The 2018 United States Report Card on

Physical Activity for Children and Youth

BRIDGING THE GAP

Presented by: National Physical Activity Plan

Support for development of the 2018 U.S. Report Card was provided by the following National Physical Activity Plan Alliance Organizational Partners: SHAPE America and the American Council on Exercise. Production and design of the 2018 Report Card was supported by SHAPE America.

Suggested Citation: National Physical Activity Plan Alliance. The 2018 United States Report Card on Physical Activity for Children and Youth. Washington, DC: National Physical Activity Plan Alliance, 2018.

Table of Contents

2018 U.S. Report Card on Physical Activity for Children and Youth Objective

The 2018 United States (U.S.) Report Card is the third comprehensive assessment of physical activity in U.S. children and youth, updating the first Report Card released in 2014[1] and second released in 2016.[2] The primary goal of the 2018 U.S. Report Card is to assess the levels of physical activity and sedentary behaviors in American children and youth, facilitators and barriers for physical activity, and health outcomes related to physical activity.

The tracking of physical activity indicators over time is an important surveillance tactic that allows for an assessment of population-level changes in behavior. The Report Card is a resource that summarizes health statistics related to physical activity levels among children and youth in the U.S. More importantly, the Report Card is an advocacy tool that provides a level of accountability and call-to-action for decision makers regarding how we, as parents, teachers, health professionals, community leaders, and policy makers, can implement new initiatives, programs, and policies in support of healthy environments to improve the physical activity levels and health of our children and youth.

About the National Physical Activity Plan Alliance

The U.S. Report Card Research Advisory Committee responsible for developing this report is a sub-committee of the National Physical Activity Plan (NPAP) Alliance, a 501c3 nonprofit organization. The Alliance is committed to ensuring the long-term success of the 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 link below for a complete list of partners).

ABOUT THE NPAP

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 communities in ways that will enable every American to be sufficiently physically active. 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 has a vision: **One day, all Americans will be physically active, and they will live, work, and play in environments that encourage and support regular physical activity.**

The first U.S. NPAP was released in 2010, and it was recently updated and re-released in 2016 with the addition of faith-based settings and sport as new societal sectors. Societal sectors are areas of opportunity for physical activity promotion that provide the infrastructure for the Plan (www.physicalactivityplan.org).

The NPAP is comprised of recommendations that are organized into nine societal sectors:

- Business and Industry
- Community Recreation, Fitness and Parks
- Education
- Faith-based Settings
- Healthcare
- Mass Media
- Public Health
- Sport
- Transportation, Land Use and Community Design

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

For more information on the NPAP and the NPAP Alliance, visit: www.physicalactivityplan.org.

About the Active Healthy Kids Global Alliance

The U.S. Report Card on Physical Activity for Children and Youth is a member of the Active Healthy Kids Global Alliance (www.activehealthykids.org).

The Active Healthy Kids Global Alliance is a network of researchers, health professionals and stakeholders who are working together to advance physical activity in children and youth from around the world. The Active Healthy Kids Global Alliance is committed to powering the global movement to get kids moving through thought leadership, knowledge translation and mobilization, capacity building, and advocacy. This is facilitated by sustainable partnerships and cross-sectoral collaborations that enable best-practice exchanges, networking and cross-fertilization.

The Active Healthy Kids Global Alliance was established in 2014, following the success of the world's first Global Summit on the Physical Activity of Children in Toronto, Canada. In 2014, 15 countries, including the U.S., participated in the Global Matrix 1.0,[1,3] releasing a set of physical activity report cards using a standard set of indicators. The Global Matrix 2.0 included 38 countries, and was released in conjunction with the 2016 Physical Activity and Public Health Congress in Bangkok, Thailand.[2,4]

The 2018 U.S. Report Card on Physical Activity for Children and Youth is participating in the Global Matrix 3.0, with a planned release in November 2018 in Adelaide, Australia.

2018 U.S. Report Card Research Advisory Committee

COMMITTEE CHAIR:

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

COMMITTEE COORDINATOR:

Kara D. Denstel, MPH
Pennington Biomedical Research Center

COMMITTEE MEMBERS:

Kim Beals, PhD, RD, CSSD, LDN
School of Health and Rehabilitation Sciences,
University of Pittsburgh

Jordan A. Carlson, PhD
Center for Children's Healthy Lifestyles & Nutrition,
Children's Mercy Kansas City

Scott E. Crouter, PhD, FACSM
Department of Kinesiology, Recreation, and Sport Studies,
The University of Tennessee

Thomas L. McKenzie, PhD, FACSM
School of Exercise and Nutritional Sciences,
San Diego State University

Russell R. Pate, PhD
Department of Exercise Science,
University of South Carolina

Amanda E. Staiano, PhD, MPP
Pennington Biomedical Research Center

Heidi I. Stanish, PhD
Department of Exercise and Health Sciences,
University of Massachusetts Boston

Susan B. Sisson, PhD, RDN, CHES
Department of Nutritional Sciences,
University of Oklahoma Health Sciences Center

Dianne S. Ward, EdD, FTOS, FACSM
Gillings School of Global Public Health,
University of North Carolina

Melicia Whitt-Glover, PhD
Gramercy Research Group

Carly Wright
SHAPE America

COMMITTEE CONSULTANTS:

Maura M. Kepper, PhD, MPH
Brown School,
Washington University in St. Louis

Emily F. Mire, MS
Pennington Biomedical Research Center

Methodology

The Report Card Research Advisory Committee (the Committee), a sub-committee of the NPAP Alliance, included experts in diverse areas of physical activity and health behaviors from academic institutions and partner organizations across the country. The Committee was charged with the development and dissemination of the U.S. Report Card, which included determining which indicators to include, identifying the best available data source(s), and assigning a letter grade to each indicator based on the best available evidence.

INDICATORS

The Committee selected 9 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) schools; and (9) community and the built environment.

Data from multiple nationally representative surveys were used to provide a comprehensive evaluation of physical activity for children and youth.

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 the standard rubric the Committee used to determine a grade for each indicator.

PHYSICAL ACTIVITY SETTINGS

This year's report card includes information on 3 settings that are especially important for physical activity promotion and increasing activity levels of children:

- Government Strategies and Investment
- Faith-based Settings
- Early Childcare Settings

The committee did not assign grades for these settings. Instead, the information for these settings identifies opportunities for increasing activity levels and how these settings can be leveraged to improve the 9 indicator grades.

Table 1 Report card grading rubric.*

GRADE	INTERPRETATION	BENCHMARK
A	We are succeeding with a large majority of children and youth (≥ 80%)	A+ = 94-100% A = 87-93% A- = 80-86%
B	We are succeeding with well over half of children and youth (60-79%)	B+ = 74-79% B = 67-73% B- = 60-66%
C	We are succeeding with about half of children and youth (40-59%)	C+ = 54-59% C = 47-53% C- = 40-46%
D	We are succeeding with less than half but some children and youth (20-39%)	D+ = 34-39% D = 27-33% D- = 20-26%
F	We are succeeding with very few children and youth (< 20%)	F = 0-19%
INC	Incomplete—insufficient or inadequate information to assign a grade	

* Developed by the Active Health Kids Global Alliance

Physical Activity Guidelines for Children and Youth

The *2008 Physical Activity Guidelines for Americans*[5] recommend that children and youth ages 6 to 17 years participate in at least 60 minutes (1 hour) of physical activity every day of the week.*

They recommend the 60 minutes include:[6]

- **Aerobic Activity**: Most of the daily 60 minutes should be ***moderate-to-vigorous aerobic physical activity*** that makes children breathe hard and sweat. Children should include ***vigorous intensity aerobic*** *activity* on at least 3 days of the week.
- **Muscle-Strengthening Activity**: The 60 daily minutes should include muscle-strengthening activities on at least 3 days of the week
- **Bone-Strengthening Activity**: The 60 daily minutes should include bone-strengthening activities on at least 3 days of the week.

*This section of the Report Card will be updated once the *2018 Physical Activity Guidelines for Americans* are released.

Table 2 Examples of moderate- and vigorous-intensity aerobic, muscle-strengthening, and bone-strengthening activities for children and youth[7]

TYPE OF PHYSICAL ACTIVITY	EXAMPLE ACTIVITIES
Moderate-to-Vigorous Intensity Aerobic	• Hiking • Biking • Skateboarding • Walking • Playing sports such as golf or gymnastics • Running • Rock climbing • Martial arts such as karate or taekwondo • Playing sports such as basketball, soccer, or football
Muscle-Strengthening	• Climbing trees • Lifting weights • Playing on playground equipment
Bone-Strengthening	• Running • Jumping rope • Playing hopscotch • Skipping • Weight-bearing sports such as gymnastics or tennis

60 Minutes of Physical Activity Every Day of the Week

Figure 1

Summary of 2018 Report Card Indicators and Grades

INDICATOR	GRADE
Overall Physical Activity	D-
Sedentary Behaviors	D
Active Transportation	D-
Organized Sport Participation	C
Active Play	INC
Physical Fitness	C-
Family and Peers	INC
School	D-
Community and Built Environment	C

Let's Bridge the Gaps

Whether or not children in the U.S. are physically active often depends on a number of factors, such as their gender, age, ability, and the neighborhood in which they live. It's time to bridge the gaps so that the physical activity levels of **ALL** American children are increased!

Simply knowing that 76% of American children and youth are not getting enough daily physical activity[8] is insufficient. There are gaps in the amount of physical activity and related opportunities according to children's gender, race/ethnicity, age, ability, and household income. The research is clear that physical activity levels are not equal:

- **Gender**: Approximately 35% of high-school boys but only 18% of high-school girls report participating in at least 60 minutes of daily physical activity (2017 Youth Risk Behavior Surveillance System; YRBSS).[9]
- **Age**: Children aged 6-11 years participate in more daily physical activity (88 minutes) compared to adolescents aged 12-15 years (33 minutes) and 16-19 years (26 minutes).[10]
- **Ability**: Children with mobility limitations may engage in less physical activity than those without limitations. 58% of boys aged 5-11 years with long-term mobility limitations met physical activity recommendations compared to 75% of boys without limitations.[11]

Where children live impacts physical activity opportunities, too. Those living in neighborhoods with high crime and limited access to parks are generally less likely to meet physical activity recommendations. Additionally, programs supporting children's physical activity may not increase activity equally among all children. Programs may be less effective for some children than others — which means giving all children the same activity programs may actually increase the physical activity gap.

- Children aged 6-11 years living in **high-crime neighborhoods participated in less physical activity** than those living in low-crime neighborhoods.[12]
- **Children living in low crime neighborhoods** significantly increased their physical activity by more than 5,000 steps per day in response to a physical activity intervention delivered via mobile phones while those living in high crime neighborhoods increased physical activity by only 1,000 steps per day.[13]
- **Safe neighborhood park access was associated with more physical activity** and less inactivity among adolescents 12-17 years old.[14]
- Unfortunately, **not all parks are safe**. Parks in highly disadvantaged neighborhoods were almost 2 times as likely to have incivilities (e.g., presence of litter, graffiti, homeless persons, etc.) compared to those in neighborhoods with low disadvantage.[15]

Let's Bridge the Gaps *(continued)*

Physical activity policies are important for closing the activity gap. However, policies promoting physical activity are not necessarily effective if they are not fully enforced. This may be especially true in school settings where physical education (PE) classes are not always synonymous with physical activity engagement, class exemptions are common, and physical activity opportunities outside of PE are low, especially for those who do not participate in school sports:

- **PE requirements decrease by school grade level**: Only 15% of elementary, 9% of middle, and 6% of high schools require students to take PE classes on at least 3 days per week for the entire school year (2014 School Health Policies and Practices Study; SHPPS).[16]
- **Students can obtain PE class exemption waivers** for many reasons including physical or cognitive disability, high physical fitness scores, enrollment in other activities (e.g., band or chorus), and religious reasons (2016 SHPPS).[17]
- **The percentage of PE class time children spent in moderate-to-vigorous intensity physical activity varied** from 11% to 89%. On average, children spent less than half (45%) of PE engaged in moderate-to-vigorous physical activity.[18]
- Approximately 51%, 46%, and 29% of school districts require or recommend that elementary, middle, and high schools, respectively, provide **regular classroom physical activity breaks** during the school day (2016 SHPPS).[17]
- Only 3% of secondary schools have established and implemented a **Comprehensive School Physical Activity Plan** (2016 School Health Profiles).[19]

INDICATORS

2018 GRADE: D-

Overall Physical Activity

YEAR	2014	2016	2018
GRADE	D-	D-	D-

INDICATOR: Percentage of children and youth who meet the *Physical Activity Guidelines for Americans*, which recommend that children and youth accumulate at least 60 minutes of daily moderate-to-vigorous physical activity.

KEY FINDINGS

- **Approximately 24% of children 6 to 17 years of age** participate in 60 minutes of physical activity every day (2016 NSCH).[8]
- **Approximately 26% of youth in high school** participate in 60 minutes of physical activity every day, while 47% participate in 60 minutes of physical activity on at least 5 days of the week (2017 YRBSS).[9]
- **A significant drop in physical activity occurs with increasing age:** 42.5%, 7.5% and 5.1% of 6-11 year olds, 12-15 year olds and 16-19 year olds meet physical activity recommendations, respectively, using objective physical activity measurement by accelerometry (2005-06 National Health and Nutrition Examination Survey; NHANES).[2,20]
- **Significant gender differences exist in reported physical activity levels in high school:** 28% of boys and 20% of girls 6 to 17 years of age participate in 60 minutes of physical activity every day (2016 NSCH).[8] Similarly, 36% of high school boys and 18% of high school girls, respectively, participate in 60 minutes of physical activity every day (2015 YRBSS).[21]
- **A low proportion of children and youth with disabling conditions participate in 60 minutes of physical activity every day:** Approximately 11% of children with cerebral palsy, 17% of children with autism spectrum disorder, and 18% of children with Down syndrome ages 6-17 years meet the 60 minute/day physical activity recommendation (2016 NSCH).[15]

DATA SYNTHESIS

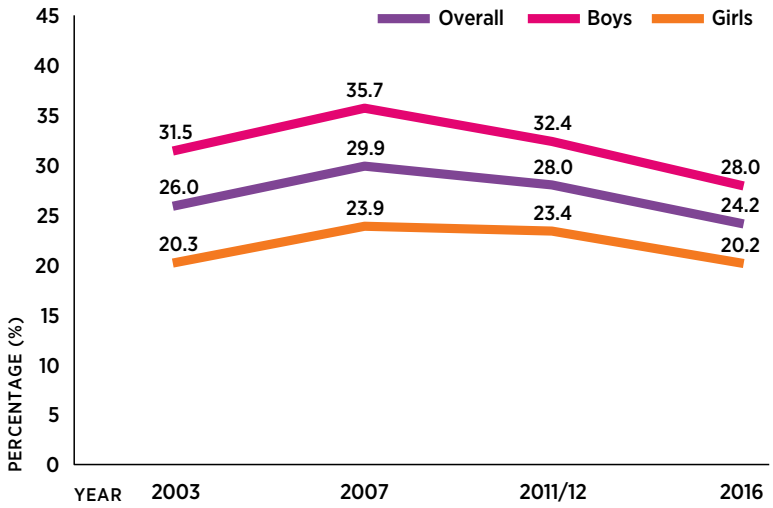
It is well known that physical activity plays an important role in overall health.[22,23] Children and youth who are physically active generally tend to be healthier, have less body fat, and lead more active lifestyles as adults.

Overall Physical Activity *(continued)*

As highlighted throughout the Report Card, physical activity can be obtained in many ways (e.g., through active play, active transportation, or organized sports) and all of these ways can contribute to daily physical activity. Based on the 2005-06 NHANES accelerometer assessment for physical activity, 21.6% of 6-19 year-old U.S. youth meet the physical activity guidelines, with activity levels highest in the youngest ages (6-11 year-olds, 42.5%) and lowest, after a considerable drop, in adolescents (16-19 year-olds, 5.1%).[2,20]

Although the 2005-06 NHANES data are over a decade old, they are the best, and most recently available, nationally representative objective measures of physical activity. More recent self-report measures of physical activity also show that approximately 25% of youth participate in 60 minutes of physical activity every day,[8,9] with boys being more physically active than girls. Additionally, the NSCH self-report measures have been fairly consistent between 2003 and 2016 (**Figure 2**) lending support to the assignment of a grade of D- in 2018 for overall physical activity.

Figure 2 Percentage of 6-17 year-old children who engaged in at least 60 minutes of physical activity every day, by gender and survey period: U.S., 2003 to 2016.



Source: NSCH[8]

Regardless of the data source, clear trends are seen for boys being more active than girls and for activity levels decreasing with advancing age. Differences among race/ethnic sub-groups of children and youth; however, are less clear. In general, physical activity measurements using accelerometry among 6-19 year old youth in NHANES show Non-Hispanic White youth to be the least active, followed by Mexican American, and with African American youth being the most active.[20,24] However, these differences were greatest in boys and younger children aged 6-11 years. In contrast, the 2017 YRBSS, which is self-reported by high school youth, show White youth report being the most active compared to African American and Hispanic youth who have similar, but lower levels of activity.[9] The YRBSS race/ethnicity trend is consistent regardless of whether youth were asked about physical activity participation on at least 5 days per week or every day of the week.[9] However,

METHODOLOGY NOTE

Objective (e.g., accelerometer) physical activity measures directly capture the time children spend doing physical activities of various intensities while survey measures of physical activity generally ask children or their parent to report how many days per week the child is physically active for at least 60 minutes. Surveys may also mention specific examples of activities within the questions (e.g., exercise, playing sports, physical activity that increased their heart rate). As objective and survey measures of physical activity do not measure exactly the same thing, it is not expected that the measures will align perfectly. However, they should track activity levels within race/ethnic sub-groups in a similar manner. The inconsistencies in physical activity levels within race/ethnic sub-groups highlight the need to further explore how well survey questions capture culturally relevant components of physical activity. This is especially important during the out-of-school time in which physical activity can be defined in different ways depending on a child's race/ethnic sub-group.

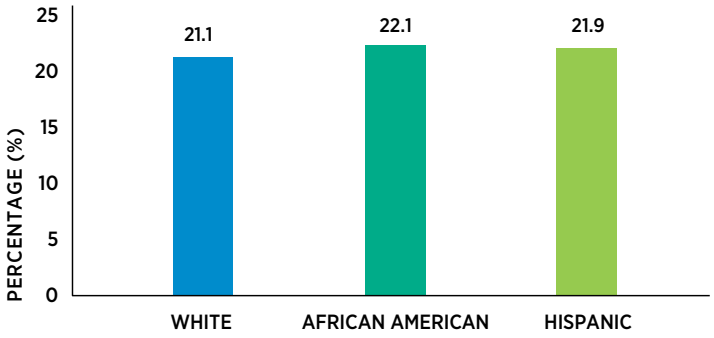
even within the same survey, there are discrepancies in physical activity trends by race/ethnic sub-groups. For example, the 2016 NSCH data show that among those who participate in 60 minutes of physical activity every day, African American children are the most active followed by White and Hispanic children. However, the trend changes when asked about participation on at least 4 days per week with White children being most active (**Figure 3**).

