



**ISSUE BRIEF SERIES: EXPLORING THE SOCIAL DETERMINANTS OF HEALTH  
WHAT SHAPES HEALTH-RELATED BEHAVIORS? THE ROLE OF SOCIAL FACTORS – MARCH 2011**

*This is one in a series of 10 issue briefs on the social determinants of health. The series began as a product of the Robert Wood Johnson Foundation Commission to Build a Healthier America and continues as a part of the Foundation's Vulnerable Populations portfolio.*



## What Shapes Health-Related Behaviors? The Role of Social Factors

### 1. Introduction

Over the past few decades, scientists have clearly documented how our behaviors protect us from, or put us at risk for, disease. Most Americans know what it takes to be healthier: exercise more, eat a more nutritious diet and abstain from smoking. Despite increased awareness, however, too many Americans continue to practice unhealthy behaviors: in 2008, for example, nearly 60 percent of U.S. adults had no regular leisure-time physical activity and one-fifth were current smokers.<sup>1</sup> These behaviors contribute significantly to poor health and early death.<sup>2-4</sup>

Until now, most efforts to improve health-related behaviors have focused on health education to better inform people about the importance of making healthier decisions. More recently, however, that focus has broadened as a result of new understanding about how the conditions in which we live, learn, work and play also shape health.<sup>5-9</sup> Many Americans live in neighborhoods with limited access to fresh food or safe places to exercise, have few affordable options for high-quality childcare and experience stressful working conditions—all of which represent significant obstacles to making healthy choices for themselves and their families. This issue brief summarizes current knowledge about factors that shape health-related behaviors and provides an overview of promising approaches based on that knowledge.

*While most approaches to health-related behaviors have focused on personal responsibility, a growing body of knowledge tells us that people's living and working conditions—and factors like education and income that shape them—play a fundamental role as well.*





## 2. What shapes health-related behaviors? The importance of social factors

We all want to be healthy, so why do some people practice healthy behaviors, while others—including many who are aware of the value of these behaviors—do not? A person’s behaviors are shaped in part by his or her individual characteristics, including genetics, but there is growing evidence that the environments in which people learn, adopt and maintain behaviors also play an important role.<sup>7, 8, 11-13</sup>

Many important behavioral risk factors for illness and early death in the United States vary dramatically depending on where people are on the social and economic ladder. The links between health-related behaviors and both education and income—the most common measures of social and economic advantage in this country—have been well-documented. As the examples below illustrate, increases in income and educational attainment typically correspond to decreases in the prevalence of health-harming behaviors and increases in the prevalence of health-promoting behaviors. In many cases, these differences reflect more than the contrast between those who are poorest or least-educated and everyone else; instead, we often see incremental improvements with each step up the income or education ladder. These patterns have been observed for an array of behaviors, beginning in childhood and continuing throughout life.<sup>14-20</sup>

The following examples illustrate the links between health-related behaviors and social factors including income, education and neighborhood conditions, beginning in childhood. These kinds of patterns have been seen in findings from a range of studies, including studies that have considered other potentially relevant factors such as gender, age and race or ethnic group.

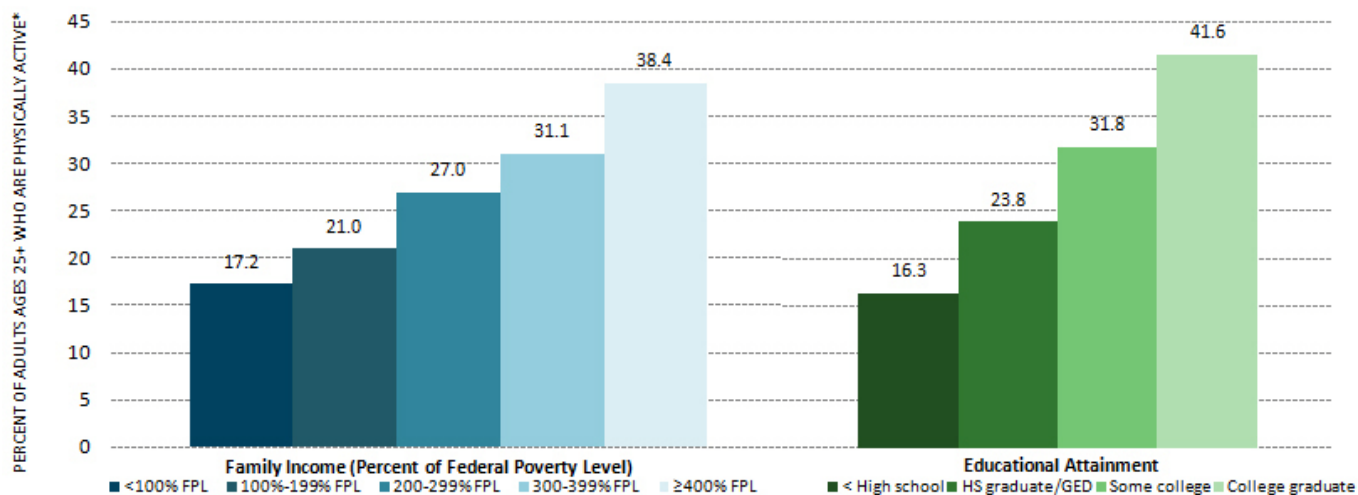
### PHYSICAL ACTIVITY

Both income and education are associated with physical activity among adults, with lower rates of physical activity (Figure 1) and higher rates of sedentary behavior (not shown) seen at lower levels of income and educational attainment. Similar patterns have been observed among adolescents as well (Figure 2).

