

# ISSUE BRIEF

February 2004

## The Role of Media in Childhood Obesity

### Introduction

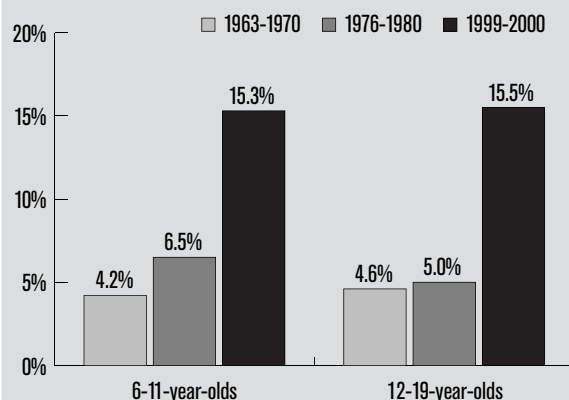
In recent years, health officials have become increasingly alarmed by the rapid increase in obesity among American children. According to the Centers for Disease Control and Prevention (CDC), since 1980 the proportion of overweight children ages 6–11 has more than doubled, and the rate for adolescents has tripled.<sup>1</sup> Today about 10% of 2- to 5-year-olds and 15% of 6- to 19-year-olds are overweight. Taking into consideration the proportion who are “at risk” of being overweight, the current percentages double to 20% for children ages 2–5 and 30% for kids ages 6–19. Among children of color, the rates are even higher: 4 in 10 Mexican American and African American youth ages 6–19 are considered overweight or at risk of being overweight.<sup>2</sup>

According to the American Academy of Pediatrics, the increase in childhood obesity represents an “unprecedented burden” on children’s health.<sup>3</sup> Medical complications common in overweight children include hypertension, type 2 diabetes, respiratory ailments, orthopedic problems, trouble sleeping, and depression.<sup>4</sup> The Surgeon General has predicted that preventable morbidity and mortality associated with obesity may exceed those associated with cigarette smoking.<sup>5</sup> Given that an estimated 80% of overweight adolescents continue to be obese in adulthood,<sup>6</sup> the implications of childhood obesity on the nation’s health—and on health care costs—are huge.<sup>7</sup> Indeed, the American Academy of Pediatrics has called the potential costs associated with childhood obesity “staggering.”<sup>8</sup>

In an effort to seek the causes of this disturbing trend, experts have pointed to a range of important potential contributors to the rise in childhood obesity that are unrelated to media: a reduction in physical education classes and after-school athletic programs, an increase in the availability of sodas and snacks in public schools, the growth in the number of fast-food outlets across the country, the trend toward “super-sizing” food portions in restaurants, and the increasing number of highly processed high-calorie and high-fat grocery products.

The purpose of this issue brief is to explore one other potential contributor to the rising rates of childhood obesity: children’s use of media.

### PROPORTION OF OVERWEIGHT CHILDREN IN THE UNITED STATES



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, Health, United States, 2003, Table 69.

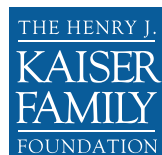
During the same period in which childhood obesity has increased so dramatically, there has also been an explosion in media targeted to children: TV shows and videos, specialized cable networks, video games, computer activities and Internet Web sites. Children today spend an average of five-and-a-half hours a day using media, the equivalent of a full time job, and more time than they spend doing anything else besides sleeping.<sup>9</sup> Even the very youngest children, preschoolers ages six and under, spend as much time with screen media (TV, videos, video games and computers) as they do playing outside.<sup>10</sup> Much of the media targeted to children is laden with elaborate advertising campaigns, many of which promote foods such as candy, soda, and snacks. Indeed, it is estimated that the typical child sees about 40,000 ads a year on TV alone.

For the first time, this report pulls together the best available research, going behind the headlines to explore the realities of what researchers do and do not know about the role media plays in childhood obesity. In addition, the report lays out media-related policy options that have been proposed to help address childhood obesity, and outlines ways media could play a positive role in helping to address this important public health problem.

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Pediatricians, child development experts, and media researchers have theorized that media may contribute to childhood obesity in one or more of the following ways:

- The time children spend using media displaces time they could spend in physical activities;
- The food advertisements children are exposed to on TV influence them to make unhealthy food choices;
- The cross-promotions between food products and popular TV and movie characters are encouraging children to buy and eat more high-calorie foods;
- Children snack excessively while using media, and they eat less healthy meals when eating in front of the TV;
- Watching TV and videos lowers children's metabolic rates below what they would be even if they were sleeping;
- Depictions of nutrition and body weight in entertainment media encourage children to develop less healthy diets.

The research to date has examined these issues from a variety of perspectives ranging from health sciences and public health, to child development and family relations, to advertising and mass communications. These investigations have been methodologically diverse, and the results have often been mixed. As with any research, caution must be used when comparing the outcomes of studies because of variations in the methods and measures used. For example, some studies are regional, while others use large, nationally representative samples. Some focus on specific demographic subsets, such as 6th-grade girls, while others are broader. Some studies rely on detailed data sets, others on fairly simplistic measures. For example, television use may be measured through self-reports, parental reports, or detailed diaries. Likewise, body fat may be assessed through multiple clinical measures or by self-reports of height and weight.

The following section of this report reviews the major research that has been conducted on the key issues concerning media and childhood obesity, and summarizes the major findings.