The nationally-representative physical activity data for children and youth with disabilities, while limited, indicate that this sub-group experiences disparities in physical activity participation compared to the general population of children and youth. The 2011-2012 NSCH data show that youth with severe visual impairments engage in fewer days per week (2.4 days) of moderate-to-vigorous physical activity compared to peers without visual impairments (3.9 days).[25] Further, 49.5% of 10-17 year old children with an intellectual disability participate in 4 or more days per week of physical activity compared to 62.9% of children without an intellectual disability.[26] Based on the 2011-2014 NHANES, boys with mobility limitations are significantly less likely to meet physical activity recommendations compared to boys without limitations.[9] A smaller proportion (20.4%) of children with special health care needs (CSHCN), those that "have or are at increased risk for chronic physical, developmental, behavioral or emotional conditions and who also require health and related services of a type or amount beyond that required by children generally",[27] participate in 60 minutes of physical activity every day compared to non-CSHCN (25.3%).[8] Additionally, 14.7% of CSHCN reportedly engage in 60 minutes of physical activity on 0 days per week compared to 7.3% of non-CSHCN.[8]

The physical activity guidelines for children and adolescents recommend that most of the 60 minutes of activity per day should be accumulated through moderate-to-vigorous intensity physical activity that is aerobic in nature.[5] However, muscle- and bone-strengthening activity should also be included as part of the 60 minutes.[5] Based on the 2017 YRBSS, 51.1%

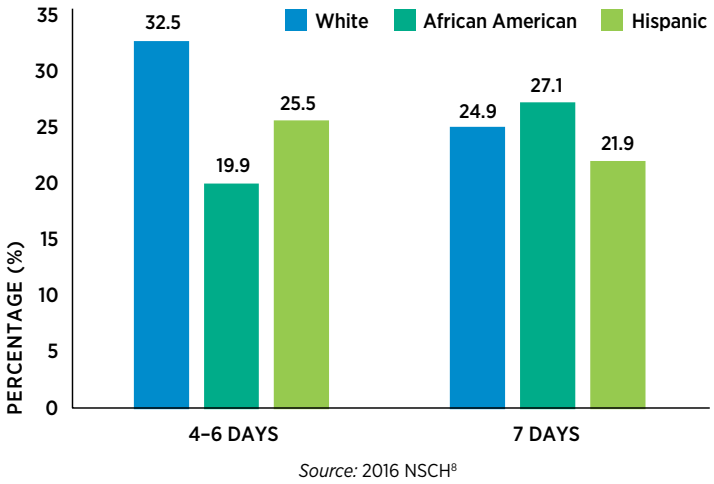
Figure 3 Percentage of 6-19 year old children and youth meeting physical activity recommendations, by race/ethnicity and data source.

Panel A. Percentage of 6-19 year-old children and youth engaging in at least 60 minutes of physical activity on at least 5 days per week, by race/ethnicity.



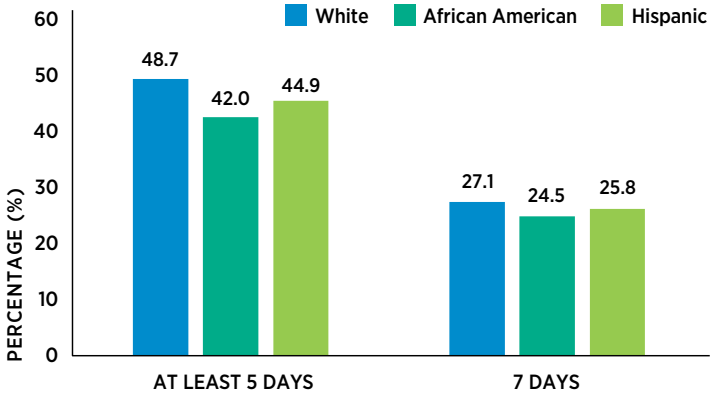
Source: 2005-06 NHANES[20]

Panel B. Percentage of 6-17 year-old children and youth engaging in at least 60 minutes of physical activity on 4-6 or 7 days per week, by race/ethnicity.



Source: 2016 NSCH[8]

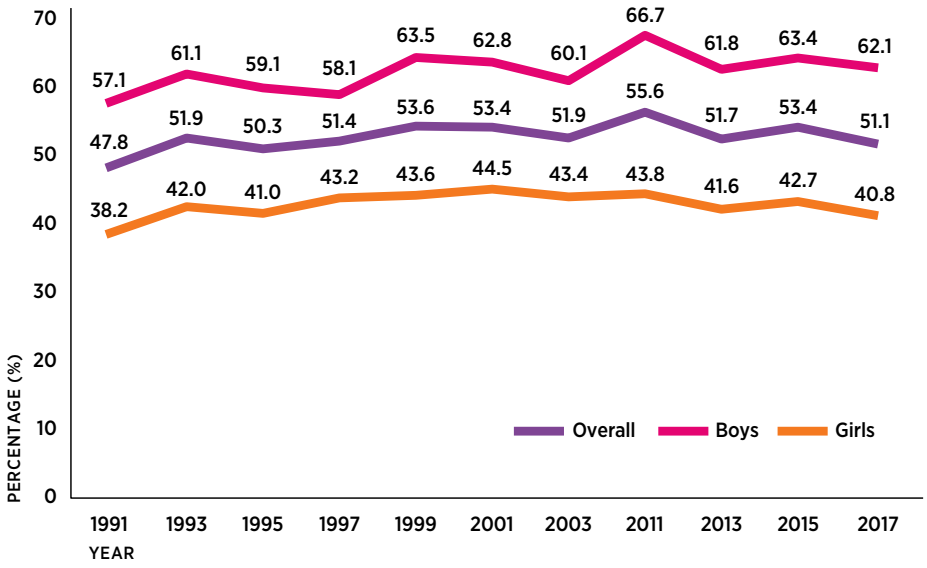
Panel C. Percentage of high school-aged youth engaging in at least 60 minutes of physical activity on at least 5 or 7 days per week, by race/ethnicity.



Source: 2017 YRBSS[9]

of youth participated in muscle strengthening activities (e.g., push-ups, sit-ups, weight lifting) on 3 or more days.[9] Since 1991, there has been an increase in the percentage of youth participating in muscle strengthening activity (**Figure 4**). However, there are disparities with boys (63.7%) engaging in muscle-strengthening activities more regularly than girls (42.7%).[9] Additionally, it is unclear if children and youth who participate in adequate levels of muscle-strengthening activities do so in addition to, or in place of, aerobic physical activities. Future studies and survey questions should aim to gather more precise data on the percentage of children and youth participating in both muscle strengthening activity and 60 minutes per day of aerobic activity as this would provide a better understanding of how youth are meeting the physical activity recommendations.

Figure 4 Percentage of U.S. high school-aged youth engaging in muscle-strengthening exercises on at least 3 days per week, by gender and survey period: 1991 to 2017.



Source: YRBSS[9]
Note: YRBSS did not ask the muscle-strengthening question in 2005, 2007, or 2009.

Overall, given the low national prevalence of achieving physical activity guidelines by U.S. children and youth as measured by objective monitoring and the evidence of age, gender, disability, and race/ethnicity disparities, a grade of D- was assigned as the indicator grade. This is further supported by the low levels of physical activity based on self-reported measures and the trends of these measures over time. Thus, the 2018 Report Card grade (D-) remains the same as the 2016 and 2014 Report Cards.

RECOMMENDATIONS

- Update nationally representative data by objective monitoring.
- Develop surveys that have physical activity questions that are culturally relevant.
- Develop studies to better understand how physical activity estimates derived from different sources (e.g., accelerometer, self-report, parent proxy) relate to each other.
- Improve understanding of race/ethnic differences in physical activity levels.
- Include children and youth with disabilities in national surveillance efforts.
- Improve integration of muscle- and bone-strengthening activity participation into the measurement of meeting the physical activity recommendation.

2018 GRADE: D

Sedentary Behaviors

YEAR	2014	2016	2018
GRADE	D	D-	D

INDICATOR: Percentage of children and youth engaging in 2 hours or less of screen time per day.

KEY FINDINGS

- **Approximately 33% of children and youth aged 6-19 years** report engaging in 2 hours or less of screen time per day (2015-16 NHANES).[28]
- **Approximately 43% of high school-aged students** report using a computer or other electronic device for more than 3 hours per day (2017 YRBSS).[9]
- **Significant gender differences exist in reported screen time:** 38% of girls and 28% of boys aged 6-19 years engage in 2 hours or less of screen time per day (2015-16 NHANES).[28]
- **Younger children aged 6-11 years are more likely to meet screen time guidelines than adolescents aged 12-19 years:** 35% and 31%, respectively (2015-16 NHANES).[28]
- **Significant race/ethnicity differences exist in reported screen time:** 35%, 32%, 30%, and 25% of White, Hispanic/Mexican American, Asian, and African American children aged 6-19 years meet screen time guidelines, respectively (2015-16 NHANES).[28]

DATA SYNTHESIS

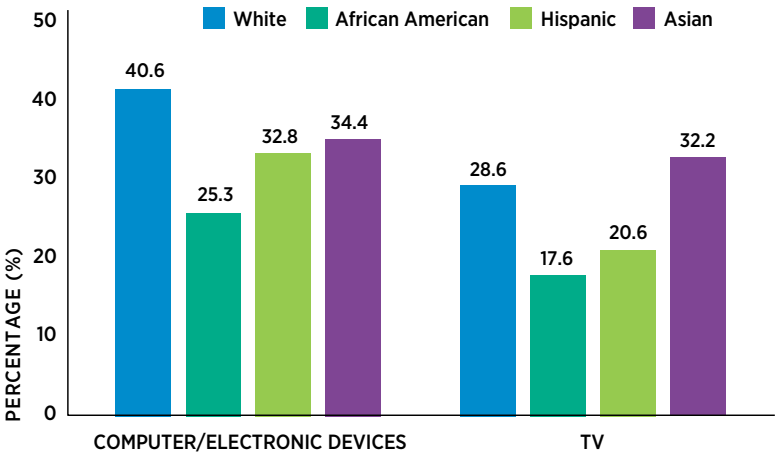
Currently, no federal guidelines exist for overall sedentary behavior or for screen time in children and youth. In 2016, the American Academy of Pediatrics changed the screen time recommendation for children ages 5 and older from '2 hours or less' to a personalized family media plan including adequate sleep and physical activity. National recommendations in Canada and Australia recommend 2 hours or less of screen time for children and youth ages 5 to 18 years. Given the ambiguity in evaluating the prevalence of children meeting the current U.S. screen time guidelines, the Committee utilized the '2 hours or less' screen time guideline from the Canadian[29] and Australian[30] recommendations. The 2015-2016 NHANES[28] prevalence of 33% of children ages 6-19 years meeting the screen time guidelines is associated with a grade of D.

Sedentary Behaviors *(continued)*

Sedentary behaviors are activities done while sitting, reclining, or lying down that have very low energy expenditure.[31] Children sit frequently during school, transportation, and recreation. Watching television, playing traditional video games, and using electronic devices (collectively called screen time) are common recreational sedentary behaviors.[32] It is difficult to measure sedentary behavior for large groups of people, and there is debate about the best way to collect this information since sedentary behavior happens across many contexts. Frequently, screen time is studied as a proxy for sedentary behavior, and was the primary data source used to determine the sedentary behavior score from the 2015-2016 NHANES public-use dataset.[28] Based on our analysis, 32.7% of U.S. children and youth aged 6 to 19 years are meeting current screen time recommendations of 2 hours or less per day. Gender, age, and ethnic disparities remain. More girls (37.9%) than boys (27.7%) meet the recommendation. More young children (6-11 years) meet the recommendation compared to older children (12-19 years). Fewer minority children meet the recommendation compared to Non-Hispanic White children. Fewer children who are overweight or obese meet the screen time recommendation compared to children with a normal weight.[28]

The 2016 NSCH is another national source of information on screen time behaviors.[8] Children aged 6-11 years were more likely to engage in less than 1 hour per day of computer/electronic use compared to youth aged 12-17 years (32.8% and 9.3%, respectively). Similar proportions of children and youth watched less than 1 hour of TV per day (18.9% and 19.3%, respectively).[8] However, disparities by ability exist in screen time behavior. Children and youth aged 6-17 years with certain disabling conditions spent more time watching TV than the overall sample of children in the 2016 NSCH.[8] For example, the proportion of children with cerebral palsy, autism spectrum disorder, and intellectual disability who watched less than 1 hour of TV per day was 7.5%, 13.1%, and 14.2%, respectively.[15] Additionally, 12% of CSHCN watched TV 4 or more hours per day compared to 7.6% of non-CSHCN.[15] **Figure 5** shows the proportions of U.S. children and youth who engaged in less than 1 hour per day of screen time across racial/ethnic groups.

Figure 5 Percentage of 6-17 year-old children engaging in less than 1 hour per day of TV or electronic device use across racial/ethnic group.



Source: 2016 NSCH[8]

RECOMMENDATIONS

- Develop national movement recommendations with guidelines for sedentary behavior and screen time in children and youth.
- Continue to refine and determine the most appropriate methods for assessing sedentary behaviors for the population.
- Incorporate electronic device use into surveillance to account for shifting use of screens and media.
- Develop a better understanding of causes for ethnic disparities and work to develop culturally relevant efforts to decrease sedentary behavior in vulnerable groups.

2018 GRADE:

D-

Active Transportation

YEAR	2014	2016	2018
GRADE	F	F	D-

INDICATOR: Percentage of children and youth who use active transportation to get to and from places (e.g., school, park, mall, friend's house).

KEY FINDINGS

- **Approximately 38% of youth aged 12-19 years** walk or use a bicycle for at least 10 minutes continuously once or more in a typical week to get to and from places (2015-16 NHANES).[28]
- **There are differences in the number of days per week youth walk or bike for travel in a typical week:** 62%, 15%, and 23% of youth ages 12-19 years walk or bike for travel on 0, 1-4, and 5-7 days per week, respectively (2015-16 NHANES).[28]
- **Significant gender differences exist in reported active transportation:** Approximately 45% of boys and 32% of girls aged 12-19 years report any active transportation in a typical week (2015-16 NHANES).[28]
- **Reported active transportation differs among youth by income status, with youth from high income households reporting less active transportation than those from lower income households:** 46%, 36%, and 34% of youth aged 12-19 years living in households earning less than 130% of the federal poverty level, 130-349% of the federal poverty level, and 350% or more of the federal poverty level, respectively, report engaging in active transportation at least once in a typical week (2015-16 NHANES).[28]
- **Significant race/ethnicity differences exist in reported active transportation among youth aged 12-19 years:** Approximately 35%, 42%, 43%, and 45% of White, Hispanic/Mexican American, Asian, and African American youth, respectively, report walking or biking to get to and from places at least once in a typical week (2015-16 NHANES).[28]
- **Approximately 13% of children and youth aged 5-14 years** usually walk or bike to school (2009 National Household Travel Survey; NHTS).[33]

DATA SYNTHESIS

Active transportation to and from school and other places in the community is an important way for children and youth to engage in physical activity. Active transportation involves travelling to destinations using one's own energy (e.g., walking, bicycling) rather than relying on a motor vehicle. Children who engage in active transportation are more likely to meet physical activity recommendations compared to those who travel by motor vehicle.[34] Further, a recent study found that active transportation to school was associated with 17 and 13 more minutes of moderate-to-vigorous intensity physical activity per day among primary and high school students, respectively.[35] Much of the research on the benefits of active transportation is limited to travel to school; however, children may bike or walk to other places in their community, thereby increasing the importance of active transport to overall physical activity.

According to the 2015-16 NHANES,[28] approximately 38% of U.S. youth aged 12 to 19 years walk or use a bicycle to get to and from places for at least 10 minutes on at least one day of the week and 23% of youth do so frequently (e.g., at least 5 days per week). The majority of youth either do not engage in active transportation at all during a typical week (e.g., 0 days per week). Of youth reporting any active transportation, they are more likely to do so on at least 5 days per week (23%) compared to 1 to 4 days per week (15%; **Table 3**).[28] Thus, much of the reported active transportation is likely on the 5 days to school rather than other destinations. Unfortunately, only 33% of school districts have policies that support or promote active transportation among students.[17] Active transportation to and from school is a daily activity with high reach as almost 33% of U.S. students live within 1.5 miles of their school, making it a particularly promising target for increasing overall physical activity in children and youth.[36] Future research should seek to identify to which locations children and youth walk and bike as well as reasons that the majority of U.S. children do not engage in active transportation in order to develop strategies to facilitate active transportation overall and to various community locations. Additionally, schools should invest in infrastructure and policies, such as Safe Routes to School initiatives[37] and walking school buses, and parents should support their children to increase the participation in active transportation to and from school.

Table 3 Percentage of U.S. youth aged 12 to 19 years reporting active transportation to and from places, by number of days per week and gender.

NUMBER OF ACTIVE TRANSPORTATION DAYS PER WEEK	TOTAL (%)	GIRLS (%)	BOYS (%)
0 days	61.6	68.3	55.3
1 day	2.5	1.0	3.9
2 days	4.7	5.5	4.0
3 days	4.6	4.8	4.3
4 days	3.5	3.0	4.0
5 days	14.9	13.5	16.2
6 days	1.8	0.6	3.0
7 days	6.3	3.3	9.3

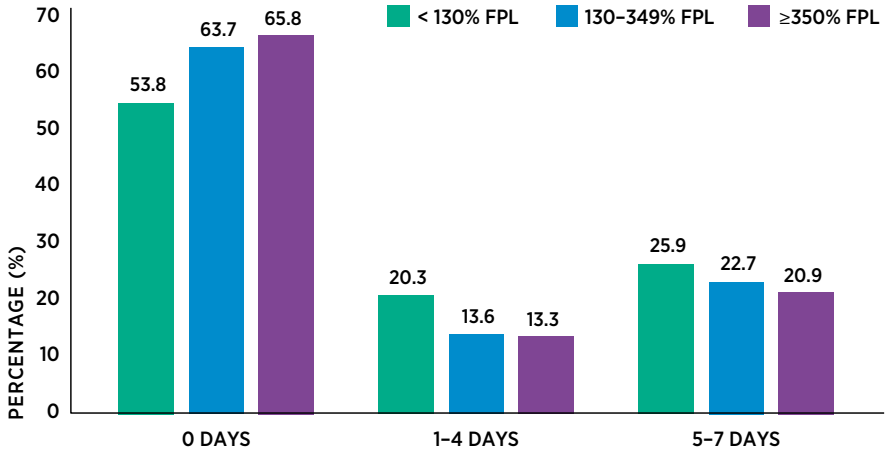
Source: 2015-16 NHANES[28]

There are important differences in the prevalence of active transportation among children and youth from different subgroups. Notably, youth living in low-income households are more likely to report any, occasional, and frequent active transportation compared to those living in higher income households (**Figure 6**).[28] Parents of children and youth living in low-income households may not have the time to drive children to and from places or sufficient income to purchase or lease a vehicle. Thus, walking and biking may be the only options available to low income children, whereas those living in higher income households may have more access to motorized transportation. Studies have found that children living in households with only 1 car are more likely

to engage in active transportation than those with multiple cars.[38,39] Further, high income parents are more likely to exhibit strict, protective parenting styles in which they restrict their child's active transportation due to perceived safety concerns.[40] Parents of all income levels should be informed about the benefits of active transportation and facilitate their children's walking and biking to neighborhood destinations.[41]

Although the grade of "D-" suggests an improvement in active transportation among U.S. children and youth compared to the 2014 and 2016 U.S. Report Cards, this grade change is mostly due to a new data source rather than a significant increase in the behavior. Previous Report Cards relied on a report from the 2009 NHTS that approximately 13% of children and youth aged 5 to 14 years usually walked or biked to school. Our primary data source this year, the 2015-2016 NHANES, includes older youth who may have more freedom to walk or bike in their community, and the survey asked about walking or biking to any place, not just to school. Additional surveillance data on active transportation among U.S. children and youth are needed to monitor potential changes over time. Surveillance system questions about active transportation should include children under 12 years old and ask respondents to where they walk and bike and the distance and duration of these trips.

Figure 6 Percentage of U.S. adolescents aged 12 to 19 years reporting no (0 days), occasional (1-4 days), and frequent (5-7 days) active transportation to and from places, by federal poverty level (FPL).