*In this brief, the term **social factors** refers to education, income or wealth, race or ethnic group, and living and working conditions throughout life.*

***Social advantage or disadvantage** refers to the relatively favorable or unfavorable conditions that people experience related to one or more of these social factors.*

*Figure 1. Adults with higher income or more education are more physically active.*



Source: National Health Interview Survey, 2001-2005 \*Age-adjusted



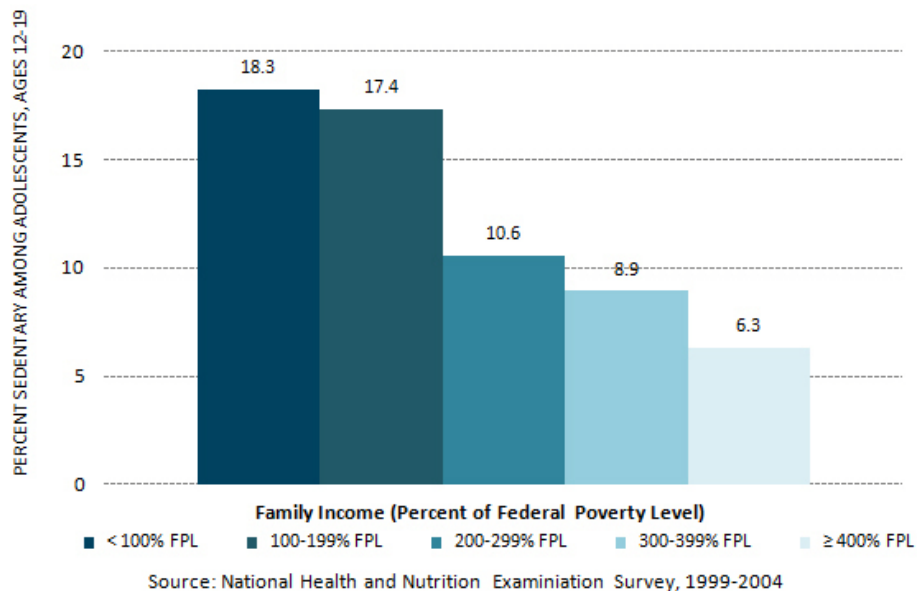
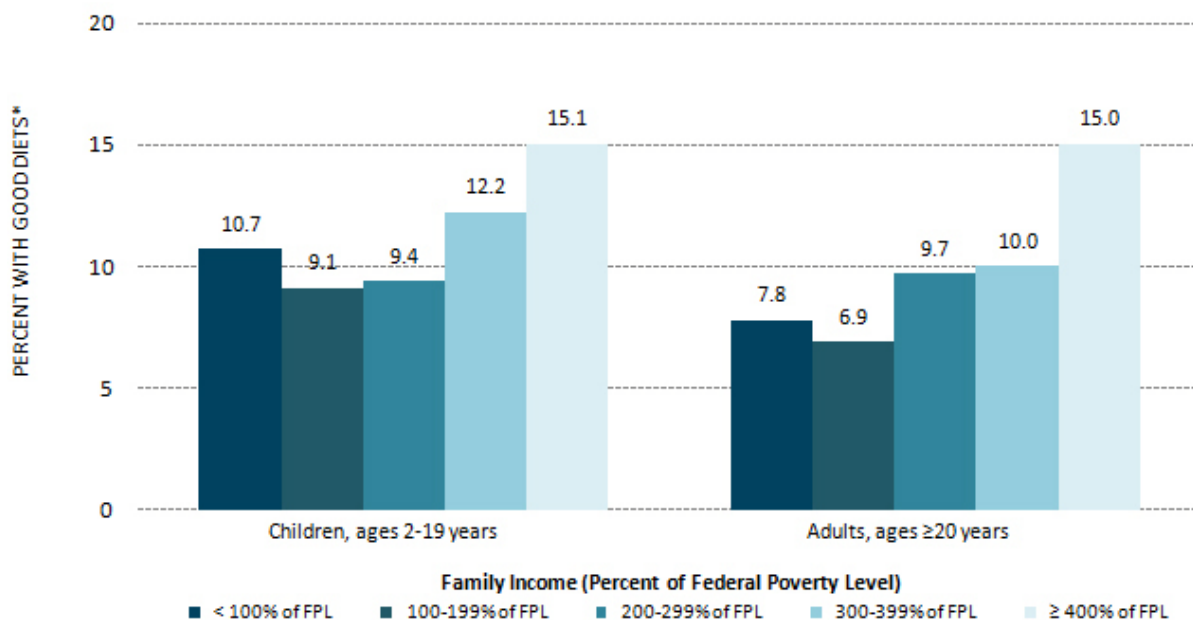


Figure 2. As family income rises, teenagers are less likely to be sedentary.

### NUTRITION/HEALTHY EATING

As illustrated in Figure 3, people in higher-income families are generally more likely to eat healthier foods.<sup>21</sup> People in lower-income households eat fruits and vegetables less frequently.<sup>22-24</sup> In addition, the quality of residents' diets improves with greater neighborhood-level access to healthy foods, as measured both by their availability in neighborhood stores and by proximity to full-service supermarkets.<sup>25</sup>

Figure 3. As family income rises, adults and children are more likely to have good diets.



\* The mean healthy eating index (HEI) score measures intake of 10 key diet components (grains, vegetables, fruits, milk, meat, total fat, saturated fat, sodium, cholesterol, and variety), each ranging from 0-10 with higher scores indicating healthier eating. A good diet is defined as having an HEI score above 80. Source: National Health and Nutrition Examination Survey, 1999-2002.

