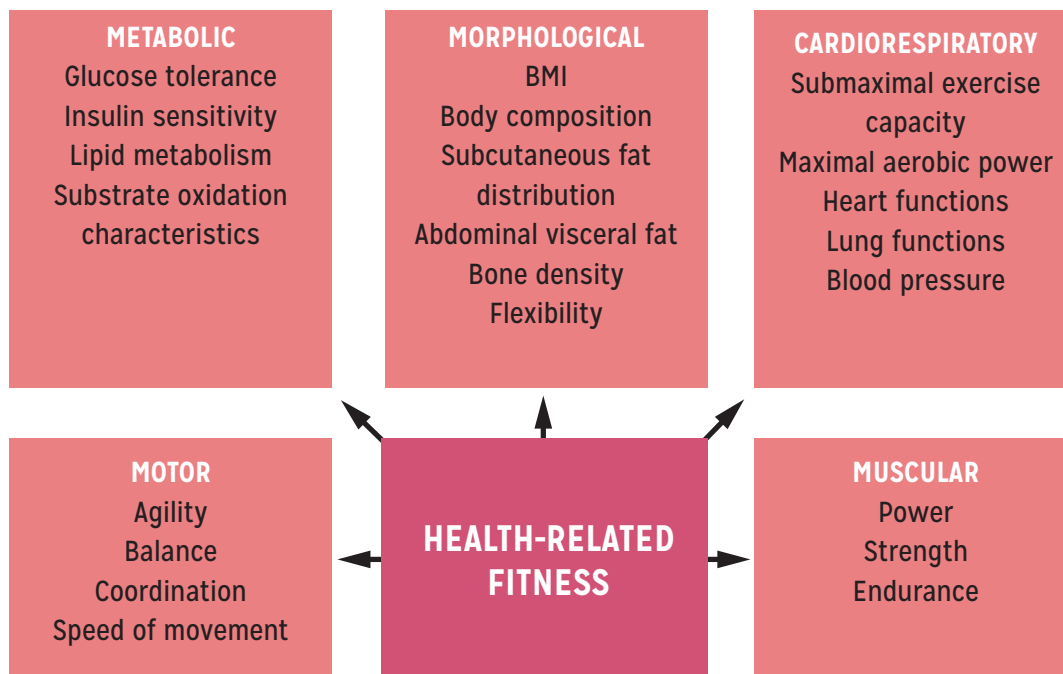
MORPHOLOGICAL FITNESS

BMI is one factor of morphological fitness widely used to determine overweight and obesity. For children of the same age and gender, overweight is defined as a BMI at or above the 85th but lower than the 95th percentile, and obesity is defined as a BMI at or above the 95th percentile, according to Centers for Disease Control and Prevention (CDC) growth charts [62]. These higher BMIs are associated with increased risk for cardiovascular disease, hypertension, and type 2 diabetes [63]. During the 50-year span from 1960 to 2010, the obesity prevalence among children and youth in the U.S. increased dramatically, see Figure 13 [64, 65]. According to NHANES data, 31.8% of children and youth in the U.S. are overweight while 16.9% are obese, and BMI classification is related to physical activity [60, 66]. Overweight and obese children were less likely to meet physical activity recommendations than their normal weight counterparts [66].

MOTOR FITNESS

Motor fitness is often overlooked as an important facet of overall physical fitness because the evidence linking motor fitness, including agility/flexibility, balance, coordination, and speed of movement, to health outcomes is less

Figure 12. Bouchard and Shephard model of health-related fitness, components and factors [57].



Source: Bouchard, C. and R.J. Shephard, Physical Activity, Fitness, and Health: The Model and Key Concepts, in Physical activity, fitness, and health: International proceedings and consensus statement, C. Bouchard, R.J. Shephard, and T. Stephens, Editors. 1994, England: Human Kinetics Publishers: Champaign, IL. p. pp. 77-88 [57].

available than for other components [57, 63]. Studies among adults suggest that flexibility is associated with prevention of back pain and other musculoskeletal issues, as well as improvements in posture, but the absence of large, nationally representative data limits this association in children [63]. Regardless, motor fitness is important as children grow and learn to control their movements and participate in daily life, including sports and other physical activities [57].

MUSCULAR FITNESS

The main aspects of muscular fitness are muscle power, strength, and endurance [57]. Children who participate

in muscle- and bone-strengthening exercises as recommended by the *2008 Physical Activity Guidelines* can increase their muscular fitness. Among youth, strength training can lead to better cardiovascular and metabolic risk profiles, healthier body composition, and improved cognition and physical functioning [67-70]. Recent data from the NNYFS [71] indicated that adolescent boys were generally stronger than adolescent girls on a variety of measures, and older boys and girls had greater strength than younger boys and girls, see Figure 14.

SECONDARY INDICATORS:

Table 4. Prevalence and characteristics of metabolic health factors among American youth ages 2-19 [60].

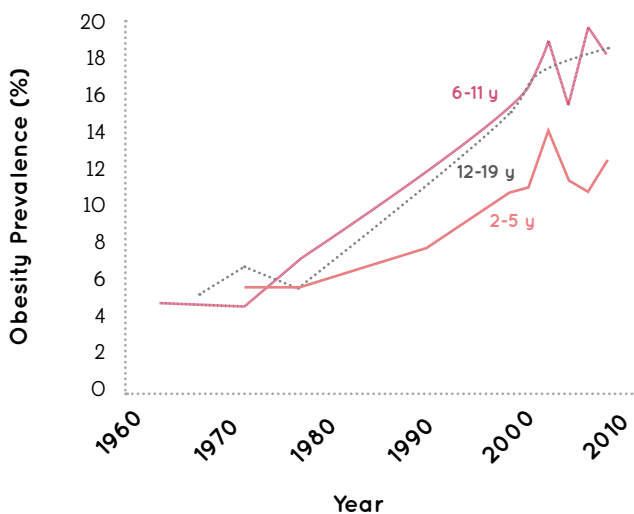
RISK FACTOR	AHA RISK FACTOR CATEGORY (cutpoint)	PREVALENCE (%)	
		Males	Females
Morphological			
BMI	Poor (>95th percentile)	20	17
	Intermediate (85-95th percentile)	15	16
	Ideal (<85th percentile)	66	67
Metabolic			
Total Cholesterol	Poor (≥ 200 mg/dL)	8	8
	Intermediate (170-199 mg/dL)	20	27
	Ideal (<170 mg/dL)	72	65
Fasting Blood Glucose	Poor (≥ 126 mg/dL)	0.7	3.7
	Intermediate (100-125 mg/dL)	26	6
	Ideal (<100 mg/dL)	74	90
Cardiorespiratory			
Blood Pressure	Poor (>95th percentile)	2.9	3.7
	Intermediate (90-95th percentile)	19.4	6
	Ideal (<90th percentile)	77.7	90

BMI: body mass index = weight (kg)/height (m)² (based on measured height and weight, using age- and gender-specific percentiles from growth charts developed by Centers for Disease Control and Prevention).

mg: milligram, dL: deciliter.

Source: Shay, C.M., et al., Status of cardiovascular health in US adolescents: prevalence estimates from the National Health and Nutrition Examination Surveys (NHANES) 2005-2010. *Circulation*, 2013. 127(13): p. 1369-76 [60].

