

CHAPTER 10

AN EXAMPLE OF HEALTH POLICY RESEARCH

by Sarika Rane Parasuraman

Research serves to make building stones out of stumbling blocks.

—Arthur D. Little

Without action, almost 400 million people will die from chronic diseases in the next 10 years. Many of these deaths will occur prematurely, affecting families, communities and countries alike.

—Dr. Catherine Le Galès-Camus, Assistant Director-General for Noncommunicable Diseases and Mental Health, World Health Organization

LEARNING OBJECTIVES

After completing this chapter, you should be able to

- appreciate how health policy research is conducted,
- discuss the determinants of a health problem,
- identify a policy intervention to address the health problem,
- assess the policy intervention, and
- propose next steps in addressing the health problem.

This chapter presents an example of how policy analysis may be applied. It reproduces an actual qualifying examination completed by a student of the Johns Hopkins University Department of Health Policy and Management in 2006. The exam requires students to choose a current public health problem and conduct a policy analysis of it. In the course of the analysis, students must present the determinants of a health problem, identify a policy intervention to address it, assess that intervention, and propose next steps in solving the health problem.

The example is presented as follows: First, the exam questions posed to the student are provided, followed by the sample exam submission. This sample policy analysis was provided by Sarika Rane Parasuraman, a graduate student at the time of the exam's completion, and is used with permission (adapted for editorial style and with additional citations of some supporting sources published since 2006). The health problem she selected was obesity.

QUESTIONS FOR POLICY ANALYSIS

1. Briefly define the nature and scope of the public health problem chosen. Then discuss the most important individual, sociocultural, political, and economic determinants of the problem. Select what you consider to be the most important determinant or combination of determinants of the problem, and defend your choice.
2. Identify one policy intervention (e.g., changes to service delivery, prevention initiative, legislation, regulation, litigation strategy) that has been used or proposed to address the public health problem you chose. Draw from the literature, when possible, to assess the appropriateness, comprehensiveness, and effectiveness of the intervention.
3. For the sample intervention, also discuss the political and economic feasibility of implementing the policy. If considerable resources are needed to implement the program, identify the source (e.g., new taxes, fees, fines, redirected current resources).
4. For the intervention you selected, provide a summary review of previous evaluations, if available. Then you may either describe and critique an existing evaluation or suggest your own evaluation. In either case, articulate the study design, key measures, type of statistical model for your key outcome measure(s), generalizability, and notable strengths and weaknesses. Your answer should include a discussion of the strengths and weaknesses of the evaluation, including its appropriateness, the reliability and validity of key measures used, and an assessment of any threats to the validity of the findings. Be realistic in developing your evaluation plan. Do not assume unlimited resources, and be mindful of standards for ethical research with human subjects.

5. On the basis of your discussion above, propose and discuss the next steps needed in the realms of research, interventions, and policy to address the problem. Of the next steps you identify, select which, in your view, is the most important next step, and justify your choice.

POLICY ANALYSIS: RESPONSES TO EXAM QUESTIONS

QUESTION 1

Introduction

Obesity in the United States is one of the most significant public health problems facing the population. The Centers for Disease Control and Prevention (CDC) estimates that more than 36 percent of adults (aged 20 or older) living in the United States are currently considered obese, with a body mass index (BMI) of 30 or higher—a figure that has steadily risen since the late twentieth century (Ogden et al. 2014). The statistics describing children and adolescents are even more shocking. Since the late 1990s, the proportions of youth aged 6–11 and aged 12–19 who exceeded a “normal” weight had nearly doubled and tripled, respectively (Hedley et al. 2004). Although the prevalence rate has slowed in its ascent, an estimated 17 percent of children and adolescents are “overweight” (BMI for age at 95th percentile or higher)—a figure many experts consider an underestimate (Hedley et al. 2004; Ogden et al. 2016). For the purposes of this paper, *obese* or *obesity* is used to denote all overweight conditions in adults and youth.

Researchers estimate that obesity is responsible for nearly 300,000 deaths per year; this figure will likely grow as obesity prevalence continues to rise in the population (Allison et al. 1999). Obesity could soon exceed tobacco to become the leading cause of preventable morbidity and mortality in the United States (IOM 2012; Sturm and Wells 2001) and may be responsible for reversing the trend of improvements in disability among elderly Americans that began in the late twentieth century (Sturm, Ringel, and Andreyeva 2004). Nutrition, physical activity, and obesity are among the 26 leading health indicators identified by *Healthy People 2020* (HHS 2010), which reinforces the significance of obesity as a public health problem (see exhibit 10.1). Obesity is also a major risk factor for, and has been linked to, the leading causes of death and disability among Americans, including heart disease, certain cancers (particularly colon and breast cancer), stroke, diabetes, hypertension, sleep apnea, pulmonary dysfunction, osteoporosis, hypercholesterolemia, and asthma (Biener and Decker 2018; Bray 2004; National Task Force on the Prevention and Treatment of Obesity 2000; NIH 2013). Obesity experienced prior to adulthood is a significant predictor for these conditions into adulthood (Baba et al. 2007; Freedman et al. 1999; Gurnani, Birken, and Hamilton 2015; Lawlor et al. 2006; Manson et al. 2004; Yanovski and Yanovski 2003). Childhood obesity also has social and economic consequences later in life, particularly for women. One study found that women who were overweight during youth experienced low educational attainment, were less likely to be married, and had higher poverty rates

(Gortmaker et al. 1993). Obese individuals are more likely to suffer the burden of disability throughout life in terms of fewer years free from limitations in their activities of daily living (Peeters et al. 2004). In fact, obesity is a major factor in the rising economic burden on the nation's healthcare system—estimated costs in the United States total approximately \$190.2 billion in annual direct and indirect obesity-related medical expenditures (Biener and Decker 2018; Daviglus 2005).

EXHIBIT 10.1

Healthy People
2020 Objectives
Related to
Nutrition and
Weight Status in
Youth

Healthier Food Access

- NWS-1: Increase the number of states with nutrition standards for foods and beverages provided to preschool-aged children in childcare.
- NWS-2: Increase the proportion of schools that offer nutritious foods and beverages outside of school meals.
- NWS-3: Increase the number of states that have state-level policies that incentivize food retail outlets to provide foods that are encouraged by the Dietary Guidelines for Americans.
- NWS-4: (Developmental) Increase the proportion of Americans who have access to a food retail outlet that sells a variety of foods that are encouraged by the Dietary Guidelines for Americans.

Healthcare and Workplace Settings

- NWS-5: Increase the proportion of primary care physicians who regularly measure the BMI of their patients.
- NWS-6: Increase the proportion of physician office visits that include counseling or education related to nutrition or weight.

Weight Status

- NWS-10: Reduce the proportion of children and adolescents who are considered obese.
- NWS-11: (Developmental) Prevent inappropriate weight gain in youth and adults.

Food and Nutrient Consumption

- NWS-14: Increase the contribution of fruits to the diets of the population aged 2 or older.
- NWS-15: Increase the variety and contribution of vegetables to the diets of the population aged 2 or older.
- NWS-16: Increase the contribution of whole grains to the diets of the population aged 2 or older.
- NWS-17: Reduce consumption of calories from solid fats and added sugars in the population aged 2 or older.
- NWS-18: Reduce consumption of saturated fat in the population aged 2 or older.
- NWS-19: Reduce consumption of sodium in the population aged 2 or older.
- NWS-20: Increase consumption of calcium in the population aged 2 or older.