## DEFINING CHILDHOOD OBESITY

The phrases “obese,” “overweight,” and “at risk for being overweight” are commonly used in the public health community. With regard to children, the terms “obese” and “overweight” are generally used interchangeably in the medical literature.<sup>11</sup> The Body Mass Index (BMI), which measures the ratio of weight to height, is a standard tool used to define these terms.<sup>12</sup> BMI definitions for children and adolescents are age- and gender-specific in order to accommodate growth patterns. The Centers for Disease Control and Prevention (CDC) classify children as “overweight” if they are above the 95th percentile for their age and sex, and “at risk of being overweight” if they are between the 85th and 95th percentile.<sup>13</sup>

## Research on Media and Childhood Obesity

### ***Do major studies find a relationship between childhood obesity and the time children spend using media?***

The first major evidence that children's media consumption may be related to their body weight came in a 1985 article by William Dietz and Stephen Gortmaker in the journal *Pediatrics*, and it was dramatic. An analysis of data from a large national study of more than 13,000 children, the National Health Examination Survey (NHES), found significant associations between the amount of time children spent watching television and the prevalence of obesity. The authors concluded that, among 12- to 17-year-olds, the prevalence of obesity increased by 2% for each additional hour of television viewed, even after controlling for other variables such as prior obesity, race, and socio-economic status.<sup>14</sup> Indeed, according to the authors, “only prior obesity had a larger independent effect than television on the prevalence of obesity.”<sup>15</sup> In a commentary published in 1993, the authors went on to note that another interpretation of their findings is that “29% of the cases of obesity could be prevented by reducing television viewing to 0 to 1 hours per week.”<sup>16</sup>

Since then, several more studies have found a statistically significant relationship between media use and rates of obesity, while others have found either a weak relationship or no relationship at all. In addition to the Dietz and Gortmaker study, other large-scale national studies have found a correlation between media use and body weight:

- Analysis of data from a nationally representative survey of more than 700 kids ages 10–15, conducted in the late 1980s, concluded that “the odds of being overweight were 4.6 times greater for youth watching more than 5 hours of television per day compared with those watching for 0–1 hours,” even when controlling for prior overweight, maternal overweight, race, and socio-economic status. The authors concluded, “Estimates of attributable risk indicate that more [than] 60% of overweight incidence in this population can be linked to excess television viewing time.”<sup>17</sup>
- Data from the 1988–1994 waves of the National Health and Nutrition Examination Surveys (NHANES) were analyzed to explore the relationship between TV watching and obesity among 8- to 16-year-olds. The study concluded that “television watching was positively associated with obesity among girls, even after controlling for age, race/ethnicity, family income, weekly physical activity, and energy intake.” The study did not find a correlation for boys.<sup>18</sup>
- Another analysis of the 1988–1994 NHANES data found that among 8- to 16-year-olds, both boys and girls “who watched the most television had more body fat and greater BMIs than those who watched less than 2 hours a day.”<sup>19</sup>
- A study based on the CDC's 1999 Youth Risk Behavior Survey which sampled more than 12,000 high school students nationwide, found that watching television more than 2 hours a day was related

to being overweight; these findings were consistent for the entire student population, controlling for race, ethnicity, and gender.<sup>20</sup>

- A later study found a link between television viewing and obesity using a different methodology. The Framingham Children's Study was a longitudinal study in which slightly more than 100 children were enrolled as preschoolers and followed into early adolescence. In this study, published in 2003, the authors found that "television watching was an independent predictor of the change in the child's BMI" and other measures of body fatness. They noted that the effect of TV viewing was "only slightly attenuated" by controlling for factors such as the child's body-fat measures at the time they were enrolled in the study, and their parents' BMI or education. The authors concluded that "television watching is a risk factor for change in body fat, not simply reflective of more obese children tending to watch more television as a consequence of their obesity making it difficult to exercise."<sup>21</sup>

Other studies—one from a nationally representative cross-sectional sample and the others from specific regions or communities—have not found a relationship between television viewing and childhood obesity:

- A recent analysis of data from a national study of more than 2,800 children ages 12 and under, which relied on detailed time-use diaries, found a "striking" lack of relationship between time spent watching television and children's weight status. On the other hand, this study did find a relationship between obesity and time spent playing video games, although that relationship was not linear: Children with higher weight played moderate amounts of games, while those with low weight played electronic games either very little or a lot.<sup>22</sup>
- A 1993 study of 6th- and 7th-grade girls in Northern California found that over a two-year period "baseline hours of after-school television viewing was not significantly associated with either baseline or longitudinal change in BMI." The authors argued that their study "refutes previous suggestions that ... television viewing is causally related to obesity."<sup>23</sup>
- A study of nearly 200 preschoolers in Texas observed the children for several hours on each of four different days a year, over the course of three years, recording the amount of TV the children watched and their physical activities. This study found that although television watching was weakly negatively correlated with physical activity levels, it was not associated with body composition.<sup>24</sup>

In evaluating this research, it is important to note that some of these studies are cross-sectional rather than longitudinal—that is, they take a specific point in time and look at whether TV viewing is associated with obesity. One problem with this approach is that while a study may indicate a relationship between TV viewing and being overweight, it does not prove that the TV viewing *caused* the increased weight. Controlling for other risk factors such as socio-economic status and parental body weight (as many studies do) can help clarify the results. Another problem with the cross-sectional approach is that the causal relationship could run in

the opposite direction: that is, being obese may cause children to engage in more sedentary (and isolated) activities, including watching more television.