*FPL: Federal Poverty Level; < 130% FPL is the lowest income category

Source: 2015-16 NHANES[28]

RECOMMENDATIONS

- Schools should invest in infrastructure, programs, and policies that promote active transportation to and from school among their students.
- Allocate funding for programs that create and improve infrastructure to encourage active transportation (e.g., sidewalks, crosswalks, bike lanes, trails, etc.) (NPAP).[42]
- Parents should encourage their children to use active transportation to school and other neighborhood locations (White House Task Force).[43]
- Routinely collect surveillance data on children's active transportation behavior, inclusive of all age ranges and questions regarding to which locations they engage in active transportation and the duration/distance of trips.
- Initiate research on the reasons the majority of U.S. children and youth do not engage in active transportation in order to better tailor programs and strategies to increase active transportation.

2018 GRADE: C

Organized Sport Participation

YEAR	2014	2016	2018
GRADE	C-	C-	C

INDICATOR: Percentage of children and youth who participate in organized sport and/or physical activity programs.

KEY FINDINGS

- **Approximately 56% and 50% of 6-12 year old children** report playing an organized or unorganized team or individual sport, respectively, at least once a year (2017 State of Play Report).[44]
- **Approximately 37% of 6-12 year old children** report playing a team sport (organized or unorganized) on a regular basis (2017 State of Play Report).[44]
- **Approximately 54% of high school students** report playing on at least one sports team during the previous year (2017 YRBSS).[9]
- **A significant socioeconomic disparity in sport participation exists:** approximately 30% of children from low-income households (<$25,000 per year) compared to 12% of children from high-income households (≥$100,000 per year) engage in **no sport activity** during the year (2017 State of Play Report).[44]
- **Children and youth with disabilities experience disparities in sport participation:** 24% of children and youth with cerebral palsy, 28% with autism spectrum disorder, and 31% with Down syndrome report participating on a sports team or taking sports lessons during the previous year compared to 58% of the full 2016 NSCH sample of children (NSCH 2016).[15]

DATA SYNTHESIS

Organized sport participation is an important avenue for children and youth to participate in moderate and vigorous levels of physical activity and to reap the benefits of interacting with others. Studies have found that students participating in sports were more likely to meet physical activity guidelines than their peers who do not participate in sports.[45] According to the 2017 State of Play Report, 56% of 6-12 year old children reported playing on a team sport at least once a year, while 37% reported playing on a team sport on a regular basis.[44] Similar results were found for high schools students: 54% of students reported playing on at least one sports team in the previous year.[9]

Organized Sport Participation *(continued)*

Interscholastic school athletic programs provide an important outlet for organized sport participation for many children and youth. In 2016-17, approximately 8 million students (43% girls) participated in high school athletics.[46] **Table 4** presents the high school athletic programs in which the most students participated. Football was the program most frequently participated in among boys, followed by outdoor track and field, basketball, baseball and soccer. Among girls, the sports program most frequently participated in was outdoor track and field, followed by volleyball, basketball, soccer and fast pitch softball. Only 13 states provided interscholastic adapted sport opportunities for male and female high school students with disabilities in 2016-17, a number that remained unchanged from 2015-16.[44] Students with disabilities most frequently participated in adapted bowling, adapted soccer, and adapted basketball.[44]

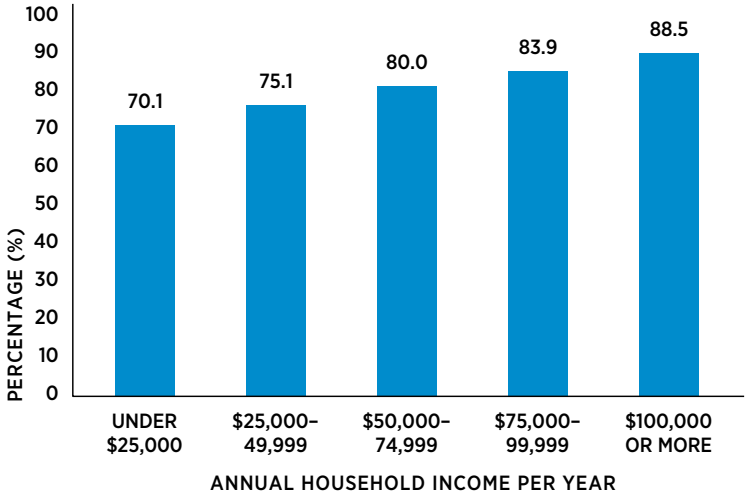
Although the grade of "C" indicates that we are succeeding with about half of children and youth with respect to organized sport participation, some important disparities are evident. For example, according to the 2017 YRBSS, 60% of boys and 49% of girls in high school report participating on at least one sports team in the past year.[9] Furthermore, 58% of heterosexual students participate, while only 39% of gay, lesbian or bisexual students participate.[9] **Figure 7** shows the prevalence of sport participation among 6-12 year old children across levels of annual family income. About 88% of children from high-income households (≥$100,000 per year) engage in at least some sport activity during the year compared to 70% of children from low-income households (<$25,000 per year).[44] Data also support that children and youth with disabilities do not participate in sport to the same extent as their peers without disabilities,[15] nor do they have equal opportunities to participate.[44]

Table 4 High school sports programs in which boys and girls most frequently participate.

BOYS	GIRLS
1. Football	1. Outdoor Track & Field
2. Outdoor Track & Field	2. Volleyball
3. Basketball	3. Basketball
4. Baseball	4. Soccer
5. Soccer	5. Fast Pitch Softball
6. Cross Country	6. Cross Country
7. Wrestling	7. Tennis
8. Tennis	8. Swimming & Diving
9. Golf	9. Competitive Spirit Squads
10. Swimming & Diving	10. Lacrosse

Source: 2016-17 National Federation of State High School Associations Athletics Participation Survey[46]

Figure 7 Percentage of 6-12 year old children engaging in at least some sport activity during the year by annual family income levels.



Source: 2017 State of Play Report[44]

Organized Sport Participation *(continued)*

RECOMMENDATIONS

- Provide access to and opportunities for organized physical activity and intramural programs before and after school (NPAP[42]; Surgeon General).[47]
- Establish joint use agreements to allow use of school facilities for physical activity programs offered by school or community-based organizations outside of school hours (Surgeon General).[47]
- Enhance existing parks, recreation, fitness, and sports infrastructure to build capacity to disseminate policy and environmental interventions that promote physical activity (NPAP).[42]
- Support interscholastic sports and help decrease prohibitive costs of sports (White House Task Force).[43]
- Expand access to recreational spaces and quality sports programming while focusing on eliminating disparities in access based on race, ethnicity, gender, disability, socioeconomic status, geography, age, and sexual orientation (NPAP).[42]
- Capture surveillance data for community sports participation in addition to interscholastic school sports.

2018 GRADE: INC

Active Play

YEAR	2014	2016	2018
GRADE	INC	INC	INC

INDICATORS:

- Percentage of children and youth who engage in unstructured/unorganized active play for several hours a day.
- Percentage of children and youth who report being outdoors for several hours a day.

KEY FINDINGS

- **The percentage of 6 to 12 year old children who spent time outdoors** decreased from approximately 16% in 1997 to 10% in 2003 (Child Development Supplement to the Panel Study of Income Dynamics).[48]
- **Approximately 65% of school districts have policies requiring** elementary schools to provide regularly scheduled recess, while 31% of districts recommend elementary schools do so (2016 SHPPS).[17]
- **Approximately 11%, 8%, and 2% of school districts** require that elementary, middle, and high schools, respectively, provide regular classroom physical activity breaks during the school day (2016 SHPPS).[17]

DATA SYNTHESIS

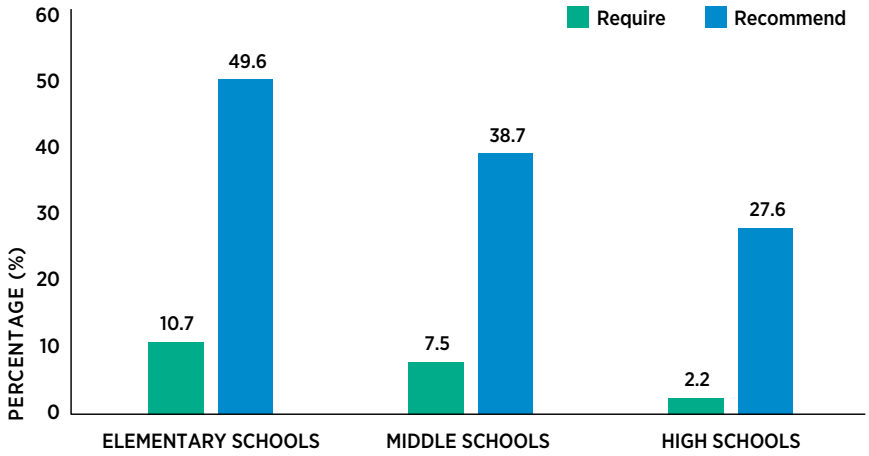
It is well known that play is an essential component of healthy human development, as it contributes to the emotional, physical, cognitive and social well-being of children and youth.[49] "Active" play is one way that children and youth can accumulate time spent in physical activity. Unfortunately, nationally representative data are not available on the percentage of children and youth who engage in unstructured/unorganized active play for several hours each day. This is a gap in our current public health surveillance systems.

Research has shown that time spent outdoors is associated with higher levels of physical activity,[50] and it encourages a greater range of active play pursuits. Although active play has many benefits, time in and opportunities for active play is eroding for many children and youth.[48] Barriers to children playing outside include extreme temperatures, rainy or inclement weather, children's fear of groups of teenagers and bullies in their play areas, and parent's perceptions of safety and lack of infrastructure.[51,52] While some of these barriers are more "real' than others, they can be overcome by creating

more supportive physical activity environments and changing child and parental perceptions and attitudes about playing outside. Unfortunately, many children have busy schedules and their play time may be limited. Between 1997 and 2003, the time children aged 6 to 12 years spent outdoors, playing sports, or engaging in other leisure activities decreased significantly while studying, television, and religious services and youth group attendance increased.[48]

One opportunity for increasing outdoor active play is school recess, but only 62% of school districts require elementary schools to provide regularly scheduled recess breaks.[17] Furthermore, the percentage of children participating in regularly scheduled recess decreases across advancing grade levels.[16] A study of elementary-aged children found that boys and girls spent about 33% and 23% of recess time engaged in physical activity, respectively. Subsequently, if children spend 1 hour each day in recess or some form of activity break, they could accrue about 14-20 minutes of daily activity.[53] Another opportunity for schools to create opportunities for active play is to provide regular physical activity breaks throughout the school day. Only about 11%, 8%, and 2% of school districts require elementary, middle, and high schools, respectively, to provide regular classroom physical activity breaks during the school day (**Figure 8**).[17] While these breaks may sometimes be teacher-led, they represent an opportunity for schools and teachers to encourage active play.

Figure 8 Percentage of U.S. school districts that require or recommend schools provide regular classroom physical activity breaks.



Source: 2016 SHPPS[17]

Not only do recess and classroom activity breaks promote physical activity, but they may also improve behavior and school achievement. A nationwide poll of 1,951 elementary school principals showed that they recognize the value that recess and activity breaks conferred on their students.[54] More than 80% of principals reported that recess led to better academic achievement and approximately 67% reported that students are better listeners and more focused following recess. Further, almost 100% of principals believed that recess has a positive effect on students' social development and general well-being. However, they cited important barriers that must be overcome. For example, almost 80% of principals reported that their school continues to take recess away from students as a punishment for bad behavior. Additionally, principals consistently reported that school staff have difficulty managing students' behavior during recess and activity breaks. To overcome these challenges and prioritize recess and other activity breaks, they indicated that schools need additional staff to monitor recess, better playground equipment, and staff training in managing playground behavior.[54]

Although several key findings are presented on active play, the Report Card Research Advisory Committee is unable to assign a grade for this indicator due to the lack of a benchmark or a guideline related to active play. Currently, there are no recommendations as to the length of time children and youth should be engaged in active play each day.

RECOMMENDATIONS

- School districts should require all schools to schedule regular recess periods and physical activity breaks to allow for more opportunities for outdoor active play.
- Policymakers and school districts should provide schools with additional resources (e.g., staff training, more playground equipment) to make recess a priority during the school day.
- Develop a consensus definition of what exactly constitutes "active play".
- Include questions related to active play in public health surveillance systems so that representative population data can be obtained and tracked over time.
- Initiate research into how much active play (outdoor and indoor) children are getting on an average day and what the associated health benefits are.

2018 GRADE:

C-

Physical Fitness

YEAR	2014	2016	2018
GRADE	INC	D	C-

INDICATORS:

- Percentage of children and youth who meet criterion-referenced standards for cardiorespiratory fitness.
- Percentage of children and youth who meet criterion-referenced standards for muscular strength.
- Percentage of children and youth who meet criterion-referenced standards for muscular endurance.

KEY FINDINGS

- **Approximately 42% of 12 to 15 year old youth** have adequate cardiorespiratory fitness levels (2012 NHANES National Youth Fitness Survey; NNYFS).[55]
- **Approximately 52% of children aged 6 to 15 years** have adequate muscular endurance, based on the number of pull-ups performed (2012 NNYFS).[55]
- **Approximately 5.3% of boys and 12.1% of girls aged 15 to 19 years** are in the "excellent" *Health Benefit Zone* for grip strength. Further, more boys (37.2%) than girls (20.3%) are in the "needs improvement" *Health Benefit Zone* (2011-12 NHANES).[56,57]

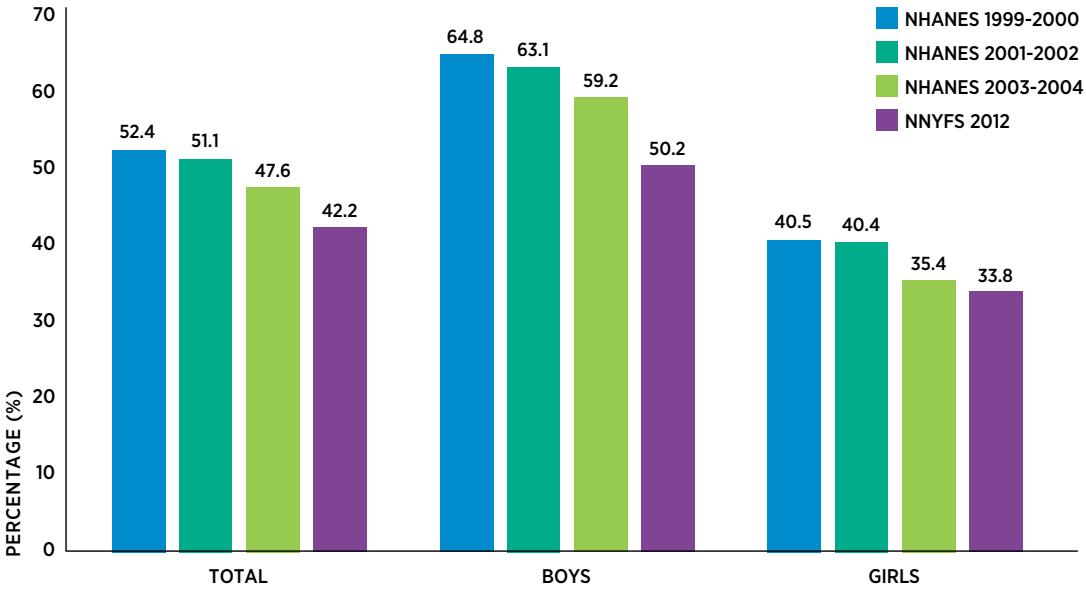
DATA SYNTHESIS

Physical fitness refers to the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits and meet unforeseen emergencies.[58] In general, the only way someone can increase their level of physical fitness is by increasing their level of physical activity. Physical fitness has many domains; however, most people generally associate "fitness" with aerobic or cardiorespiratory fitness. Other important components of fitness include muscular strength, muscular endurance, balance, agility, flexibility, and body composition.

Nationally representative data on cardiorespiratory fitness are available. Adolescents 12-15 years of age participated in a sub-maximal exercise test on a treadmill in the 1999-2004 NHANES[59] in addition to the 2012 NNYFS[55]. A total of 42% of adolescents had "adequate" cardiorespiratory fitness levels, which refers to attaining the age- and gender-specific FITNESSGRAM "Healthy Fitness Zone".[60] The percentage of youth

aged 12 to 15 years with adequate levels of cardiorespiratory fitness decreased from 52% in 1999–2000 to 42% in 2012. **Figure 9** demonstrates these changes over time, and the decreasing trends mirror results from other countries. A research study pooled data from over 25 million 6 to 19 year olds from 27 countries collected between 1958 and 2003.[61] Over this 45 year period, there was a global decline in aerobic fitness performance of 0.36% per year.[61]

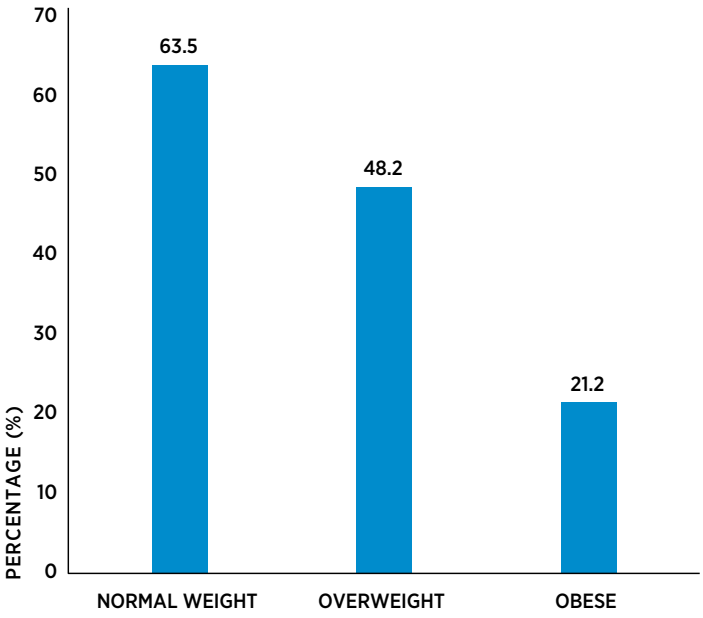
Figure 9 Percentage of youth aged 12 to 15 years reaching adequate levels of cardiorespiratory fitness, by gender and survey period: U.S., 1999 to 2012.



Source: Adapted from Gahche et al.[60]

Data on muscular strength are also available from the 2011-12 NHANES.[56,57] Grip strength is a common indicator muscular strength, and 12.1% of girls and 5.3% of boys were in the "excellent" category, based on Canadian Health Benefits Zones. Further, 37.2% of boys and 20.3% of girls were in the "needs improvement category.[57] Based on the number of pull-ups performed, approximately 52% of children aged 6 to 15 years had adequate muscular endurance, attaining the age and gender specific FITNESSGRAM "Healthy Fitness Zone".[55] There were differences in the number of pull-ups performed across body weight categories, with normal weight children performing better than overweight or obese children (**Figure 10**).[55]

Figure 10 Percentage of youth aged 6 to 15 years with adequate levels of muscular endurance, by body weight status.