Physical Activity

- PA-3: Increase the proportion of adolescents who meet current federal physical activity guidelines for aerobic physical activity and for muscle-strengthening activity.
 - PA-4: Increase the proportion of the nation's public and private schools that require daily physical education for all students.
 - PA-5: Increase the proportion of adolescents who participate in daily school physical education.
 - PA-6: Increase regularly scheduled elementary school recess in the United States.
 - PA-7: Increase the proportion of school districts that require or recommend elementary school recess for an appropriate period of time.
 - PA-8: Increase the proportion of children and adolescents who do not exceed recommended limits for screen time.
 - PA-9: Increase the number of states with licensing regulations for physical activity provided in childcare.
 - PA-10: Increase the proportion of the nation's public and private schools that provide access to their physical activity spaces and facilities for all persons outside of normal school hours (that is, before and after the school day, on weekends, and during summer and other vacations).
 - PA-11: Increase the proportion of physician office visits that include counseling or education related to physical activity.
 - PA-13: Increase the proportion of trips made by walking.
 - PA-14: Increase the proportion of trips made by bicycling.
 - PA-15: (Developmental) Increase legislative policies for the built environment that enhance access to and availability of physical activity opportunities.
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Source: HHS (2010).

EXHIBIT 10.1

Healthy People
2020 Objectives
Related to
Nutrition and
Weight Status in
Youth
(continued)

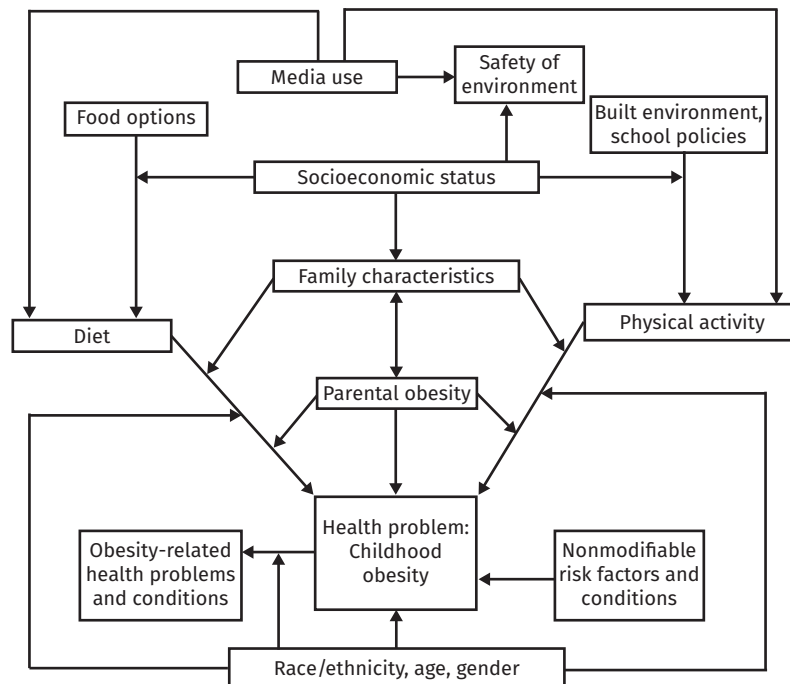
Perhaps the most alarming trends are of those conditions newly incident among youth that are traditionally associated with adulthood; for example, pediatricians now report higher incidences of asthma, hypertension, and type 2 diabetes in patients (Din-Dzietham et al. 2007; Luma and Spiotta 2006; Veugelers and Fitzgerald 2005). Obese children and adolescents also experience lower health-related quality of life than their non-overweight counterparts in the form of poor school performance, lower social functioning, poor emotional health, and depression (Sjoberg, Nilsson, and Leppert 2005; Swallen et al. 2005; Williams et al. 2005), although there is some conflicting evidence regarding these associations (Williams et al. 2005). Obesity is a psychosocial, medical, and economic threat to youth, which establishes it (specifically childhood obesity) as a significant public health problem that must be addressed.

Determinants of Obesity

The determinants attributed to childhood obesity are multifactorial and complex. A conceptual framework (exhibit 10.2) has been developed that helps categorize determinants

as proximate (biological, demographic, behavioral), midlevel distal (home, neighborhood, school), and macrolevel distal (social, political, economic). Some evidence suggests non-modifiable causes of obesity that include genetic susceptibility, endocrine disorders, maternal diabetes, and high birth weight (Farooqi and O’Rahilly 2006; Han, Lawlor, and Kim 2010; Mello, Rimm, and Studdert 2003; Plourde 2006). Having one or both parents who are obese is a strong and proven risk factor for childhood obesity and can be considered a proximate and distal determinant (Whitaker et al. 1997). The roles of age, gender, and race or ethnicity on obesity are more consistently proven at the population level, although the exact causal mechanisms are not completely understood (Han, Lawlor, and Kim 2010; Hedley et al. 2004). The prevalence figures between males and females slightly differ. Although in recent years only males have exhibited a significant increase in obesity prevalence, females are more likely to suffer extreme obesity (Manson et al. 2004; Ogden et al. 2016). Significant differences in obesity prevalence by race or ethnicity have persisted over the years. In general, obesity is more prevalent among males and females in minority groups, but gender acts as a modifier of the relationship between race or ethnicity and obesity (Freedman et al. 2006; Ogden et al. 2016).

EXHIBIT 10.2
Conceptual Model
of Proximate
and Distal
Determinants of
Childhood Obesity



Note: Proximate determinants = race/ethnicity, age, gender, unmodifiable risk factors and conditions, diet, physical activity, family characteristics, parental obesity, and media use. Midlevel distal determinants = safety of environment, built environment, and food options. Macrolevel distal determinants = socioeconomic status and school policies.

Proximate determinants also include behaviors, habits, and other lifestyle choices of the individual. Experts generally agree that childhood obesity mostly results from caloric intake in excess of physical activity; as previously shown, this relationship is confounded by nonmodifiable determinants. Thus, the two major behavioral determinants of childhood obesity are physical activity and dietary choices. Both factors are included in the top health indicators identified in *Healthy People 2020* (HHS 2010) and are the focus of a call to action by the US surgeon general (HHS 2001). Just 22 percent of youth aged 6–19 achieve the recommended amount of moderate-to-vigorous physical activity as recommended (National Physical Activity Plan Alliance 2016). Although about 50 percent are enrolled in physical education classes in schools, less than 30 percent regularly attend these classes (Grunbaum et al. 2004). Inadequate physical activity is an undisputed determinant linked to requisite energy expenditure, childhood obesity, and the development of obesity-related health conditions (Duke, Huhman, and Heitzler 2003; Grunbaum et al. 2004; HHS 2001; Plourde 2006; Schneider 2000). Similarly, an unhealthy diet is a proven determinant of childhood obesity (HHS 2001; Mello, Rimm, and Studdert 2003; Schneider 2000), although evidence is mixed regarding whether childhood obesity is due to excessive fat intake or excessive carbohydrate intake (Plourde 2006; Whitaker et al. 1997). One study found a dose–response relationship between the consumption of sugar-sweetened drinks and BMI in children and adolescents (Ludwig, Peterson, and Gortmaker 2001). Although consumption of fruits and vegetables has improved in the twenty-first century, most youth do not consume the CDC’s recommended amount of fruits and vegetables (Grunbaum et al. 2004; Kim et al. 2014). Both age and gender are modifying determinants between the aforementioned behavioral choices. Males are more likely to regularly engage in vigorous or moderate physical activity; in contrast, females are more likely to engage in risky behaviors aimed at trying to lose or keep from gaining weight (Grunbaum et al. 2004). The role of media use, particularly screen time and television viewing, has been shown to be a determinant of obesity in children by some researchers (Dietz and Gortmaker 1985; Epstein et al. 2008), yet others have failed to prove such associations (Burdette and Whitaker 2005). Some researchers have proven an association between television use and sedentary lifestyles, reduced intake of fruits and vegetables, and reduced participation in organized sports (Boynton-Jarrett et al. 2003; Dietz and Gortmaker 1985; Robinson 2001). One early study found a dose–response relationship whereby incrementally decreasing television viewing was associated with decreasing BMI in youth (Dietz and Gortmaker 1985). A link between food choices and marketing of high-calorie food and beverages to youth on television has been posited, but little empirical evidence has emerged to support it. Finally, one study showed parental obesity to be a modifier between television use and obesity (Vandewater and Huang 2006), while another showed neighborhood safety to be significantly linked to television use but not directly to obesity (Burdette and Whitaker 2005).

