

## Disparities in Adolescents' Residence in Neighborhoods Supportive of Physical Activity — United States, 2011–2012

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In 2013, only 27% of adolescents in grades 9–12 met the current federal guideline for aerobic physical activity (at least 60 minutes of physical activity each day\*), and sex and racial/ethnic disparities in meeting the guideline exist (1). The Community Preventive Services Task Force has recommended a range of community-level evidence-based approaches† to increase physical activity by improving neighborhood supports for physical activity.§ To assess the characteristics of adolescents who live in neighborhoods that are supportive of physical activity, CDC analyzed data on U.S. children and adolescents aged 10–17 years (defined as adolescents for this report) from the 2011–2012 National Survey of Children's Health (NSCH). Overall, 65% of U.S. adolescents live in neighborhoods supportive of physical activity, defined as neighborhoods that are perceived as safe and have sidewalks or walking paths and parks, playgrounds, or recreation centers. Adolescents who were Hispanic and non-Hispanic black race/ethnicity; who lived in lower-income households, households with less educated parents, and rural areas; or who were overweight or obese were less likely to live in neighborhoods supportive of physical activity than were white adolescents and adolescents from higher income households, with a more highly educated parent, living in urban areas, and not overweight or obese. Within demographic groups, the largest disparity in the percentage of adolescents living in these neighborhoods was observed between adolescents living in households with a family income <100% of the Federal Poverty Level (FPL) (51%) and adolescents living in households with a family income ≥400% of the FPL (76%). Efforts to improve neighborhood supports, particularly in areas with a substantial percentage of low-income and minority residents, might increase physical activity among adolescents and reduce health disparities.

CDC used data from the 2011–2012 NSCH, a national- and state-representative, random-digit-dialed, cross-sectional telephone survey of households with at least one child aged 0–17 years living in the home at the time of the interview. Although data were collected for 95,677 households, body mass index for age was available only for persons aged 10–17 years; therefore, the sample was limited to the 45,309 households with

at least one child aged 10–17 years. The survey respondent (parent) was an adult in the household identified as “the parent or guardian who lives in this household who knows the most about the health and health care of the child.” Among households with two or more children, one child was randomly selected as the target of the interview. The NSCH interview completion rate was 54.1% for the landline sample and 41.2% for the cell phone sample.

The primary outcome measure, a neighborhood supportive of physical activity, was a composite measure derived from individual features related to perceived neighborhood safety; availability of sidewalks or walking paths; and the availability of parks, playgrounds, or recreation centers (2). A composite measure was used because different features are associated with different types of activity (e.g., walking for transportation versus being active in a park) (3) and a composite measure can capture the multiple influences on overall physical activity. Adolescents whose parent responded “usually” or “always” to the question, “How often do you feel {child's name} is safe in your community or neighborhood?” and affirmed that “sidewalks or walking paths” and either “a park or playground area” or “a recreation center, community center or boys' and girls' club” are available in their neighborhood were classified as living in a neighborhood supportive of physical activity.

Data were analyzed by demographic characteristics and weighted to provide estimates and standard errors for the proportion of adolescents living in neighborhoods supportive of physical activity. Pairwise t-tests ( $p < 0.05$ ) were used to compare the group with the largest proportion of adolescents living in a neighborhood supportive of physical activity (referent group) with all other groups.

Among the 45,309 households with at least one adolescent aged 10–17 years living at home, 4,351 (9.6%) were excluded because of missing demographic, neighborhood environment, and body mass index values, resulting in a final sample of 40,958 households. During 2011–2012, 65.4% of U.S. adolescents lived in neighborhoods that support physical activity (Table). Among racial/ethnic groups, the proportion of adolescents living in these neighborhoods was lower among non-Hispanic blacks (blacks; 60.0%) and Hispanics (61.6%) than among non-Hispanic whites (whites; 67.2%) and non-Hispanic multi/other races (70.1%). Among adolescents who lived in households with a parent whose highest level of education was a high school diploma or who did not graduate from high school, a lower percentage lived in neighborhoods that support physical

\* <http://health.gov/paguidelines>.

† Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities (<http://www.surgeongeneral.gov/library/calls/walking-and-walkable-communities/>).

§ <http://www.thecommunityguide.org/pa/environmental-policy/index.html>.