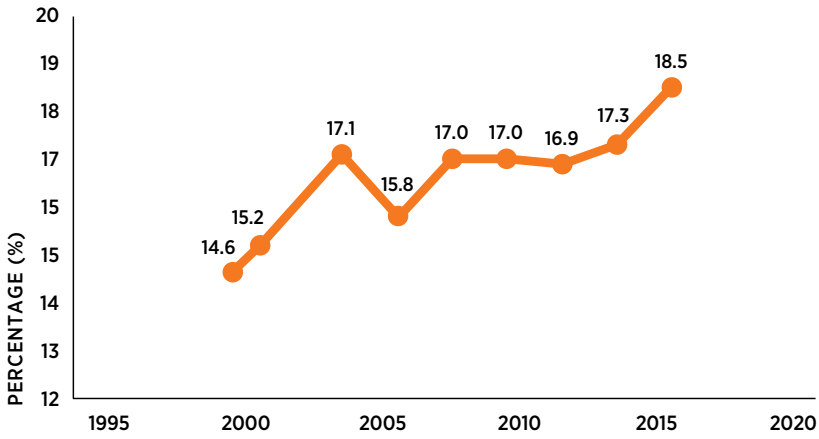
Source: 2012 NNYFS[55]

Obesity continues to be a major public health concern in the U.S. Recent data from the 2015-16 NHANES indicates that approximately 19% of boys and 18% of girls 2 to 19 years of age were obese (body mass index; BMI, greater than or equal to the 95th percentile).[62] Perhaps more concerning, 1.9% of children and youth suffer from severe obesity (BMI greater than or equal to 120% of the 95th percentile or a BMI greater than or equal to 35 kg/m^2).[62] **Figure 11** illustrates the trends in the prevalence of obesity over time in the U.S. Significant increases in childhood obesity have continued to be observed between 2009 and 2016.

Physical Fitness *(continued)*

Children and youth with disabilities fall behind their typically developing peers in components of health-related fitness. Published reports using the 2011-12 NSCH indicate that obesity prevalence among 10-17 year old children with an intellectual disability was 28.9% vs. 15.5% for those without an intellectual disability,[26] and 23.1% for children with autism spectrum disorder vs. 14.1% for those without autism spectrum disorder.[63] While the scarcity of U.S. population level data on fitness among children and youth with disabilities makes it difficult to determine the extent of disparities in this indicator, evidence exists that children and youth with Down syndrome,[64] autism spectrum disorder,[65] cerebral palsy,[66] and intellectual disability[67] exhibit lower levels of aerobic and muscular fitness than those without disabilities.

Figure 11 Percentage of obesity in 2 to 19 year old children and adolescents from 1999 to 2016 in the U.S.



Source: Skinner et al., 2018[62]

RECOMMENDATIONS

- Promote opportunities for children and youth to engage in moderate-to-vigorous levels of aerobic physical activity of sufficient intensity and duration to impact fitness levels, given the observed decline in cardiorespiratory fitness levels over time in U.S. youth.
- Appropriately adapt physical fitness measures in national surveillance efforts to ensure valid and reliable data on children and youth with physical and intellectual disabilities.
- Add measures of physical fitness to public health surveillance systems in the U.S., given the sporadic nature of representative data on physical fitness in children and youth.
- Encourage researchers to use standard criterion references when publishing fitness data to allow for benchmarking and tracking progress over time.

2018 GRADE: INC

Family and Peers

YEAR	2014	2016	2018
GRADE	INC	INC	INC

INDICATORS:

- % of family members (e.g., parents, guardians) who facilitate physical activity and sport opportunities for their children (e.g., volunteering, coaching, driving, paying for membership fees and equipment).
- % of family members (e.g., parents, guardians) who are physically active with their kids.
- % of children and youth with friends and peers who encourage and support them to be physically active.

KEY FINDINGS

- There are no nationally representative data or benchmarks for this indicator.

DATA SYNTHESIS

Parental and peer/friend support plays a key role in children's ability to achieve recommended levels of physical activity. Several studies provided evidence for the role family members and peers play in supporting physical activity among children and youth. Yet, there is a lack of nationally representative data in this area, which led to an incomplete grade this year as in the 2014 and 2016 Report Cards. Additional assessment of family and peer influence on physical activity remains a priority for future research.

Support from family and peers may increase children's ability to perform physical activity and help them overcome barriers to participation in physical activity. Two recent systematic reviews concluded that social support from parents, friends and family results in higher levels of physical activity for both children and youth.[68,69] Yet, parents and peers may also serve as barriers to a child's physical activity through bullying, restricting time for outdoor play and physical activity opportunities, or modeling sedentary behaviors instead of activity. Less is known about parental and peer influence on physical activity participation among children and youth with disabilities. However, reviews of facilitators and barriers to physical activity suggest that support from parents and peers is important for children and youth with disabilities.[70,71]

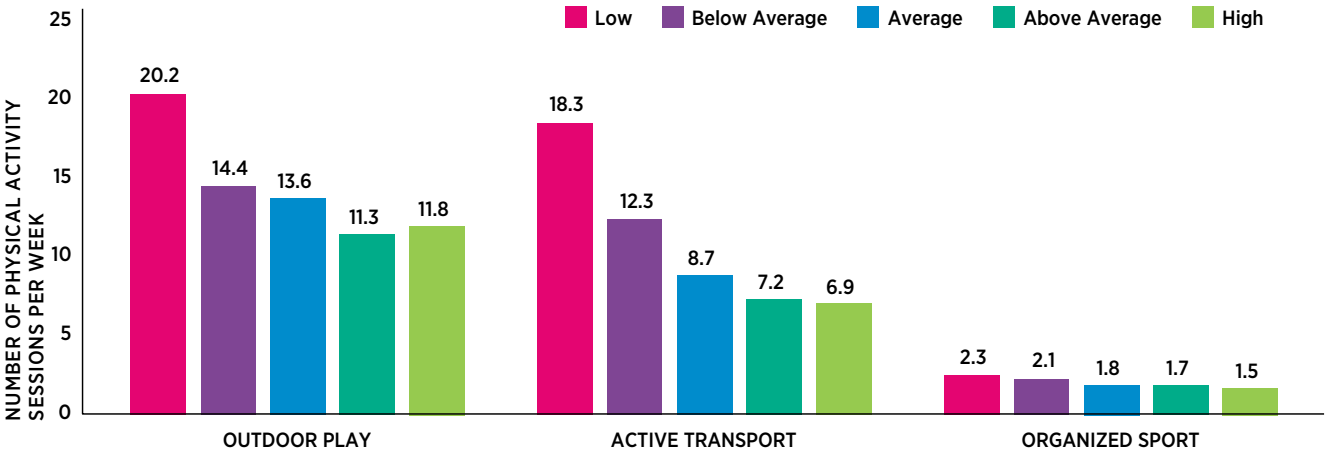
Family and Peers *(continued)*

Family and peers support children's physical activity by providing information and encouragement, discussing types of activity and the benefits of being active, modeling or sharing in physical activity, and limiting screen time. Additionally, parents can help their child be more active by providing instrumental support, such as providing money for registration fees, transportation to activities, or physical activity equipment. A review of studies examining the influence of parental support and modeling on physical activity reported mixed results.[68] However, most studies showed that parental modeling had a small influence on child physical activity levels, and there were important differences by age with parental modeling being more strongly associated with young children's physical activity.[68]

In addition to modeling and supporting physical activity, parents may influence their child's physical activity through their parenting style, which encompasses the overarching attitudes and behaviors through which a parent interacts with their child. For example, children raised by parents with authoritative (e.g., warm and responsive, clear rules, high-expectations, supportive)[72] or permissive (e.g. warm and responsive, few or no rules, indulgent, lenient)[73-75] parenting styles were more physically active and had a lower body mass index than children raised using some other parenting styles. Permissive parents are more likely to have few rules and less likely to restrict their children's play to certain locations (e.g., backyard only), forbid unsupervised outdoor play, or insist on driving their child to school instead of allowing them to walk.[76]

Children whose parents reported these types of restrictions had lower levels of active transport and moderate-to-vigorous physical activity outside of school hours.[76] Additionally, some parenting styles can restrict children's physical activity. A recently recognized type of parenting, called hyper-parenting, was related to decreased levels of physical activity among 7 to 12 year old children.[40] Hyper-parenting includes overprotective "helicopter parenting"; strict "tiger mom parenting"; "concerted cultivation parenting" in which parents enroll children into several extracurricular activities; and "little emperor parenting" which gives children all the material goods they request. Children exposed to excessive hyper-parenting may have limited time for physical activity due to the heavy demands of homework and extracurricular commitments that promote sedentary lifestyles.[40] Children of parents with low levels of hyper-parenting had an average

Figure 12 Frequency of physical activity sessions among 7-12 year old children by levels of hyper-parenting.



Source: Adapted from Janssen et al.[40]

of 20 more sessions of active outdoor play, active transportation, or organized sport participation per week than children of parents with average or high levels of hyper-parenting (**Figure 12**).[40] This study measured the weekly frequency of activity not the time spent in the activity; however, even if sessions were short (e.g., 10 minutes), the amount of physical activity could accumulate substantially over a week (i.e., 200 minutes more physical activity).[40] Similar studies should further explore these relationships using more detailed methods that are more rigorous and assess the amount and intensity of activity. Additionally, research is needed to further understand how parenting styles and behaviors interact to influence their children's physical activity.

As children move toward adolescence, peers may serve as increasingly important role models compared to parents.[77] As reported in the 2016 Report Card, youth engage in similar amounts of physical activity as others in their peer group, suggesting the importance of social influence.[78] More recent research found similar results among a sample of 11- and 12-year old youth.[79] General friend support for physical activity, living in a neighborhood with similarly aged friends with whom the child can play, and friends' physical activity beliefs and participation were associated with more steps per weekday and time spent playing outside on weekdays.[79] Similar results were found for older youth aged 15 to 16 years in that friend social support was related to more time in vigorous physical activity.[80] Additional research, especially at a national scale, is necessary to better understand the influence of specific family and peer support behaviors, the importance of the support provider (i.e., parents or peers), and differences across age groups, gender, and race/ethnicity.

RECOMMENDATIONS

- Invest in programs to help parents live more active lifestyles so that they are modeling positive behaviors that may increase levels of physical activity, especially among younger children.
- Collect nationally representative data exploring the influence of family and peers on children and youth physical activity.
- Add surveillance questions on family and peer physical activity involvement and support behaviors should be included in national surveys.
- Initiate research to improve the understanding of how specific behaviors (i.e. modeling, instrumental support, etc.) and individuals (i.e., parents or peers) influence physical activity among different age groups, genders, races/ethnicities and socioeconomic classes.
- Conduct research examining how parenting styles and parenting behaviors (i.e., rules around outdoor play time) influence youth physical activity to generate a more comprehensive understanding of parental influence.

2018 GRADE:

D-

School

YEAR	2014	2016	2018
GRADE	C-	D+	D-

INDICATORS:

- Percentage of schools with active school policies (e.g., daily PE, daily physical activity, recess, "everyone plays" approach, bike racks at school, traffic calming on school property, outdoor time).
- Percentage of schools where the majority (> 80%) of students are taught by a PE specialist.
- Percentage of schools where the majority (> 80%) of students are offered the mandated amount of PE (for the given state/territory/region/country).
- Percentage of schools that offer physical activity opportunities (beyond PE) to the majority (> 80%) of their students.
- Percentage of parents who report their children and youth have access to physical activity opportunities at school in addition to PE classes.
- Percentage of schools with students who have regular access to facilities and equipment that support physical activity (e.g., gymnasium, outdoor playgrounds, sporting fields, multi-purpose space for physical activity, equipment in good condition).

KEY FINDINGS

- **Approximately 33% of school districts support** or promote walking or biking to and from school (2016 SHPPS).[17]
- **Approximately 71%, 74% and 81% of school districts** have a policy that requires undergraduate or graduate training in PE or a related field for newly hired staff who teach PE in elementary, middle school and high school, respectively (2016 SHPPS).[17]
- **Almost all school districts have policies requiring schools to meet the PE needs of students with disabilities** by including accommodations for PE in 504 plans* and individualized education programs (98%), providing adapted PE as appropriate (91%), and using modified instructional strategies (96%), assessments (94%), and equipment/facilities (89%) (2016 SHPPS).[17]
- **Approximately 30% of high school-aged students** attend PE classes 5 days a week, and 52% attended PE classes 1 day a week (2017 YRBSS).[9]

School *(continued)*

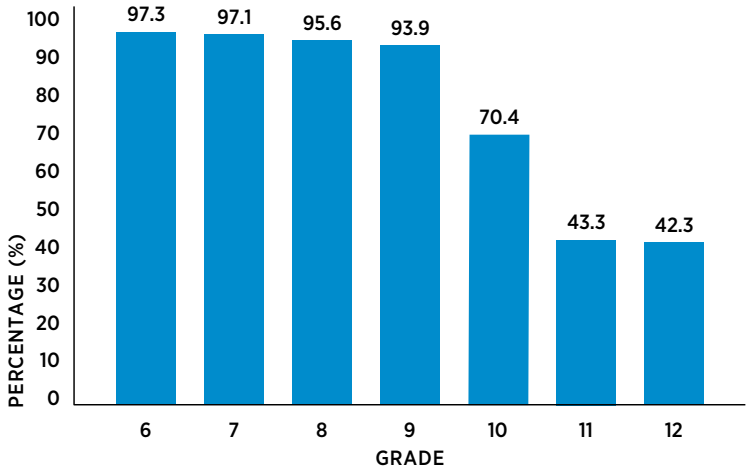
- **The percentage of schools requiring a PE course be taught** in each grade decreases from 97% in 6th grade to 42% in 12th grade (2016 School Health Profiles).[19]
- **Approximately 3.0% of secondary schools** established and implemented a Comprehensive School Physical Activity Program (2016 School Health Profiles).[19]
- **1.7%, 7.5%, and 2.2% of districts require that elementary, middle, and high schools**, respectively, provide regular classroom physical activity breaks during the school day beyond PE and recess (2016 SHPPS).[17]

*A 504 plan outlines and ensures that a student who has a disability receives the appropriate accommodations to maximize their academic success and equal access to the learning environment.

DATA SYNTHESIS

Approximately half of U.S. adolescents attend at least one PE class per week. There are disparities by age and gender as girls enroll in PE less often than boys, and participation drops significantly from the elementary to middle- and high-school years (**Figure 13**). The grade of D- for the school indicator is lower than that for the 2014 Report Card because physical activity programs beyond PE were considered.

Figure 13 Percentage of U.S. schools providing a required PE class, by grade.



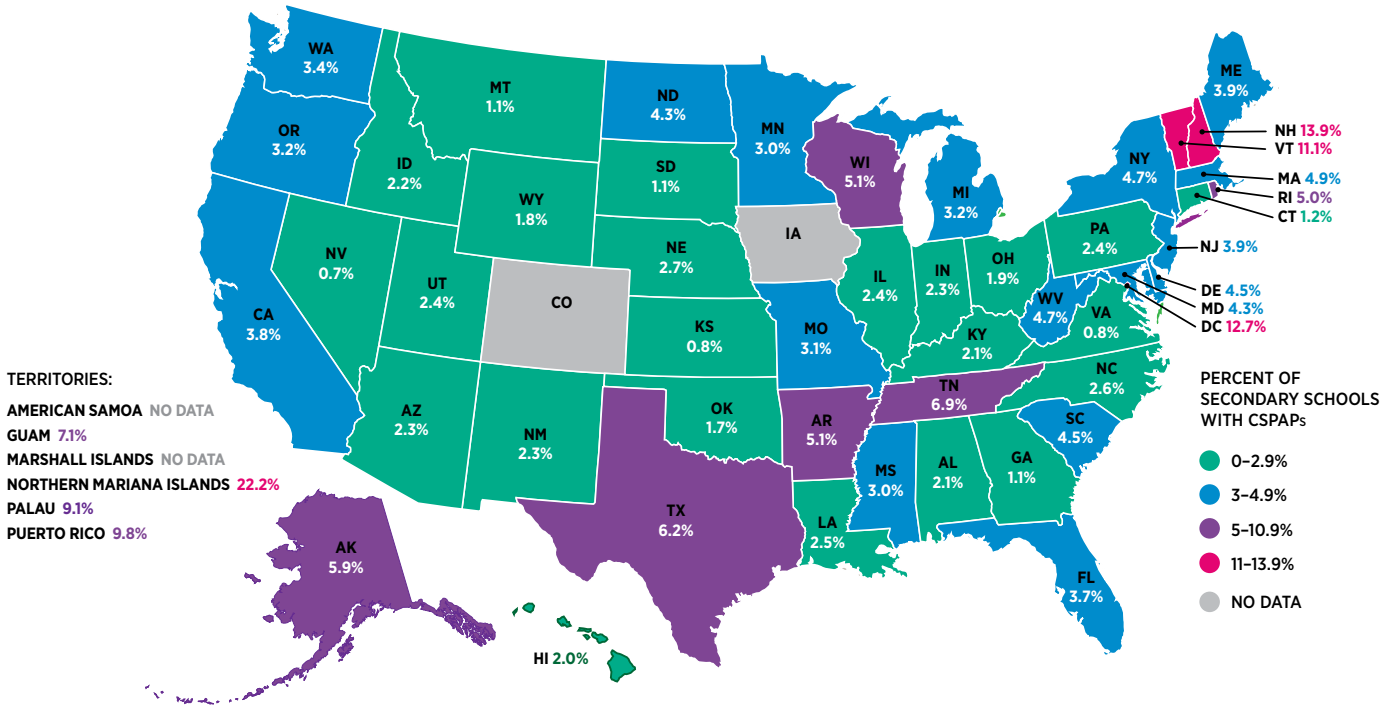
Source: 2016 School Health Profiles[19]

Most children and youth spend large proportions of their time at schools, and it is recommended that they accrue at least 30 of their daily recommended 60 minutes of moderate-to-vigorous physical activity at school.[81,82] To meet this goal, a whole-of-school approach to increasing physical activity at schools, often called Comprehensive School Physical Activity Programs (CSPAP), is recommended.[81,83-85] CSPAPs involve extensive, collaborative efforts among all school personnel to provide students with opportunities to be physically active within a variety of contexts (e.g., PE, recess, and before-, during-, and after-school sport, dance, exercise, and play opportunities). The widespread feasibility and the effectiveness of the individual CSPAP components; however, are still not well known, and the 2016 School Health Profiles reported that only about 3% of U.S. secondary schools had a full CSPAP (**Figure 14**).[19] Additionally, widespread information on CSPAP policies and practices relies almost exclusively from self-reported data obtained from administrators and staff of traditional public schools.

Public education in the U.S. functions primarily within state mandates and there are tremendous differences in policies and practices among states.[19,86] The CSPAP component most frequently identified in state laws is PE, with all states having some mandates for it. Nonetheless, only 22 states have laws mandating the minimum number of PE minutes students should receive.[87] Despite the mounting evidence of the importance of PE to children's overall physical activity level, a recent study found no increases in physical activity (estimated energy expenditure) during PE classes from 2012 to 2016.[87]

The majority of U.S. students attend public schools, but there are other educational options. Private elementary and secondary education has traditionally been prominent in the U.S. In the 2013-14 school year,

Figure 14 Establishment and implementation of CSPAPs by state.



Source: 2016 School Health Profiles[19]

5.4 million students attended over 33,000 private schools, representing 10% and 25% of total American students and schools, respectively.[88] Additionally, there have been recent increases in state legislation that permit families to make choices among public schools resulting in the rapid growth of charter schools across the country.[89] Minnesota enacted the first laws in the country to permit charter schools in 1991, and now 44 states and Washington, D.C. have charter schools enrolling about 3.2 million students in nearly 7,000 schools.[89,90]

Most charter schools are tax-funded public schools and, similar to private schools, are permitted to be more flexible and autonomous in their curriculum, staffing, and operational practices than public schools. This flexibility and autonomy make it increasingly more challenging to study the specific school components that contribute to student physical activity. Further, it is difficult to compare physical activity opportunities across school types due to the differences in regulations and resources across traditional public, charter, and private schools. Therefore, it is important to examine the presence of policies at various levels (i.e., state, district, and school policies) that both promote and prohibit physical activity and to assess the degrees of policy enforcement and implementation. In addition to policies, local environmental conditions (e.g., school size and facilities and neighborhood socioeconomic status) may also support or impede physical activity participation and these should be studied as well.