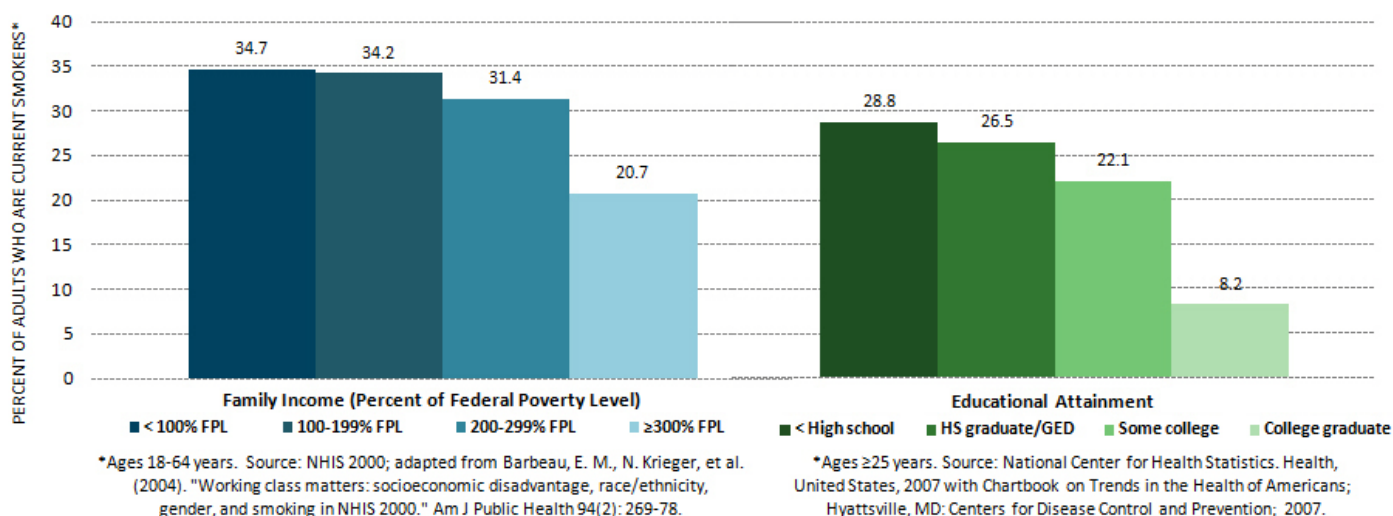




### SMOKING

As seen in Figure 4, both income and education have been associated with smoking among U.S. adults,<sup>17, 23, 26, 27</sup> including pregnant women,<sup>28</sup> with the lowest rates typically seen in the highest-income and most-educated groups. While smoking rates have decreased over time, the declines have been most dramatic among the most socially and economically advantaged groups.<sup>29</sup> Smoking rates have also been associated with neighborhood characteristics; even after taking into account individual-level income and education, rates of smoking are higher in neighborhoods with more convenience stores, higher crime and limited access to transportation and exercise facilities.<sup>30, 31</sup> Socioeconomic disadvantage during childhood has also been associated with smoking later in life.<sup>32, 33</sup>

Figure 4. Adults with lower incomes or less education are more likely to smoke.



### 3. What explains the links between health-related behaviors and social factors?

A large body of research sheds light on the relatively direct ways in which aspects of people's physical environments—for instance, access to and quality of housing, transportation, stores, playgrounds and parks—either promote or present obstacles to healthy behaviors.<sup>25, 34, 35</sup> Aspects of the social environment also can shape behaviors, often in less direct ways. For example:

- **Income and wealth shape access to health-promoting conditions.** Economic resources affect the extent to which people can afford to make health-promoting choices for themselves and their families regarding the food they eat; how they spend their time, including physical activity; and whether they live in safe homes and neighborhoods free of physical hazards. Fresh food typically costs more than processed food and tends to be less available in lower-income neighborhoods where full-service grocery stores may be scarce. Lower-income neighborhoods often lack safe places to exercise as well.<sup>25, 36, 37</sup>





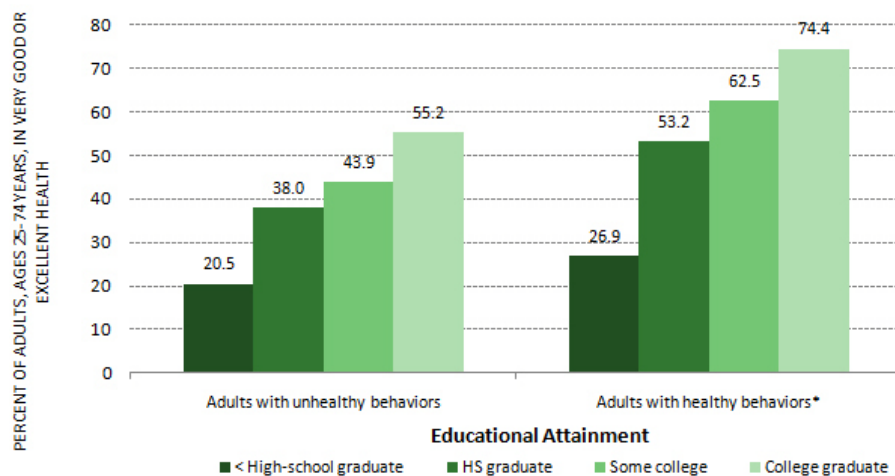
- **Education plays a powerful role in shaping health behaviors, in multiple ways.** Having more education may mean greater health knowledge and better problem-solving skills to make more informed choices about behaviors,<sup>38</sup> including those related to seeking appropriate medical care.<sup>39-41</sup> Education can also shape health-related behaviors in other important ways. A person’s educational attainment is closely linked with his or her options for employment and income, which in turn can influence behaviors as noted above. Having more education and a better job is also linked with the kinds of social support, networks and norms that support healthy behaviors and discourage behaviors that are health-harming.<sup>42-44</sup>
- **Stressful conditions and experiences contribute to unhealthy behaviors.** While a growing body of research suggests that chronic stress can have direct physiologic effects on health, stress also can shape health via its effects on health-related behaviors. For example, children who experience stressful circumstances, particularly on a daily basis, are more likely later in life to adopt—and less likely to discontinue—risky health behaviors like smoking and abuse of alcohol or drugs<sup>45-47</sup> that may function as coping mechanisms. (Another issue brief in this series focuses on the links between stress and health.)