Longitudinal studies can help address the causality issue; however, the results of these studies have varied. As noted above, the two-year longitudinal study of adolescent girls in Northern California did not find a causal relationship between children's weight and the time they spent with media. On the other hand, the Framingham Children's Study, which tracked preschoolers through early adolescence, did find such a relationship. The authors of the latter study have theorized that the effects of media use on body weight may emerge slowly over time, and hence were not revealed in the two-year study in Northern California. It has also been argued that the lack of effect in that study may be due to factors specific to the sample of 6th- and 7th-grade girls in Northern California. Additionally, the study of 700 10- to 15-year-olds referenced above used height and weight data from 1986 and compared it to TV viewing and BMI measures in 1990. These authors concluded that "no evidence was found for a selective effect of overweight; i.e., children who were overweight in 1986 were unlikely to watch more television in 1990 than were children who were not overweight."<sup>25</sup>

Others argue that the only way to truly demonstrate a causal relationship is through an experimental trial; for example, reduce TV viewing and see whether that affects children's weight when compared to a control group.<sup>26</sup> Several interventions of this nature have been found to have a positive impact in reducing children's body weight.

#### ***Do experimental interventions that reduce children's media time result in weight loss?***

Experimental trials are considered the best way of determining whether there is a causal relationship between television viewing and childhood obesity. Some experiments have incorporated reductions in media time as part of a more comprehensive program involving diet and increased physical activity as well. Another experiment used reduced media time as the only intervention, yet still found an impact on children's weight and body fatness.

- During the 1996–97 school year, Stanford University researchers conducted a randomized controlled trial in which they reduced the amount of time a group of about 100 3rd- and 4th-graders in Northern California spent with TV, videos, and video games. Two matched elementary schools were selected to participate, one of which served as the control group. The intervention involved a "turnoff" period of no screen time for 10 days followed by limiting TV time to 7 hours per week, as well as learning media literacy skills to teach selective viewing. At the end of a 6-month, 18-lesson classroom curriculum, students who received the intervention achieved statistically significant reductions in their television viewing and meals eaten in front of the TV set, as well as decreases in BMI, triceps skinfold thickness, waist circumference, and waist-to-hip ratio. While these changes were not accompanied by reduced high-fat food intake or increased physical activity, the findings do appear to demonstrate the feasibility of decreasing body weight by reducing time spent with screen media.<sup>27</sup>

- Another school-based intervention found improved diet, increased physical activity, and decreased television time to be effective. The study, which measured prevalence, incidence, and remission of obesity among ethnically diverse middle-school boys and girls, involved a randomized controlled field trial with five intervention and five control schools. Classroom teachers in math, science, language arts, social studies, and physical education incorporated lessons within the existing curricula over two years. The lessons focused on decreasing television viewing to 2 hours per day, increasing physical activity, reducing consumption of high-fat food, and increasing servings of fruits and vegetables. For each hour television viewing was reduced, the prevalence of obesity was reduced among girls in the intervention schools compared with the control schools; no similar effect was found for boys. The program also resulted in an increase in girls' consumption of fruits and vegetables.<sup>28</sup>
- A family-based weight-control program found that decreasing sedentary behaviors (such as screen media use) is a viable alternative to increasing physical activity in treating childhood obesity. Families with obese children ages 8–12 were randomly assigned to one of four groups that included dietary and behavior-change information, but differed in whether they tried to decrease sedentary activities or increase physical activity. Results indicated that significant decreases in percent of overweight and body fat were associated with decreasing sedentary behaviors such as watching TV or videos, or playing video or computer games.<sup>29</sup>

These interventions indicate that reducing the time children spend with media may indeed be an effective way to address childhood obesity. Researchers, health professionals, and advocates have theorized several ways media may contribute to childhood obesity. The following sections summarize some of the major scientific studies in order to provide an understanding of media's potential influence on the incidence of overweight among children and adolescents in the United States.

***Does the time children spend using media displace time spent in more physical activities?***

From toddlers to teens, American youth are spending a substantial part of every day of their lives using media. But the time children spend using media does not necessarily mean a decrease in time spent in physical activities. Surprisingly, few studies have examined this relationship, and results have been mixed. Some studies have found a weak but statistically significant relationship between hours of television viewing and levels of physical activity, while others have found no relationship between the two.

- A study of 6th- and 7th-grade adolescent girls in four Northern California middle schools found that the number of hours they spent watching TV after school was negatively associated with their level of physical activity; however, the relationship accounted for less than 1% of the variance and there was no connection with body weight.<sup>30</sup>
- A study of a small sample of preschool children in Texas, conducted in a naturalistic setting, found a weak but statistically significant relationship between TV

viewing and physical activity, although it did not find a relationship between viewing and body weight.<sup>31</sup>

- A recent national telephone survey of parents of children ages 4–6 found that children who spent more than two hours watching TV the previous day spent an average of a half-hour less playing outside that day than did other children their age.<sup>32</sup>
- A review of data from the 1999 National Youth Risk Behavior Study, which includes a nationally representative sample of more than 15,000 high school students, found that among white female students only, time spent watching TV was associated with being sedentary.<sup>33</sup>
- A survey of close to 2,000 9th-graders in Northern California found a weak but statistically significant relationship between TV viewing and physical activity for white males only.<sup>34</sup>
- A study of national data from the 1988–1994 NHANES found no relationship between TV viewing and the number of bouts of vigorous physical activity, although it did find a statistically significant relationship between TV viewing and body weight.<sup>35</sup>

While logic suggests that extensive television viewing is part of a more sedentary lifestyle, the evidence for this relationship has been surprisingly weak to date. In order for this relationship to be true, as one study noted, children who watch less TV would have to be choosing physically vigorous activities instead of TV, rather than some other relatively sedentary pastime such as reading books, talking on the phone, or playing board games.<sup>36</sup>

Another possibility is that the act of watching TV itself actually reduces children's metabolic rate, contributing to weight gain. One study of 8- to 12-year-olds found that TV viewing decreased metabolic rates even more than resting or sleeping, but several other studies found no such effect.<sup>37</sup>

The fact that most studies have failed to find a substantial relationship between the time children spend watching TV and the time they spend in physical activity may suggest that the *nature* of television viewing—that is, how children watch and what they watch—may be as or more important than the number of hours they watch.