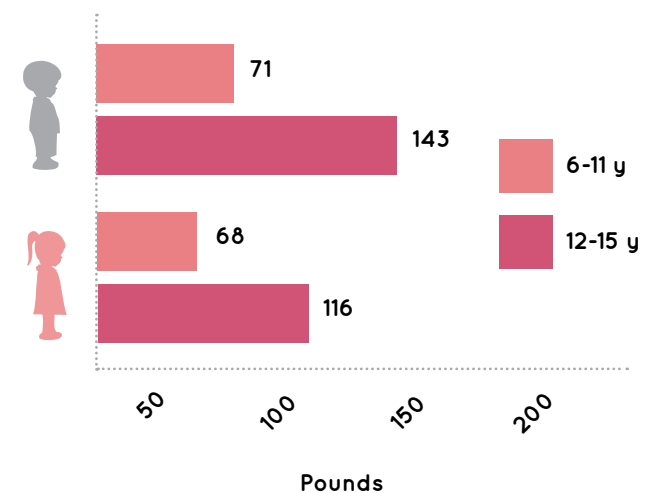
Figure 13. Obesity prevalence among U.S. children and youth ages 2-19, from 1960-2010 [64, 65].



Source: Ogden, C.L., et al., Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. *JAMA*, 2012. 307(5): p. 483-90 [64].

Source: Ogden CL, C.M., Prevalence of obesity among children and adolescents: United States, trends 1963-65 through 2007-2008. *NCHS Health E Stat*, 2010 [65].

Figure 14. Grip strength as measured by handheld dynamometer among U.S. children and adolescents aged 6-15 y, by sex and age [71].



Source: 2012 NHANES National Youth Fitness Survey. Ervin, R.B., et al., Measures of muscular strength in U.S. children and adolescents, 2012. *NCHS Data Brief*, 2013(139): p. 1-8 [71].



**REGULAR PHYSICAL
ACTIVITY IS ASSOCIATED
WITH HIGHER
CARDIORESPIRATORY
FITNESS AND A BETTER
RISK FACTOR PROFILE IN
CHILDREN AND YOUTH [58].**

PRIMARY INDICATOR:

None.

Family and peer support of physical activity is an important determinant of this behavior in children and youth. However, currently there are insufficient nationally representative data available to inform the selection of a grade. Therefore, the Committee assigned an Incomplete to this indicator.

DATA SOURCE: N/A

Male: N/A ; Female: N/A

Parents can support their children’s participation in physical activities by providing direct/logistic support, through behavior modeling, by providing encouragement, and attending events and games of their children. Direct support includes parents enrolling their child in sports, providing transportation to and from physical activities, and/or active parental involvement in the activity [72]. Behavior modeling occurs when parents show or encourage their children to be active through their own behavior; for example, by participating in daily physical activities or sports [72]. Evidence is lacking with regard to how parental behaviors influence children’s physical activity levels. The Framingham Heart Study reported that children with active parents were almost 6 times more likely to be active compared to children with inactive parents [73]. Conversely, a recent comprehensive review of the correlates of children (ages 4-11 y) and youth (ages 12-18 y) physical activity levels found mixed results among the potential parental influence variables [16]. Thirty-eight percent of studies found a significant positive association between children’s and their parent’s physical activity levels, or parental role modeling. Likewise, no definitive association was found between children’s physical activity levels and parent participation in their child’s physical activity. The findings for parental role modeling were similar for youth, but direct help from parents, support from significant others, and sibling physical activity levels were consistently related to adolescent physical activity among studies included in the review [16].

Evidence from the 2010 National Youth Physical Activity and Nutrition Study (NYPANS) indicates that between 60 to 75% of parents reported encouraging their children to be physically active, see Table 5 [44]. However, only 48.5% reported actually being active with their child. Results from the same study provide some evidence that adult support for physical activity resulted in a greater odds of the children meeting physical activity recommendations, see Table 6 [44].

SECONDARY INDICATORS:

Table 5. Prevalence of adult support for physical activity among U.S. high school students [44].

ADULT SUPPORT FOR PHYSICAL ACTIVITY (≥ 1 TIME/WEEK)	
How often does the adult in the household...	%
Encourage the adolescent to participate in PA or play sports?	73.9%
Do PA or plays sports with the adolescent?	48.5%
Provide transportation to PA or sports adolescent participants in?	67.8%
Watch the adolescent do PA or play sports?	61.8%

PA: Physical Activity

Source: 2010 National Youth Physical Activity and Nutrition Study. Lowry, R., et al., Obesity and other correlates of physical activity and sedentary behaviors among US high school students. *J Obes*, 2013. 2013; p. 276318 [44].


Table 6. Associations between meeting the 2008 Physical Activity Guidelines and adult support for physical activity [44].

ADULT SUPPORT FOR PHYSICAL ACTIVITY (≥ 1 TIME/WEEK)	
Meeting guidelines for...	OR
MVPA (≥ 60 min/day, 7 days/week)	1.09**
VPA (≥ 20 min/day, ≥ 3 days/week)	1.12**
Muscle-strengthening activities (≥ 3 days/week)	1.10**

OR: odds ratio, adjusted for gender, ethnicity, grade, and other PA correlates. MVPA: moderate-to-vigorous physical activity. VPA: vigorous physical activity.

**P value < 0.001

Source: 2010 National Youth Physical Activity and Nutrition Study. Lowry, R., et al., Obesity and other correlates of physical activity and sedentary behaviors among US high school students. *J Obes*, 2013. 2013; p. 276318 [44].



THE FRAMINGHAM HEART STUDY REPORTED THAT CHILDREN WITH ACTIVE PARENTS WERE ALMOST 6 TIMES MORE LIKELY TO BE ACTIVE COMPARED TO CHILDREN WITH INACTIVE PARENTS [73].

PRIMARY INDICATOR:

The proportion of U.S. high school students attending at least one physical education (PE) class in an average week.

Approximately half of American high school students report attending a PE class during an average school week. At many high schools throughout the country, PE classes are not mandated for all 4 years, and a school grade disparity within PE participation is seen. PE participation in high school is highest in 9th grade, decreases in 10th and 11th grade students, and is lowest in 12th grade. In addition to the grade disparity, PE participation also differs by gender with males more likely to regularly attend PE classes than females [32]. A grade of C- was selected for this indicator because only half of youth participate in daily PE and due to this gender disparity in attendance.

2011 YRBSS [32]: 51.8%

Male: 56.7% ; Female: 46.7%

School-based PE is one of five strategies to increase physical activity levels strongly recommended by the Task Force on Community Preventive Services [74, 75]. The results in Table 7, from the 2010 NYPANS, indicate that youth who participate in PE have greater odds of meeting the physical activity guidelines [32]. Currently, 90 to 94% of U.S. school districts require elementary, middle, and high schools to teach PE, see Table 8 [54]; however, offering PE classes is not synonymous with students attending the classes, especially during the high school years [32]. High school PE participation was selected as the primary indicator for this year's report card given the availability of nationally representative data. According to the 2011 YRBSS, approximately half of U.S. high school students reported attending no PE class during an average week, and the prevalence of attending PE classes decreased

for each ascending grade, with highest participation rates among 9th grade and lowest among 12th grade students, see Figure 15 [32].

Additionally, elementary and middle school PE classes are frequently taught by untrained classroom teachers or without an activity-based PE curriculum, and therefore the classes may not be effective to increase activity levels among students [2, 75]. PE classes should be taught by trained teachers or PE specialists and designed to produce maximal physical activity benefits. When these conditions are met, PE classes not only significantly increase students' daily amounts of moderate-to-vigorous physical activity and the proportion of PE class time spent being active, but also provide muscular and cardiorespiratory fitness health benefits [2, 74, 75].

...PE CLASSES NOT ONLY SIGNIFICANTLY INCREASE STUDENTS' DAILY AMOUNTS OF MODERATE-TO-VIGOROUS PHYSICAL ACTIVITY, BUT ALSO PROVIDE MUSCULAR AND CARDIORESPIRATORY FITNESS HEALTH BENEFITS [2, 74, 75].