National data on CSPAP programs and their components across the U.S. are scarce, especially among charter and private schools. Nonetheless, one nationally representative study of U.S. public schools observed that participation in extracurricular physical activity programs varied by gender, race/ethnicity, and socioeconomic backgrounds with boys, Whites, and economically advantaged students often favored.[91]

School *(continued)*

These findings highlight the importance of school-based extracurricular physical activity and sports programs to physical activity. However, school sport participation may be limited to students who are able and willing to pay fees to participate (i.e., "pay-to-play"). A recent study found that 17 U.S. states had policies specifically allowing public schools to collect sports participation fees while only 1 state had a law prohibiting such a fee collection.[92] Pay-to-play policies may widen the gap in sports participation between children of high and low socioeconomic status and subsequently lead to lower overall physical activity among children with low socioeconomic status.

A study in California found private secondary schools in the state typically met national guidelines for PE class size, but few of the schools met national recommendations for weekly PE minutes, banning substitutions for PE, and classes being delivered by PE specialists.[93] Most of these private schools provided interscholastic sport programs (88%), intramural activity programs (56%), and club activity programs (55%).[94] Six factors were associated with schools providing extracurricular physical activity programs. Four factors were relatively unchangeable (school location, grade level, number of students enrolled, and religious classification), but two were modifiable (i.e., whether the school met the state mandate for PE class time and whether PE programs were taught by PE specialists).[94] The latter finding supports the notion that PE specialists are important in promoting overall opportunities for physical activity well beyond PE classes alone. Additional studies of all CSPAP components at both the elementary and secondary levels are needed and charter and private schools should be included.

RECOMMENDATIONS

- Schools should adopt current professional guidelines (e.g., those of SHAPE America[95] and/or the Institute of Medicine[81]) for PE time allocations, class size, physical fitness testing, employing PE specialists, and not permitting exemptions for PE.
- State governments should enact policies that prohibit public schools from collecting sports participation fees so that students of all socioeconomic levels can participate.
- Continue and expand current national surveillance through the SHPPS[17] and School Health Profiles.[19]
- Include all CSPAP components in future research studies, ensuring public, private and charter schools are assessed and that on-site visits are included to verify and enhance self-reports.
- Conduct research to better understand gender, race/ethnicity, disability, and socioeconomic status differences in school-provided physical activity opportunities to identify disparities and tailor school-based physical activity interventions to populations most in need.

2018 GRADE:

C

Community and Built Environment

YEAR	2014	2016	2018
GRADE	B-	B-	C

INDICATORS:

- Percentage of communities/municipalities that report they have infrastructure (e.g., sidewalks, trails, paths, bike lanes) specifically geared toward promoting physical activity.
- Percentage of children or parents who report having facilities, programs, parks and playgrounds available to them in their community.
- Percentage of children or parents who report living in a safe neighborhood where they can be physically active.
- Percentage of children or parents who report having well maintained facilities, parks and playgrounds in their community that are safe to use.

KEY FINDINGS

- **Approximately 75% of 6 to 17 year old children** live in a neighborhood with sidewalks or walking paths (2016 NSCH)[8]
- **Approximately 77% of 6 to 17 year old children** live in a neighborhood with a park or playground area (2016 NSCH)[8]
- **Approximately 64% of 6 to 17 year old children** live in a safe environment; however, there are disparities in this indicator: 72% of White children, 53% of African American children and 54% of Hispanic children live in safe environments (2016 NSCH)[8]
- **42% of states** earned at least 20 out of 30 points on Complete Streets Policies* (NPAP Walking Report Card)[96]
- **32% of states** have at least 30% of the population living in highly walkable neighborhoods (NPAP Walking Report Card)[96]
- **The five most common park features** are lawns, play areas, restrooms, basketball courts, and baseball fields, while the five least common park features are gymnasia, exercise areas, dog parks, skate parks, and fitness zones (National Study of Neighborhood Parks)[97]

- **Most park features are both usable and accessible:** 97% of park features are usable, and 98% of park features are accessible (National Study of Neighborhood Parks)[97]
- **Park conditions are varied**: 62% of parks have little to no litter present and 89% of parks have no graffiti (National Study of Neighborhood Parks)[97]

*The Complete Streets Policies rating guide captured whether a state's Complete Streets policy included mandatory requirements for clear action that demonstrate the state's intent to meet the needs of all users (up to 15 points), language addressing the applicability to or role of county or municipal jurisdictions (up to 5 points), and two or more clear implementation steps (up to 10 points).[37]

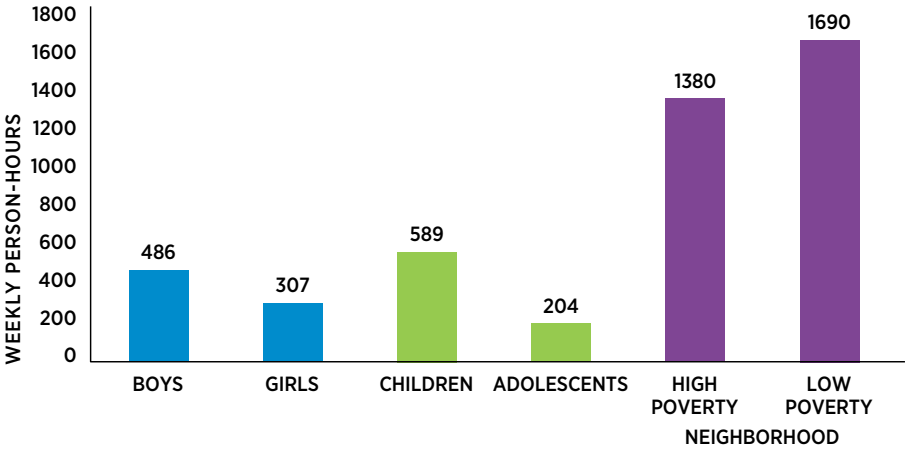
DATA SYNTHESIS

Multiple aspects of the community and built environment are important to children's and youth's physical activity. Several studies have found that children and youth living in a high-walkable neighborhood, broadly defined as a community where it is safe and easy to walk and where pedestrian activity is encouraged,[98] engaged in more physical activity than their peers who resided in a low-walkable neighborhood.[99] Being in a walkable neighborhood can mean having sidewalks and destinations in walking distance (e.g., schools) and being safe from traffic and crime. According to the 2016 NSCH, a large number (75%) of children and youth lived in a neighborhood with sidewalks.[8] However, the recently compiled National Walkability Index[100] indicated that less than one-third of U.S. states had at least 30% of their children and youth living in high walkable communities.[96] Although re-designing entire communities to be more walkable can take decades, more short-term projects such as improving safety from traffic and street crossings are feasible and can support rapid increases in walkability and walking.[101]

In regards to safety, although the majority of parents (64%) reported living in a safe neighborhood,[8] there is substantial room for improvement. Furthermore, there are clear racial/ethnic gaps in perceived neighborhood safety, with only 53-54% of parents of African American and Hispanic children reporting living in a safe neighborhood.[8] Perceived safety plays an important role in children and youth's physical activity by influencing parents to either support or restrict their child from engaging in outdoor neighborhood activities such as walking to school and active outdoor play.[76] Thus, more efforts are needed to both improve neighborhood safety in unsafe areas and support more accurate perceptions of safety in safe areas.

In addition to living in a walkable and safe neighborhood, having access to parks that are safe and include amenities supportive of physical activity is important to physical activity in children and youth. A single park is estimated to contribute 235 hours of physical activity across visiting children and youth every week based on a recent national study of U.S. parks.[97] Over 75% of children and youth reported living in a neighborhood with a park or playground area;[8] however, this percentage only captures the presence of parks and not actual use by neighborhood children. It is interesting to note that a similar proportion of CSHCN and children and youth with certain disabilities (e.g. autism spectrum disorder, intellectual disability, learning disability, Down syndrome) report having a park or playground in their neighborhood, yet only 62% of children with cerebral

Figure 15 Average weekly park use by gender, age group, and community socioeconomic status for US parks.



Source: National Study of Neighborhood Parks[97]

Note: Person-hours for the high and low poverty groups included children and adults.

Table 5 Weekly person-hours of children's and youth's moderate-to-vigorous intensity physical activity by park feature.

PARK FEATURE	WEEKLY MVPA PERSON-HOURS
Gymnasium	137
Walking Loop	72
Pool	72
Skate Park	72
Outdoor Basketball Court	45
Play Area	41
Baseball Field	36
Sports Field	30
Fitness Zone	28
Picnic Area	11
Tennis	8
Seating Area	7
Lawn	6
Bleachers	6
Exercise Area	6
Dog Park	4

Source: National Study of Neighborhood Parks[97]

MVPA: Moderate-to-Vigorous Physical Activity

palsy report these amenities.[15] Research has shown that park use was significantly lower in low- vs. high-income communities (**Figure 15**), highlighting a gap across communities that may contribute to lower physical activity levels among children living in low-income communities.[97] Another important gap exists as children reach adolescence, with teens being much less likely to use parks as compared to children and adults.[97] Features within parks are also important, with some features supporting physical activity more than others, as shown in **Table 5**. Additionally, adolescents may use parks more often if they include features appropriate to their age (e.g., skate park, sports court) rather than those supportive of activity among children (e.g., playground).[102]

The grade of B- for the community and built environment in the 2016 Report Card was primarily based on children and youth having access to parks. The updated grade in the 2018 Report Card considers multiple additional aspects of the community and built environment, including safety, walkability, and complete streets policies. These additional data resulted in lowering the grade to C and suggest substantial efforts are needed to improve the community and built environment in the U.S. to be more supportive of children's and youth's physical activity, particularly in underserved, low-income communities. More national surveillance measures that are sensitive to change are also needed to better track whether such efforts are leading to improvements in the community and built environment and children's and youth's physical activity over time.

RECOMMENDATIONS

- Address disparities in park use to support greater use in low-income areas and in teens.
- Make complete streets design, which involves safely accommodating everyone who uses streets, including pedestrians and bicyclists, universal.

Community and Built Environment *(continued)*

- Focus community and built environment improvement projects near schools to maximize impacts on children's and youth's physical activity by supporting active transportation to and around school.
- Design outdoor play/recreational spaces to accommodate children of all abilities and inspire inclusive play in order to promote physical activity participation.
- Conduct research studies on the accessibility of parks and playgrounds for children and youth with disabilities, as well as the extent to which they use these neighborhood amenities.
- Evaluate the impacts of various community and built environment improvement projects on children's and youth's physical activity to better identify specific targets that maximize impacts.

PHYSICAL ACTIVITY SETTINGS

Government Strategies and Investments

At all levels, government is becoming increasingly involved in promoting physical activity and healthy living among children and youth. This year, we highlight some of the federal, state, and local efforts to support physical activity and active living, including the BAM! Body and Mind Program by the Centers for Disease Control and Prevention (CDC), state policies across the nation, and the Healthy Kids, Healthy Communities initiative.

FEDERAL

BAM! Body and Mind is a CDC online program promoting nutrition, physical activity, stress management, and other healthy lifestyle habits through interactive features, such as games and quizzes, meant for children ages 9 through 12 years. The program also provides teachers and parents with instructional lessons and activities that are linked to National Education Standards. The website covers physical activity, food and nutrition, safety, and emotional health, as well as the body (specifically hygiene, puberty, and the effects of genes on behavior) and disease. The BAM! Body and Mind program also has downloadable activities for children, such as a short "Motion Commotion" quiz to find out which physical activities fit their personality, an activities calendar to promote exercise, and a "Dining Decisions" mobile app to teach healthy eating. The entire online program is available on the CDC's website at https://www.cdc.gov/bam/.

Title IX and the **Americans with Disabilities Act (ADA)** are prominent federal legislation with widespread influence on children's physical activity levels. An evaluation of the influence of Title IX of the Education Amendments of 1972 observed an increase from 4.5% to 28.6% in high school girls' sports participation over a 6-year period from 1972 to 1978.[103] This increase in girls' sports participation was associated with 24% higher self-reported physical activity levels and a 28% lower prevalence of overweight among adolescent girls.[104] Additionally, higher state-level girls' sport participation rates following Title IX were associated with a lower average BMI and obesity prevalence 20 to 25 years later.[103] The **Individuals with Disabilities Education Act (IDEA)** requires public schools to provide a free, developmentally appropriate education to children with disabilities in the least restrictive environment possible, including the PE classes and instruction required to meet state standards. More information on IDEA and the ADA can be found at: https://www.ada.gov/cguide.htm#anchor65310.

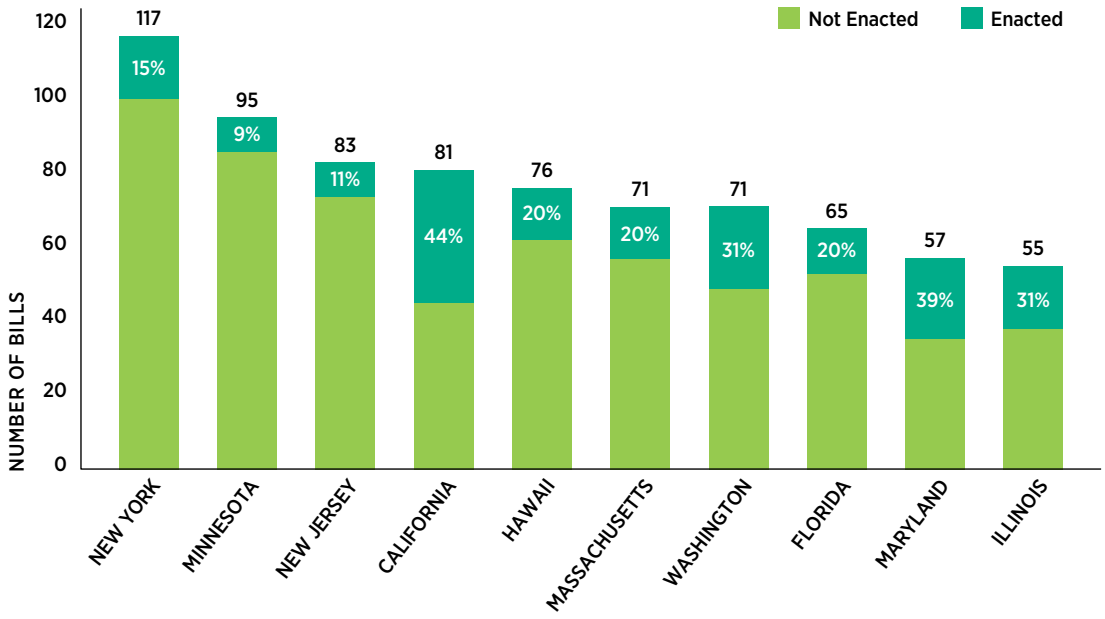
STATE

State legislatures hear and vote on many bills each year related to improving healthy living and physical activity among children and youth. Each state has its own **PE policies** for children enrolled in K-12 schools. Most states have a standard curriculum for PE teachers and school administrators that is mandated, suggested, or encouraged by state boards or education departments. Additionally, states may have policies requiring specific professional or educational qualifications for PE teachers. Each state's policies are listed

online by the National Association of State Boards of Education's State School Health Policy Database with support by the CDC: http://www.nasbe.org/healthy_schools/hs.

Between 2006 and 2012, state legislatures enacted approximately 30% of the 1,542 introduced **physical activity promotion bills**.[105] **Figure 16** shows the 10 states that introduced the greatest number of physical activity-related bills and the percentage that were enacted. While there was previously a decrease in required time and frequency of PE class across states, this decrease has now plateaued. Bills that involved increasing infrastructure and access to public transportation and walking or bicycling trails were more likely to be enacted compared to other healthy living bills.[105] Additionally, bills that used strong enforcement language, such as 'require' or 'mandate', were more likely to be enacted compared to bills using weaker enforcement language, such as 'recommend' or 'encourage'.[105]

Figure 16 Number of bills introduced related to physical activity and percentage enacted across the 10 states with the greatest number of introduced bills, 2006 to 2012.



Source: Adapted from Eyler, et al.[105]

LOCAL

From 2008 to 2014, Robert Wood Johnson Foundation's **Healthy Kids, Healthy Communities (HKHC)** program supported 49 communities across the U.S. and Puerto Rico to encourage local policy, system, and environment changes that support healthier lifestyles and prevent childhood obesity. The program placed special emphasis on communities with the greatest obesity risk, especially those in which a high percentage of their community members were low income and minority race/ethnicity and located in the Southern U.S. HKHC supported initiatives designed to have both broad (e.g., community-wide bicycle lanes) and narrow impacts (e.g., installation of restrooms in a park). Projects were categorized into 6 groups: Active Transportation, Park and Play Space, Child Care Physical Activity, Child Care Nutrition, Corner Store, and Farmers' Market. Between 2009 and 2014, HKHC enacted 4,261 policy, practice, or environmental changes in these categories across the nation.[106] Beyond immediately benefitting the partnering communities and their residents, HKHC helped increase understanding of how to best maximize the reach of beneficial changes in a community in order to increase healthy living among high risk groups as well as the population as a whole. For more information, visit the HKHC website at: https://www.rwjf.org/en/library/research/2012/02/healthy-kids--healthy-communities.html

Government Strategies and Investments *(continued)*

The NPAP Alliance's **"2017 U.S. Report Card on Walking and Walkable Communities"**[96] assesses the prevalence of walking among U.S. adults and children and the extent to which U.S. communities provide physical and social supports that promote walking. It is the first comprehensive assessment of walking and community walkability in the U.S. While the report is a national effort, a related resource from the NPAP Alliance, **"Promoting Walking and Walkable Communities – Cross-Sector Recommendations form the National Physical Activity Plan Alliance",**[107] provides strategies to increase walking among all residents in local communities. Strategies and tactics are recommended across 6 main components: policies, places, programming, cross-sector collaborations, data and monitoring, and resources and funding (see **Table 6** for examples). The full report[96] and recommendations[107] are available for download at: http://www.physicalactivityplan.org/projects/walking.html

Table 6 Examples of the NPAP Alliance's recommended tactics to increase walking behavior and community walkability in the U.S. by component

COMPONENT	TACTIC
Policies	"Community recreation organizations should promote policies and strategies that specifically support funding for community trails, multi-use recreation and fitness facilities, playgrounds, and public access to safe places to walk and roll."
Places	"Colleges, Universities, and local school districts should design walkable campuses that promote safe and accessible active transportation options for students."
Programming	"Faith-based organizations should develop programs that link inclusive walking programs to other activities, such as prayer and study groups."
Cross-Sector Collaborations	"Community recreation organizations should partner with experts in media and social media to increase awareness and uptake of resources that support physical activity."
Data and Monitoring	"Transportation and public health agencies should develop new data collection sources for pedestrian counts and impacts of pedestrian trips on economic and personal health."
Resources and Funding	"Federal, state and local governments should preferentially commit resources to enhancement of accessible walking-related infrastructure (e.g., sidewalks, crosswalks, traffic lights, crossing guards) in low-income communities."