**EXPLAINING DIFFERENCES IN HEALTH: BOTH HEALTH-RELATED BEHAVIORS AND SOCIAL FACTORS PLAY IMPORTANT ROLES**

We know that behaviors, along with medical care and genetic makeup, are key determinants of health. But there have been tremendous advances over the past two decades in our understanding of the fundamental importance of the social determinants of health—of how health also is shaped by factors including income and education, living and working conditions, and early childhood experiences.

It is important to note that behaviors alone do not fully account for the strong links between factors such as income and education and so many health outcomes. For example, Figure 5 shows differences in adult health status by both educational attainment and smoking and leisure-time exercise. This figure demonstrates that a person’s chances of being in very good or excellent health are greater at each higher level of educational attainment—whether or not he or she practices healthy behaviors. Social factors—such as education—can have powerful effects on health, over and above how they shape health-related behaviors.



*Figure 5. Social factors—such as education—can have powerful effects on health, over and above how they shape health-related behaviors.*

Prepared for the RWJF Commission to Build a Healthier America by the Center on Social Disparities in Health, University of California, San Francisco  
Source: 2005-2007 Behavioral Risk Factor Surveillance System Survey Data \*Smoking and leisure-time exercise







#### 4. Helping people choose health

Good health depends on personal choice and responsibility, on people making the commitment to choose health-promoting behaviors for themselves and their families—to eat a healthy diet, include physical activity as part of daily life and avoid risky behaviors like smoking and excessive drinking. As noted above and seen in Figure 6, however, people’s health behaviors are also shaped by conditions over which they as individuals have little or no control. Many Americans live and work in circumstances that make healthy living nearly impossible, even when they are informed and motivated. Many have limited or no access to grocery stores that sell nutritious food; many live in communities that are unsafe or in disrepair, making it difficult or risky to exercise.<sup>5, 7, 10, 25, 35, 48, 49</sup> The chronic stress produced by working in conditions with excessive demands, lack of social support, long working hours and job insecurity can manifest in unhealthy behaviors, even among individuals highly motivated to “choose health.”<sup>50-54</sup> In addition, the legacy of racial segregation means that many people in historically disadvantaged groups have particularly limited choices about the physical and social environments in which they live, even though racial discrimination is no longer legal.<sup>55</sup>

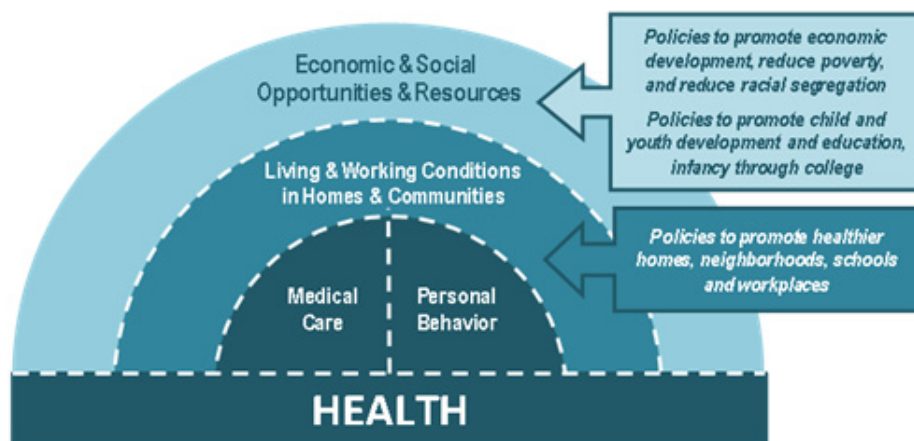


Figure 6. What influences health? Broadening the focus.

Source: Robert Wood Johnson Foundation Commission to Build a Healthier America





Efforts to improve health-related behaviors have focused primarily on providing information and encouragement to convince individuals to change their behaviors. We have learned, however, that these efforts often appear to be least successful in reaching those who need them most.<sup>29, 56-58</sup> The success of anti-smoking campaigns in reducing overall smoking rates, as noted above, has largely been based on the declining rates of smoking among people in more socially advantaged groups.<sup>26, 29, 59</sup> However, persistent differences in smoking rates by income and education<sup>11</sup> (Figure 7) raise concerns about the growing proportion of smokers for whom traditional interventions may be ineffective.<sup>60</sup>