SECONDARY INDICATORS:

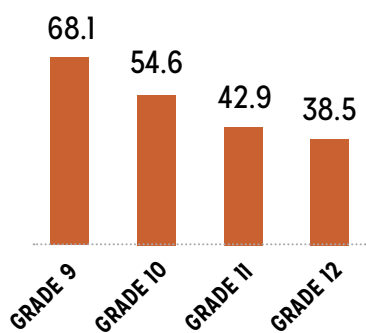
Table 7. Associations between attending daily physical education classes and meeting the 2008 Physical Activity Guidelines among U.S. high school students [44].

DAILY PE CLASSES (5 DAYS/WEEK)	
Meeting guidelines for...	OR
MVPA (≥60 min/day, 7 days/week)	1.4*
VPA (≥20 mins/day, ≥3 days/week)	2.80**
Muscle-strengthening activities (≥3 days/week)	2.57**

PE: Physical Education. OR: odds ratio, adjusted for gender, ethnicity, grade, and other PA correlates. MVPA: moderate-to-vigorous physical activity. VPA: vigorous physical activity.
*P value < 0.01, **P value < 0.001

Source: 2010 National Youth Physical Activity and Nutrition Study. Lowry, R., et al., *Obesity and other correlates of physical activity and sedentary behaviors among US high school students*. J Obes, 2013. 2013: p. 276318 [44].

Figure 15. Percentage of U.S. high school students who attended PE classes in an average school week, by grade [32].



PE: Physical Education.

Source: 2011 Youth Risk Behavior Surveillance System. Eaton, D.K., et al., *Youth risk behavior surveillance - United States, 2011*. MMWR Surveill Summ, 2012. 61(4): p. 1-162 [32].

Table 8. Percentages of U.S. school districts requiring certain policies supporting physical activity [54].

POLICIES SCHOOL DISTRICTS REQUIRE	ELEMENTARY SCHOOLS	MIDDLE SCHOOLS	HIGH SCHOOLS
Schools must teach PE	93.6	91.9	92.4
Schools must provide PA breaks outside of PE class and recess	11.8	10.8	2.0

PA: Physical Activity; Physical Education: PE

Source: 2012 School Health Policies and Practices Study. Centers for Disease Control and Prevention., *School Health Policies and Practices Study 2012: Results from the School Health Policies and Practices Study 2012*. 2013, U.S. Department of Health and Human Services.: Atlanta [54].

Community & the Built Environment

GRADE

B-
★★★★☆

PRIMARY INDICATOR:

The proportion of children and youth living in neighborhoods with at least 1 park or playground area.

.....
According to the National Survey of Children's Health (NSCH), the large majority of American children and youth live in neighborhoods with at least 1 park or playground area. However, significant disparities exist by ethnicity and socioeconomic status as measured relative to the federal poverty level (FPL) [76]. The grade of B- was selected because of these disparities.

2011-12 NSCH [76]: 84.6%

≤ 99% FPL: 80.7% ≥ 400% FPL: 88.7%

The term “built environment” refers to human-made features of the community built to facilitate daily life, such as streets, shops, restaurants, and parks. The Task Force on Community Preventive Services strongly recommends “creating or enhancing access to places for physical activity combined with informational outreach activities” as an effective strategy to increase physical activity levels in neighborhoods and communities [74]. The built, or physical, environment can facilitate physical activity, improve health-related fitness, and decrease body fatness among children and youth in many ways, for example, by providing convenient access to parks or recreation centers and safe sidewalks to actively transport to and from nearby locations [74, 77, 78]. See Figures 16-18 for prevalence of U.S. children and youth with neighborhood access to environmental features that promote physical activity. Evidence suggests parks are second only to schools as the setting where children and youth are most active [79, 80], and numerous studies have shown higher physical activity levels among children and youth living near parks or recreation centers [78-82]. For these reasons, the Committee selected

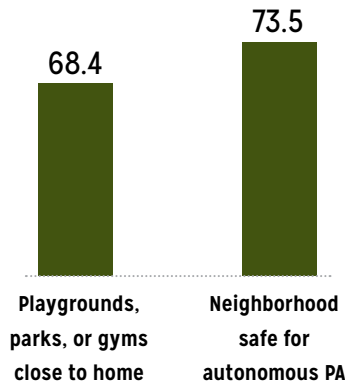
the presence of parks as the graded indicator, but many other community and built environment characteristics may influence children’s physical activity levels.

In addition to the presence of neighborhood parks, certain park features seem to impact the physical activity levels of the children and youth who use them. Many parks encourage use by younger children by including playground equipment, such as swing sets and climbing bars; parks, however, should also engage older children by providing equipment they enjoy using [79]. Studies have shown modifying parks to include sports courts, skateboarding areas, or a velodrome increases park use and physical activity levels among youth [51, 79]. This year’s grade for Community and Built Environment is based solely on the presence of parks or playgrounds. Park characteristics, including activity programming and equipment, are strongly correlated with park use and physical activity levels within the park [83]. More information is required on the quality of the park infrastructure, the availability of programming and activities available, and safety concerns due to violence and traffic.

STUDIES HAVE SHOWN MODIFYING PARKS TO INCLUDE SPORTS COURTS, SKATEBOARDING AREAS, OR A VELODROME INCREASES PARK USE AND PHYSICAL ACTIVITY LEVELS AMONG YOUTH [51, 79].

SECONDARY INDICATORS:

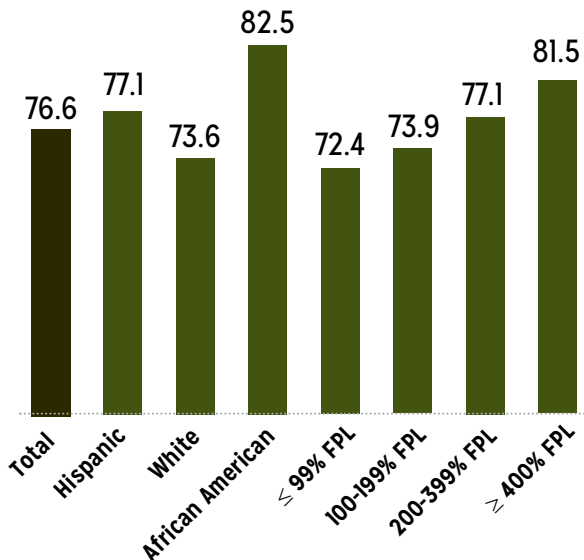
Figure 16. Percentage of U.S. high school students who reported living in physical activity supportive neighborhoods [44].



PA: Physical Activity

Source: 2010 National Youth Physical Activity and Nutrition Study. Lowry, R., et al., Obesity and other correlates of physical activity and sedentary behaviors among US high school students. *J Obes*, 2013. 2013: p. 276318 [44].

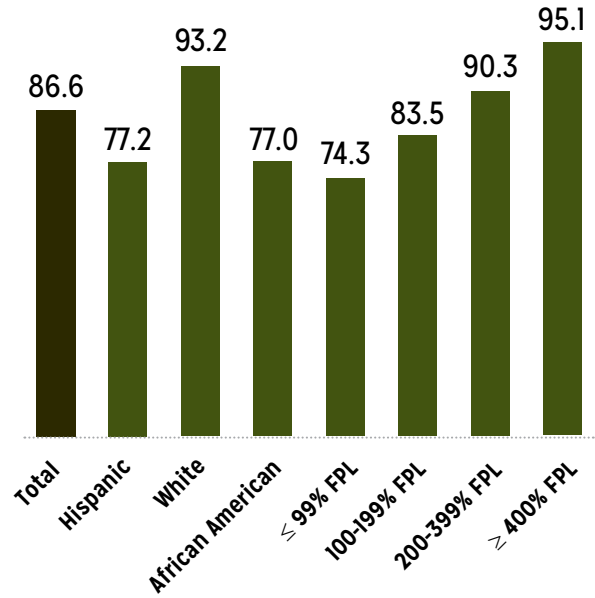
Figure 18. Percentage of U.S. children and youth who reported living in neighborhoods with sidewalks, by ethnicity and FPL [76].