Source: 2017 NPAP U.S. Report Card on Walking and Walkable Communities[107]

RECOMMENDATIONS

- Invest financial resources to support walking, cycling, active recreation, sports, and play in alignment with the World Health Organization's Global Action Plan on Physical Activity (GAPPA).[96,108]
  - — As recommended by GAPPA,[108] make specific investments in groups who traditionally have less access to safe, affordable, and appropriate spaces and places for physical activity. This includes girls, youth from low socioeconomic households, youth with disabilities and chronic diseases, youth from indigenous communities, and youth residing in rural communities.
  - — Support policies and funding initiatives that promote active transport including road safety and the prioritization of road access to pedestrians, cyclists, and users of public transportation.[108]
  - — Support policies and funding initiatives that promote youth participation in sport and active recreation.[108]

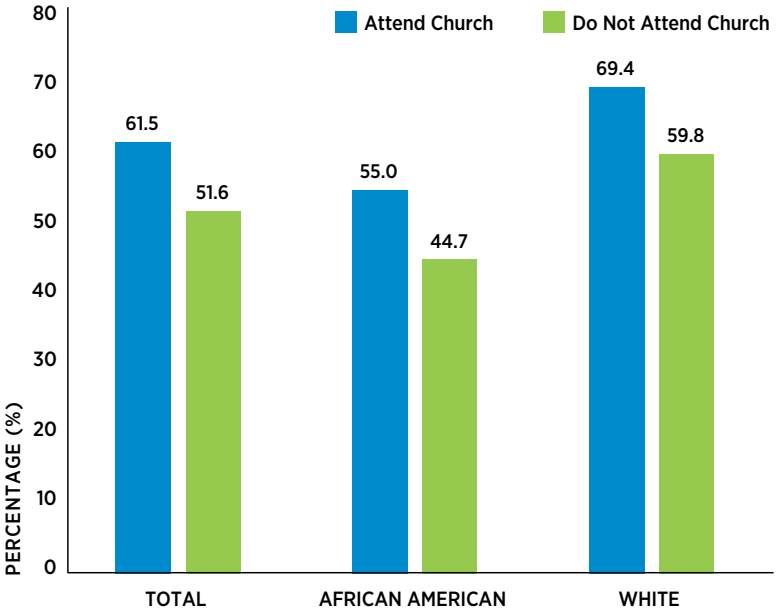
Government Strategies and Investments *(continued)*

- Support the updating and dissemination of national guidelines for physical activity promotion and strategies across childhood and adolescence.
- Enact policies that require physical activity in the school day delivered through quality PE and supportive school environments so youth attain the recommended 60 min/day moderate-to-vigorous intensity physical activity and build skills for lifelong physical activity participation.
  - — Policies should include P.E., recess, and classroom activity breaks.
  - — Policies should comply with Title IX and the ADA to ensure that all children have access to free, developmentally appropriate physical activity and PE that meet standards.
  - — Policies should include an evaluation plan for school accountability.
  - — Policies should include funding/resources/ technical assistance for schools.

Faith-based Settings

Faith-based organizations may be appropriate health promotion partners for improving health-related behaviors, including physical activity levels. Among American adults, 89% report believing in God, 77% affiliate with a religion, and 36% attend worship services at least once per week.[109,110] Additionally, nearly one-third (31%) of individuals who attend church at least once a week and those who attend once or twice monthly/a few times a year are parents of children under 18 years of age.[110] Church affiliation and attendance are higher for women and racial/ethnic minorities, who also report lower levels of physical activity and higher rates of chronic disease than other population subgroups.[110] In addition, faith-based organizations typically have physical space to hold activities and tend to be trusted in their community with deep social networks. Previous reviews in the literature have established linkages between spirituality/church attendance and health-promoting behaviors, including physical activity, among adults and youth (**Figure 17**).[111] Studies have also highlighted the success of faith-based physical activity interventions for improving physical activity levels among adults suggesting that this approach is promising,[112-114] particularly among racial/ethnic minority adults. Unfortunately, much of the literature evaluating faith-based physical activity interventions has been based on small pilot studies. Additional research should be performed with larger samples in order to better understand the role of using faith-based settings and incorporating faith tenets into intervention strategies for physical activity promotion.

Figure 17 Percentage of U.S. high school girls who met moderate-to-vigorous intensity physical activity guidelines by church attendance and race/ethnicity.



Source: Adapted from Pfeiffer, et al.[111]

While the faith community has been evaluated as a conduit for promoting physical activity behaviors among adults, very little is known about the utility and effectiveness of faith-based interventions for promoting physical activity among children and youth. Several small pilot studies have evaluated the feasibility of church-based interventions on physical activity participation among youth. For example, Trost and colleagues[115] evaluated the 4-lesson "Shining Like Stars" curriculum to promote activity among elementary school students during Sunday school. Intervention participants (n=65 parent-child pairs) received a curriculum with biblical lessons that incorporated physical activity while control participants (n=40 parent-child pairs) received the same lessons without incorporating physical activity. In addition, intervention participants received family devotional activities to complete during the week that were designed to promote parental support of physical activity and physical activity participation outside of Sunday school. Results showed statistically significant increases in moderate-to-vigorous intensity physical activity during Sunday school among children in intervention churches compared to those in control churches over 4 weeks of the intervention. No outside of church differences in physical activity were observed; however, authors concluded that Sunday school is a feasible and potentially effective setting in which to increase children's physical activity levels.[115]

Faith-based Settings *(continued)*

Several other studies examining the feasibility of church-based physical activity promotion programs among children and youth showed mixed results potentially due to small sample sizes, lack of a control group, and low intensity of the intervention. Thompson and colleagues[116] evaluated the feasibility of a 12-week church-based physical activity intervention for African American adolescent girls aged 12 to 18 years (n=41). Intervention sessions were 60 minutes each and incorporated scriptures, health education, and activity sessions. There were no statistically significant changes in self-reported weekly physical activity participation. However, the program was well attended and reported high retention and program satisfaction which indicates that church may be a feasible setting in which to implement a more intensive physical activity promotion program.[116] A feasibility study of a church-based mother-daughter intervention to promote physical activity among young Latinas evaluated an 8-week intervention that included educational topics, interactive activities, and religious themes.[117] Self-reported surveys were used to assess change in physical activity among 11 mother-daughter pairs. Data showed a trend toward increased physical activity following the intervention; however, the small sample size prevented the authors from testing for statistical significance.[117] Larger studies testing more intensive physical activity interventions among youth are needed.

Promoting physical activity in faith-based centers appears to be a feasible approach for both children and adults. Additional research using larger samples and randomized, controlled study designs are needed to fully understand the extent to which faith-based interventions can increase, and sustain increases in, physical activity among adults and youth.

RECOMMENDATIONS

- Conduct research studies among children and youth that use larger samples and randomized, controlled study designs to understand the extent to which faith-based interventions can increase physical activity.

Early Child Care Settings

During children's early years, regular physical activity and limited sedentary time are critically important factors for optimal growth and development, even in infancy.[118] Physical activity contributes to the development of a healthy weight, better bone and muscular-skeletal development, improved cardiometabolic health, and enhanced motor and cognitive development.[119-123] Physical activity and sedentary behavior habits formed early in childhood can provide a link to activity levels in adolescence and adulthood, adding to the importance of promoting these behaviors very early in life.[124]

The *2008 Physical Activity Guidelines for Americans*[5] do not offer physical activity recommendations for children during their early years. However, the *2018 Physical Activity Guidelines Advisory Committee Scientific Report* concluded that there was strong evidence demonstrating that higher amounts of physical activity are associated with more favorable indicators of bone health and with reduced risk for excessive increases in body weight and adiposity in children ages 3 to 6 years.[58] In 2016, the American Academy of Pediatrics revised their media recommendations for infants, toddlers, and preschoolers.[125] Those guidelines suggest that children 18 months and younger should have no media use other than parent communication, with careful introduction of media use for children ages 18 months to 2 years. For children 2-5 years of age, media usage should be limited to one hour of high quality programming. Recent 24-hour movement guidelines from Canada[29] and Australia[126] offer recommendations for movement and sedentary time (as well as sleep). These countries recommend 30 minutes of tummy time for infants and 180 minutes of total physical activity for toddlers and preschoolers, with at least 60 minutes of that time being energetic play. Further, they recommend that children in this age group should not have their movement restricted (e.g., by securing or seating) for more than one continuous hour.[29,126] Screen time is discouraged for infants and should be limited to one hour for toddlers and preschoolers. **Figures 18-19** show the percentage of U.S. children ages 5 years and under engaged in various amounts of daily screen time.

U.S. surveillance systems currently do not include physical activity information on children below the age of 6 years. Because of the lack of large-scale surveillance data on the birth to 5 years age group, it is unknown exactly how active children are during their early years or the amount of time they spent in sedentary pursuits. A recent review of 40 studies that assessed physical activity in preschoolers found great variability in children's activity.[127] Among these studies, sedentary time

In the U.S., early care and education (ECE) programs serve a large number of children and families and can play an important role in promoting physical activity and reducing unnecessary sedentary time. Unfortunately, there currently are no physical activity recommendations for young children, birth to age 5, in the *2008 Physical Activity Guidelines for Americans*.[5] Similarly, there are no nationally representative surveillance data for these settings. In this year's Report Card, we describe how ECE programs can structure physical and social environments that reinforce the development of early physical activity patterns and start young children on the path to good health.

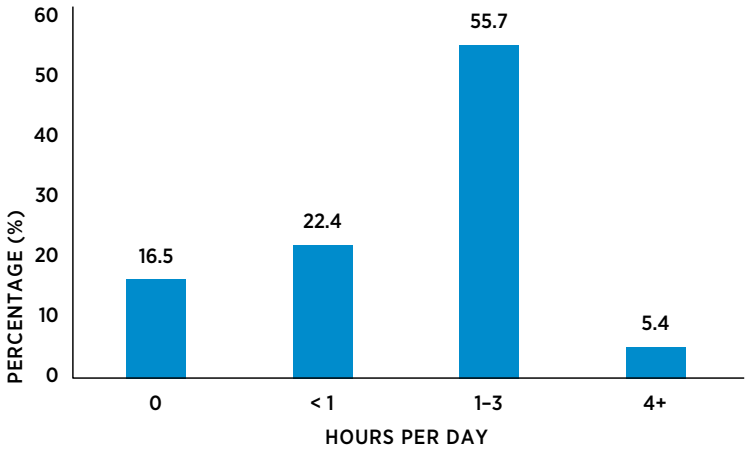
Early Child Care Settings *(continued)*

ranged from 34% to 94%, light-intensity activity from 4% to 33%, and moderate to vigorous activity from 2% to 41%. Future national surveillance efforts should include data from younger children.[127]

Although school-aged children have been the primary focus of the Report Card, ECE programs provide important opportunities for the promotion of physical activity among younger aged children. More than 60% of young children in the U.S. are in some type of out-of-home ECE setting and spend between 25 and 32 hours per week in these programs.[128] Most children are in center-based care, but family childcare homes provide care and education for large numbers of children. As such, both of these ECE settings have the potential to make a significant impact on the physical activity and sedentary behaviors of many U.S. children.

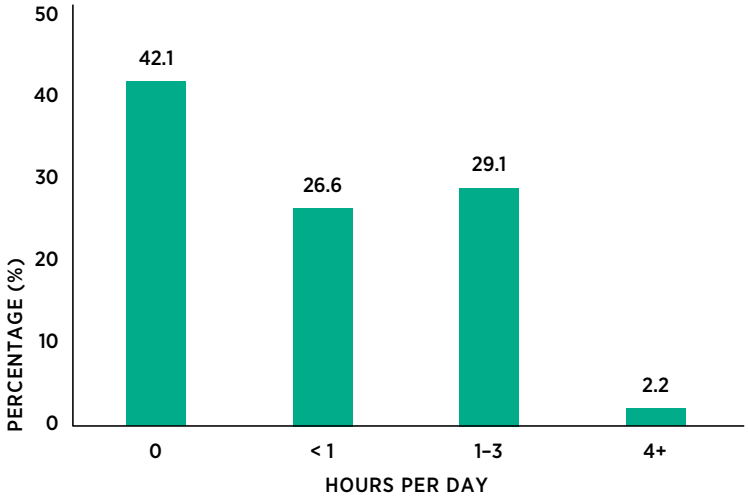
A number of public health experts have encouraged the development of physical activity best-practice recommendations for ECE programs[129-131] to improve the environments in ECE settings and their support for physical activity. One prime example of a set of best practices is *Caring for our Children*, a comprehensive set of national standards for nutrition and physical activity developed specifically for ECE programs.[132] At this time, no surveillance system exists to monitor how ECE programs support a young child's physical activity development. However, the CDC has plans to pilot test a surveillance initiative for ECE settings. Data collection has not yet begun.

Figure 18 Time spent watching TV or playing video games among young children aged birth through 5 years.



Source: 2016 NSCH[8]

Figure 19 Time spent using computers, cell phones, video games, and other electronic devices among young children aged birth through 5 years.



Source: 2016 NSCH[8]

ECE center and family home environments include multiple components that can influence young children's physical activity and sedentary behaviors: provisions (e.g. time, equipment, space); provider practices and behaviors; and organizational policies. Factors such as time spent outdoors;[133] availability of portable play equipment,[134-137] and outdoor play spaces[135] can facilitate children's physical activity. Provider practices also can support children's activity, including teacher-led physical activity[134] and verbal prompting for activity.[138,139] Policies such as requiring staff to receive training about physical activity[134] or requiring daily outdoor time[140] positively influence children's physical activity. Importantly, intervention evidence suggests that modifications to various environmental characteristics within ECE centers can result in increased physical activity in young children.[137,141-144]

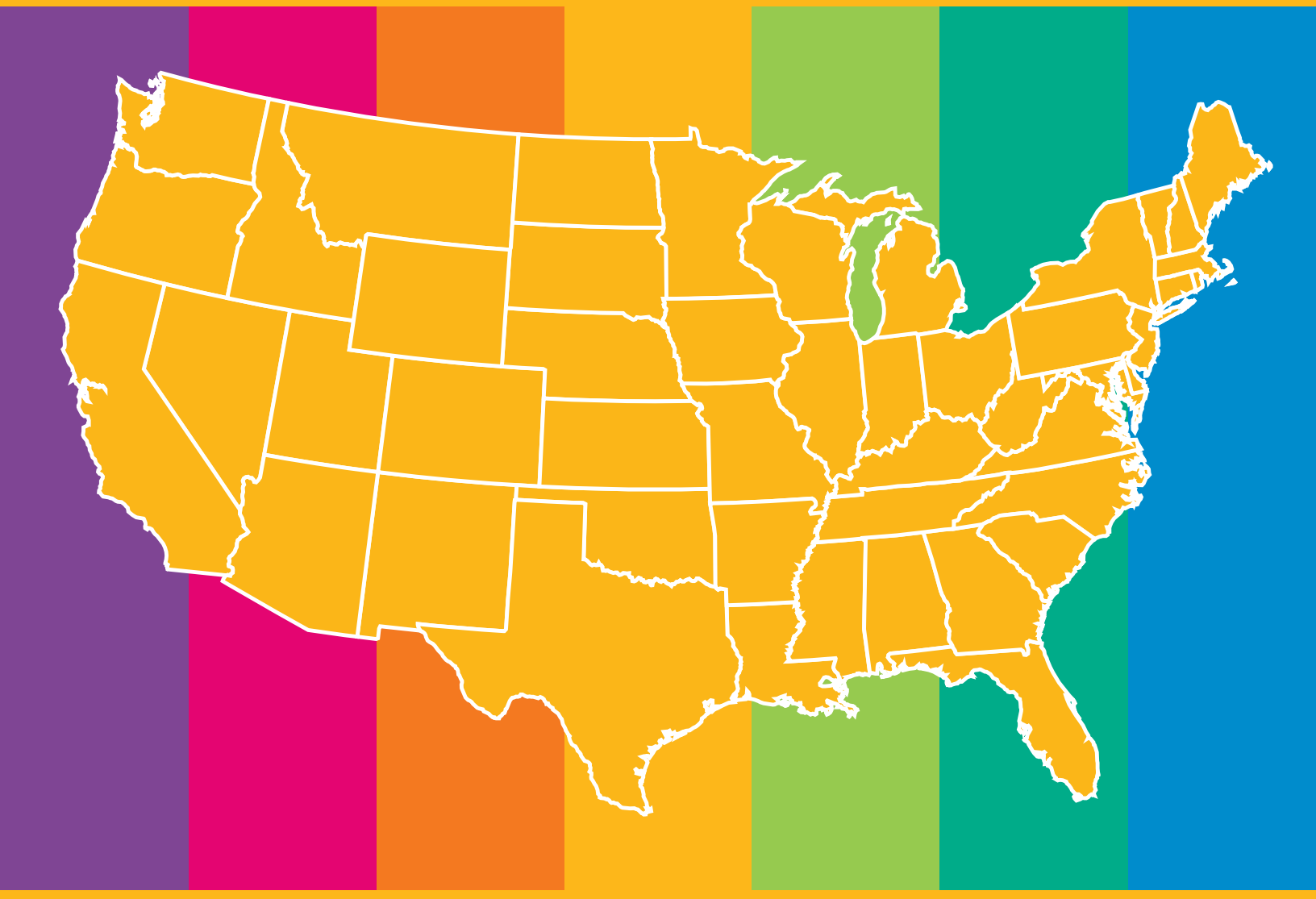
Early Child Care Settings *(continued)*

RECOMMENDATIONS

- Develop national physical activity and sedentary behavior guidelines for young children, birth to age 5.
- Create a national surveillance system that assesses physical activity and sedentary behavior information on children below the age of 6 years in order to track children's activity levels during their early years.
- ECE programs should adhere to physical activity best-practice recommendations, such as those provided by *Caring for Children*[132] or other authoritative groups.
- Surveillance systems should track ECE programs provisions (e.g., time, equipment, and space), provider practices and behaviors, and organizational policies related to physical activity to determine how these programs support a young child's physical activity.

How Is Your State Doing?