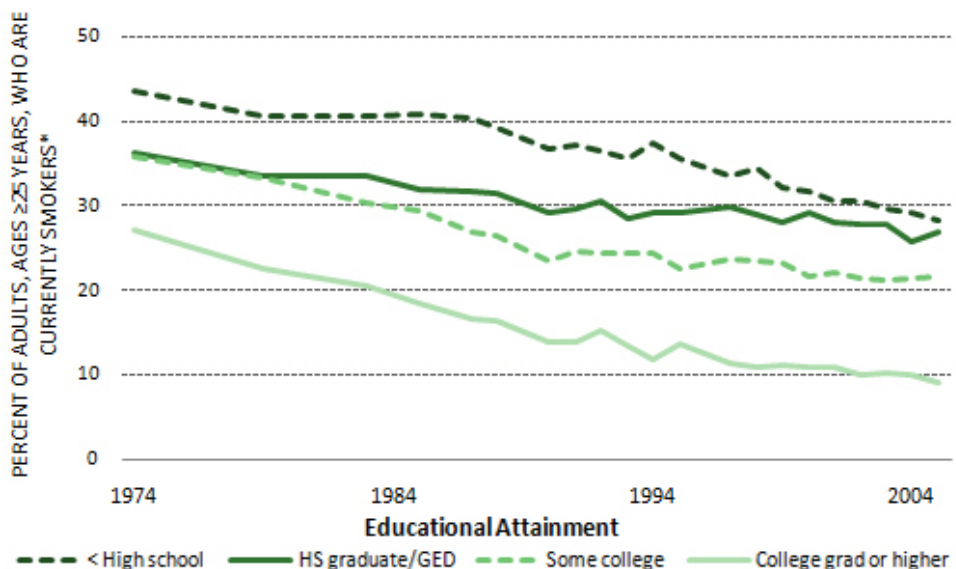


Figure 7. Persistent gaps in smoking by education.

Source: NCHS. Health, US, 2006 with Chartbook on Trends in the Health of Americans. Hyattsville, MD. \*Age-adjusted.

Much remains to be learned about the most successful strategies for helping people adopt and maintain health-promoting behaviors. Current knowledge tells us that improving the health-related behaviors of all Americans and narrowing disparities will require broadening our focus. We must move beyond the necessary, but not sufficient, step of educating and encouraging individuals to make healthier choices, to find ways to improve the conditions in people’s homes, schools, workplaces and communities. Because these conditions affect people’s choices, improving them will create more opportunities for people to make healthy choices.<sup>5, 10, 61-63</sup>

Other issue briefs in this series explore the role of income, education,<sup>38</sup> working conditions<sup>64</sup> and neighborhoods<sup>34</sup> in health and health-related behaviors and provide examples of interventions that appear to have worked in creating healthier environments. In addition to policies focused on expanding social and economic resources and opportunities, including the Earned Income Tax Credit, minimum wage laws and extending high-quality Early Head Start programs, the following are examples of approaches that show promise, in part because of their emphasis on capacity-building:





- Pennsylvania’s Fresh Food Financing Initiative is a public-private partnership that mobilizes community support and investment to address a broad range of obstacles to supermarket development in distressed neighborhoods. New York State and New Orleans have adopted this model, hoping both to increase fresh food access and create jobs,<sup>65</sup> and a recent bipartisan coalition in Congress introduced bills to replicate this approach nationwide in an effort to eliminate “food deserts” and reduce childhood obesity.<sup>66</sup>
- An evaluation of programs combining universal free breakfast with nutrition education found less stigma associated with eating free breakfast at school (a factor contributing to less than optimal participation in these programs) as well as improvements in eating habits among students.<sup>65</sup>
- The Robert Wood Johnson Foundation Commission to Build a Healthier America recommended that schools be required to provide physical education programs, active recess or after-school activities to help children meet the goal of an hour of physical activity every day. In Chicago, the city’s Walking School Bus program, in which one or more adults walk with a group of children to and from school, has helped to increase walking to and from school by addressing safety concerns; 90 percent of these public-school students are now closer to meeting the activity goal by walking to and from school.<sup>65</sup> Similar programs have been initiated in other municipalities.<sup>67</sup>
- The Arabia Mountain Trail in a primarily African-American community near Atlanta has connected neighborhoods, downtown and commercial areas with historic sites and nature preserves, providing a transportation route and recreational resource for pedestrians and bicyclists.<sup>65</sup> In another community, opening a schoolyard after-hours with attendants for safety increased the number of children playing actively outdoors and reduced their television, movie and computer-game time.<sup>68</sup>
- The Shape-up Somerville program involved a wide range of community participants to increase options for physical activity and availability of healthful foods in children’s school, home and community environments. After one year, participating 1st- to 3rd-grade children had significantly decreased BMIs compared with children in two similar Massachusetts communities.<sup>69</sup>
- In 2002, New York City embarked on an ambitious effort to address behavioral causes of chronic disease. After large increases in cigarette taxes, legislation promoting smoke-free workplaces and restaurants, provision of free nicotine replacement therapy to smokers and an aggressive anti-tobacco advertising campaign, the city saw its first drop in smoking prevalence in a decade. The declines were evident across all age and racial-ethnic groups, at every level of educational attainment, among both U.S.-born and foreign-born persons and in all five boroughs of the city, and were especially pronounced among low-income and Hispanic women.<sup>70</sup>







## 5. Conclusion

Given the fundamental role of behaviors in shaping health,<sup>69</sup> building a healthier America will clearly depend on finding ways to ensure that more Americans have the ability to adopt and maintain healthy behaviors, beginning in childhood and throughout their lives. As Thomas R. Frieden, the current head of the U.S. Centers for Disease Control and Prevention, has recommended, highest priority should be given to “interventions that change the context to make individuals’ default decisions healthy.”<sup>10</sup> While no government or private program can take the place of people making healthy choices for themselves and their families, society bears a responsibility as well: to pursue programs and policies that both encourage and enable all Americans—and particularly those who face the greatest obstacles—to choose health.