FPL: Federal poverty level.

Source: National Survey of Children's Health, NSCH 2011/12. Data query from the Child and Adolescent Health Measurement Initiative. . Data Resource Center for Child and Adolescent Health website [76].

Figure 17. Percentage of U.S. children and youth who reported living in safe neighborhoods by ethnicity and FPL [76].



FPL: Federal poverty level.

Source: National Survey of Children's Health, NSCH 2011/12. Data query from the Child and Adolescent Health Measurement Initiative. . Data Resource Center for Child and Adolescent Health website [76].

PRIMARY INDICATOR:

Strategies, policies, and investments made by the U.S federal government toward increasing physical activity levels and developing guidelines recommending healthful amounts of physical activity among American children and youth.

.....
The U.S. government has established or continued programs and policies aimed at improving physical activity levels of children and youth. Notable initiatives include the 2008 Physical Activity Guidelines for Americans, the Community Transformation Grant Program, the Federal Safe Routes to School Program, Let's Move!, NHANES National Youth Fitness Survey, and the President's Council on Fitness, Sports, and Nutrition. However, currently there are insufficient nationally representative data to inform the selection of a grade. Therefore, the Committee assigned an Incomplete to this indicator.

2008 PHYSICAL ACTIVITY GUIDELINES FOR AMERICANS [15]

The 2008 Physical Activity Guidelines for Americans represent the first comprehensive evidence-based physical activity guidelines for Americans issued by the U.S. government. The 2008 Physical Activity Guidelines provide scientific evidence for the amounts and types of physical activities recommended for children and adults in order to improve their health. These guidelines have influenced physical activity recommendations across the globe. In addition to the recommended amounts of activity, the 2008 Physical Activity Guidelines contain information on the health benefits of routine physical activity, special considerations for children, youth, adults, elderly persons, pregnant women, those with disabilities or chronic medical conditions, and action strategies to help adults and children meet the guidelines. In 2012, the Physical Activity Guidelines for Americans Midcourse Report: Strategies to Increase Physical Activity among Youth was released by the Department of Health and Human Services (HHS) and the President's Council on Fitness, Sports, & Nutrition. The overarching goal of this midcourse report was to provide evidence-based strategies to increase physical activity among children and youth. The physical activity recommendations established in the 2008 Physical Activity Guidelines report were not altered, but ways to meet the guidelines in a variety of settings were provided. For more information and a PDF of the 2008 Physical Activity Guidelines or Midcourse Report, visit <http://www.health.gov/paguidelines/>

COMMUNITY TRANSFORMATION GRANT PROGRAM [84]

The Community Transformation Grant program supports programs that focus on community health and wellness, including those that promote active living and healthy

eating. Since 2011, CDC has awarded more than \$170 million to state and local government agencies, tribes and territories, and nonprofit organizations across the U.S. Approximately 75% of awardees' programs focus on increasing access to physical activity opportunities, such as improving school-based PE, increasing the number of schools providing regularly scheduled recess, and increasing access to physical activity outside of the school through community sports and recreation programs. For more information on the Community Transformation Grant program or funded programs, visit: <http://www.cdc.gov/nccdphp/dch/programs/communitytransformation/index.htm>.

FEDERAL SAFE ROUTES TO SCHOOL PROGRAM [85]

The Federal Safe Routes to School (SRTS) Program was established in August 2005 through the legislation, Safe Accountable Efficient Transportation Equity Act: A Legacy for All Users (SAFETEA-LU). SAFETEA-LU provided funding for State Departments of Transportation to create and administer SRTS programs. The SRTS Program aims to empower states and communities to establish programs and projects that make actively commuting to school safe and routine for children and youth. From FY 2005-12, the SRTS apportioned over \$1 billion to state SRTS programs in all 50 states and the District of Columbia (D.C.). In 2012, the Moving Ahead for Progress in the 21st Century (MAP-21) legislation was passed, which authorized funding for the Transportation Alternatives Program (TAP). The TAP replaced funding from the SRTS Program by funding programs deemed "transportation alternatives", such as safe routes to schools projects, pedestrian and bicycle facilities, recreational trails, and more. In essence, TAP

widened the scope of physical activity-friendly projects eligible for funding compared to the SRTS program. The TAP includes an \$809M authorization for FY 2013 and an \$820M appropriation for FY 2014. For more information about SRTS or TAP, visit http://www.fhwa.dot.gov/environment/safe_routes_to_school/ or http://www.fhwa.dot.gov/environment/transportation_alternatives/.

LET'S MOVE! [86]

Launched in 2010, *Let's Move!* was introduced and implemented by First Lady Michelle Obama. Its mission is to solve the problem of childhood obesity in the U.S. in a single generation. *Let's Move!* includes five goals as follows: (1) Creating a healthy start for children; (2) Empowering parents and caregivers; (3) Providing healthy food in schools; (4) Improving access to healthy, affordable foods, and (5) Increasing physical activity. The White House Task Force on Childhood Obesity was created in 2010 by a Presidential Memorandum to research and develop a report providing benchmarks and an action plan addressing the five overarching goals of *Let's Move!* The Task Force's mission was to review all available evidence on programs and policies aimed at childhood nutrition or physical activity in order to develop a national action plan to solve the problem of childhood obesity in a single generation. The final report and recommendations were released in 2011. For more information on *Let's Move!* or the White House Task Force on Childhood Obesity, visit: <http://www.letsmove.gov/>

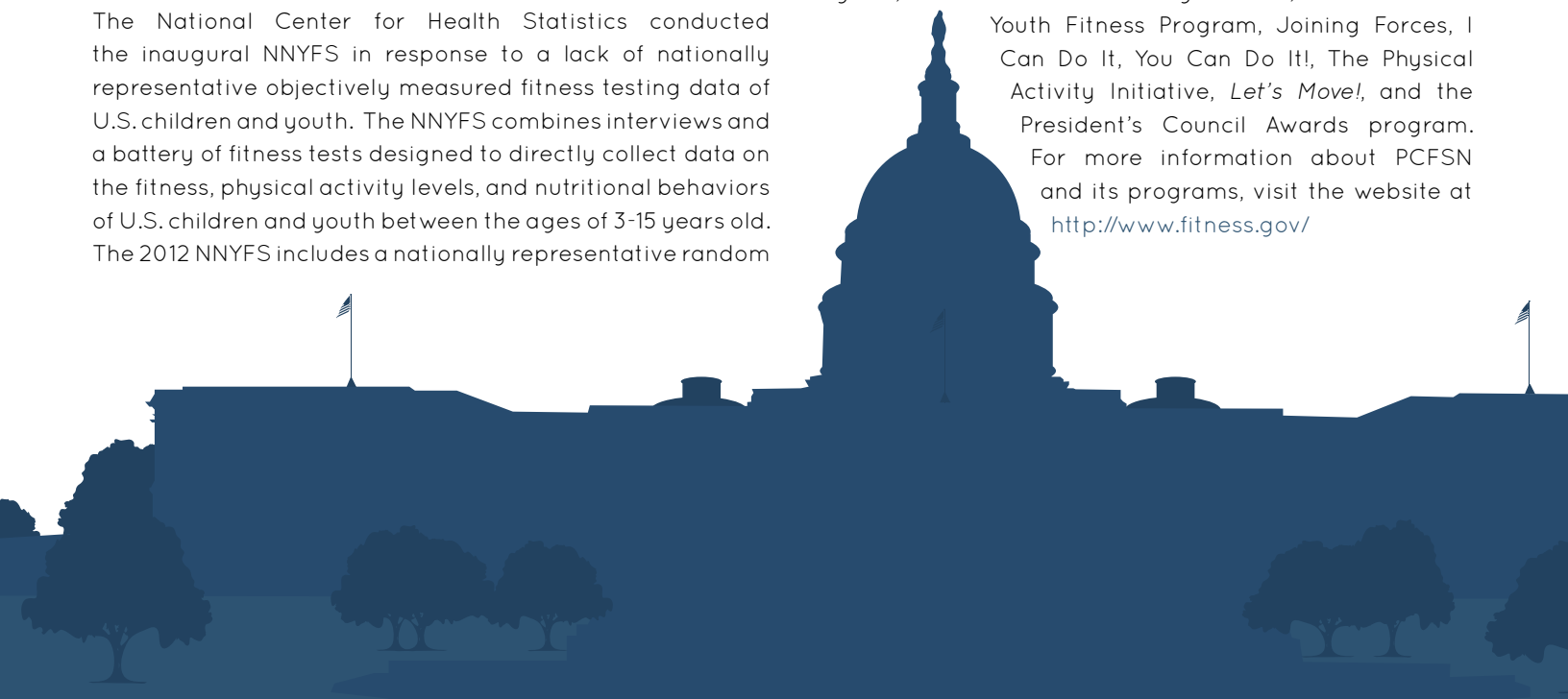
NHANES NATIONAL YOUTH FITNESS SURVEY [87]