Overall Physical Activity | Sedentary Behaviors
Sports Participation | Fitness | School
Community and Built Environment



How Is Your State Doing? *(continued)*

INDICATOR	OVERALL PHYSICAL ACTIVITY Active on ≥ 5 days[9]	SEDENTARY BEHAVIORS Watched TV ≥ 3 h/d[9]	SEDENTARY BEHAVIORS Video Game/Computer Use ≥ 3 h/d[9]
U.S. (Total)	46.5	20.7	43
Alabama	—	—	—
Alaska	41.4	20.6	40.6
Arizona	46.3	19.4	38.9
Arkansas	35.1	23.2	36.5
California	51.7	18.4	45.6
Colorado	49.8	16.8	36.3
Connecticut	44.0	16.7	42.2
Delaware	43.5	23.6	44.6
Florida	39.3	23.3	45.3
Georgia	—	—	—
Hawaii	36.6	18.4	40.7
Idaho	50.4	16.6	36.6
Illinois	49.3	17.9	41.4
Indiana	—	—	—
Iowa	49.2	18.8	36.8
Kansas	52.6	14.5	34.4
Kentucky	40.6	20.9	41.2
Louisiana	35.3	28.7	38.0
Maine	42.2	23.5	41.8
Maryland	35.2	22.1	38.0
Massachusetts	45.7	—	47.9
Michigan	45.6	21.4	42.6
Minnesota	—	—	—
Mississippi	—	—	—
Missouri	46.2	21.1	42.3
Montana	53.4	18.0	34.6
Nebraska	51.7	19.2	38.3
Nevada	46.4	—	—
New Hampshire	47.2	—	47.8
New Jersey	—	—	—
New Mexico	51.2	21.1	36.8
New York	42.4	20.7	40.8
North Carolina	42.3	23.1	41.6
North Dakota	51.5	18.8	43.9
Ohio	—	—	—
Oklahoma	48.1	23.1	42.7
Oregon	—	—	—
Pennsylvania	42.4	20.8	46.1
Rhode Island	41.3	21.4	43.4
South Carolina	36.8	23.9	40.0
South Dakota	—	—	—
Tennessee	44.1	23.7	44.4
Texas	42.9	21.9	42.7
Utah	47.4	16.9	33.7
Vermont	49.1	—	—
Virginia	42.3	18.9	42.9
Washington	—	—	—
West Virginia	44.4	23.9	40.8
Wisconsin	48.7	16.7	40.3
Wyoming	—	—	—
District of Columbia	25.5	27.3	40.8
Territories (Total)			
American Samoa	—	—	—
Guam	33.1	20.3	42.5
Marshall Islands	—	—	—
Northern Mariana Islands	37.2	17.4	47.5
Palau	—	—	—
Puerto Rico	24.1	24.4	33.6

Note: Shown as percentages (%)

How Is Your State Doing? *(continued)*

INDICATOR	SPORTS PARTICIPATION Played on ≥ 1 sports team/y[9]	FITNESS Overweight or Obese[8]	SCHOOL Attended PE class 5 days/week[9]
U.S. (Total)	54.3	31.2	29.9
Alabama	—	35.5	—
Alaska	57.2	26.3	17.7
Arizona	51.6	26.9	36.5
Arkansas	54.1	33.9	23.9
California	60.4	31.2	34.6
Colorado	59.5	27.2	13.1
Connecticut	—	30.2	8.7
Delaware	53.3	30.9	—
Florida	46.8	36.6	21.9
Georgia	—	32.2	—
Hawaii	50.2	25.5	5.8
Idaho	55.7	26.0	21.4
Illinois	55.2	27.0	68.4
Indiana	—	33.9	—
Iowa	61.0	29.9	16.4
Kansas	58.3	30.9	24.6
Kentucky	48.3	33.5	19.2
Louisiana	48.8	34.0	32.0
Maine	—	28.2	6.5
Maryland	—	33.6	15.3
Massachusetts	—	26.6	16.6
Michigan	—	32.0	22.0
Minnesota	—	27.7	—
Mississippi	—	37.0	—
Missouri	—	29.4	28.6
Montana	61.3	23.2	34.7
Nebraska	62.8	29.2	27.7
Nevada	47.3	30.5	28.4
New Hampshire	61.5	23.8	—
New Jersey	—	31.7	—
New Mexico	—	24.9	25.7
New York	—	31.8	15.2
North Carolina	—	30.9	24.5
North Dakota	61.4	37.1	—
Ohio	—	33.1	—
Oklahoma	53.0	33.8	27.0
Oregon	—	20.3	—
Pennsylvania	58.0	31.7	19.6
Rhode Island	—	36.3	16.6
South Carolina	48.5	32.9	19.3
South Dakota	—	31.4	—
Tennessee	49.2	37.7	26.2
Texas	48.4	33.3	31.2
Utah	58.7	19.2	18.0
Vermont	—	22.2	—
Virginia	—	27.2	12.9
Washington	—	25.5	—
West Virginia	50.5	35.1	26.9
Wisconsin	—	29.5	36.9
Wyoming	—	27.1	—
District of Columbia	52.4	33.8	—
Territories (Total)	—	—	—
American Samoa	—	—	—
Guam	41	—	8.0
Marshall Islands	—	—	—
Northern Mariana Islands	41.3	—	28.5
Palau	—	—	—
Puerto Rico	44.2	—	0.2

Note: Shown as percentages (%)

How Is Your State Doing? *(continued)*

INDICATOR	SCHOOL Comprehensive School Physical Activity Plan[19]	COMMUNITY & BUILT ENVIRONMENT Sidewalks/Walking Paths[8]	COMMUNITY & BUILT ENVIRONMENT Park or Playground[8]
U.S. (Total)	3.0	74.9	76.5
Alabama	2.1	48.3	53.1
Alaska	5.9	68.8	73.0
Arizona	2.3	86.2	81.9
Arkansas	5.1	52.3	55.1
California	3.8	89.9	87.5
Colorado	—	89.5	87.9
Connecticut	1.2	68.8	76.2
Delaware	4.5	71.6	72.1
Florida	3.7	80.1	73.4
Georgia	1.1	57.7	68.0
Hawaii	2.0	80.1	87.2
Idaho	2.2	74.0	72.8
Illinois	2.4	87.9	89.2
Indiana	2.3	69.3	64.5
Iowa	—	77.8	77.1
Kansas	0.8	73.0	77.3
Kentucky	2.1	61.2	58.8
Louisiana	2.5	56.5	59.0
Maine	3.9	58.9	70.2
Maryland	4.3	80.8	82.7
Massachusetts	4.9	84.4	82.1
Michigan	3.2	72.5	76.6
Minnesota	3.0	76.4	84.9
Mississippi	3.0	42.0	46.4
Missouri	3.1	68.2	71.2
Montana	1.1	69.6	73.3
Nebraska	2.7	86.8	84.5
Nevada	0.7	88.2	80.1
New Hampshire	13.9	58.7	69.2
New Jersey	3.9	83.3	88.9
New Mexico	2.3	75.3	70.9
New York	4.7	81.8	88.6
North Carolina	2.6	55.2	56.7
North Dakota	4.3	80.9	81.8
Ohio	1.9	70.4	73.3
Oklahoma	1.7	47.9	64.4
Oregon	3.2	82.1	81.8
Pennsylvania	2.4	72.7	81.8
Rhode Island	5.0	74.3	83.9
South Carolina	4.5	52.2	56.3
South Dakota	1.1	79.1	79.8
Tennessee	6.9	47.8	58.1
Texas	6.2	78.0	74.2
Utah	2.4	92.0	89.7
Vermont	11.1	65.3	73.0
Virginia	0.8	65.5	69.8
Washington	3.4	80.0	80.5
West Virginia	4.7	52.1	56.7
Wisconsin	5.1	70.3	78.9
Wyoming	1.8	79.6	77.5
District of Columbia	12.7	98.7	91.3
Territories (Total)	9.5	—	
American Samoa	—	—	—
Guam	7.1	—	—
Marshall Islands	—	—	—
Northern Mariana Islands	22.2	—	—
Palau	9.1	—	—
Puerto Rico	9.8	—	—

Note: Shown as percentages (%)

2018 Report Card Development and 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:

Child Development Supplement to the Panel Study of Income Dynamics[48]

The Panel Study of Income Dynamics is a longitudinal survey that has been collecting nationally representative data on men, women, children, and their families in the U.S. since 1968. Data were collected yearly until 1997 when data collection was changed to every 2 years. As of 2017, data have been collected from more than 77,000 individuals and 11,000 families that are followed over time. The Child Development Supplement was first conducted in 1997 in order to collect information on U.S. children ages 0-12 years and their families in order to study early life development and social processes. It followed a cohort of children for 10 years with data collected at 3 time points. A more recent version of the Child Development Supplement cohort began in 2014 with similar goals for children who were 0-17 years of age at the time the cohort was formed in 2013. The data included in this report are published in *Changes in American Children's Time – 1997 to 2003* by Hofferth, et al.[48] For more information on the Panel Study of Income Dynamics, please visit: https://psidonline.isr.umich.edu/

High School Athletics Participation Survey[46]

The High School Athletic Participation Survey is a national survey administered annually since 1971 by the National Federation of State High School Associations (NFHS). The High School Athletic Participation Survey 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 2016-17 High School Athletic Participation Survey 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 NFHS website in a document entitled, *2016-17 High School Athletics Participation Survey*. More information on the High School Athletics Participation Survey can be accessed online at: http://www.nfhs.org/ParticipationStatistics/ParticipationStatistics/

National Household Travel Survey (NHTS)[33]

The NHTS is the only nationally representative survey that collects detailed 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 Surveys, since 1969. The most recent NHTS was conducted during 2016-17 and collected data from 129,969 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* by McDonald, et al.[33] For more information on the NHTS, please visit: http://nhts.ornl.gov/introduction.shtml

The National Study of Neighborhood Parks[97]

The National Study of Neighborhood Parks, conducted during 2014-2016, was the first comprehensive assessment of a nationally-representative sample of U.S. parks. It included a sample of 175 neighborhood parks in 25 major cities across the U.S. Data were collected using a variety of methods, including systematic direct observation within the parks to observe park use, park-based physical activity, and park conditions and interviews with park administrators to assess park policies and practices. The data included in this report are published in *The First National Study of Neighborhood Parks: Implications for Physical Activity* by Cohen, et al.[97] For more information, please visit: https://www.cityparksalliance.org/why-urban-parks-matter/national-study-of-neighborhood-parks

National Health and Nutrition Examination Survey (NHANES)[28]

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. The most recent data available from NHANES are from the 2015-16 cycle. More information on NHANES can be found at: https://www.cdc.gov/nchs/nhanes/about_nhanes.htm

NHANES National Youth Fitness Survey (NNYFS)[55]

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. 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. For more information visit the NNYFS website: http://www.cdc.gov/nchs/nnyfs/about_nnyfs.htm

2018 Report Card Development and Data Sources *(continued)*

National Survey of Children's Health (NSCH)[8]

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 2016. 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://childhealthdata.org/learn/NSCH

School Health Policies and Practices Study (SHPPS)[16,17]

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 2016 at the school district-level using online questionnaires to obtain a nationally representative sample. In 2014, SHPPS was administered at the school and classroom levels. The data included in this report are published in the *Results from the School Health Policies and Practices Study 2016* (access at: https://www.cdc.gov/healthyyouth/data/shpps/pdf/shpps-results_2016.pdf) and the *Results from the School Health Policies and Practices Study 2014* (access at: http://www.cdc.gov/healthyyouth/data/shpps/pdf/shpps-508-final_101315.pdf)

School Health Profiles[19]

School Health Profiles evaluates school health guidelines by surveying principals and health education teachers from middle and high schools across the U.S. The surveys are conducted every other year with support from the CDC's Division of Adolescent and School Health, with the most recent data available being from 2016. Among other policies, School Health Profiles monitors school health and PE, physical activity, and family and community involvement. Survey results are weighted to represent the state, district or territory from which they were sampled when at least 70% of those sampled completed the survey; unweighted data are only representative of the school-level. Information about School Health Profiles, including results, data, and participation by state can be found at: http://www.cdc.gov/healthyyouth/data/profiles/index.htm

State of Play Report[44]

The Aspen Institute released the first State of Play Report in 2016 and the 2nd report in 2017 to begin tracking trends over time. The report includes nationally representative data on youth sports participation from the Sports & Fitness Industry Association's annual household survey and detailed information on key developments related to youth sports. It also provides grades on how well adult stakeholders are providing access to and opportunity for youth sports participation in 8 key areas: ask kids what they want, reintroduce free play, encourage sport sampling, revitalize in-town leagues, think small, design for development, train all coaches, and emphasize prevention. Data included in this report are from the *State of Play 2017: Trends and Developments*[44] report. For more information and to read the full report, please visit: https://www.aspeninstitute.org/publications/state-of-play-2017-trends-and-developments/

2018 Report Card Development and Data Sources *(continued)*

Youth Risk Behavior Surveillance System (YRBSS)[9]

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 high school students. The sampling frame for the 2017 YRBSS consisted of all public and private schools with students in at least one of grades 9-12 in participating U.S. states and the 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://www.cdc.gov/healthyyouth/data/yrbs/index.htm

Methods of Data Analysis

For the 2018 Report Card, original data analyses were performed on data collected by both the NHANES and NSCH using SAS (version 9.4; SAS Institute Inc., Cary, NC). NHANES data were analyzed to inform the grades for Sedentary Behaviors and Active Transportation. NSCH data were analyzed to provide information on children with disabilities within the indicator sections. Participants were excluded on an individual basis if they were missing data for variables used in each distinct analysis. Cases with non-positive sample weights were also excluded. Categories of BMI were established using age- and gender-specific percentiles calculated using the CDC growth charts.

SAS survey procedures were utilized to account for the stratification, clustering and unequal weighting that is a product of the complex, multistage probability designs of NHANES and NSCH.

Abbreviations and Definitions

ABBREVIATION	DEFINITION
ADA	Americans with Disabilities Act
BMI	Body Mass Index
CDC	Centers for Disease Control and Prevention
the Committee	Report Card Research Advisory Committee
CSHCN	Children with Special Health Care Needs
CSPAP	Comprehensive School Physical Activity Program
ECE	Early Care and Education
FPL	Federal Poverty Level
GAPPA	Global Action Plan on Physical Activity
HKHC	Healthy Kids, Healthy Communities
IDEA	Individuals with Disabilities Education Act
INC	Incomplete
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
PE	Physical Education
SHPPS	School Health Policies and Practices Study
U.S.	United States
YRBSS	Youth Risk Behavior Surveillance System

References

1. Dentro KN, Beals K, Crouter SE, et al. Results from the United States' 2014 Report Card on Physical Activity for Children and Youth. *J Phys Act Health*. 2014;11 Suppl 1:S105-112.
2. Katzmarzyk PT, Denstel KD, Beals K, et al. Results From the United States of America's 2016 Report Card on Physical Activity for Children and Youth. *J Phys Act Health.* 2016;13(11 Suppl 2):S307-s313.
3. Tremblay MS, Gray CE, Akinroye K, et al. Physical activity of children: A global matrix of grades comparing 15 countries. *J Phys Act Health.* 2014;11 Suppl 1:S113-125.
4. Tremblay MS, Barnes JD, Gonzalez SA, et al. Global Matrix 2.0: Report Card Grades on the Physical Activity of Children and Youth Comparing 38 Countries. *J Phys Act Health.* 2016;13(11 Suppl 2):S343-s366.
5. U.S. Department of Health and Human Services. *2008 Physical Activity Guidelines for Americans.* 2008.
6. U.S. Department of Health and Human Services. Physical Activity Guidelines for Children and Adolescents. 2018; https://health.gov/paguidelines/guidelines/children.aspx. Accessed 5/17, 2018.
7. U.S. Department of Health and Human Services. Physical Activity Guidelines Chapter 3: Active Children and Adolescents. 2018; https://health.gov/paguidelines/guidelines/chapter3.aspx. Accessed 5/17, 2018.
8. The Child & Adolescent Health Measurement Initiative (CAHMI). *2016 National Survey of Childrens Health.* Data Resource Center for Child and Adolescent Health;2016.
9. Centers for Disease Control and Prevention. *2017 High School Youth Risk Behavior Surveillance System.* Atlanta, GA: U.S. Department of Health & Human Services;2017.
10. Belcher BR, Berrigan D, Dodd KW, Emken BA, Chou CP, Spruijt-Metz D. Physical activity in US youth: effect of race/ethnicity, age, gender, and weight status. *Med Sci Spots Exerc.* 2010;42(12):2211-2221.
11. Wilson PB, Haegele JA, Zhu X. Mobility status as a predictor of obesity, physical activity, and screen time use among children aged 5-11 years in the United States. *J Pediatr.* 2016;176:23-29.e21.
12. Kneeshaw-Price SH, Saelens BE, Sallis JF, et al. Neighborhood crime-related safety and its relation to children's physical activity. *J Urban Health.* 2015;92(3):472-489.
13. Broyles ST, Myers CA, Drazba KT, Marker AM, Church TS, Newton RL. The influence of neighborhood crime on increases in physical activity during a pilot physical activity intervention in children. *J Urban Health.* 2016;93(2):271-278.
14. Babey SH, Hastert TA, Yu H, Brown ER. Physical activity among adolescents. When do parks matter? *Am J Prev Med.* 2008;34(4):345-348.
15. Hughey SM, Walsemann KM, Child S, Powers A, Reed JA, Kaczynski AT. Using an environmental justice approach to examine the relationships between park availability and quality indicators, neighborhood disadvantage, and racial/ethnic composition. *Landsc Urban Plan.* 2016;148:159-169.
16. Centers for Disease Control and Prevention. *Results from the School Health Policies and Practices Study 2014.* Atlanta, GA: U.S. Department of Health and Human Services;2015.
17. Centers for Disease Control and Prevention. *Results from the School Health Policies and Practices Study 2016.* Atlanta, GA: U.S. Department of Health and Human Services;2017.
18. Hollis JL, Williams AJ, Sutherland R, et al. A systematic review and meta-analysis of moderate-to-vigorous physical activity levels in elementary school physical education lessons. *Prev Med.* 2016;86:34-54.
19. Brener ND, Demissie Z, McManus T, Shanklin SL, Queen B, Kann L. *School Health Profiles 2016: Characteristics of Health Programs Among Secondary Schools.* Atlanta, GA: Centers for Disease Control and Prevention;2017.
20. National Center for Health Statistics. National Health and Nutrition Examination Survey. Hyattsville, MD: U.S. Department of Health and Human Services, CDC, National Center for Health Statistics; 2005-06.
21. Centers for Disease Control and Prevention. *2015 High School Youth Risk Behavior Surveillance System.* Atlanta, GA: U.S. Department of Health & Human Services;2015.
22. Raitakari OT, Porkka KV, Taimela S, Telama R, Rasanen 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(3):195-205.
23. Andersen LB, Harro M, Sardinha LB, et al. Physical activity and clustered cardiovascular risk in children: a cross-sectional study (The European Youth Heart Study). *Lancet.* 2006;368(9532):299-304.
24. 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(1):181-188.
25. Haegele JA, Aigner CJ, Healy S. Physical activity, body mass index, and health status among youth with severe visual impairments aged 13-17 years in the United States. *Disabil Health J.* 2018.
26. Segal M, Eliasziw M, Phillips S, et al. Intellectual disability is associated with increased risk for obesity in a nationally representative sample of U.S. children. *Disabil Health J.* 2016;9(3):392-398.
27. McPherson M, Arango P, Fox H, et al. A new definition of children with special health care needs. *Pediatrics.* 1998;102(1):137-139.
28. National Center for Health Statistics. National Health and Nutrition Examination Survey. Hyattsville, MD: U.S. Department of Health and Human Services, CDC, National Center for Health Statistics; 2015-16.
29. Tremblay MS, Chaput JP, Adamo KB, et al. Canadian 24-Hour Movement Guidelines for the Early Years (0-4 years): An Integration of Physical Activity, Sedentary Behaviour, and Sleep. *BMC Public Health.* 2017;17(Suppl 5):874.
30. Australian Government Department of Health. Australia's Physical Activity and Sedentary Behaviour Guidelines. 2014; http://www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-strateg-phys-act-guidelines#apa1317. Accessed 8/1, 2018.
31. Tremblay MS, Aubert S, Barnes JD, et al. Sedentary Behavior Research Network (SBRN) – Terminology Consensus Project process and outcome. *Int J Behav Nutr Phys Act.* 2017;14(1):75.
32. Rideout VJ, Foehr UG, Roberts DF. *Generation M2: Media in the Lives of 8- to 18-Year Olds.* Menlo Park, CA: Kenry J. Kaiser Family Foundation;2010.
33. McDonald NC, Brown AL, Marchetti LM, Pedroso MS. U.S. school travel, 2009 an assessment of trends. *Am J Prev Med.* 2011;41(2):146-151.
34. Denstel KD, Broyles ST, Larouche R, et al. Active school transport and weekday physical activity in 9–11-year-old children from 12 countries. *Int J Obes Suppl.* 2015;5(Suppl 2):S100-S106.
35. Martin A, Kelly P, Boyle J, Corlett F, Reilly JJ. Contribution of walking to school to individual and population moderate-vigorous intensity physical activity: Systematic review and meta-analysis. *Pediatr Exerc Sci.* 2016;28(3):353-363.
36. Safe Routes to School National Partnership. School Siting: Location Affects the Potential to Walk or Bike. *State Policies: Best Practices* 2015; https://www.saferoutespartnership.org/state/bestpractices/schoolsiting. Accessed 07/30, 2018.
37. Lieberman M, Pedroso M, Zimmerman S, Safe Routes to School National Partnership. *Making Strides: 2016 State Report Cards on Support for Walking, Bicycling, and Active Kids, and Communities.* Safe Routes to School National Partnership;2016.