**TABLE. Disparities in the proportion of U.S. adolescents aged 10–17 years living in a neighborhood that supports physical activity, by selected characteristics — National Survey of Children’s Health, 2011–2012**

Characteristic	All adolescents	Adolescents living in a neighborhoods supportive of physical activity*	
	No. (% <sup>†</sup> )	% <sup>†</sup> (SE)	Amount of disparity <sup>§</sup>
<b>Total</b>	<b>40,958 (100.0)</b>	<b>65.4 (0.5)</b>	—
<b>Sex</b>			
Male	21,386 (51.5)	65.6 (0.8)	Referent
Female	19,572 (48.5)	65.2 (0.8)	0.3
<b>Age group (yrs)</b>			
10–12	14,651 (36.6)	64.2 (0.9)	1.9
13–17	26,307 (63.4)	66.1 (0.7)	Referent
<b>Race/Ethnicity</b>			
White, non-Hispanic	28,913 (58.2)	67.2 (0.6)	Referent
Black, non-Hispanic	3,745 (14.1)	60.0 (1.5)	7.2 <sup>¶</sup>
Hispanic	4,286 (18.4)	61.6 (1.8)	5.6 <sup>¶</sup>
Multi/Other, non-Hispanic	4,014 (9.3)	70.1 (1.7)	N/A <sup>**</sup>
<b>Highest household education<sup>††</sup></b>			
Less than a high school graduate	6,191 (21.1)	56.2 (1.5)	14.5 <sup>¶</sup>
High school graduate only	15,146 (34.4)	64.2 (0.8)	6.5 <sup>¶</sup>
More than high school graduate	19,621 (44.5)	70.7 (0.7)	Referent
<b>Household income (% FPL)</b>			
<100	4,694 (16.5)	51.1 (1.5)	24.8 <sup>¶</sup>
100–199	6,751 (20.8)	58.8 (1.4)	17.1 <sup>¶</sup>
200–399	13,067 (30.4)	66.6 (0.9)	9.3 <sup>¶</sup>
≥400	16,446 (32.3)	75.9 (0.7)	Referent
<b>Geographic location</b>			
Urban	32,703 (89.0)	66.5 (0.6)	Referent
Rural	8,255 (11.0)	56.8 (1.3)	9.7 <sup>¶</sup>
<b>Body mass index category<sup>§§</sup></b>			
Underweight/Healthy weight	29,242 (69.3)	67.4 (0.6)	Referent
Overweight/Obese	11,716 (30.7)	60.9 (1.1)	6.5 <sup>¶</sup>

**Abbreviations:** FPL = Federal Poverty Level; N/A = not applicable; SE = standard error.

\* Neighborhood supportive of physical activity is defined as the parent feeling the adolescent is usually or always safe in the neighborhood or community; walking paths or sidewalks are present in the neighborhood; and parks, recreation centers, or boys’ and girls’ clubs are present in the neighborhood.

<sup>†</sup> Weighted proportion.

<sup>§</sup> Measured as percentage point difference from referent group, which is the group with the highest proportion living in a neighborhood supportive of physical activity.

<sup>¶</sup> Significant pairwise difference at  $p < 0.05$ .

\*\* Multi/other, non-Hispanic not included in disparity comparison because the racial/ethnic characteristics of this group were heterogeneous.

<sup>††</sup> Highest level of parental education in the household.

<sup>§§</sup> All adolescents were assumed to be at the midpoint of their age-year for this calculation. Body mass index for age is based on parent’s recall of the selected adolescent’s height and weight. Underweight/healthy weight = <85th percentile; overweight/obese = ≥85th percentile ([http://www.cdc.gov/growthcharts/cdc\\_charts.htm](http://www.cdc.gov/growthcharts/cdc_charts.htm)).

activity (64.2% and 56.2%, respectively), compared with adolescents living in households with a parent with more than a high school education (70.7%). The proportion of adolescents living in a neighborhood that supports physical activity was lower among adolescents with household income <100% of the FPL (51.1%), 100%–199% of the FPL (58.8%), and 200%–399% of the FPL (66.6%), than among adolescents with household incomes ≥400% of the FPL (75.9%). By geographic location, the proportion of adolescents living in neighborhoods that support physical activity was lower among rural residents (56.8%) than among adolescents living in urban areas (66.5%). By BMI, the proportion of adolescents living in neighborhoods that support physical activity was lower among overweight or obese adolescents (60.9%) than adolescents who were underweight or at a healthy weight (67.4%).

## Discussion

Approximately two thirds of U.S. adolescents live in neighborhoods that are supportive of physical activity; however, racial/ethnic, socioeconomic, and health disparities exist. A lower proportion of Hispanic and black adolescents and adolescents who were overweight or obese lived in these types of neighborhoods than did their white and underweight or healthy weight counterparts. A lower proportion of adolescents living in these neighborhoods also resided in a lower-income household, a household with less educated parents, or in a rural area than adolescents who resided in more socioeconomically advantaged households or in urban areas.