The National Center for Health Statistics conducted the inaugural NNYFS in response to a lack of nationally representative objectively measured fitness testing data of U.S. children and youth. The NNYFS combines interviews and a battery of fitness tests designed to directly collect data on the fitness, physical activity levels, and nutritional behaviors of U.S. children and youth between the ages of 3-15 years old. The 2012 NNYFS includes a nationally representative random

sample of approximately 1,500 children and youth living in the U.S. Self-report data consist of interviews, which include both a family and participant questionnaire. The family questionnaire collects demographics and socioeconomic status information while the participant questionnaire includes information on dietary and other health-related behaviors and activities. The health measurements and fitness tests are conducted in a mobile examination center by trained medical personnel. Fitness and physical activity measurements include anthropometric measurements, accelerometry and performance on age-specific physical activities to assess the different components of physical fitness, including body composition, cardiorespiratory endurance, musculoskeletal strength and endurance, and flexibility. More information on the NNYFS can be found at: <http://www.cdc.gov/nchs/nyfs.htm>.

PRESIDENT'S COUNCIL ON FITNESS, SPORTS, & NUTRITION [88]

With the vision, "All Americans lead healthy, active lives," the President's Council on Fitness, Sports, & Nutrition (PCFSN) strives to educate and motivate all Americans to live healthy lifestyles, including habitual physical activity and good nutrition. PCFSN includes all Americans in their efforts and programs, special considerations are made to promote education and access to healthy behaviors among children, youth, and other at-risk populations. PCFSN partners with private and public sector organizations on a number of programs aimed to promote physical activity among children and youth, including the President's Challenge Program, Presidential Active Lifestyle Award, the Presidential Youth Fitness Program, Joining Forces, I Can Do It, You Can Do It!, The Physical Activity Initiative, *Let's Move!*, and the President's Council Awards program. For more information about PCFSN and its programs, visit the website at <http://www.fitness.gov/>



2014 Report Card Development & Data Sources

An interdisciplinary team of scientists and professionals compiled the available resources to determine this year's grades. Several sources of data were available to inform the grades (listed alphabetically below):

HEALTH BEHAVIOUR IN SCHOOL-AGED CHILDREN (HBSC) [20]

The HBSC study conducted in collaboration with the World Health Organization (WHO) Regional Office for Europe is a cross-sectional survey conducted every four years in 43 countries across Europe and North America. The most recent HBSC was administered in 2009-10 and included data on over 200,000 11-, 13-, and 15-year old boys and girls. Data are collected on various topics related to adolescent health and well-being, including body image, bullying, obesity, alcohol and tobacco use, mental health, physical activity and sexual health. The findings from the survey are used both at the national and international levels to inform policies and practices aimed to improve adolescent health. The data included in this report are published in *The Social determinants of health and well-being among young people: Health Behaviour in School-aged Children (HBSC) study: international report from the 2009/2010 survey* [20]. For additional information on the HBSC, including fact sheets, please visit: <http://www.hbsc.org/>

HIGH SCHOOL ATHLETICS PARTICIPATION SURVEY (HSAPS) [46]

The HSAPS is a national survey administered annually since 1971 by the National Federation of State High School Associations. The HSAPS includes data on the number and types of sports programs offered to male and female students in U.S. high schools. It also collects data on the number of students who participate in high school sports programs overall and by sport. Additionally, participation data are collected on adapted sports programs for students with disabilities. The 2012-13 HSAPS includes data from state high school athletic associations in all 50 states and the District of Columbia. The data included in this report are published on the National Federation of State High School Associations website in a document entitled, *2012-13 High School Athletics Participation Survey* [46]. More information on the HSAPS can be accessed online at: <http://www.nfhs.org/content.aspx?id=3282>

NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES) [89]

NHANES involves a series of surveys designed to assess the health and nutritional status of adults and children in the

U.S. conducted by the National Center for Health Statistics. A nationally representative sample of approximately 5,000 persons living in the U.S. is examined each year. The survey combines interviews and physical examinations. The interview includes information on demographics, socioeconomic, dietary, and health-related questions. The NHANES examination consists of medical, dental, and physiological measurements, as well as laboratory tests performed by trained medical personnel. NHANES was most recently conducted in 2011-12. The data included in this report are published in various peer-reviewed publications cited in each section, no novel analyses were performed [17, 19, 59, 64, 65]. More information on NHANES can be found at: http://www.cdc.gov/nchs/nhanes/about_nhanes.htm

NATIONAL HOUSEHOLD TRAVEL SURVEY (NHTS) [90]

The NHTS is the only nationally representative survey that collects information on Americans' transportation patterns to inform national and state transportation programs and policies. The U.S. Department of Transportation Federal Highway Administration has conducted the NHTS or its predecessor the Nationwide Personal Transportation Survey since 1969. The most recent NHTS was conducted during 2008-09 and collected data from 150,147 households using a list-assisted random digit dialing computer-assisted telephone interviewing survey design. Data are collected on all trips taken on a randomly assigned day, including the purpose and duration of each trip, mode of transportation, time and day of the trip, vehicle occupancy, demographics of driver, vehicle characteristics, public perceptions of the transportation system, and many additional factors that may relate to transportation patterns. The 1969 and 2009 survey administrations included special sections dedicated to obtaining information on students' travel to and from school. The data included in this report are published in *U.S. School Travel, 2009: An Assessment of Trends* [35]. For more information on the NHTS, please visit: <http://nhts.ornl.gov/introduction.shtm1>

NHANES NATIONAL YOUTH FITNESS SURVEY (NNYFS) [87]

The CDC's National Center for Health Statistics conducted the inaugural NNYFS in response to the lack of nationally representative fitness testing data of American children and youth. The NNYFS combines interviews and a battery of fitness tests designed to collect data on the fitness and physical activity levels and nutritional behaviors of U.S. children and youth between the ages of 3-15 years. The 2012 NNYFS includes a nationally representative

random sample of approximately 1,500 children and youth living in the U.S. Interviews include both a family and participant questionnaire. The family questionnaire collects demographics and socioeconomic status information while the participant questionnaire includes information on dietary and other health-related behaviors and activities. The health measurements and fitness tests are conducted in a mobile examination center by trained medical personnel. Fitness measurements include anthropometric measurements, accelerometry and performance on age-specific physical activities to assess the different components of physical fitness, including body composition, cardiorespiratory endurance, musculoskeletal strength and endurance, and flexibility. The battery of fitness tests differ depending on participant age, and include measuring core muscle strength, upper and lower body muscle strength, assessing coordination and balance, and treadmill fitness measures consisting of walking and/or running. The data included in this report are published in *Measures of muscular strength in U.S. children and adolescents, 2012* [71]. For more information, please visit: <http://www.cdc.gov/nchs/nnyfs.htm>

NATIONAL SURVEY OF CHILDREN'S HEALTH (NSCH) [76]

The NSCH is a national survey that is conducted every four years by the Maternal and Child Health Bureau within the U.S. Department of Health and Human Services, with the last survey cycle conducted in 2011-12. Telephone numbers are called at random to identify households with one or more child less than 18 years of age. The NSCH is administered to the parent or guardian concerning one child randomly selected to be the subject of the interview. Thus, children's health measures are collected by proxy report. The NSCH collects data on over 100 indicators of children's health, including: BMI, physical activity, screen time, and the environment. Survey responses are weighted to be representative of each state and the national population. The NSCH data used in this report can be accessed at: <http://www.nschdata.org>.