Midlevel distal determinants include home, neighborhood, and school environments. The home environment includes family characteristics such as emotional well-being, marital

status, and cognitive stimulation. One study quantified these home environment characteristics into one standardized measure and showed that low-scoring youth were at greater risk of developing obesity than their high-scoring counterparts (Strauss and Knight 1999). Parental obesity is a relevant determinant in this category as well (recall that it was also categorized as a personal characteristic due to a possible heritable trait of obesity). Parental obesity can interact with family characteristics (e.g., marital status, emotional well-being in the home) and can also modify the behaviors of children by influencing lifestyle choices (Whitaker et al. 1997). Neighborhood characteristics are broad and include walkability, the presence of recreational facilities, number of mobility options, food choices (markets or fast-food restaurants), and other traits of the built environment (Sallis et al. 2018). Neighborhood safety has been previously discussed, with an unproven direct link to inactivity (Burdette and Whitaker 2005). All have been linked to either sedentary lifestyles (Gordon-Larsen et al. 2006; Merchant et al. 2007; Nelson 2006) or unhealthy diets (Merchant et al. 2007; Nelson 2006; Nielsen 2002; Strauss and Knight 1999) in children, although the causal link to obesity is precarious (Merchant et al. 2007; Nelson 2006). Finally, school policies have been linked to an increasing prevalence of childhood obesity, most notably loosening standards for foods served in school cafeterias, the presence of vending machines that offer snacks and drinks with little nutritional value, and physical education requirements that are either not required or unenforced (Trust for America's Health 2005). To date, no federal laws mandate either physical education or school nutrition requirements, and state mandates vary.

Finally, macrolevel distal determinants affect childhood obesity and include socioeconomic status (SES) as measured by income, education, and occupation. The relationship between SES and obesity is complex, and an inverse relationship between SES and BMI has been empirically determined in a number of studies (Janssen et al. 2006; Marmot and Wilkinson 2006; Stunkard and Sorenson 1993). SES and the behavioral risk factors of sedentary lifestyle, unhealthy diet, and inadequate physical activity have also been linked. However, the status of SES as a direct predictor of obesity in any of these cases is intuitively questionable (Adler and Ostrove 1999; Janssen et al. 2006; Marmot and Wilkinson 2006). Experts have attempted to consolidate these factors to state that SES is likely an important modifying determinant affecting the link between home or neighborhood environment and behavioral or lifestyle determinants (Janssen et al. 2006; Marmot and Wilkinson 2006; Stunkard and Sorenson 1993). For example, SES could affect access to recreational facilities or various food options. Finally, SES is significantly associated with both family characteristics and neighborhood safety (Boynton-Jarrett et al. 2003; Gordon-Larsen et al. 2006).

Most Significant Determinant of Obesity

It is clear that behavioral and lifestyle choices of youth are the most important determinants of childhood obesity. Direct causal links between physical activity, diet, and childhood obesity have been consistently proven in the literature. Moreover, a dose-response relationship

exists between physical activity and BMI; moderate physical activity results in lower BMI and a decrease in risk factor status for several obesity-related conditions, and this effect is stronger after consistent vigorous physical activity. Studies also show that lifestyle habits begun during youth are likely to be continued into adulthood (Rhodes, MacDonald, and McKay 2006). Although the interaction of several more distal determinants is linked to the aforementioned primary relationships (acting to facilitate, inhibit, or confound the relationships), their association is complex and likely affected by a host of additional confounding or mediating determinants that are beyond the scope of this paper. In this regard, the literature can be considered limited.

A final reason that inadequate physical activity and unhealthy diets may be considered major determinants of childhood obesity is that they are highly actionable. As previously mentioned, many lifestyle habits begun in childhood are continued into adulthood. Primary prevention interventions that address these two determinants and affect the decision-making process of youth could have the most profound impact on reducing the prevalence of childhood obesity, regardless of intervening factors or barriers that may exist in the environment (Daviglius 2005; Nelson 2006). Recognizing that activity and diet directly affect childhood obesity, the federal government has deemed them important, actionable health areas (HHS 2010) and centerpieces of major policy objectives to reduce obesity among children and adolescents (HHS 2001).

QUESTION 2

Selection of the Intervention

A hallmark of public health practice is the planning and implementation of interventions aimed at preventing a health problem. The Question 1 analysis shows that childhood obesity is a complex problem, and the major (and most actionable) determinants are those categorized as behaviors or lifestyle choices. Evidence reveals direct relationships between inadequate physical activity and unhealthy diets and childhood obesity. Because habits established during youth are likely to continue into adulthood (Rhodes, MacDonald, and McKay 2006), interventions for the primary prevention of obesity that seek to alter these risky behaviors and encourage youth to make positive and healthy lifestyle choices are most appropriate for addressing the major determinants of childhood obesity (Schneider 2000). In fact, evidence suggests that interventions aimed at behavioral modification may be more effective with youth than with adults (Yanovski and Yanovski 2003).

Schools are an ideal setting in which to administer primary obesity prevention interventions. An estimated 58 million children and adolescents attend more than 98,000 schools throughout the year (US Census Bureau 2017), so school-based interventions can reach a wide array of students. Randomized controlled trials that evaluate interventions have found that health education administered in schools can reduce risky behaviors among students, such as smoking, alcohol use, and substance abuse—behaviors that are clear determinants of adult chronic diseases (Fisher et al. 2007). Dietary and activity habits can be potentially

risky behaviors established during school-age years (Edmunds, Waters, and Elliot 2001). Studies have underscored the potential strength of coordinated health education approaches to address childhood obesity in schools (HHS 2001; Nelson 2006; Veugelers and Fitzgerald 2005).

Clearly, childhood obesity is a salient issue, and schools are ideal settings for health education interventions; however, current results from school-based interventions are mixed. Most only show modest behavioral modifications and uneven results with regard to obesity and BMI levels. This paper considered only programs shown to be partially effective (exhibit 10.3); Planet Health is currently one of the most effective examples of such a program.

EXHIBIT 10.3

School-Based
Interventions
Considered in
Addition to Planet
Health

Child and Adolescent Trial for Cardiovascular Health (CATCH)

As described by Luepker et al. (1996), CATCH was a comprehensive, three-year, school-based health behavior intervention targeted toward elementary school students and aimed at the primary prevention of cardiovascular disease. Program components encompassed the elementary school environment, classroom curricula, and home programs. The pilot incorporated the program through 56 intervention schools (with 40 control schools), involving more than 5,000 ethnically diverse third, fourth, and fifth graders in California, Louisiana, Minnesota, and Texas. Although the program appeared to somewhat improve the behaviors of students and lower cardiovascular risk, it did not significantly affect obesity.

Wellness, Academics & You (WAY)

As reported by Spiegel (2006), WAY is a multidisciplinary, elementary school-based intervention focused on fourth and fifth graders. The pilot was conducted in four states (Delaware, Florida, Kansas, and North Carolina) and comprised more than 1,000 students in 16 schools. WAY aims to reduce obesity and its concomitant diseases as well as improve academic performance. The program incorporates health content in the existing academic curriculum through rigorous and extensive modules led by teachers. It also includes activities that involve parents and families. The main areas of intended impact are obesity, fruit/vegetable consumption, and physical activity. The program showed significant changes in students' BMI and healthy food consumption, although its rigorous nature and costs are challenges to widespread implementation.

Pathways

As described by Sharma (2006), Pathways is a two-year school-based intervention aimed at American Indian elementary school students in third through fifth grades. The program's aim is to develop and implement an intervention to prevent obesity, promote healthy eating behaviors, and increase physical activity. It incorporates a classroom curriculum, encourages physical activity, instituted food preparation and service modifications, and includes an extensive family support component. To date, the intervention has produced significant changes in students' attitudes and behaviors but no significant changes related to obesity. Furthermore, because the program's components are specific to the needs and background of American Indians, its widespread implementation and generalizability are limited.