***Do the food ads children are exposed to on TV influence them to make unhealthy food choices?***

Many researchers suspect that the food advertising children are exposed to through the media may contribute to unhealthy food choices and weight gain. Over the same period in which childhood obesity has increased so dramatically, research indicates that the number of ads children view has increased as well. In the late 1970s, researchers estimated that children viewed an average of about 20,000 TV commercials a year; in the late 80s, that estimate grew to more than 30,000 a year.<sup>38</sup> As the number of cable channels exploded in the 1990s, opportunities to advertise directly to children expanded as well. The most recent estimates are that children now see an average of more than 40,000 TV ads a year.<sup>39</sup>

The majority of ads targeted to children are for food: primarily candy (32% of all children's ads), cereal (31%), and fast food (9%).<sup>40</sup> One study documented approximately 11 food commercials per hour during children's Saturday morning television programming, estimating that the average child viewer may be exposed to one food commercial every 5 minutes.<sup>41</sup> According to another study, even the two minutes of daily advertising targeted to students in their classrooms through Channel One expose them to fast foods, candy, soft drinks, and snack chips in 7 out of 10 commercial breaks.<sup>42</sup>

A review of the foods targeted to children in commercials on Saturday morning television indicates that the nutritional value has remained consistently low over the past quarter-century. Over the years, the most prevalent foods advertised have been breakfast cereals. Up until the 1990s, the next most-advertised products were foods high in sugar, such as cookies, candy, and other snacks. By the mid-1990s, canned desserts, frozen dinners, and fast foods overtook ads for snack foods. The data indicate that ads for these high-fat and high-sodium convenience foods have more than doubled since the 1980s.<sup>43</sup> While studies vary as to the exact percentages, the same pattern emerges: a predominance of ads for high-sugar cereals, fast food restaurants, and candy, and an absence of ads for fruit or vegetables.<sup>44</sup>

#### **The effect of food advertising on children**

The vast majority of the studies about children's consumer behavior have been conducted by marketing research firms and have not been made publicly available.<sup>45</sup> Clearly, the conclusion advertisers have drawn is that TV ads can influence children's purchases – and those of their families. Fast food outlets alone spend \$3 billion in television ads targeted to children.<sup>46</sup> Recent years have seen the development of marketing firms, newsletters, and ad agencies specializing in the children's market. The New York Times has noted that “the courtship of children is no surprise, since increasingly that is where the money is,” and added that marketing executives anticipate that children under 12 will spend \$35 billion of their own money and influence \$200 billion in household spending in 2004.<sup>47</sup> The enthusiasm of marketers can be felt in the February 2004 edition of Harris Interactive's “Trends and Tudes” newsletter, which notes that “This generation has become a huge consumer group that is worthy of attention from many businesses seeking to maximize their potential. Kids, teens and young adults spend significant amounts of their own money, and they influence the shopping behavior of their parents, their siblings, their relatives, and other adults in their lives.”<sup>48</sup>

Scientific studies that are available in the public realm back up these marketing industry assessments of the effectiveness of advertising directed at children. Studies have demonstrated that from a very young age, children influence their parents' consumer behavior. As many parents can attest after a trip down the grocery aisle with their children, television viewing has also been found to impact children's attempts to influence their parents' purchases at the supermarket. For example, several studies have found that the amount of time children had spent watching TV was a significant predictor of how often they requested products at the grocery store,

and that as many as three out of four requests were for products seen in TV ads. These studies have also found that children's supermarket requests do indeed have a fairly high rate of success.<sup>49</sup>

One study found that among children as young as 3, the amount of weekly television viewing was significantly related to their caloric intake as well as their requests and parent purchases of specific foods they saw advertised on television.<sup>50</sup> Another study manipulated advertising shown to 5- to 8-year-olds at summer camp, with some viewing ads for fruit and juice, and others ads for candy and Kool-Aid. This study found that children's food choices were significantly impacted by which ads they saw.<sup>51</sup>

Experimental studies have demonstrated that even a brief exposure to food commercials can influence children's preferences. In one study, researchers designed a randomized controlled trial in which one group of 2- to 6-year-olds from a Head Start program saw a popular children's cartoon with embedded commercials, and the other group saw the same cartoon without commercials. Asked to identify their preferences from pairs of similar products, children who saw the commercials were significantly more likely to choose the advertised products. Preference differences between the treatment and control group were greatest for products that were advertised twice during the cartoon rather than only once.<sup>52</sup>

Researchers are beginning to document a link between viewing television and children's consumption of fast foods and soda, a possible result of exposure to food advertising. A recent study found that students in grades 7–12 who frequently ate fast food tended to watch more television than other students.<sup>53</sup> Another study found that middle-school children who watched more television tended to consume more soft drinks.<sup>54</sup>

Other evidence of television's potential impact on children's dietary habits indicates a negative relationship between viewing television and consuming fruits and vegetables. The USDA's Dietary Guidelines recommend that youth eat three to five daily servings of fruits and vegetables, yet only 1 in 5 children meet the guideline, and one-quarter of the vegetables consumed reportedly are french fries.<sup>55</sup> In a recent study, more than 500 middle school students from ethnically diverse backgrounds were studied over a 19-month period to determine whether daily television and video viewing predicted fruit and vegetable consumption. Using a linear regression analysis, researchers found that for each additional hour of television viewed per day, daily servings of fruits and vegetables decreased among adolescents. The researchers who conducted the study conclude that this relationship may be a result of television advertising.<sup>56</sup>