NATIONAL YOUTH PHYSICAL ACTIVITY AND NUTRITION SURVEY (NYPANS) [91]

NYPANS was conducted among U.S. high school students in grades 9-12 by the CDC in 2010. NYPANS was a cross-sectional survey designed to collect nationally representative physical activity and dietary data, to provide data to supplement and improve the YRBSS, and to understand the relationship between physical

activity and dietary determinants with BMI and weight status. The study included an in-person questionnaire capturing information related to demographics, physical activity routines, and dietary habits, standardized height and weight measurements, and 24-hour dietary recall telephone interview. The 2010 NYPANS collected data from 11,429 students in public and private high schools in all 50 states and the District of Columbia. The data included in this report card are published in *Obesity and Other Correlates of Physical Activity and Sedentary Behaviors among US High School Students* [44]. For more information, please visit: <http://www.cdc.gov/healthyouth/yrbs/nyfans.htm>.

SCHOOL HEALTH POLICIES AND PRACTICES STUDY (SHPPS) [54, 56]

The CDC conducts the SHPPS, a national survey to assess school health policies and practices. In previous administrations, data were collected at the state, district, school, and classroom levels. The most recent survey cycle of SHPPS was conducted in 2012 at the state and district levels only through internet-based questionnaires to obtain a nationally representative sample. The CDC plans to administer SHPPS at the school and classroom levels in 2014. The 2012 SHPPS included data collected from 50 states and the District of Columbia and 804 districts. The data included in this report are published in *Results from the School Health Policies and Practices Study 2012* which can be assessed at the following website: <http://www.cdc.gov/HealthyYouth/shpps/index.htm>.

YOUTH RISK BEHAVIOR SURVEILLANCE SYSTEM (YRBSS) [32]

The YRBSS is a school-based survey conducted by state, territorial and local education and health agencies and tribal governments. National data are collected by the CDC under the Division of Adolescent and School Health. The YRBSS is administered every other year and is designed to assess health-risk behaviors and the prevalence of obesity and asthma among middle and/or high school students. The sampling frame for the 2011 YRBSS consisted of all public and private schools with students in at least one of grades 9-12 in the 50 states and District of Columbia. Survey results are weighted to be representative of 9th through 12th grade students in public and private schools throughout the U.S. The YRBSS data used in this report card can be accessed at: <http://apps.nccd.cdc.gov/youthonline>.

Abbreviations & Definitions

ABBREVIATION	DEFINITION
AAP	American Academy of Pediatrics
AHA	American Heart Association
BMI	Body Mass Index
CDC	Centers for Disease Control and Prevention
D.C.	District of Columbia
HHS	Department of Health & Human Services
FPL	Federal Poverty Level
FY	Fiscal Year
HBSC	Health Behaviour in School-Aged Children
HDL	High-density Lipoprotein
HSAPS	High School Athletics Participation Survey
INC	Incomplete
MAP-21	Moving Ahead for Progress in the 21st Century
METs	Metabolic Equivalents
MVPA	Moderate-to-Vigorous Physical Activity
NHANES	National Health and Nutrition Examination Survey
NHTS	National Household Travel Survey
NNYFS	NHANES National Youth Fitness Survey
NPAP	National Physical Activity Plan
NSCH	National Survey of Children's Health
NYPANS	National Youth Physical Activity and Nutrition Survey
OR	Odds Ratio
PA	Physical Activity
PCFSN	President's Council on Fitness, Sports, & Nutrition
PE	Physical Education
SHPPS	School Health Policies and Practices Study
SRTS	Safe Routes to School
SAFETEA-LU	Safe Accountable Efficient Transportation Equity Act: A Legacy for All Users
TAP	Transportation Alternatives Program
The Alliance	National Physical Activity Plan Alliance
The Committee	Report Card Research Advisory Committee
The Report Card	The 2014 U.S. Report Card on Physical Activity for Children and Youth
U.S.	United States
VO _{2max}	Maximal Oxygen Uptake
VPA	Vigorous Physical Activity
WHO	World Health Organization
YRBSS	Youth Risk Behavior Surveillance System

References

1. Sallis JF, Cervero RB, Ascher W, Henderson KA, Kraft MK, Kerr J. An ecological approach to creating active living communities. *Annu Rev of Public Health* 2006;27:297-322.
2. Sallis JF, McKenzie TL, Alcaraz JE, Kolody B, Faucette N, Hovell MF. The effects of a 2-year physical education program (SPARK) on physical activity and fitness in elementary school students: Sports, play and active recreation for kids. *Am J Public Health* 1997;87:1328-34.
3. Trudeau F, Shephard RJ. Physical education, school physical activity, school sports and academic performance. *Int J Behav Nutr Phys Act* 2008;5:10.
4. Andersen LB, Harro M, Sardinha LB, Froberg K, Ekelund U, Brage S, et al. Physical activity and clustered cardiovascular risk in children: A cross-sectional study (the European Youth Heart Study). *Lancet* 2006;368:299-304.
5. Boreham C, Riddoch C. The physical activity, fitness and health of children. *JSports Sci* 2001;19:915-929.
6. Carson V, Ridgers ND, Howard BJ, Winkler EA, Healy GN, Owen N, et al. Light-intensity physical activity and cardiometabolic biomarkers in us adolescents. *PLoS One* 2013;8:e71417.
7. Steinberger J, Daniels SR. Obesity, insulin resistance, diabetes, and cardiovascular risk in children: An American Heart Association scientific statement from the Atherosclerosis, Hypertension, and Obesity in the Young Committee (Council on Cardiovascular Disease in the Young) and the Diabetes Committee (Council on Nutrition, Physical Activity, and Metabolism). *Circulation* 2003;107:1448-53.
8. Bailey DA, McKay HA, Mirwald RL, Crocker PRE, Faulkner RA. A six-year longitudinal study of the relationship of physical activity to bone mineral accrual in growing children: The University of Saskatchewan Bone Mineral Accrual Study. *J Bone Miner Res* 1999;14:1672-1679.
9. Boot AM, Deridder MaJ, Pols HaP, Krenning EP, Keizer-Schrama SMPFD. Bone mineral density in children and adolescents: Relation to puberty, calcium intake, and physical activity. *J Clin Endocrinol Metab* 1997;82:57-62.
10. Calfas KJ, Taylor WC. Effects of physical-activity on psychological variables in adolescents. *Ped Exer Sci* 1994;6:406-423.
11. Taylor CB, Sallis JF, Needle R. The relation of physical activity and exercise to mental health. *Public Health Rep* 1985;100:195-202.
12. Coe DP, Pivarnik JM, Womack CJ, Reeves MJ. Effect of physical education and activity levels on academic achievement in children. *Med Sci Sports Exerc* 2006;38:1515-1519.
13. Sibley BA, Etnier JL. The relationship between physical activity and cognition in children: A meta-analysis. *Ped Exer Sci* 2003;15:243-256.
14. Wrotniak BH, Epstein LH, Dorn JM, Jones KE, Kondilis VA. The relationship between motor proficiency and physical activity in children. *Pediatrics* 2006;118:E1758-E1765.
15. U.S. Department of Health and Human Services (DHHS). *Physical Activity Guidelines for Americans, 2008*. Washington, DC: U.S. Government Printing Office; 2008.
16. Sallis JF, Prochaska JJ, Taylor WC. A review of correlates of physical activity of children and adolescents. *Med Sci Sports Exerc* 2000;32:963-75.
17. Troiano RP, Berrigan D, Dodd KW, Masse LC, Tilert T, McDowell M. Physical activity in the United States measured by accelerometer. *Med Sci Sports Exerc* 2008;40:181-8.
18. Fakhouri TH, Hughes JP, Burt VL, Song M, Fulton JE, Ogden CL. Physical activity in U.S. youth aged 12-15 years, 2012. NCHS Data Brief, no 141. Hyattsville, MD: National Center for Health Statistics. 2014.
19. Belcher BR, Berrigan D, Dodd KW, Emken BA, Chou CP, Spruijt-Metz D. Physical activity in U.S. youth: Effect of race/ethnicity, age, gender, and weight status. *Med Sci Sports Exerc* 2010;42:2211-21.
20. Currie C, Zanotti C, Morgan A, Currie D, de Looze M, Roberts C, et al. Social determinants of health and well-being among young people: HBSC international report from the 2009/2010 survey. World Health Organization, Regional Office for Europe, Copenhagen;2012.
21. Raitakan OT, Porkka KVK, Taimela S, Telama R, Räsänen L, Viikari JS. Effects of persistent physical activity and inactivity on coronary risk factors in children and young adults. The Cardiovascular Risk in Young Finns Study. *Am J Epidemiol* 1994;140:195-205.
22. Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents: summary report. *Pediatrics* 2011;128(Suppl. 5):S213-56.
23. Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction. *Pediatrics* 2012;129:e1111.
24. Barlow SE. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. *Pediatrics* 2007;120:S164-S192.
25. Strasburger V. Children, adolescents, obesity, and the media. *Pediatrics* 2011;128:201-208.
26. Fakhouri TI, Hughes JP, Brody DJ, Kit BK, Ogden CL. Physical activity and screen-time viewing among elementary school-aged children in the United States from 2009 to 2010. *JAMA Pediatrics* 2013;167:223-229.
27. Sedentary Behaviour Research Network. Letter to the editor: Standardized use of the terms "sedentary" and "sedentary behaviours". *Appl Physiol Nutr Metab* 2012;37:540-542.