Planet Health is a unique and ideal intervention to examine, mainly because it incorporates comprehensive health education into the standard academic curriculum. The program was applied to a broad sample of schools and among students of all demographic backgrounds. It also includes a component targeted to reducing television viewing among youth—a study outcome that had not been examined by other researchers or evaluators at the time of the pilot program. Thus, Planet Health addresses the two major determinants of childhood obesity, physical activity and diet, plus the third determinant of television viewing, which, while more distal, is likely an important secondary, modifiable behavior and risk factor for obesity in youth that is worth incorporating into health education programs (Katz et al. 2005).

Description of the Intervention

Planet Health is an interdisciplinary program that is school based, incorporating health education into the regular, existing academic curriculum. Planet Health was developed through the Harvard Prevention Research Center on Nutrition and Physical Activity and was originally supported by the National Institute of Child Health and Human Development in 1995 as a pilot program in ten Boston public middle schools among sixth and seventh graders. After the initial success of the program, Boston Public Schools partnered with Planet Health researchers in 2002 to expand the pilot to 12 additional Boston middle schools. Further success of the program caught the interest of state decision makers, and in 2004, BlueCross BlueShield of Massachusetts partnered with Planet Health to implement the program statewide, expanding it to include after-school programs. At the time of this writing, 48 states and 20 countries have demonstrated interest in learning more about the program (Franks et al. 2007). The main goal of the program is to lower the prevalence of obesity among middle-school students and is largely based on social cognitive theory (Gortmaker et al. 1999). The objectives of Planet Health are as follows: (1) reduce television viewing time (i.e., decrease sedentary behavior), (2) decrease consumption of unhealthy food choices, (3) increase consumption of healthy food choices, and (4) increase physical activity.

The program includes teacher training, as teachers in schools administer the program; classroom lessons in math, science, language arts, and social studies; a “media-reduction campaign”; physical education units; and wellness sessions for teachers. Classroom sessions are delivered over two years (the time duration a typical child spends attending a Boston public middle school). Sixteen sessions per year are conducted during 30- or 45-minute class periods. The time duration for teacher training is typically two to three hours. Planet Health program materials can be ordered through the program’s website (Harvard T. H. Chan School of Public Health 2018).

Analysis of the Intervention

It is important to first consider the appropriateness of Planet Health. The program focuses on four behavioral objectives in physical activity and diet. Health education is incorporated into

32 regular classroom lessons. Additionally, teachers lead 30 physical education “microunits” with activity and inactivity themes. Thus, Planet Health is consistent with the primary determinants identified in Question 1. The intervention also addresses television viewing with a two-week lesson entitled “Power Down,” which focuses on reducing TV use to increase activity time. Planet Health is based on social cognitive theory, a framework that models behavior change as resulting from dynamics between psychosocial factors and individual characteristics (Glanz, Rimer, and Lewis 2002). The program encourages students to work together in the modeling and practice of decision making and gives them confidence to perform behaviors with reinforcement by peers and teachers, the power of self-determination by imparting cognitive skills to alter risky behaviors, and time for self-reflection of new behaviors (Glanz, Rimer, and Lewis 2002; Gortmaker et al. 1999).

Planet Health is also appropriate when considering the participants’ demographics. First, research has shown that poor eating habits, sedentary lifestyles, and even binge eating and dieting are solidified during middle childhood (Edmunds, Waters, and Elliott 2001; Tanofsky-Kraff et al. 2006). These findings indicate that the initiation of Planet Health in middle schools serves an appropriate target population of students. Furthermore, Planet Health meets standards upheld by the Massachusetts Curriculum Framework; because the program is interwoven with the standard academic curriculums, it is grade appropriate and accounts for the varying competency levels of children during middle childhood (Gortmaker et al. 1999). Studies suggest that sustained results from school-based obesity programs often originate from those focused on preadolescents, which is one potential weakness of Planet Health (although the program is being expanded to fourth and fifth graders in Massachusetts). A further weakness of the program is its lack of gender specificity. Statistics suggest that young females have different personal attitudes and sociocultural pressures than young males regarding body image and self-esteem (Grunbaum et al. 2004); the broad-based approach of Planet Health may not address such gender differences. Similarly, Planet Health does not contain educational components that are specific to minority groups who have differing levels of obesity risk (Ogden et al. 2016). Finally, a strength of Planet Health is its even application throughout most school populations, which contain both overweight students and students with normal BMI. The premise for this application lies in social cognitive theory, which espouses a population-based approach (combined with an individual approach) to effect change. Obesity, particularly among youth, often results in stigmatization and low self-esteem (Latner, Stunkard, and Wilson 2005), but Planet Health’s approach avoids such stigmatization.

An assessment of Planet Health’s comprehensiveness overlaps with the appropriateness analysis in terms of the target population’s characteristics (i.e., age, gender, and race or ethnicity) and the breadth of obesity-related determinants it addresses. To that end, two weaknesses exist. First, the program does not attempt to address socioeconomic determinants of obesity. SES is a complex and distal determinant; the efficacy of actionable strategies that alter its relationship with obesity is tenuous. However, the literature does suggest the

utility of school-based interventions prioritized for low-SES youth (Veugeliers and Fitzgerald 2005). Furthermore, parental involvement in obesity interventions can greatly enhance the effectiveness and sustainability of behaviors, including activity levels and television viewing (Vandewater and Huang 2006; Yanovski and Yanovski 2003). The framework outlined in Question 1 identifies the moderating role of family (under family characteristics) in the relationships between physical activity, diet, and obesity. Several voluntary Planet Health lessons provide opportunities for parents and family members to participate. A strength of Planet Health with regard to comprehensiveness is its strategy of incorporating health education into existing academic frameworks. Additionally, the entire school and all teachers are actively involved in designing and implementing Planet Health into the curriculum. Thus, Planet Health is comprehensive in that it imparts a holistic, pedagogical approach to obesity-related health education within the target setting of schools that is widely recommended (Brener et al. 2006; HHS 2001, 2010).

To date, credible evaluations of Planet Health that report the program as effective in achieving its objectives and goals are limited. The most widely cited evaluation was conducted by program researchers during the pilot program from 1995 to 1997 (Gortmaker et al. 1999). It was a randomized controlled trial evaluating the curriculum and outcomes of the Planet Health program in ten Boston public middle schools. Students participated in the full Planet Health curriculum and were evaluated using BMI measurements, body assessments, and a food and activity survey. The evaluation found that only the amount of television viewing was reduced in both boys and girls of the intervention schools (versus control schools). The following significant outcomes were shown *only* among girls in the intervention schools: decrease in obesity prevalence, increase in consumption of fruits or vegetables, and reduction in dietary energy intake. There were no significant outcome differences among males. This evaluation is unique because it was randomized, involved a broad base of study participants, and assessed behaviors (a somewhat subjective measure) and BMI (an objective measure). Thus, this evaluation is the most useful to analyze.

A three-year diffusion analysis of this benchmark evaluation to investigate its feasibility, acceptability, and sustainability was conducted among six Boston public middle schools (Wiecha et al. 2004). During the evaluation, teachers attended training workshops on Planet Health and received instruction from trained program professionals. A majority of teachers found the curriculum to be acceptable and indicated that they would continue to use it in classrooms. Additionally, more than 90 percent found the curriculum effective and an asset to school curricula. A major weakness of this evaluation was its descriptive nature and small sample size, which prevented statistically significant assertions or power assurances. The study also depended on teacher self-report, which may have resulted in overestimates. Finally, the generalizability of the methods is questionable.

Finally, a small, two-year outcome evaluation of Planet Health was conducted in an Indiana middle school among seventh and eighth graders (Bai et al. 2006). The Planet Health curriculum was implemented in the intervention school and no intervention was

administered to the control school. The School Physical Activity and Nutrition questionnaire was administered by the researchers conducting the program evaluation to students during pre- and postintervention periods in both schools. The evaluation reported a significant decrease among all students in fat and soda intake and reduced television viewing; however, no significant change was seen in fruit or vegetable consumption or physical activity promotion. This evaluation is weakened by its small size and scope (involving only two middle schools). Furthermore, the full reliance on a self-report questionnaire by students only allows analysis of behavioral change, rather than the associated health outcome of obesity.