Some researchers believe that TV ads may also contribute to children's misconceptions about the relative health benefits of certain foods. One of the earlier studies found that 70% of 6- to 8-year-olds believed that fast foods were more nutritious than home-cooked foods.<sup>57</sup> Another study showed a group of 4th- and 5th- graders a series of paired food items and asked them to choose the healthier item from each pair

(for example, corn flakes or frosted flakes). Children who watched more television were more likely to indicate that the less healthy food choice was the healthier one.<sup>58</sup> These results replicated the results of an earlier study conducted with children of the same age.<sup>59</sup>

***Do cross-promotions between food products and popular TV and movie characters encourage children to buy and eat more high-calorie foods?***

Recent years have seen what appears to be a tremendous increase in the number of food products being marketed to children through cross-promotions with popular TV and movie characters. From SpongeBob Cheez-Its to Hulk pizzas and Scooby-Doo marshmallow cereals, today's grocery aisles are filled with scores of products using kids' favorite characters to sell them food. Fast food outlets also make frequent use of cross-promotions with children's media characters.

A recent article in the New York Times business section noted that "aiming at children through licensing is hardly new. What has changed is the scope and intensity of the blitz as today's youth become unwitting marketing targets at ever younger ages through more exposure to television, movies, videos and the Internet."<sup>60</sup> One food industry executive was quoted as saying that licensing "is a way to... infuse the emotion and popularity of a current kids' hit into a product."<sup>61</sup>

Some promotions involve toys based on media characters that are included in the food packages or offered in conjunction with fast food meals. McDonald's and Disney have an exclusive agreement under which Happy Meals include toys from top Disney movies. In the past, Happy Meals have reportedly also included toys based on the Teletubbies TV series, which is aimed at pre-verbal babies.<sup>62</sup> Burger King has also featured Teletubbies tie-ins, along with Rugrats, Shrek, Pokemon and SpongeBob.<sup>63</sup> More than a decade ago, researchers were finding that the typical "kid's meal" advertised to children consisted of a cheeseburger, french fries, soda, and a toy.<sup>64</sup> One study found that about 1 in 6 (16.9%) food commercials aimed at children promise a free toy.<sup>65</sup> In addition to the use of toys as an incentive in marketing food to children, many commercials use cartoon characters to sell products, which research has shown to be particularly effective in aiding children's slogan recall and ability to identify the product.<sup>66</sup>

A recent example of the effectiveness of this technique is the growth in the dried fruit snack market. Almost half (45%) of fruit snacks had licensing agreements in 2003 compared to 10% in 1996. Sales have increased substantially every year since 1999: 5.6% in 2000, 8.7% in 2001, 3.2% in 2002, and 5.5% in 2003. Marketing experts attribute the sales growth to children's influence on their parents' purchasing decisions and parental beliefs that dried fruit snacks are healthier than other sweets.<sup>67</sup>

***Do depictions of nutrition and body type in entertainment media encourage children to develop less healthy diets and eating habits?***

Over the years, some critics have argued that TV, movies, and magazines have promoted unrealistically thin body types as the ideal, possibly encouraging teen girls to engage in unhealthy dieting or eating disorders.

But after years of an imbalance toward depictions of thin characters, the true weight-related health emergency among young people is, paradoxically, obesity. This paradox has yet to be explained.

Some advocates note that television gives children and teens contradictory messages about dietary habits and ideal body type: be thin but eat fatty foods, sugary sweets, and salty snacks. They point out that on the one hand, the stories media tell are about thin people who are popular and successful, while on the other hand, thin and average-size people on TV can eat whatever they want and almost never gain weight.

Some advocates and researchers also have criticized TV producers for not including more depictions of obese characters, and for negatively portraying the obese characters that do make it onto the screen.<sup>68</sup> On the other hand, it could be argued that portraying obesity as an unhealthy and undesirable characteristic—and associating it with overeating—sends an *appropriate* message to youth. And while some critics fault the media for leaving obese characters off the screen, adding to stigmatization and isolation, other critics complain that too many minority characters are overweight.<sup>69</sup>

***Food content in television shows and movies***

The first scientific studies to examine the significance of television content and health behaviors were reviewed in the National Institute of Mental Health (NIMH) report *Television and Behavior: Ten Years of Scientific Progress and Implications for the Eighties*. Noting the potential impact of television on the public's health-related knowledge, the review concluded that the food consumed in both prime time and children's Saturday morning TV shows were inconsistent with healthy nutritional guidelines. In both cases, characters were as likely or more likely to be seen eating snacks versus meals, and fruits were rarely depicted as part of the diet.<sup>70</sup>

Since that 1982 NIMH report, a number of studies have compared the nutritional value of food servings in television shows with the recommended nutritional guidelines. One major study of the top-ranked prime time shows in the 1988 TV season found that food references occurred almost 10 times per hour, and that the majority (60%) were for low-nutrient beverages such as coffee, soft drinks, and alcohol. Most food eaten was snacks (72%) and tended to be sweets (44%) or salty snacks (25%), with vegetables far behind (6%).<sup>71</sup> A decade later, by the 1998 TV season, a content analysis of the highest-ranked prime time shows found little improvement.<sup>72</sup>

A content analysis of children's programming during the 1997 TV season on the major broadcast networks, cable, and PBS found food references in all the shows sampled. The highest-rated programs among 2- to 5-year-olds contained a reference to food in every episode, and one-third had 16 or more references. At this rate, it was estimated that the average child viewer might see more than 500 food references per week, almost one-third for empty-calorie foods high in fat, sugar, or salt, and another one-quarter for nutrient-rich foods also high in fat, sugar, and salt.<sup>73</sup>

Food content and consumption in films is rarely a topic of study. One study was found that analyzed the portrayals of nutritional practices and exercise in popular American films over the past decade. Researchers selected the 10 top-grossing films in each year from 1991 through 2000. Overall, foods high in fats, oils and sugars were disproportionately shown, while fruits and vegetables, as well as dairy products, were seldom shown. This study also noted the common practice of companies paying to place their products in movies. The occurrence of branded foods averaged about one to two in a typical movie—usually for soda (31.9%) or beer (20%), followed by candy (7.8%), chips/pretzels (7.1%), and liquor (7.1%).<sup>74</sup>

### **Body type in television shows and movies**

Unlike the real world, not much has changed over the past 25 years in the body size and shape of the characters who inhabit the TV world. Back then, prime time characters were relatively healthy and slim, regardless of their age, and today they still are, although perhaps a little thinner. Overweight or obese characters on television have been primarily middle-aged or older.