28. Matthews CE, Chen KY, Freedson PS, Buchowski MS, Beech BM, Pate RR, et al. Amount of time spent in sedentary behaviors in the United States, 2003–2004. *Am J Epidemiol* 2008;167:875–881.
29. Hardy LL, Booth ML, Okely AD. The reliability of the Adolescent Sedentary Activity Questionnaire (ASAQ). *Prev Med* 2007;45:71–4.
30. American Academy of Pediatrics Committee on Communications. Children, adolescents, and television. *Pediatrics* 1990;85:1119–1120.
31. Strasburger VC, Hogan MJ, American Academy of Pediatrics Committee on Public Education. Children, adolescents, and the media. *Pediatrics* 2013;132:958–961.
32. Eaton DK, Kann L, Kinchen S, Shanklin S, Flint KH, Hawkins J, et al. Youth risk Behavior Surveillance – United States, 2011. *MMWR Surveill Summ* 2012;61:1–162.
33. Sisson SB, Church TS, Martin CK, Tudor-Locke C, Smith SR, Bouchard C, et al. Profiles of sedentary behavior in children and adolescents: The U.S. National Health and Nutrition Examination Survey, 2001–2006. *Int J Pediatr Obes* 2009;4:353–359.
34. Mark AE, Janssen I. Relationship between screen time and metabolic syndrome in adolescents. *J Public Health (Oxf)* 2008;30:153–160.
35. McDonald NC, Brown AL, Marchetti LM, Pedroso MS. U.S. school travel, 2009 an assessment of trends. *Am J Prev Med* 2011;41:146–51.
36. Hayne CL, Moran PA, Ford MM. Regulating environments to reduce obesity. *J Public Health Policy* 2004;25:391–407.
37. Mendoza JA, Watson K, Nguyen N, Cerin E, Baranowski T, Nicklas TA. Active commuting to school and association with physical activity and adiposity among U.S. youth. *J Phys Act Health* 2011;8:488–95.
38. Ostergaard L, Kalle E, Steene-Johannessen J, Anderssen SA, Andersen LB. Cross-sectional analysis of the association between mode of school transportation and physical fitness in children and adolescents. *Int J Behav Nutr Phys Act* 2013;10:91.
39. Pizarro AN, Ribeiro JC, Marques EA, Mota J, Santos MP. Is walking to school associated with improved metabolic health? *Int J Behav Nutr Phys Act* 2013;10:12.
40. Seefeldt V, Ewing M, Walk S. Overview of youth sports in the United States. Carnegie Council on Adolescent Development. Washington, DC; 1991.
41. Leek D, Carlson JA, Cain KL, Henrichon S, Rosenberg D, Patrick K, et al. Physical activity during youth sports practices. *Arch Pediatr Adolesc Med* 2011;165:294–9.
42. Katzmarzyk PT, Malina RM. Contribution of organized sports participation to estimated daily energy expenditure in youth. *Pediatr Exerc Sci* 1998;10:387–386.
43. Wickel EE, Eisenmann JC. Contribution of youth sport to total daily physical activity among 6- to 12-yr-old boys. *Med Sci Sports Exerc* 2007;39:1493–500.
44. Lowry R, Lee SM, Fulton JE, Demissie Z, Kann L. Obesity and other correlates of physical activity and sedentary behaviors among U.S. high school students. *J Obes* 2013;2013:276318.
45. Katzmarzyk PT, Walker P, Malina RM. A time-motion study of organized youth sports. *Journal of Human Movement Studies* 2001;40:325–334.
46. National Federation of State High School Associations. 2012–13 high school athletics participation survey results. Available from: <http://www.nfhs.org/content.aspx?id=3282>.
47. Trost SG, Rosenkranz RR, Dziewaltowski D. Physical activity levels among children attending after-school programs. *Med Sci Sports Exerc* 2008;40:622–629.
48. Maitland C, Stratton G, Foster S, Braham R, Rosenberg M. A place for play? The influence of the home physical environment on children's physical activity and sedentary behaviour. *Int J Behav Nutr Phys Act* 2013;10:99.
49. Burdette HL, Whitaker RC. Resurrecting free play in young children: Looking beyond fitness and fatness to attention, affiliation, and affect. *Arch Pediatr Adolesc Med* 2005;159:46–50.
50. Verstraete SJM, Cardon GM, De Clercq DLR, DeBourdeaudhuij IMM. Increasing children's physical activity levels during recess periods in elementary schools: The effects of providing game equipment. *Eur J Public Health* 2006;16:415–419.
51. Bassett DR, Fitzhugh EC, Heath GW, Erwin PC, Frederick GM, Wolff DL, et al. Estimated energy expenditures for school-based policies and active living. *Am J Prev Med* 2013;44:108–113.
52. Huberty JL, Siahpush M, Beighle A, Fuhrmeister E, Silva P, Welk G. Ready for recess: A pilot study to increase physical activity in elementary school children. *J Sch Health* 2011;81:251–257.
53. Loucaides CA, Jago R, Charalambous I. Promoting physical activity during school break times: Piloting a simple, low cost intervention. *Prev Med* 2009;48:332–334.