QUESTION 3

Organization and Financing of the Intervention

Planet Health was originally funded with grants from the National Institutes of Health (NIH) and CDC Prevention Research Centers and a monetary gift from the Harvard School of Public Health (Glanz, Rimer, and Lewis 2002). This funding helped develop the Planet Health curriculum, implement the program as a pilot, and support the subsequent benchmark randomized controlled trial study. In 2002, the US Department of Education's Physical Education for Progress grant program funded a diffusion study to assess the feasibility and sustainability of the program. Results showed the Planet Health curriculum to be effective and positively viewed by teachers. Independent funding supported further efforts to expand and sustain the program in Boston schools (Glanz, Rimer, and Lewis 2002). In 2004, BlueCross BlueShield of Massachusetts announced that it would provide \$3 million over four years to Massachusetts middle schools to implement and expand Planet Health programs.

The US federal government is committed to supporting initiatives aimed at childhood obesity (HHS 2001, 2010; IOM 2012; National Task Force on the Prevention and Treatment of Obesity 2000). Several agencies provide avenues for obtaining funding, including the departments of Agriculture, Health and Human Services, and Education; CDC; and NIH. Federal support for obesity prevention, in the form of "chronic disease funding" and "prevention and public health," is largely distributed through state grants from the CDC National Center for Chronic Disease Prevention and Health Promotion.

Federal agencies often partner with public and private organizations to support obesity initiatives, as in the case of Planet Health and its grant from BlueCross BlueShield. Such collaborations allow different stakeholders to become engaged in the program and provide promising sources of funding for schools to implement Planet Health. Initial implementation of Planet Health's pilots was successful in assessing positive outcomes, suggesting that schools may not face onerous barriers in obtaining such funding. The fact that more than 5,000 copies of the program's textbook have been purchased by 48 states and 20 countries speaks to the large-scale implementation possibilities (Harvard T. H. Chan School of Public Health 2018).

Economic Feasibility

It is important to consider the economic feasibility of implementing Planet Health in a school or school system. Avenues to obtain federal support exist, particularly considering that the program's efficacy and effectiveness have been proven through evidence-based techniques. States face rising healthcare costs partly due to a rising prevalence of obesity and its concomitant conditions; more than 25 percent of growth in total US healthcare spending over a 15-year period was estimated to be attributable to obesity (Finkelstein, Fiebelkorn, and Wang 2003). An increased prevalence of childhood obesity could have profound implications on future state healthcare spending because obese individuals incur higher medical costs and have decreased quality of life compared with their nonobese counterparts (Thorpe et al. 2004). Hospital costs associated with obesity have risen nearly threefold since the 1990s for youth aged 6–17 years and are largely borne by states or private insurers (Wang and Dietz 2002). These figures, while staggering, do not include intangible costs such as school absenteeism or missed days of work. Clearly, states could benefit on many levels from widespread implementation of Planet Health in schools to reduce the burden of obesity among youth and the state's future population.

Programs and policies instituted by states are not always implemented to an equal or appropriate degree by schools. Physical education requirements and school nutrition mandates are two such programs for several reasons. Schools throughout a state often serve diverse populations with a variety of backgrounds and needs. Schools in the inner city or a rural locale may serve children of lower SES, minority students, and others who are prone to risky behaviors. Furthermore, such schools may be unable to allocate limited budgets to implementing Planet Health, purchasing didactic materials for the program, or paying for teacher training and time away from the classroom. Finally, schools may worry that funding to support activities beyond the initial program implementation would be unstable and difficult to obtain.

In 2003, independent researchers conducted a cost–benefit analysis of the first randomized pilot of Planet Health (Wang et al. 2003). To date, this analysis is the only one to formally evaluate a health promotion program aimed at reducing obesity. Its strength is that it considers the benefits of Planet Health from a population perspective rather than on an individual level. The outcomes assessed were cases of adulthood obesity prevented and quality-adjusted life years saved. Tangible program costs were assessed. Due to the seamless coordination of Planet Health with existing academic curricula, additional classroom costs (monetary costs and time) are minimal. The requisite curriculum book is priced at about \$45 [in 2007; \$68 in 2018] and includes lesson plans, micro units, the Power Down campaign, and the FitCheck self-assessment tool (Human Kinetics 2018). Wang and colleagues (2003) estimated that the program cost per student per year was \$14; the program could save approximately \$1.20 in medical costs and lost wages for every \$1 spent. Given that states and schools have finite monetary resources, the preceding economic analysis shows that implementing Planet Health would be an “effective use of available resources

and should be included in [school] portfolios” (Wang et al. 2003). However, during times of tight budgets, weak academic performance standards, or economic downturns, schools may not choose to prioritize health education or accept the relatively low program costs. Planet Health must be in part financially supported at the district, county, or state level.

Administrative Feasibility

An assessment of administrative feasibility naturally follows economic feasibility. Schools have varying levels of curriculum competencies and may face challenges in implementing Planet Health—particularly if they have little prior experience with interdisciplinary curricula or substandard existing academic curricula (Gortmaker et al. 1999). Teachers can incorporate Planet Health components in a piecemeal fashion or teach lessons in varying degrees of detail, but these approaches may compromise program efficacy. Teachers also vary in teaching competencies, and the average training time may be insufficient for those needing additional support. A strength of the program is that teachers are responsible for program implementation and administration, and they tailor Planet Health materials to their schools and classrooms. However, if the school itself is experiencing overall staffing shortages, administration of Planet Health could be threatened. The cost of teacher training is mostly a onetime cost, as teachers could pass on material and knowledge as soon as they were properly trained and knowledgeable—and could volunteer if they believe it has a positive effect on students (Wiecha et al. 2004). Planet Health requires every participating teacher to use the program book (Human Kinetics 2018), but schools may not be willing or able to purchase many books. However, one book can be purchased and shared between teachers or school districts, with the only cost being the copying of materials. The technological requirements are minimal (a computer or an overhead projector for presentations during teacher training) for Planet Health and could be borrowed. Finally, because the program is diffused over the course of two years, it is not overly burdensome to deliver or administer.

Some administrative burden is placed on the human resources component associated with Planet Health. Teachers may not have the time to undergo training, although the time is designed to be minimal (an average of two to three hours). They must also spend time incorporating Planet Health components into their regular academic lessons (on the other hand, this could allow for creative adaptations). Teachers also have the option of self-training, although key components of teacher training are group activities, discussion, and expert training. They may be reluctant to participate in the voluntary program. A stipend was provided to teachers throughout the pilot program; however, schools may not be able to provide such monetary incentives even with additional funding from outside sources. School administrators could explore nonmonetary incentives to offer (e.g., the optional wellness program). Overall, Planet Health has a moderately high level of administrative feasibility and allows schools to try creative or collaborative solutions to the aforementioned challenges they may face.

Political Feasibility

A final analysis of political feasibility is critical before overall feasibility and implementation can be judged. The political environment is generally supportive of programs aimed to reduce childhood obesity. First, the American public believes obesity to be a serious health concern facing children and adolescents. A recent nationally representative survey suggests that a majority of Americans ascribe responsibility to schools with regard to addressing obesity; most also believe that it is the government's responsibility to help support health promotion programs aimed at obesity (Evans 2005). Further, the program is socially acceptable because it incurs minimal costs to the public and offers proven benefits (Lakdawalla, Goldman, and Shang 2005). Additional supportive stakeholders include teachers and other school administrators, community groups, family members, advocacy agencies, community healthcare providers, and private and public insurers. The cost-effectiveness of Planet Health's broad and local implementation was previously outlined, but it becomes even more striking when considered against the backdrop of costs to the federal healthcare system, which will escalate because the deleterious effects of obesity will soon eclipse those from smoking and problem drinking (Lakdawalla, Goldman, and Shang 2005; Sturm 2002). Planet Health implementation could reduce costs to the federal government and taxpayers.