*We need “interventions that change the context to make individuals’ default decisions healthy.” — Thomas Frieden, Director of the U.S. Centers for Disease Control and Prevention, 2010*

---

### ABOUT THE ROBERT WOOD JOHNSON FOUNDATION

The Robert Wood Johnson Foundation focuses on the pressing health and health care issues facing our country. As the nation's largest philanthropy devoted exclusively to improving the health and health care of all Americans, the Foundation works with a diverse group of organizations and individuals to identify solutions and achieve comprehensive, meaningful and timely change. For more than 35 years, the Foundation has brought experience, commitment, and a rigorous, balanced approach to the problems that affect the health and health care of those it serves. When it comes to helping Americans lead healthier lives and get the care they need, the Foundation expects to make a difference in your lifetime.

### ABOUT THE COMMISSION TO BUILD A HEALTHIER AMERICA

The Robert Wood Johnson Foundation Commission to Build a Healthier America was a national, independent, non-partisan group of leaders that released 10 recommendations to dramatically improve the health for all Americans. [www.commissiononhealth.org](http://www.commissiononhealth.org)

### ABOUT THIS ISSUE BRIEF SERIES

This issue brief is one in a series of ten on the social determinants of health. The series began as a product of the Robert Wood Johnson Foundation Commission to Build a Healthier America and continues as a part of the Foundation’s Vulnerable Populations portfolio. [www.rwjf.org/vulnerablepopulations](http://www.rwjf.org/vulnerablepopulations)

### CREDITS: LEAD AUTHORS

University of California, San Francisco  
Center on Disparities in Health  
Paula Braveman, M.D., M.P.H.  
Susan Egerter, Ph.D.  
Colleen Barclay, M.P.H.