Various reasons for disparities in the neighborhood environment have been proposed, including poverty, residential segregation, disinvestment of economic resources, and poor

quality housing (4). Infrastructure, such as street lighting and sidewalks, might not be as available or well maintained in poor neighborhoods as in affluent neighborhoods (4).

This report uses national data and a composite measure of perceived neighborhood features to demonstrate disparities in the proportion of adolescents living in neighborhoods that support physical activity. A composite measure provides a more comprehensive picture of the perceived neighborhood environment. For example, although sidewalks might be available in a neighborhood, parents might perceive that it is unsafe for a child to use the sidewalks. If there are no sidewalks to get to a nearby park, a child might not be able to use the park without taking public transportation or riding in a private vehicle. A previous study used the same data for children and adolescents age 0–17 years and reported a positive association between FPL and both living in a safe neighborhood and living in a neighborhood with sidewalks (2). When stratified by race and ethnicity, more black and Hispanic adolescents aged 0–17 years lived in neighborhoods with sidewalks (82.5% and 77.1%, respectively), compared with white (73.6%) children (2). However, fewer black and Hispanic adolescents aged 0–17 years lived in neighborhoods that were safe (77.0% and 77.2%, respectively), compared with white (93.2%) adolescents (2).

Another national study reported that 68.4% of high school students had playgrounds, parks, or gyms close to their home and 73.5% lived in a neighborhood that was safe for autonomous physical activity (5). Findings from these studies highlight some of the challenges facing investigators assessing the neighborhood environment and how results might differ when using slightly different constructs (e.g., “safe for autonomous physical activity” compared with “safe neighborhood”) and when reporting individual neighborhood features compared with a composite measure. Access to some neighborhood features that support physical activity, such as sidewalks, might be more common in low-income, minority, and highly urbanized areas (6); however, access to sidewalks that are safe and well maintained in these areas might be lacking (6). Even with well-maintained sidewalks, in some cases, safety concerns, such as higher crime rates or broken windows, alone might explain why a neighborhood is not supportive of physical activity (6).

This study is subject to at least three limitations. First, neighborhood features were measured by parent perception, which could lead to under- or overestimating the presence of these supports. However, one study of perceptions of caregivers of young children from high- and low-risk areas found parent-reported perceptions of the neighborhood environment to be reliable (7). Parents’ perception of neighborhood features is relevant to adolescent behavior because parents typically decide whether their adolescent, particularly a young adolescent, is allowed to play at the park, walk or bike to school, or use neighborhood

## Summary

### What is already known about this topic?

Physical activity has health benefits for persons of all ages. Currently, approximately one in four youths is active enough to meet the aerobic physical activity guideline. Strategies to improve the built environment, such as ensuring the safety and availability of sidewalks or locating parks and recreation facilities nearby, are recommended approaches to promote physical activity.

### What is added by this report?

During 2011–2012, approximately two thirds of adolescents aged 10–17 years lived in a neighborhood supportive of physical activity, based on a composite measure derived from parental perceived neighborhood safety; availability of sidewalks or walking paths; and the availability of parks, playgrounds, or recreation centers. The proportion of adolescents living in neighborhoods supportive of physical activity was lower among adolescents who were non-Hispanic black or Hispanic, overweight or obese, from households with lower socioeconomic status (less educated, lower income), or from rural areas.

### What are the implications for public health practice?

All children and adolescents should have access to opportunities to be physically active. Creating or enhancing programs and strategies aimed at increasing physical activity might reduce disparities. Programs and strategies include ensuring that neighborhoods are safe and have well-maintained sidewalks and parks or recreation facilities nearby, especially in areas with a higher concentration of minority, low-income, and less educated residents and in rural areas.

recreation locations (8). Second, because NCSH did not assess time spent in both moderate and vigorous intensity physical activity, disparities in the association between neighborhood features that support physical activity and time spent in physical activity by population groups were not examined. Finally, response bias might have affected the results because the NSCH interview completion rate was only 54.1% for the landline sample and 41.2% for the cell phone sample.

Additional studies exploring community-based strategies that best support physical activity in low-income, minority, and rural areas are needed. Community strategies, including creating or enhancing access to places for physical activity, are important because of the potential for extensive reach, effectiveness, and sustainability (9). Improving access to local opportunities to be physically active might be particularly important for adolescents who do not drive, whose parents limit where they may go, and who therefore spend a considerable amount of time in their neighborhoods (10). Ensuring that neighborhoods are safe and have well-maintained sidewalks and parks nearby are examples of programs and strategies aimed at increasing physical activity through improvements to the

built environment. Focusing these efforts in areas with higher concentrations of minority, low-income, and less educated populations and those in rural areas might help to reduce disparities in neighborhood support for physical activity.

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