Several federal agencies already support initiatives targeting childhood obesity. Some federal lawmakers have championed the issue and pushed it onto Congress's agenda with the introduction of various pieces of legislation; such bills offer comprehensive approaches to prevention but have been slow to garner attention. State-level policies are similarly slow to develop. A critical point is thus revealed: Planet Health, which is evidence based, generally feasible in its implementation and delivery, cost-effective, and socially acceptable, presents a unique alternative that is palatable to a wide range of stakeholders. This point demonstrates the unique role of what Kingdon (2011) terms *specialists*—hidden participants in the generation of policy or program alternatives who are often responsible for unique yet grounded ideas. Lawmakers may view policies structured in a similar manner as Planet Health to be characterized as “client politics”—politically attractive to lawmakers on both sides of the aisle, large in scope, having one or more clear and measured objectives, and targeting a group deemed deserving (Oliver 2006). The ultimate political success of Planet Health lies in the formation of coalition groups comprising a wide array of stakeholders; such collaborations would increase buy-in to the program, enable the generation of creative strategies and solutions that are personalized to the community's needs, and encourage program sustainability.

QUESTION 4

Selection of the Evaluation

For one main reason, few outcome evaluations of Planet Health exist. As outlined in Question 3, conducting outcome evaluations is a challenge for many schools with limited human and financial resources or expertise. One evaluation was a diffusion analysis aimed at evaluating

feasibility, acceptability, and sustainability of Planet Health. The descriptive study used a relatively small sample size (Wiecha et al. 2004). Another evaluation was performed between two Indiana middle schools using a quasi-experimental design but was small in sample size and collected data completely through self-report questionnaires from students (Bai et al. 2006).

The evaluation chosen avoids many of these weaknesses (Gortmaker et al. 1999). When it was conducted, little evidence showed a causal link between program objectives, target behaviors, and obesity. In addition, few studies had been conducted on school-based interventions for broad populations of adolescents (such studies were mostly on obese or high-risk individuals). The evaluation used a population deemed demographically and ethnically diverse. Its objective was to evaluate the impact of Planet Health on obesity among boys and girls in grades 6–8. Completion of this evaluation produced a benchmark that is widely used in the implementation of Planet Health and related programs.

Study Design

As shown in exhibit 10.4, this evaluation employed a randomized pretest–posttest control group experimental design (Gliner and Morgan 2000). At the start in 1995, schools were matched by town, or school size and ethnic composition, after which ten schools from four communities were randomly assigned as either intervention or control schools. The Planet Health curriculum was administered to students whose school enrollments in grades 6 or 7 began in fall 1995. Intervention school students received two years of Planet Health teaching within schools. In contrast, control schools did not receive the Planet Health curriculum—they only received the standard health education and/or existing physical education classes.

EXHIBIT 10.4
Study Design of
Planet Health

Randomized experimental design: Pretest–posttest control design				
Assignment	Group	Fall 1995 (pretest)	I.V.	Spring 1997 (posttest)
R	E:	O ₁	X	O ₃
R	C:	O ₂	~X	O ₄

Key

- I.V. = Active independent variable
- R = Random
- E: = Experimental/intervention group
- C: = Control or comparison group
- O = Observation/measurement (anthropometric and behavioral assessments)
- X = Intervention (Planet Health)
- ~X = Control or other treatment

Baseline data were collected in fall 1995 and follow-up data were collected in spring 1997. Planet Health didactic materials were provided to each teacher in the intervention schools, and the curriculum was applied during teacher trainings, classroom lessons, and other activities.

Study Population

The target or theoretical population from which researchers hoped to generalize results included all male and female students in grades 6–8. Researchers recruited schools to participate, choosing them on the basis of their willingness to implement the classroom or physical education curriculum, understanding of possible random assignment to a control or intervention group, and having an ethnically diverse student body. A cluster sampling technique was employed—schools were first matched in a nonrandom way and later randomly assigned to a study group. The selected sample had divided ten schools into an intervention group ($NI = 5$) and a control group ($NC = 5$). Students within each school (cluster) were not randomized. The study sample was an appropriate target for the intervention.

This study met ethical considerations to ensure protection of study participants and was approved by the Committee on Human Subjects at the Harvard School of Public Health. Five schools used active informed consent, which required parents to return a consent form indicating whether they wanted the child to participate. The other five schools used passive consent; parents had to sign and return a form only if they did *not* want their child to participate. Forms originally written in English were also translated into seven other languages to accommodate the schools' multiethnic compositions.

Researchers collected baseline data from 1,560 students after considering exclusion criteria; sample size calculations for precision were not performed. Students were excluded if they had transferred schools during 1995, attended special education classes, or were in a grade that would not have been expected for their age (either skipped a grade or were held back). Baseline analysis showed that the intervention and control students were similar in terms of gender, age, and ethnic composition.

Key Measures

Several types of variables and measures were used in this analysis (see exhibit 10.5 for variable analysis and measure assessment). The active independent variable was the Planet Health intervention. Attribute independent variables were assessed by program staff and included age, sex, and race or ethnicity. Dependent variables included BMI (as a function of height and weight), triceps skinfold (TSF), amount of television and video viewing, moderate or vigorous physical activity levels, intake of fruits and vegetables, proportion of energy from total fat versus saturated fat, and total energy intake. Several measures were used to assess these variables, including assessment by program staff and student self-report on a food and activity survey.

EXHIBIT 10.5
Key Variables and
Measures

Category of variable	Variables	Levels of measures	Data collection (instruments, etc.)	Instrument and measure assessment
(1) Attribute independent variables	Age (years)	Continuous	Calculated by program staff on the basis of birthdate and date of baseline examination.	Generally reliable; in cases of missing birthdate, data from the Food and Activity Survey were used (questionable reliability).
	Sex (M/F)	Dichotomous, categorical	Classified by program staff during baseline examination.	Reliable; in cases of missing data, data from school records were obtained.
	Race/ethnicity (white, African American, Hispanic, Asian/Pacific Islander, other)	Nominal, categorical	Reported by students; based on responses to baseline surveys.	Generally reliable, although weakened because of reliance on self-reporting and student discretion.
(2) Active independent variable	Planet Health intervention	N/A	N/A	Not available at time of evaluation.
(3) Dependent variables	BMI (kg/m ²)*	Continuous	Height and weight were obtained by program staff. Height was measured using a Shorr stadiometer; weight was measured using a calibrated electronic scale.	The electronic scale for measuring weight was calibrated using a standard test. It is unclear whether the instrument used to measure height was calibrated.
	TSF (mm)	Continuous	Program staff measured TSF using Holtain calipers.	Measurements of TSF were performed twice to ensure precision. When measurements differed substantially, an average measure was calculated.
	Television and video viewing (hours/day)	Continuous	Students answered 11 questions pertaining to a television and video measure.	The study cited high test-retest reliability of youth self-reports for television viewing.
	Moderate and vigorous physical activity levels (hours/day)	Continuous	Students answered 16 questions on a youth activity questionnaire.	The questionnaire was excerpted from a larger survey that had been proven reliable and valid in adults only.

(3) Dependent variables (<i>continued</i>)	Intake of fruits and vegetables (servings/day)	Continuous	Students answered questions on a youth food frequency questionnaire.	The questionnaire was excerpted from a larger survey that had been validated for use in ethnically and socio-economically diverse populations. It is unclear whether validation occurred only among children.
	Proportion of energy from fat and saturated fat (%)	Continuous		
	Total energy intake (kJ/day)	Continuous		
	Dieting to lose weight (%)	Continuous	Students answered questions on the Food and Activity Survey related to these measures.	These questions were adapted from the Youth Risk Behavior Surveillance Survey (YRBSS), which is widely recognized and used among youth. The measures used in the YRBSS have been shown to be associated with obesity in youth (Grunbaum et al. 2004).
	Exercising to lose weight (%)	Continuous		
	Vomiting/taking laxatives to lose weight (%)	Continuous		
	Taking diet pills to lose weight (%)	Continuous		

BMI = body mass index; TSF = triceps skinfold

*BMI has high specificity but low sensitivity for identifying adolescents who are overweight or obese. BMI has a high degree of correlation with laboratory measures of body fat composition but may differ by age, sex, and race or ethnicity. The use of BMI alone is also weak because it does not account for an individual's body frame size (Freedman et al. 2006).