## REFERENCES

1. Centers for Disease Control and Prevention. Early Release of Selected Estimates Based on Data From the 2008 National Health Interview Survey. 2009 December 17, 2010]; Available from: <http://www.cdc.gov/nchs/nhis/released200906.htm#7>
2. Alcohol-attributable deaths and years of potential life lost--United States, 2001. *MMWR Morb Mortal Wkly Rep* 2004;53(37):866-70.
3. Smoking-attributable mortality, years of potential life lost, and productivity losses--United States, 2000-2004. *MMWR Morb Mortal Wkly Rep* 2008;57(45):1226-8.
4. Finkelstein EA, Brown DS, Wraga LA, Allaire BT, Hoerger TJ. Individual and aggregate years-of-life-lost associated with overweight and obesity. *Obesity (Silver Spring)* 2010;18(2):333-9.
5. Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health. Final Report of the Commission on Social Determinants of Health. Geneva, Switzerland: World Health Organization; 2008.
6. Datta GD, Subramanian SV, Colditz GA, Kawachi I, Palmer JR, Rosenberg L. Individual, neighborhood, and state-level predictors of smoking among US Black women: a multilevel analysis. *Soc Sci Med* 2006;63(4):1034-44.
7. Lynch JW, Kaplan GA, Salonen JT. Why do poor people behave poorly? Variation in adult health behaviours and psychosocial characteristics by stages of the socioeconomic lifecourse. *Soc Sci Med* 1997;44(6):809-19.
8. Woolf SH, Dekker MM, Byrne FR, Miller WD. Citizen-centered health promotion: Building collaborations to facilitate healthy living. *Am J Prev Med* 2011;40(1S1):S38-S47.
9. Yen IH, Syme SL. The social environment and health: a discussion of the epidemiologic literature. *Annu Rev Public Health* 1999;20:287-308.
10. Frieden TR. A framework for public health action: the health impact pyramid. *Am J Public Health* 2010;100(4):590-5.
11. Braveman P, Egerter S. Overcoming Obstacles to Health: Report From the Robert Wood Johnson Foundation to the Commission to Build a Healthier America. Washington, DC: Robert Wood Johnson Foundation Commission to Build a Healthier America; 2008.
12. Braveman PA, Egerter SA, Mockenhaupt RE. Broadening the Focus The Need to Address the Social Determinants of Health. *Am J Prev Med* 2011;40(1S1):S4-S18.
13. Glass TA, McAtee MJ. Behavioral science at the crossroads in public health: extending horizons, envisioning the future. *Soc Sci Med* 2006;62(7):1650-71.
14. Baltrus PT, Everson-Rose SA, Lynch JW, Raghunathan TE, Kaplan GA. Socioeconomic position in childhood and adulthood and weight gain over 34 years: the Alameda County Study. *Ann Epidemiol* 2007;17(8):608-14.
15. Braveman PA, Cubbin C, Egerter S, Williams DR, Pamuk E. Socioeconomic disparities in health in the United States: What the patterns tell us. *Am J Public Health* 2010 14(1):20-35.
16. Harman J, Graham H, Francis B, Inskip HM. Socioeconomic gradients in smoking among young women: A British survey. *Soc Sci Med* 2006;63(11):2791-800.
17. Harper S, Lynch J. Trends in socioeconomic inequalities in adult health behaviors among U.S. states, 1990-2004. *Public Health Rep* 2007;122(2):177-89.
18. Karter AJ, Stevens MR, Brown AF, Duru OK, Gregg EW, Gary TL, et al. Educational disparities in health behaviors among patients with diabetes: the Translating Research Into Action for Diabetes (TRIAD) Study. *BMC Public Health* 2007;7:308.
19. National Center for Health Statistics. Health, United States, 2007 with Chartbook on Trends in the Health of Americans. Hyattsville, MD: Centers for Disease Control and Prevention; 2007.
20. Singh GK, Kogan MD, Siahpush M, van Dyck PC. Independent and joint effects of socioeconomic, behavioral, and neighborhood characteristics on physical inactivity and activity levels among US children and adolescents. *J Community Health* 2008;33(4):206-16.
21. Robert Wood Johnson Foundation Commission to Build a Healthier America. Fact Sheet: Improving the Health of All Americans through Better Nutrition. 2009 March 11, 2011]; Available from: <http://www.commissiononhealth.org/PDF/b354bd1e-a956-4f75-b783-83b175d562f1/NutritionFactSheetJun09.pdf>
22. Lorton BA, Melgar-Quinonez HR, Taylor CA. Correlates of fruit and vegetable intakes in US children. *J Am Diet Assoc* 2009;109(3):474-8.
23. McGuire LC, Ahluwalia IB, Strine TW. Chronic disease-related behaviors in U.S. older women: Behavioral Risk Factor Surveillance System, 2003. *J Womens Health (Larchmt)* 2006;15(1):3-7.
24. Riediger ND, Shoostari S, Moghadasian MH. The influence of sociodemographic factors on patterns of fruit and vegetable consumption in Canadian adolescents. *J Am Diet Assoc* 2007;107(9):1511-8.
25. Diez Roux AV, Mair C. Neighborhoods and health. *Ann N Y Acad Sci* 2010;1186:125-45.
26. Centers for Disease Control and Prevention. Cigarette Smoking among Adults--United States, 2007. *MMWR Morb Mortal Wkly Rep* 2008;57(45):1221-1226.
27. Pierce JP, Fiore MC, Novotny TE, Hatziaandreu EJ, Davis RM. Trends in cigarette smoking in the United States. Educational differences are increasing. *Jama* 1989;261(1):56-60.
28. Phares TM, Morrow B, Lansky A, Barfield WD, Prince CB, Marchi KS, et al. Surveillance for disparities in maternal health-related behaviors--selected states, Pregnancy Risk Assessment Monitoring System (PRAMS), 2000-2001. *MMWR Surveill Summ* 2004;53(4):1-13.
29. Kanjilal S, Gregg EW, Cheng YJ, Zhang P, Nelson DE, Mensah G, et al. Socioeconomic status and trends in disparities in 4 major risk factors for cardiovascular disease among US adults, 1971-2002. *Arch Intern Med* 2006;166(21):2348-55.
30. Chuang YC, Cubbin C, Ahn D, Winkleby MA. Effects of neighbourhood socioeconomic status and convenience store concentration on individual level smoking. *J Epidemiol Community Health* 2005;59(7):568-73.
31. Gary TL, Safford MM, Gerzoff RB, Ettner SL, Karter AJ, Beckles GL, et al. Perception of neighborhood problems, health behaviors, and diabetes outcomes among adults with diabetes in managed care: the Translating Research Into Action for Diabetes (TRIAD) study. *Diabetes Care* 2008;31(2):273-8.
32. Fergusson DM, Horwood LJ, Boden JM, Jenkin G. Childhood social disadvantage and smoking in adulthood: results of a 25-year longitudinal study. *Addiction* 2007;102(3):475-82.
33. Jefferis BJ, Power C, Graham H, Manor O. Effects of childhood socioeconomic circumstances on persistent smoking. *Am J Public Health* 2004;94(2):279-85.
34. Cubbin C, Pedregon V, Egerter S, Braveman P. Issue Brief 3: Neighborhoods and Health. Princeton, NJ: Robert Wood Johnson Foundation; 2008.