One early study found that overall about 12% of characters were portrayed as overweight or obese. Overweight and obese characters tended to be unattractive, unpopular, or unsuccessful, while their thin or average counterparts had more positive traits.<sup>75</sup> A study published in 2003 compared the distribution of body types on top-rated prime time TV programs with the real world, using estimated body mass index (BMI) as the criterion. This study found that 14% of female and 24% of male characters were overweight or obese, half what the percentages are in real life. Among women in the TV world, a third are underweight, compared with 5% in reality. Overweight characters tend to be nonrecurring characters and have fewer romantic interactions, fewer friends, fewer leadership characteristics, and are less likely to be attractive, date, and have sex than thinner TV characters.<sup>76</sup> Another study found that overweight female characters in sitcoms received fewer positive body and weight-related comments from male characters than did thinner female characters.<sup>77</sup> In both studies, the authors suggested that these depictions could have a negative impact on viewers.

Given that the percentage of African Americans who are overweight and obese is significantly higher than the general population, another group of researchers designed a study to compare four of the most popular sitcoms viewed by the general public with four sitcoms most watched by African American audiences. A much higher prevalence of obesity was found in the shows targeted to African Americans than in those designed for the public at large (27% vs. 2%), and there were more food commercials overall during the African American shows (4.8 vs. 2.9 per half-hour show).<sup>78</sup> Again, exactly what effect seeing obese characters on these shows has on the prevalence of obesity among African Americans in real life is not clear.

A study of film characters indicates that over the past decade, the proportion categorized as overweight or obese has been low (13.1%). Food choices were seldom the focus of a character or used to evaluate the character negatively or positively. Characters commonly led an active lifestyle with about two incidents an

hour of scheduled exercise and sports. A character's demographic profile was not significantly associated with either dietary practices or intensity of exercise or sports choices.<sup>79</sup>

### **Effects of entertainment media depictions on obesity-promoting behaviors**

Media's effects on children are documented in a significant and accumulating body of scientific research. Based on other media effects studies, researchers reason that just as portrayals in television and film shape viewers' perceptions of health behaviors such as smoking cigarettes or drinking alcohol, the images and messages about eating certain foods or being too fat or too thin may affect them as well.

Some researchers suggest that the pervasiveness of the thin ideal in media may inspire children to look like the body standards they see in the media culture and put them at risk for developing weight concerns and subsequent eating disturbances. One researcher reported a link between television exposure and a possible tendency for disordered eating among children as young as 11 years old,<sup>80</sup> and many others point to media as one of the influences on children internalizing the thin-ideal body image that may result in subsequent eating disturbances.<sup>81</sup>

Longitudinal data from the nationally representative Growing Up Today Study provide some insight into the connection between adolescents' media exposure, their preference for a slim body type, and their weight-control beliefs and behaviors. During a one-year follow-up, researchers analyzed data from more than 6,000 girls and 5,000 boys 9–14 and found that independent of age and BMI, both girls and boys who were making a lot of effort to look like same-sex figures in the media were more likely than their peers to become very concerned about their weight.<sup>82</sup> Another analysis using the same data, but focusing only on adolescent girls, found that trying to look like females in television, movies, or magazines was predictive of tween girls' beginning to purge at least once a month.<sup>83</sup>

Another study found that increased television exposure was linked to increased risk of eating disorders for both boys and girls.<sup>84</sup> However, a more recent study by the same researcher indicated that exposure to thin-ideal television content did *not* predict disordered eating among 6th-, 9th-, and 12th-graders, although fat-character television content was found to be a significant positive predictor of bulimia for all age girls.<sup>85</sup> As discussed earlier, while some of these studies may indicate a correlation between media and disordered eating, they do not indicate causality, nor do they explain why so many young people are becoming obese. To date, research does not appear to have substantiated a link between media depictions of body type and the increase in childhood obesity.

## Policy Options

Most experts in the field of child health and nutrition agree that the causes of childhood obesity are complex and multidimensional. Likewise, most agree that effective prevention and treatment demands a multifaceted approach. Many in the public health community have been frustrated at the difficulty of developing effective methods for preventing or treating obesity. Given the fact that children spend so much time with media, some have pointed to media use as one of the most easily modifiable influences on overweight and obesity among children. Advocates and researchers have become increasingly hopeful that changes can be made that will reduce the role media plays in childhood obesity and capitalize on the positive contribution media messages can make.<sup>86</sup> Some of the proposed steps to help reverse the trend of childhood obesity are discussed in the following section.

### Reduce or regulate food ads targeted to children

For decades, policymakers, child advocates, pediatricians, and others have advocated for policy measures to protect children from advertising, including ads for unhealthy food. In light of the rapid increase in childhood obesity, food ads aimed at children have come under increasing scrutiny. Policy suggestions to reduce or regulate food advertising targeted to children take a wide array of forms, from voluntary action taken by media companies or the food industry to government regulation. [See box on this page.]