The main outcome measure was obesity, defined as a “BMI and TSF measure greater than or equal to the 85th percentile of age- and sex-specific reference data” (Gortmaker et al. 1999). Researchers cited limitations in previous obesity assessment using solely BMI or TSF (refer back to exhibit 10.5) and chose to use this definition to ensure methodological soundness. Baseline data to assess demographics, anthropometry, and diet and activity were collected in fall 1995 from students in both intervention and control schools. Follow-up data on anthropometry and diet and activity were collected in spring 1997 from students in both intervention and control schools.

Analytic Strategy

Researchers employed the generalized estimating equation regression method (Zeger and Liang 1986) to adjust for individual-level confounders within clusters (schools) and account for correlations between responses within schools. The generalized estimating equation is an appropriate regression model to use because it works well in analyses of multivariate, longitudinal data; assumes independence of between-cluster responses; assumes that a correlation pattern exists within cluster responses; and can control for the matched-pair

EXHIBIT 10.5

Key Variables and Measures
(*continued*)

design of this study. Researchers also accounted for school matching by including indicator variables in the regression analysis to represent randomization pairs. A further strength of the strategy used by Zeger and Liang (1986) was that it accounted for differences between boys and girls—running separate regressions by gender. The following variables were controlled for in the regression models: race or ethnicity, age, BMI, TSE, intervention status, and randomization pair indicators.

Regression analyses were run not only to predict changes in behavioral measures but also to assess to what level the intervention could be attributed to significant changes in behavior. Neither power calculations to ensure sufficient ability to detect statistical change nor α and β levels were reported in the analysis.

Threats to Internal Validity

The randomized design granted a high degree of internal validity to this study, which helped ensure that any observed outcomes were actually due to the active independent variables. Researchers controlled for most threats to internal validity by ensuring equivalence of intervention and control schools through their particular sampling methods and assessment of baseline characteristics. Regarding instrumentation, steps were taken for all measures to ensure measurement validity and reliability, through proper calibration of instruments or objective survey results assessment (i.e., Scantron). Randomization averted threats from regression—groups were similar throughout the study and did not appear to have extreme characteristics at the outset—and selection bias in this study. (An additional note: Neither schools nor students self-selected into either group.) Attrition initially appeared to be a threat. At baseline, the participation rate of students was 65 percent; rates were lower at follow-up due to school transfers, school absences during data-collection times, or refusal to participate. However, participation rates at test points were similar between intervention and control schools, suggesting that any effects from attrition are likely to be controlled in the study.

Because this was a field-based design, particularly one being conducted in schools, researchers had a low level of control over extraneous variables in the students' environment (Gliner and Morgan 2000). Although Planet Health's ultimate goal is to enable adolescents to make healthy choices in any scenario, the lack of control for such factors in the analysis threatened internal validity. As an example, a major advocacy group could have launched a nationwide campaign aimed at reducing child obesity during this study's time frame, rendering any significant results solely attributed to Planet Health questionable. Finally, the use of self-report on dietary intake and physical activity is a major threat to validity. Students could have overestimated their actual behaviors to show themselves in a positive light or simply reported results that they thought researchers would want to see. These self-report responses also have questionable reliability due to the young age of study participants—a measurement error that could have biased outcome measures.

Threats to External Validity

External validity refers to the generalizability of the study. Study populations were determined to be a good representation of adolescents across the country; because the actual sample was a good representation of the theoretical target population, a high level of population external validity exists (Gliner and Morgan 2000). A high degree of ecological external validity also exists, as a “natural” setting for Planet Health was used (Gliner and Morgan 2000). External validity was threatened by reactive or situational effects of testing. Students’ awareness of learning from the Planet Health program may have been heightened during the study time—particularly after their baseline characteristics were gathered and the food and activity survey was administered. Their responsiveness may also have changed after taking the pretest—this change could have occurred in both the intervention and control groups. Finally, threats from multiple treatments were small but may have existed. Although additional interventions were not administered in the schools, health promotion campaigns could have existed in the community or at parents’ workplaces. Such situations could have biased the results of the study to make them less generalizable to the general population. A final source of bias could have been inherent in the researchers’ initial active recruitment of the ten schools. Researchers sought schools that had experience with multidisciplinary curricula and whose academic standards were at least minimally being met with adequate resources. These schools also received financial assistance. Such assistance may not exist in many other schools; thus, results may be tempered if Planet Health is applied in other settings.

Appropriateness of the Evaluation

Overall, the use of a randomized design for this evaluation strengthened the design and validity of the study. Randomization reduced bias and ensured equivalence among control and intervention schools; the initial matching of school pairs only served to enhance sampling efficiency and did not appear to affect outcomes. The main outcome measure was a reliable and valid indicator of obesity change because it incorporated both BMI and TSF measures. Furthermore, although the behavioral measures were assessed via self-report, they were compiled using valid and reliable survey instruments. The large sample populations taking the surveys overcame any inaccuracies of survey results. Possible confounding characteristics of the obesity–behavior relationship were controlled by both randomization and sampling as well as within regression analyses. When considering recommended program evaluation standards (CDC 1999), this Planet Health evaluation scored high—having great utility (properly served the needs of participants), good feasibility (practicality), high propriety (fair application of the intervention to students along appropriate ethical protocols), and high accuracy (addressed every hypothesis and research question it posited). It showed that Planet Health achieved many of its goals and objectives. Thus, although the generalizability of Planet Health was moderate, both the program and proper evaluations must continue to

occur. Such evaluations will increase knowledge about the reliability and validity of program measures and continue to build an evidence base for Planet Health.

QUESTION 5

Consideration of the Intervention

As shown, Planet Health is a school-based primary prevention program that uniquely addresses childhood obesity by weaving health education through a school's academic curriculum. It addresses the major proximate and most actionable determinants of obesity (physical activity and diet) through comprehensive classroom lessons. Planet Health also incorporates the theory that television viewing among youth is an important and actionable determinant of obesity with the inclusion of a two-week campaign aimed at limiting television use and encouraging physical activity.

Planet Health targets a population on the basis of evidence that supports the efficacy of such programs in focusing on risky health behaviors. It also addresses the alarming increased prevalence, noting that it becomes more difficult for aging, overweight children to return to normal weight, who are then at risk for developing a host of obesity-related conditions. Thus, middle-aged adolescents are at a critical age for interventions such as Planet Health, strengthening the potential effectiveness of such a program. It is encouraging to learn that researchers are expanding Planet Health programs for fourth and fifth graders throughout Massachusetts. Per Question 3, schools, policymakers, and other stakeholders may perceive advantages to Planet Health implementation due to its low startup and subsequent costs, cost-effectiveness, and high administrative feasibility. That it is a school- and community-wide collaborative effort—requiring active participation from teachers and families—only ensures that the program is likely to be sustained. Finally, per Question 4, Planet Health was scientifically proven to deliver on several program goals and objectives: lowering obesity rates in schools, decreasing time of television viewing, and increasing quality of diet. Clearly, this program can deliver tangible results within just one program cycle (two years) when fully implemented.

Next Steps in Research

Perhaps the biggest strength of Planet Health—its randomized outcome evaluation—also reveals an inherent weakness. The evaluation is one of the first to assess a school-based program targeting obesity among this age bracket, and although its results are strong, it may have limited impact (particularly to policymakers). Sound evaluative research is a challenge to conduct, although Planet Health is relatively simple to implement. Schools may lack the human and financial resources necessary to conduct an evaluation. School staff may be busy with school-related responsibilities, with little time for or interest in evaluation. The absence of long-term cohort data is another area of major concern. These data would show

that Planet Health is effective well beyond the middle-school years, but its collection would require a large commitment of resources. There is also little data showing the effectiveness of Planet Health on other age groups or populations (e.g., elementary school students, minority populations). However, this information may be forthcoming with the recent expansion of Planet Health throughout the state of Massachusetts and among other grades. As alluded to in Question 3, political feasibility is often swayed by evidence-based arguments proving the efficacy and financial soundness of policy and program alternatives. Furthermore, policymakers and school administrators alike look to best practices when considering the implementation of new and innovative programs. In this regard, “best practices” databases that compile data on various school-based health promotion programs would be useful. The widespread implementation of Planet Health and similar programs may be stymied due to such current limitations.