35. Pickett KE, Pearl M. Multilevel analyses of neighbourhood socioeconomic context and health outcomes: a critical review. *J Epidemiol Community Health* 2001;55(2):111-22.
36. Morland K, Wing S, Diez Roux A, Poole C. Neighborhood characteristics associated with the location of food stores and food service places. *Am J Prev Med* 2002;22(1):23-9.
37. Powell LM, Slater S, Mirtcheva D, Bao Y, Chaloupka FJ. Food store availability and neighborhood characteristics in the United States. *Prev Med* 2007;44(3):189-95.
38. Egerter S, Braveman P, Sadegh-Nobari T, Grossman-Kahn R, Dekker M. Issue Brief 6: Education and Health. Princeton, NJ: Robert Wood Johnson Foundation; 2009.
39. Bennett IM, Chen J, Soroui JS, White S. The contribution of health literacy to disparities in self-rated health status and preventive health behaviors in older adults. *Ann Fam Med* 2009;7(3):204-11.
40. DeWalt DA, Hink A. Health literacy and child health outcomes: a systematic review of the literature. *Pediatrics* 2009;124 Suppl 3:S265-74.
41. Sanders LM, Federico S, Klass P, Abrams MA, Dreyer B. Literacy and child health: a systematic review. *Arch Pediatr Adolesc Med* 2009;163(2):131-40.
42. Cohen S, Gottlieb B, Underwood L. Social relationships and health. In: Cohen S, Underwood L, Gottlieb B, editors. *Measuring and intervening in social support*. New York: Oxford University Press; 2000. p. 3-25.
43. Mirowsky J, Ross CE. *Education, social status, and health*. Hawthorne, NY: Aldine de Gruyter; 2003.
44. Uchino B. Social support and health: A review of physiological processes potentially underlying links to disease outcomes. *J Behav Med* 2006;29:377-387.
45. Anda RF, Croft JB, Felitti VJ, Nordenberg D, Giles WH, Williamson DF, et al. Adverse childhood experiences and smoking during adolescence and adulthood. *JAMA* 1999;282(17):1652-8.
46. Chung EK, Nurmohamed L, Mathew L, Elo IT, Coyne JC, Culhane JF. Risky health behaviors among mothers-to-be: the impact of adverse childhood experiences. *Acad Pediatr* 2010;10(4):245-51.
47. Dube SR, Miller JW, Brown DW, Giles WH, Felitti VJ, Dong M, et al. Adverse childhood experiences and the association with ever using alcohol and initiating alcohol use during adolescence. *J Adolesc Health* 2006;38(4):444 e1-10.
48. Institute of Medicine. *Promoting Health: Intervention Strategies from Social and Behavioral Research*. Washington, D.C.: National Academy Press; 2000.
49. McNeill LH, Kreuter MW, Subramanian SV. Social environment and physical activity: a review of concepts and evidence. *Soc Sci Med* 2006;63(4):1011-22.
50. Burgard SA, Brand JE, House JS. Perceived job insecurity and worker health in the United States. *Soc Sci Med* 2009;69(5):777-85.
51. Eller NH, Netterstrom B, Gyntelberg F, Kristensen TS, Nielsen F, Steptoe A, et al. Work-related psychosocial factors and the development of ischemic heart disease: a systematic review. *Cardiol Rev* 2009;17(2):83-97.
52. Hamer M, Molloy GJ, Stamatakis E. Psychological distress as a risk factor for cardiovascular events: pathophysiological and behavioral mechanisms. *J Am Coll Cardiol* 2008;52(25):2156-62.
53. Karasek RA, Theorell T. *Healthy work: stress, productivity and the reconstruction of working life*. New York: Basic Books; 1990.
54. Marmot M, Bosma H, Hemingway H, Brunner E, Stansfeld S. Contribution of job control and other risk factors to social variations in coronary heart disease incidence. *Lancet* 1997;350:235-239.
55. Williams DR, Collins C. Racial residential segregation: a fundamental cause of racial disparities in health. *Public Health Rep* 2001;116(5):404-16.
56. Brownson RC, Boehmer TK, Luke DA. Declining rates of physical activity in the United States: what are the contributors? *Annu Rev Public Health* 2005;26:421-43.
57. Centers for Disease Control and Prevention. Racial/ethnic and socioeconomic disparities in multiple risk factors for heart disease and stroke--United States, 2003. *MMWR Morb Mortal Wkly Rep* 2005;54(5):113-7.
58. Mechanic D. Disadvantage, inequality, and social policy. *Health Aff (Millwood)* 2002;21(2):48-59.
59. de Walque D. Education, Information, and Smoking Decisions: Evidence from Smoking Histories, 1940-2000. Washington, DC: The World Bank; 2004 July. Report No.: World Bank Policy Research Working Paper No. 3362.
60. Graham H, Inskip HM, Francis B, Harman J. Pathways of disadvantage and smoking careers: evidence and policy implications. *J Epidemiol Community Health* 2006;60 Suppl 2:7-12.
61. Macintyre S. The social patterning of exercise behaviours: the role of personal and local resources. *Br J Sports Med* 2000;34(1):6.
62. Marmot M, Friel S, Bell R, Houweling TA, Taylor S. Closing the gap in a generation: health equity through action on the social determinants of health. *Lancet* 2008;372(9650):1661-9.
63. Schroeder SA. We can do better—Improving the health of the American people. *New England Journal Of Medicine* 2007;357(12):1221-1228.
64. Egerter S, Dekker M, An J, Grossman-Kahn R, Braveman P. Issue Brief 4: Work and Health. Princeton, NJ: Robert Wood Johnson Foundation; 2008.
65. Miller W, Simon P, Maleque S. *Beyond health care: New directions to a healthier America*. Washington, DC: Robert Wood Johnson Foundation Commission to Build a Healthier America; 2009.
66. PolicyLink. Bipartisan “Healthy Food Financing” Bills Would Create Jobs and Cut Childhood Obesity. 2010 December 10, 2010]; Available from: <http://www.thefoodtrust.org/pdf/HFFI%20Release.pdf>
67. Starting a Walking School Bus. Program Examples. December 22, 2010]; Available from: <http://www.walkingschoolbus.org/resources.html>
68. Farley TA, Meriwether RA, Baker ET, Watkins LT, Johnson CC, Webber LS. Safe play spaces to promote physical activity in inner-city children: results from a pilot study of an environmental intervention. *Am J Public Health* 2007;97(9):1625-31.
69. Economos CD, Hyatt RR, Goldberg JP, Must A, Naumova EN, Collins JJ, et al. A community intervention reduces BMI z-score in children: Shape Up Somerville first year results. *Obesity (Silver Spring)* 2007;15(5):1325-36.
70. Frieden TR, Mostashari F, Kerker BD, Miller N, Hajat A, Frankel M. Adult tobacco use levels after intensive tobacco control measures: New York City, 2002-2003. *Am J Public Health* 2005;95(6):1016-23.
71. Danaei G, Ding EL, Mozaffarian D, Taylor B, Rehm J, Murray CJ, et al. The preventable causes of death in the United States: comparative risk assessment of dietary, lifestyle, and metabolic risk factors. *PLoS Med* 2009;6(4):e1000058.