References *(continued)*

38. Timperio A, Ball K, Salmon J, et al. Personal, family, social, and environmental correlates of active commuting to school. *Am J Prev Med.* 2006;30(1):45-51.

39. DiGuiseppi C, Roberts I, Li L, Allen D. Determinants of car travel on daily journeys to school: cross sectional survey of primary school children. *BMJ.* 1998;316(7142):1426-1428.

40. Janssen I. Hyper-parenting is negatively associated with physical activity among 7–12year olds. *Prev Med.* 2015;73:55-59.

41. Mertens L, Ghekiere A. 7 - Individual Correlates of Active Transportation. In: Larouche R, ed. *Children's Active Transportation*: Elsevier; 2018:105-114.

42. National Physical Activity Plan Alliance. *National Physical Activity Plan.* 2016.

43. White House Task Force on Childhood Obesity. *Solving the Problem of Childhood Obesity within a Generation.* Washington, DC: Executive Office of the President of the United States;2010.

44. The Aspen Institute: Project Play. *State of Play 2017: Trends and Developments.* Washington, D.C. 2017.

45. Mandic S, Bengoechea EG, Stevens E, Leon de la Barra S, Skidmore P. Getting kids active by participating in sport and doing It more often: focusing on what matters. *Int J Behav Nutr Phys Act.* 2012;9(1):86.

46. The National Federation of State High School Associations. 2016-17 High School Athletics Participation Survey. 2017; http://www.nfhs.org/ParticipationStatistics/PDF/2016-17_Participation_Survey_Results.pdf

47. U.S. Department of Health and Human Services. *The Surgeon General's Vision for a Healthy and Fit Nation.* Rockville, MD: U.S. Department of Health and Human Services, Office of the Surgeon General;2010.

48. Hofferth SL. Changes in American children's time – 1997 to 2003. *Electron Int J Time Use Res.* 2009;6(1):26-47.

49. Ginsburg KR. The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics.* 2007;119(1):182-191.

50. Gray C, Gibbons R, Larouche R, et al. What is the relationship between outdoor time and physical activity, sedentary behaviour, and physical fitness in children? A systematic review. *Int J Environ Res Public Health.* 2015;12(6):6455-6474.

51. Veitch J, Bagley S, Ball K, Salmon J. Where do children usually play? A qualitative study of parents' perceptions of influences on children's active free-play. *Health Place.* 2006;12(4):383-393.

52. Brockman R, Jago R, Fox KR. Children's active play: self-reported motivators, barriers and facilitators. *BMC Public Health.* 2011;11:461-461.

53. Ridgers ND, Stratton G, Fairclough SJ. Assessing physical activity during recess using accelerometry. *Prev Med.* 2005;41(1):102-107.

54. Gallup. *The State of Play.* Princeton, NJ: Robert Wood Johnson Foundation;2010.

55. National Center for Health Statistics. *NHANES National Youth Fitness Survey.* Hyattsville, MD: U.S. Department of Health and Human Services, CDC, National Center for Health Statistics;2012.

56. National Center for Health Statistics. National Health and Nutrition Examination Survey. Hyattsville, MD: U.S. Department of Health and Human Services, CDC, National Center for Health Statistics; 2011-12.

57. Perna FM, Coa K, Troiano RP, et al. Muscular grip strength estimates of the U.S. population from the National Health and Nutrition Examination Survey 2011-2012. *J Strength Cond Res.* 2016;30(3):867-874.

58. 2018 Physical Activity Guidelines Advisory Commitee. *2018 Physical Activity Guidelines Advisory Committee Scientific Report.* Washington, DC: U.S. Department of Health and Human Services;2018.

59. National Center for Health Statistics. National Health and Nutrition Examination Survey. Hyattsville, MD: U.S. Department of Health and Human Services, CDC, National Center for Health Statistics.

60. Gahche J, Fakhouri T, Carroll DD, Burt VL, Wang CY, Fulton JE. Cardiorespiratory fitness levels among U.S. youth aged 12-15 years: United States, 1999-2004 and 2012. *NCHS Data Brief.* 2014(153):1-8.

61. Tomkinson GR, Olds TS. Secular changes in pediatric aerobic fitness test performance: the global picture. *Med Sport Sci.* 2007;50:46-66.

62. Skinner AC, Ravanbakht SN, Skelton JA, Perrin EM, Armstrong SC. Prevalence of obesity and severe obesity in US Children, 1999–2016. *Pediatrics.* 2018.

63. Aviva M, Misha E, M. PS, et al. The Effect of Age on the Prevalence of obesity among US youth with Autism Spectrum Disorder. *Child Obes.* 2017;13(1):25-35.

64. Pitetti K, Baynard T, Agiovlasitis S. Children and adolescents with Down syndrome, physical fitness and physical activity. *J Sport Health Sci.* 2013;2(1):47-57.

65. Tyler K, MacDonald M, Menear K. Physical activity and physical fitness of school-aged children and youth with Autism Spectrum Disorders. *Autism Res Treat.* 2014;2014:6.

66. García CC, Alcocer-Gamboa A, Ruiz MP, et al. Metabolic, cardiorespiratory, and neuromuscular fitness performance in children with cerebral palsy: A comparison with healthy youth. *J Exerc Rehabil.* 2016;12(2):124-131.

67. Hartman E, Smith J, Westendorp M, Visscher C. Development of physical fitness in children with intellectual disabilities. *J Intellect Disabil Res.* 2015;59(5):439-449.

68. Yao CA, Rhodes RE. Parental correlates in child and adolescent physical activity: a meta-analysis. *Int J Behav Nutr Phys Act.* 2015;12:10.

69. Mendonca G, Cheng LA, Melo EN, de Farias Junior JC. Physical activity and social support in adolescents: a systematic review. Health Educ Res. 2014;29(5):822-839.

70. McGarty AM, Melville CA. Parental perceptions of facilitators and barriers to physical activity for children with intellectual disabilities: A mixed methods systematic review. *Res Dev Disabil.* 2018;73:40-57.

71. Shields N, Synnot AJ, Barr M. Perceived barriers and facilitators to physical activity for children with disability: a systematic review. *Br J Sports Med.* 2012;46(14):989-997.

72. Sleddens EF, Gerards SM, Thijs C, de Vries NK, Kremers SP. General parenting, childhood overweight and obesity-inducing behaviors: A review. *Int J Pediatr Obes.* 2011;6(2-2):e12-27.

73. Hennessy E, Hughes SO, Goldberg JP, Hyatt RR, Economos CD. Parent-child interactions and objectively measured child physical activity: a cross-sectional study. *Int J Behav Nutr Phys Act.* 2010;7:71.

74. Jago R, Davison KK, Brockman R, Page AS, Thompson JL, Fox KR. Parenting styles, parenting practices, and physical activity in 10- to 11-year olds. *Prev Med.* 2011;52(1):44-47.

75. Saunders J, Hume C, Timperio A, Salmon J. Cross-sectional and longitudinal associations between parenting style and adolescent girls' physical activity. *Int J Behav Nutr Phys Act.* 2012;9:141.

76. Carver A, Timperio A, Hesketh K, Crawford D. Are children and adolescents less active if parents restrict their physical activity and active transport due to perceived risk? *Soc Sci Med.* 2010;70(11):1799-1805.

77. Fitzgerald A, Fitzgerald N, Aherne C. Do peers matter? A review of peer and/or friends' influence on physical activity among American adolescents. *J Adolesc.* 2012;35(4):941-958.

78. Macdonald-Wallis K, Jago R, Sterne JA. Social network analysis of childhood and youth physical activity: a systematic review. *Am J Prev Med.* 2012;43(6):636-642.

79. Loucaides CA, Tsangaridou N. Associations between parental and friend social support and children's physical activity and time spent outside playing. *Int J Pediatr.* 2017;2017:11.

References *(continued)*

80. Hamilton K, Warner LM, Schwarzer R. The role of self-efficacy and friend support on adolescent vigorous physical activity. *Health Educ Behav.* 2016;44(1):175-181.

81. Committee on Physical Activity and Physical Education in the School Environment; Food and Nutrition Board; Institute of Medicine. *Educating the Student Body: Taking Physical Activity and Physical Education to School.* Washington, D.C.: National Academies Press; 2013.

82. Centers for Disease Control and Prevention. *Comprehensive School Physical Activity Programs: A Guide for Schools.* Atlanta, GA: U.S. Department of Health and Human Services;2013.

83. Rasberry CN, Slade S, Lohrmann DK, Valois RF. Lessons learned from the whole child and coordinated school health approaches. *J Sch Health.* 2015;85(11):759-765.

84. Centers for Disease Control and Prevention. *National Framework for Physical Activity and Physical Education.* Atlanta, GA: U.S. Department of Health and Human Services;2014.

85. Erwin H, Beighle A, Carson RL, Castelli DM. Comprehensive school-based physical activity promotion: A review. *Quest.* 2013;65(4):412-428.

86. National Cancer Institute. *Classification of Laws Associated with School Students (C.L.A.S.S.).* Rockville, MD: U.S. National Institute of Health, U.S. Department of Health and Human Services.

87. Kahan D, McKenzie TL. Energy expenditure estimates during school physical education: Potential vs. reality? *Prev Med.* 2017;95:82-88.

88. Council for American Private Education (CAPE). Facts and Studies. http://www.capenet.org/facts.html. Accessed May 8, 2018.

89. National Alliance for Public Charter Schools. Charter Schools: Reimagining Education. https://www.publiccharters.org/. Accessed May 17, 2018.

90. U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD). *Public Elementary/Secondary School Universe Survey: 1999-2000 through 2014-15.* Washington, D.C.: U.S. Department of Education;2016.

91. Johnston LD, O'Malley PM, Terry-McElrath YM, Colabianchi N. *School Policies and Practices to Improve Health and Prevent Obesity: National Secondary School Survey Results: School Years 2006-07 through 2009-10.* Ann Arbor, MI: Bridging the Gap Program, Survey Research Center, Institute for Social Research;2014.

92. Eyler AA, Piekarz-Porter E, Serrano NH. Pay to play? State laws related to high school sports participation fees. *J Public Health Manag Pract.* 2018.

93. Kahan D, McKenzie TL. Physical education policies and practices in California private secondary schools. *J Phys Act Health.* 2017;14(2):130-137.

94. Kahan D, McKenzie TL. Extracurricular physical activity programs in California private secondary schools. *Res Q Exerc Sport.* 2017;88(4):524-529.

95. SHAPE America. *The Essential Components of Physical Education.* Reston, VA: SHAPE America;2015.

96. National Physical Activity Plan Alliance. *The 2017 United States Report Card on Walking and Walkable Communities.* Washington, DC: National Physical Activity Plan Alliance;2017.

97. Cohen DA, Han B, Nagel C, et al. The first national study of neighborhood parks: Implications for physical activity. *Am J Prev Med.* 2016;51(4):419-426.

98. U.S. Department of Health and Human Services. *Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities.* Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General;2015.

99. Ding D, Sallis JF, Kerr J, Lee S, Rosenberg DE. Neighborhood environment and physical activity among youth. *Am J Prev Med.* 2011;41(4):442-455.

100. U.S. Environmental Protection Agency, Office of Sustainable Communities. Walkability Index. https://developer.epa.gov/walkability-index/. Accessed: May 20,2018.

101. Sallis JF, Cain KL, Conway TL, et al. Is your neighborhood designed to support physical activity? A brief streetscape audit tool. *Prev Chronic Dis.* 2015;12:E141.

102. McCormack GR, Rock M, Toohey AM, Hignell D. Characteristics of urban parks associated with park use and physical activity: A review of qualitative research. *Health Place.* 2010;16(4):712-726.

103. Kaestner R, Xin X. Title IX, girls' sports participation, and adult female physical activity and weight. *Eval Rev.* 2010;34(1):52-78.

104. Kaestner R, Xin X. Effects of Title IX and sports participation on girls' physical activity and weight. *Adv Health Econ Health Serv Res.* 2006;17:79-114.

105. Eyler AA, Budd E, Camberos GJ, Yan Y, Brownson RC. State legislation related to increasing physical activity: 2006-2012. *J Phys Act Health* 2016;13(2):207-213.

106. Brennan LK, Kemner AL, Donaldson K, Brownson RC. Evaluating the implementation and impact of policy, practice, and environmental changes to prevent childhood obesity in 49 diverse communities. *J Public Health Manag Pract*. 2015;21 Suppl 3:S121-134.

107. National Physical Activity Plan Alliance. Promoting Walking and Walkable Communities - Cross-Sector Recommendations from the National Physical Activity Plan Alliance. Columbia, SC: 2018.

108. World Health Organization. *Global action plan on physical activity 2018-2030: More active people for a healthier world.* Geneva: World Health Organization;2018.

109. Pew Research Center. U.S. Public Becoming Less Religious. *2014 Religious Landscape Study* 2015; http://www.pewforum.org/2015/11/03/u-s-public-becoming-less-religious/. Accessed June 19, 2018.

110. Pew Research Center. Attendance at Religious Services. *2014 Religious Landscape Study* 2015; http://www.pewforum.org/religious-landscape-study/attendance-at-religious-services/. Accessed June 19, 2018.

111. Pfeiffer K, Colabianchi N, Dowda M, Porter D, Hibbert J, Pate RR. Examining the role of churches in adolescent girls' physical activity. *J Phys Act Health.* 2011;8(2):227-233.

112. Lancaster KJ, Carter-Edwards L, Grilo S, Shen C, Schoenthaler AM. Obesity interventions in African American faith-based organizations: a systematic review. *Obes Rev.* 2014;15 Suppl 4:159-176.

113. Maynard MJ. Faith-based institutions as venues for obesity prevention. *Curr Obes Rep.* 2017;6(2):148-154.

114. Bopp M, Peterson JA, Webb BL. A comprehensive review of faith-based physical activity interventions. *Am J Lifestyle Med.* 2012;6(6):460-478.

115. Trost SG, Tang R, Loprinzi PD. Feasibility and efficacy of a church-based intervention to promote physical activity in children. *J Phys Act Health.* 2009;6(6):741-749.

116. Thompson WM, Berry D, Hu J. A Church-based intervention to change attitudes about physical activity among Black adolescent girls: A feasibility study. *Public Health Nurs.* 2013;30(3):221-230.

117. Arredondo EM, Morello M, Holub C, Haughton J. Feasibility and preliminary findings of a church-based mother-daughter pilot study promoting physical activity among young Latinas. *Fam Community Health.* 2014;37(1):6-18.

118. Worobey J. Physical activity in infancy: developmental aspects, measurement, and importance. *Am J Clin Nutr.* 2014;99(3):729s-733s.

119. Timmons BW, Leblanc AG, Carson V, et al. Systematic review of physical activity and health in the early years (aged 0-4 years). *Appl Physiol Nutr Metab.* 2012;37(4):773-792.

120. Hinkley T, Teychenne M, Downing KL, Ball K, Salmon J, Hesketh KD. Early childhood physical activity, sedentary behaviors and psychosocial well-being: a systematic review. *Prev Med.* 2014;62:182-192.

121. Carson V, Hunter S, Kuzik N, et al. Systematic review of physical activity and cognitive development in early childhood. *J Sci Med Sport.* 2016;19(7):573-578.

References *(continued)*

122. Carson V, Lee EY, Hewitt L, et al. Systematic review of the relationships between physical activity and health indicators in the early years (0-4 years). *BMC Public Health.* 2017;17(Suppl 5):854.

123. Tandon PS, Tovar A, Jayasuriya AT, et al. The relationship between physical activity and diet and young children's cognitive development: A systematic review. *Prev Med Rep.* 2016;3:379-390.

124. Jones RA, Hinkley T, Okely AD, Salmon J. Tracking physical activity and sedentary behavior in childhood: a systematic review. *Am J Prev Med.* 2013;44(6):651-658.

125. American Academy of Pediatrics. Media and Young Minds. *Pediatrics.* 2016;138(5).

126. Okely AD, Ghersi D, Hesketh KD, et al. A collaborative approach to adopting/adapting guidelines - The Australian 24-Hour Movement Guidelines for the Early Years (Birth to 5 years): An integration of physical activity, sedentary behavior, and sleep. *BMC Public Health.* 2017;17(Suppl 5):869.

127. Hnatiuk JA, Salmon J, Hinkley T, Okely AD, Trost S. A review of preschool children's physical activity and sedentary time using objective measures. *Am J Prev Med.* 2014;47(4):487-497.

128. Laughlin L. Who's minding the kids? Child care arrangements: Spring 2011. *Current Population Reports.* 2013:70-135.

129. Story M, Kaphingst KM, French S. The role of child care settings in obesity prevention. *Future Child.* 2006;16(1):143-168.

130. Larson N, Ward DS, Neelon SB, Story M. What role can child-care settings play in obesity prevention? A review of the evidence and call for research efforts. *J Am Diet Assoc.* 2011;111(9):1343-1362.

131. Institute of Medicine. *Early Childhood Obesity Prevention Policies.* Washington, DC: The National Academies Press; 2011.

132. American Academy of Pediatrics, American Public Health Association, National Resource Center for Health and Safety in Child Care and Early Eduation. *Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs.* 3rd ed: Elk Grove Village, IL: American Academy of Pediatrics, Washington, DC: American Public Health Association, Aurora, CO: National Resource Center for Health, Safety in Child Care and Early Education; 2011.

133. Sallis JF, Prochaska JJ, Taylor WC. A review of correlates of physical activity of children and adolescents. *Med Sci Sports Exerc.* 2000;32(5):963-975.

134. Bower JK, Hales DP, Tate DF, Rubin DA, Benjamin SE, Ward DS. The childcare environment and children's physical activity. *Am J Prev Med.* 2008;34(1):23-29.

135. Brown WH, Pfeiffer KA, McIver KL, Dowda M, Addy CL, Pate RR. Social and environmental factors associated with preschoolers' nonsedentary physical activity. *Child Dev.* 2009;80(1):45-58.

136. Dowda M, Brown WH, McIver KL, et al. Policies and characteristics of the preschool environment and physical activity of young children. *Pediatrics.* 2009;123(2):e261-266.

137. Ward DS. Physical activity in young children: the role of child care. *Med Sci Sports Exerc.* 2010;42(3):499-501.

138. Gubbels JS, Kremers SP, van Kann DH, et al. Interaction between physical environment, social environment, and child characteristics in determining physical activity at child care. *Health Psychol.* 2011;30(1):84-90.

139. Henderson KE, Grode GM, O'Connell ML, Schwartz MB. Environmental factors associated with physical activity in childcare centers. *Int J Behav Nutr Phys Act.* 2015;12(1):43.

140. Hinkley T, Crawford D, Salmon J, Okely AD, Hesketh K. Preschool children and physical activity: a review of correlates. *Am J Prev Med.* 2008;34(5):435-441.

141. Ward DS, Welker E, Choate A, et al. Strength of obesity prevention interventions in early care and education settings: A systematic review. *Prev Med.* 2017;95 Suppl:S37-s52.

142. Sisson SB, Krampe M, Anundson K, Castle S. Obesity prevention and obesogenic behavior interventions in child care: A systematic review. *Prev Med.* 2016;87:57-69.

143. Zhou YE, Emerson JS, Levine RS, Kihlberg CJ, Hull PC. Childhood obesity prevention interventions in childcare settings: systematic review of randomized and nonrandomized controlled trials. *Am J Health Promot.* 2014;28(4):e92-103.

144. Matwiejczyk L, Mehta K, Scott J, Tonkin E, Coveney J. Characteristics of effective interventions promoting healthy eating for pre-schoolers in childcare settings: An umbrella review. *Nutrients.* 2018;10(3).

www.physicalactivityplan.org