In broader terms, there is a clear need for research on the relationships between other midlevel distal obesity determinants outlined in Question 1, including demographics, family characteristics, and home environment. Planet Health is successful in reducing obesity and certain behavioral measures *only* among females. These results suggest that mediating forces exist in the direct relationship between gender and obesity—a hypothesis that is mostly unsupported in the scientific literature and merits further research. Further research would be prudent to elucidate the association between obesity and risk in ethnically or culturally diverse populations (Freedman et al. 2006). The federal government has identified this as a crucial area of obesity research, but evidence for adults or children still lacks substance (National Task Force on the Prevention and Treatment of Obesity 2000). Finally, SES remains a complex yet distal determinant tied to obesity. Little evidence exists that adds to better understanding of this relationship; thus, there exists a need for research in this area.

Next Steps in Interventions

To date, the Planet Health program has been implemented in a number of demographically and socioeconomically diverse schools. The relatively simple implementation strategy is a major draw for school administrators interested in adding health education to school curriculums. However, a potential limitation of the current program is that it is only available in one form, which could hamper widespread implementation. The factor of race, ethnicity, or culture plays a potentially large role in obesity development, and expansion of Planet Health’s curriculum could account for a variety of community needs. Multiple versions of the didactic materials specific to various cultures, ethnicities, languages, and even religions could be produced. The development of culturally competent materials need not be overly burdensome. Planet Health seems to thrive on school and community involvement; thus, disparate stakeholders throughout a community could collaborate to tailor the program to the specific needs of students served by community schools in keeping with the broad programmatic goals.

Planet Health is effective in helping students overcome risks associated with obesity by giving them the competencies to make healthy decisions in schools and beyond. However, the framework in Question 1 showed that distal factors, such as neighborhood safety, availability of food choices, and built environments, can have an effect on obesity. The program is somewhat limited by forces that exist beyond the school walls. The CDC supports and funds interventions designed to fall within one or more parts of the Coordinated School Health Program—a systematic model aimed at promoting student health through a multifaceted approach (Fisher et al. 2007). Thus, many possible interventions can be implemented throughout the school and community to address these distal determinants, such as initiatives to add or enhance the presence of community recreational facilities or to deliver comprehensive after-school programs for students and families. To this end, Planet Health is ahead of the curve through the addition of coordinated after-school programs throughout Massachusetts.

Next Steps in Policy

Per Question 3, the Planet Health program has a high degree of political feasibility, mostly due to its low cost and simple administration and the high salience of the problem among lawmakers and the American public. The program has important implications for targeted policy initiatives. The first is regarding research support. Question 3 outlined mechanisms from federal sources that exist to fund programs such as Planet Health. Clearly, federal financial support is critical to most schools that are interested in implementing Planet Health; the precarious nature of federal grants for health promotion programs reinforces the need for policies that ensure sustained support to states and communities. Similarly, the challenges to conducting valid, reliable, and long-term evaluations of Planet Health are questionable. Many grant mechanisms for health promotion programs fail to support long-term goals, indicating the need for policies that ensure sustained funding. Finally, one weakness of Planet Health concerned its implementation and sustainability within schools that may have limited budgets or serve poor socioeconomic populations. Priority funding could be allocated to such schools to implement Planet Health and similar programs (Veugelers and Fitzgerald 2005).

A unique strength of Planet Health is its effect on television viewing. Question 1 hypothesized the effect of commercial messaging on obesity. Policy options to this end include a ban on food product advertising targeted toward children, mandatory marketing about nutrition and fitness that is equal in time to “junk food” ads, or a prohibition on the use of children’s characters to promote unhealthy food (KFF 2004; Mello, Rimm, and Studdert 2003). Advocacy groups are persistent in pushing this issue, and Congress has directed incremental regulations aimed at the food manufacturing industry or media corporations. In 1990, Congress passed the Children’s Television Act, mandating advertising limits during children’s programming. This action is a step in the right direction but likely not enough to strengthen the effects of a program such as Planet Health.

Finally, schools across the United States are decreasing or eliminating physical or health education from curriculums, partly due to financial constraints. Public schools also face pressures in meeting academic standards to obtain funding. Few states require the recommended level of physical education for students, and of these states, many either lack the resources for implementation or freely grant participation waivers to excuse students. School nutrition standards suffer from similar circumstances—nutritious foods are often expensive for schools and difficult to prepare. Moreover, many schools depend on subsidies from food or vending machine manufacturers that provide unhealthy food options to students. The Planet Health program could fall victim to this circumstance, thereby confusing students in schools that provide lessons on healthy eating yet offer unhealthy food options. Federal or state policies that mandate physical education or set standards for school food options would address these problems. Advocates continue to push this issue at both levels, although states have been more receptive to such policies than Congress has.

Most Important Next Step

The most crucial step in addressing childhood obesity relates to research—to develop and evaluate initiatives focused on gender and certain sociodemographic groups. The link between obesity and gender, SES, and race or ethnicity is poorly understood, yet these are powerful confounders affecting the pathways between many other determinants and obesity. Females, youth of low SES, and racial or ethnic minorities still disparately suffer from obesity and its concomitant conditions. Strong research findings could feed the political “problem stream” (Kingdon 2011) and drive broad-based policy changes, such as increased funding toward initiatives for certain marginalized populations. This point is particularly important when considering that issues related to the aforementioned groups typically have moderate social or political acceptability (although issues related to children are much more salient). A further important step is federal, state, or local financial support of health promotion programs and accompanying evaluations among these groups. As stated, evidence proving the efficacy of such programs—particularly among youth—is sparse. Policymakers need to know which types of interventions are successful and a prudent use of public funds. Childhood obesity is a major health problem that is complex in its origin and the potential avenues for solutions, which warrants continued research to understand its determinants. Such research drives development of evidence-based health promotion interventions aimed at primary prevention in youth. Research and the development of interventions aimed at certain marginalized groups, set in either schools or communities, appear to be the most important steps when considering how best to address the problem. While entities face many challenges in how they choose to address childhood obesity, the growing magnitude and salience of the problem will continue to drive science and practice solutions.

KEY POINTS

- The public health problem identified was obesity, especially among youth, in the United States.
- The health determinants of obesity in the United States are complex and can be classified as proximate, midlevel distal, or macrolevel distal, of which the most important one is behavioral and lifestyle choices of youth, a proximate determinant.
- The intervention chosen to address obesity in the United States was Planet Health, an interdisciplinary school-based intervention that integrated health education in the curriculum.
- The economic feasibility of this intervention was demonstrated with a cost-benefit analysis that showed cost savings of reducing obesity through Planet Health, and administrative and political feasibility were also proven with studies showing acceptability among the program stakeholders.
- The most important next step to address obesity among youth in the United States is for research to be conducted on the effect of determinants of gender, race or ethnicity, and socioeconomic status. Other steps include studying populations other than youth, creating a database of best practices, developing culturally sensitive materials, investigating distal determinants, and creating policies for funding.

FOR DISCUSSION

1. What public health problem was identified and investigated in this policy analysis?
2. Explain the major categories of health determinants that influence this public health problem. Give examples of specific determinants. Which is considered the most important one, and why?
3. What intervention was selected to address the public health problem? List example programs.
4. Which intervention program was chosen for this policy analysis? Describe its components.
5. How was the feasibility of implementing this program determined? Explain the results.
6. What evaluation of this intervention was chosen? Describe its design and variables.
7. List the suggested next steps to address the health issue. Which is the most important next step?

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