Most researchers agree that children do not understand commercials in the same way adults do. Most children under age 6 cannot distinguish between program content and commercials, and most children under age 8 do not understand that the purpose of advertising is to sell a product. Even children ages 8–10 who have the cognitive ability to understand the nature of advertising may not always discern the persuasive intent or understand the wording of a disclaimer.<sup>87</sup> The American Academy of Pediatrics reviewed the publicly available research about children and advertising and concluded that “advertising directed toward children is inherently deceptive and exploits children under 8 years of age.”<sup>88</sup>

Children’s advertising guidelines are currently regulated by the Federal Communications Commission (FCC), which requires compliance before renewing a station’s license. One guideline requires that a clear distinction between program content and commercial messages be maintained by using separation devices known as “bumpers” to signal the beginning and end of a commercial break. Others prohibit ads with character endorsements from running during or immediately adjacent to that character’s show. The Children’s Television Act, passed by Congress in 1990, also mandates advertising limits during programming aired primarily for children under age 12 to 10.5 minutes per hour on weekends and 12 minutes per hour on weekdays.<sup>89</sup>

Children’s advertising is also subject to self-regulatory policies adopted under the Children’s Advertising Review Unit (CARU).<sup>90</sup> The Grocery Manufacturers Association has pointed out that CARU guidelines suggest that advertising should: not mislead children about the nutritional benefits of products; depict appropriate amounts of a product for the situation portrayed; depict

## AMONG THE OPTIONS THAT HAVE BEEN SUGGESTED ARE:<sup>92</sup>

- A ban on any advertising to preschoolers
- A ban on advertising of “junk” food to very young children
- An FTC investigation into marketing of “junk” food to children
- A prohibition on food product placement in children’s programming
- The provision of “equal time” for messages on nutrition or fitness, to counteract food ads in children’s shows
- Parental “warnings” about the nutritional value of advertised foods
- A repeal of the tax deduction for company expenses associated with advertising “junk” food products to children
- A prohibition on food advertising in school-based TV programs such as Channel One
- Explicit announcement of food-related product placement deals in popular TV shows or movies seen by large numbers of children
- Eliminating or limiting cross-promotions between popular children’s media characters and unhealthy food products
- Increasing the use of popular media characters and celebrities to promote healthy food alternatives

food products “with a view toward development of good nutritional practices;” refrain from portraying snacks as substitutes for meals; and show mealtime products in the context of a balanced diet.<sup>91</sup> The latter policy, for example, is illustrated in cereal ads that show a bowl of cereal with milk and juice, and a voice-over noting that cereal should be part of a balanced, healthy breakfast.

In December 2003, while on the campaign trail, Senator Joseph Lieberman, called for a Federal Trade Commission (FTC) investigation into the marketing practices of companies that target unhealthy foods to children.<sup>93</sup> Just recently a coalition of obesity experts, health professionals, and child advocates asked Sesame Workshop not to air sponsorship messages for McDonald’s before or after “Sesame Street.”<sup>94</sup> In response, children’s TV producers note that banning food advertising or underwriting would remove one of the most lucrative sources of funding for children’s television, particularly given the lack of public funds available in this country for that purpose.

Several industrialized democracies have adopted policies designed to protect children from excessive marketing practices. Sweden, Norway, and Finland, for instance, do not permit commercial sponsorship of children’s programs. Sweden also does not permit any television advertising directed to children under age 12. Belgium imposes restrictions on commercials five minutes before and after as well as during children’s programming.<sup>95</sup> The BBC decided to prohibit use of its cartoon characters in fast food ads, and England is pushing for stricter guidelines for advertising aimed at children.<sup>96</sup>



### **Expand public education campaigns to promote healthy eating and more exercise**

Another media strategy recommended by public health experts is for media companies and the government to adopt and expand public service campaigns aimed at young people, promoting healthy eating and an active lifestyle. A range of such campaigns exist today, but the amount of airtime they have received has been limited, particularly in comparison with the airtime devoted to advertising for candy, sodas, snacks, and cereals. These public education campaigns could be significantly expanded, either through the donation of airtime in children's programs by the networks, purchase of airtime by food companies, or government funding. Some have suggested a tax on "junk" food as a means of funding such an initiative.

The CDC launched the "Verb" campaign to encourage a more active lifestyle for tweens ages 9–13. The campaign uses advertising, marketing, online content, and on-the-ground events to get the message to youth, parents, and educators. The National Cancer Institute's "5 A Day" campaign, designed to promote fruits and vegetables, also includes a media component. But these campaigns are very modest compared to those mounted by the food industry: The entire budget for the "5 A Day" effort is \$3.5 million a year, compared to \$29 million in advertising for Pringles, \$74 million for M&Ms, \$209 million for Coke, and \$665 million for McDonald's.<sup>97</sup> In addition to devoting more resources to fitness and nutrition campaigns aimed at kids, campaigns could also be designed to help raise parental awareness about the problem of childhood obesity and suggest steps parents can take.

Some TV networks have created their own branded campaigns on related topics. For example, Nickelodeon launched the national "Let's Just Play" campaign in June of 2003, combining media messages and grassroots activities to encourage kids to get more physically active.