54. Centers for Disease Control and Prevention (CDC). School Health Policies and Practices Study: Results from the School Health Policies and Practices Study 2012. 3, Atlanta: U.S. Department of Health and Human Services; 2007.
55. U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics. Elementary and Secondary Education. Digest Educ Stat 2012;NCES 2014-015.
56. Centers for Disease Control and Prevention. School Health Policies and Programs Study: Changes between 2000 and 2006. Atlanta: U.S. Department of Health and Human Services; 2007.
57. Bouchard C, Shephard RJ, Stephens T (Eds.). Physical Activity, Fitness, and Health: International Proceedings and Consensus Statement. Human Kinetics, Champaign, IL (1994).
58. Strong WB, Malina RM, Blimkie CJ, Daniels SR, Dishman RK, Gutin B, Hergenroeder AC, Must A, Nixon PA, Pivarnik JM, et al. Evidence based physical activity for school-age youth. *J Pediatr* 2005;146(6):732-7.
59. Pate RR, Wang CY, Dowda M, Farrell SW, O'neill JR. Cardiorespiratory fitness levels among U.S. youth 12 to 19 years of age: Findings from the 1999-2002 National Health and Nutrition Examination Survey. *Arch Pediatr Adolesc Med* 2006;160:1005-12.
60. Shay CM, Ning H, Daniels SR, Rooks CR, Gidding SS, Lloyd-Jones DM. Status of cardiovascular health in U.S. adolescents: Prevalence estimates from the national health and nutrition examination surveys (nhanes) 2005-2010. *Circulation* 2013;127:1369-76.
61. Brage S, Wedderkopp N, Ekelund U, Franks PW, Wareham NJ, Andersen LB, et al. Features of the metabolic syndrome are associated with objectively measured physical activity and fitness in Danish children: The European Youth Heart Study (EYHS). *Diabetes Care* 2004;27:2141-8.
62. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et al. 2000 growth charts for the United States: Methods and development. *Vital Health Stat* 11 2002;1:190.
63. Institute of Medicine (IOM). Fitness measures and health outcomes in youth. Washington, DC: The National Academics Press; 2012.
64. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among U.S. children and adolescents, 1999-2010. *JAMA* 2012;307:483-90.
65. Ogden CL, Carroll MD. Prevalence of obesity among children and adolescents: United States, trends 1963-65 through 2007-2008. *NCHS Health E Stat* 2010.
66. Chung AE, Skinner AC, Steiner MJ, Perrin EM. Physical activity and bmi in a nationally representative sample of children and adolescents. *Clin Pediatr (Phila)* 2012;51:122-9.
67. Behringer M, Vom Heede A, Matthews M, Mester J. Effects of strength training on motor performance skills in children and adolescents: a meta-analysis. *Pediatr Exerc Sci* 2011;23:186-206.
68. Davis JN, Gyllenhammer LE, Vanni AA, Meija M, Tung A, Schroeder ET, et al. Startup circuit training program reduces metabolic risk in Latino adolescents. *Med Sci Sports Exerc* 2011;43:2195-203.
69. Faigenbaum AD, Myer GD. Pediatric resistance training: Benefits, concerns, and program design considerations. *Curr Sports Med Rep* 2010;9:161-8.
70. Van Der Heijden GJ, Wang ZJ, Chu Z, Toffolo G, Manesso E, Sauer PJ, et al. Strength exercise improves muscle mass and hepatic insulin sensitivity in obese youth. *Med Sci Sports Exerc* 2010;42:1973-80.
71. Ervin RB, Wang CY, Fryar CD, Miller IM, Ogden CL. Measures of muscular strength in U.S. children and adolescents, 2012. *NCHS Data Brief*, no 139. Hyattsville, MD: National Center for Health Statistics. 2013.
72. Davison KK, Cutting TM, Birch LL. Parents' activity-related parenting practices predict girls' physical activity. *Med Sci Sports Exerc* 2003;35:1589-95.
73. Moore LL, Lombardi DA, White MJ, Campbell JL, Oliveria SA, Ellison RC. Influence of parents' physical activity levels on activity levels of young children. *J Pediatr* 1991;118:215-219.
74. Task Force on Community Preventive Services. Recommendations to increase physical activity in communities. *Am J Prev Med* 2002;22:67-72.
75. McKenzie TL, Sallis JF, Prochaska JJ, Conway TL, Marshall SJ, Rosengard P. Evaluation of a two-year middle-school physical education intervention: M-SPAN. *Med Sci Sports Exerc* 2004;36:1382-1388.
76. National Survey of Children's Health. NSCH 2011/12. Data query from the Child and Adolescent Health Measurement Initiative. Data Resource Center for Child and Adolescent Health website. Available from: www.childhealthdata.org.

77. Ding D, Sallis JF, Kerr J, Lee S, Rosenberg DE. Neighborhood environment and physical activity among youth: a review. *Am J Prev Med* 2011;41:442-455.
78. Davison K, Lawson C. Do attributes in the physical environment influence children's physical activity? A review of the literature. *Int J Behav Nutr Phys Act* 2006;3:19.
79. Floyd MF, Bocarro JN, Smith WR, Baran PK, Moore RC, Cosco NG, et al. Park-based physical activity among children and adolescents. *Am J Prev Med* 2011;41:258-265.
80. Loukaitou-Sideris A, Sideris A. What brings children to the park? *J Am Plann Assoc* 2010;76:89-107.
81. Norman GJ, NS, Ryan S, Sallis Jf, Calfas KJ, Patrick K. Community design and access to recreational facilities as correlates of adolescent physical activity and body-mass index. *J Phys Act Health* 2006;3:S118-S128.
82. Timperio A, Giles-Corti B, Crawford D, Andrianopoulos N, Ball K, Salmon J, et al. Features of public open spaces and physical activity among children: Findings from the CLAN study. *Prev Med* 2008;47:514-518.
83. Cohen DA, Lapham S, Evenson KR, Williamson S, Golinelli D, Ward P, et al. Use of neighbourhood parks: Does socio-economic status matter? A four-city study. *Public Health* 2013;127:325-32.
84. Centers for Disease Control and Prevention (CDC). National Center for Chronic Disease Prevention and Health Promotion. Community Transformation Grant Program. Atlanta, GA: Centers for Disease Control and Prevention, <http://www.cdc.gov/nccdphp/dch/programs/communitytransformation/index.htm>.
85. U.S. Department of Transportation (DOT). Federal Highway Administration (FHWA). Safe Routes to School. Washington, DC: U.S. Department of Transportation, Federal Highway Administration, http://www.fhwa.dot.gov/environment/safe_routes_to_school/.
86. Centers for Disease Control and Prevention (CDC). National Center for Health Statistics (NCHS). National Health and Nutrition Examination Survey National Youth Fitness Survey Data. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, <http://wwwn.cdc.gov/nchs/nhanes/search/nnyfs12.aspx>.
87. Office of the First Lady. Let's Move!, the White House, Office of the First Lady, <http://www.letsmove.gov/>
88. United States Department of Health and Human Services (DHHS). President's Council on Fitness, Sports, & Nutrition. <http://fitness.gov/>.
89. Centers for Disease Control and Prevention (CDC). National Center for Health Statistics (NCHS). National Health and Nutrition Examination Survey. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, <http://www.cdc.gov/nchs/nhanes.htm>.
90. U.S. Department of Transportation (DOT). National Household Travel Survey. Washington, DC: U.S. Department of Transportation, Federal Highway Administration, <http://nhts.ornl.gov/>.
91. Centers for Disease Control and Prevention (CDC). Adolescent and School Health. National Youth Physical Activity and Nutrition Study. Atlanta, GA: U.S. Centers for Disease Control and Prevention, <http://www.cdc.gov/healthyyouth/yrbs/nyfans.htm>.





Make the Move

www.physicalactivityplan.org