An example of a nutrition-related media campaign that many consider to have been effective is The Center for Science and the Public Interest's "1% or Less" campaign. The goal was to encourage adults and children age 2 and older to switch from whole or 2% milk to 1% or fat-free milk as a way to reduce consumption of saturated fat. Paid advertising in TV, newspapers and radio, as well as point-of-sale messages, news coverage, community-wide nutrition education programs and school activities achieved a market share increase of 21% for low-fat and 11% for fat-free milk in several communities after seven weeks.<sup>98</sup> Public health leaders suggest that similar campaigns could be targeted to children to encourage walking, biking, and other active lifestyle choices, as well as healthier eating.<sup>99</sup>

### **Incorporate messages about healthy eating into TV storylines**

Public health officials have also suggested inserting obesity-related messages into storylines in TV programming, which they believe could have far-reaching implications for raising awareness about the obesity epidemic and motivating children and their parents to take action. For example, the Surgeon General has recommended that media professionals incorporate messages about eating healthy and exercising regularly into youth-oriented television programming, depict

characters of diverse sizes, and emphasize characters' healthy dietary practices and physically active lifestyles.<sup>100</sup>

Research has shown that spotlighting a health issue in popular entertainment television programming has the potential of reaching millions of viewers who otherwise may not receive the information.<sup>101</sup> Several studies have found that viewers pick up health information from shows they watch, learn about diseases and how to prevent them, use the information to make decisions about their own health care, and even contact their physician about something they saw on a TV show.<sup>102</sup> A recent study indicated that entertainment television could be an effective way for teens to learn about health issues relevant to their own lives.<sup>103</sup> Other studies have found that linking health storylines to public service announcements following the show can inspire viewers to seek additional information by calling a toll-free telephone hotline.<sup>104</sup> Messages about healthy eating and fitness could be incorporated into programming aimed at children or teens, and storylines about childhood obesity could be incorporated into shows for adults.

Some children's shows may already be motivating viewers to move around as they watch. One study, which interviewed a small sample of 66 mothers of children ages 3–8, found that in some instances television stimulates children's physical activity by prompting them to exercise along with the TV program or imitate the actions of a TV character.<sup>105</sup> Elmo has his own exercise videos, *Elmocize* and *Elmo's Exercise Camp*, as do the Teletubbies. In early 2004, PBS began broadcasting a new show called "Boohbah," which its creators say is designed to encourage 3- to 6-year-olds to get active. The show features characters doing activities like stretching and jumping.<sup>106</sup> Whether it will inspire a similar response in its viewers—or perhaps displace more active play instead—is of course unknown at this time.

### **Support interventions to reduce the time children spend with media**

For a variety of reasons concerning children's healthy development, the American Academy of Pediatrics recommends no TV or videos for children under age 2, and suggests limiting children's screen media time after that age to 1–2 hours of quality programming a day. In its recently issued policy statement about childhood obesity, the Academy advocates restricting television viewing as a specific strategy for preventing pediatric overweight and the risk of obesity.<sup>107</sup>

Other health experts concerned about childhood obesity endorse having parents limit their children's media time, along with increasing physical activity levels and promoting healthy eating patterns. For instance, the Surgeon General's action plan called for a decrease in time spent watching television to help prevent and reduce obesity and overweight among youth.<sup>108</sup> Among the target goals of *Healthy People 2010*, the nation's prevention agenda for the first decade of the 21st Century, is to increase the proportion of adolescents who view television 2 hours or less on a school day from 57% to 75%.<sup>109</sup> The USDA Dietary Guidelines recommend that parents help children be physically active by limiting their television watching, computer game playing, and other forms of inactive play.<sup>110</sup>

In addition to general efforts to encourage parents and children to limit the time kids spend with media, health advocates also have suggested childhood obesity can be curbed by specific interventions that help children make small lifestyle changes, including reducing screen time. They also support teaching children skills to mitigate potential adverse effects of all forms of food marketing, from commercials to product placements, to depictions of food, fitness, and body types in television shows and movies.

Several successful interventions have used reductions in media use as a key component (see “Do experimental interventions that reduce children’s media time result in weight loss?” in this report). Local and state governments, nonprofits, school districts, or the federal government could provide additional financial support to develop curricula and promote adoption of such interventions as a way of reducing the incidence of child obesity.

## Conclusion

The rising rates of childhood obesity present one of the most significant public health challenges we face. While there are many factors that contribute to the problem, this review of the major studies indicates that children’s use of media is an important piece of the puzzle. Fortunately, there are an array of options for policymakers, food companies, media companies and parents to consider that may help minimize any negative effect media may be having and maximize the positive role media can play in addressing the problem.

Most large national cross-sectional studies and several longitudinal studies indicate that children who spend more time with media are more likely to be overweight than children who don’t. While several regional studies have come to different conclusions, experimental interventions clearly indicate that there is an opportunity to reduce children’s body weight by curbing the time they spend with media.

Exactly *how* media may contribute to childhood obesity has not been conclusively documented. Contrary to common assumptions, most studies have found only limited evidence for the theory that the time children spend with media displaces time they would otherwise spend in more vigorous physical activities. There may be limitations to the measures used in these studies, and more research needs to be done in this area.

But in the absence of such research at this time, it appears likely that the main mechanism by which media use contributes to childhood obesity may well be through children’s exposure to billions of dollars worth of food advertising and cross-promotional marketing year after year, starting at the very youngest ages, with children’s favorite media characters often enlisted in the sales pitch. Research indicates that children’s food choices—and parents’ food purchases—are significantly impacted by the advertising they see. The number of ads children see on TV has doubled from 20,000 to 40,000 since the 1970s, and the majority of ads targeted to kids are for candy, cereal, and fast food. More research, perhaps removing ads from children’s media while not reducing their overall time spent with media, could help clarify this issue.

While the magnitude of the impact of media’s effects on childhood obesity is not clear, the body of evidence indicates there is a role for media-related policies to play in a comprehensive effort to prevent and reduce childhood obesity. While this report does not endorse any specific policies, it does lay out a variety of possibilities for consideration, from reducing the time children spend with media, to reducing their exposure to food advertising, to increasing the number of media messages promoting fitness and sound nutrition.

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