

# **CHILDHOOD OBESITY IN TEXAS**

**The Costs, The Policies, and a Framework for the Future**

by

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## **Childhood Obesity in Texas: The Costs, The Policies, and a Framework for the Future**

The Children's Hospital Association of Texas (CHAT) is an organization of regional not for profit children's hospitals in Texas. CHAT's mission is to advance pediatric health care services for the benefit of children in Texas.

To further its mission, CHAT works to inform and educate the public and state decision makers about issues in pediatric health care. To recognize the leadership of the late Senator Lloyd Bentsen in child health, CHAT supports occasional research reports by public policy students at the LBJ School of Public Affairs on selected pediatric health care issues.

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## EXECUTIVE SUMMARY

One in three Texan children is overweight or obese, including almost half of Hispanic children in the state. These children have greater than a two-thirds chance of remaining obese at age 35. These children will suffer lifelong health and productivity consequences. Already by 2005, obese adults cost Texas businesses \$3.3 billion per year. Today's obese children are poised to triple Texas' current adult obesity rate by 2040, and obesity-related expenses are projected to skyrocket accordingly.

Fortunately, obesity is a preventable condition. Innovative policies can reach children while they are still young, reversing their unhealthy weight trends, and preventing weight gain in the first place. Texas has taken bold first steps toward reducing childhood obesity, yet more work remains. With the right combination of actions, the state could avert future costs for Texas and its businesses, and improve the next generation's quality of life.

### *Costs of childhood obesity to Texas*

Obese children's bodies suffer impairments that lead to a lifetime of chronic disease, and their academic performance suffers, leading to a lifetime of lowered productivity. Not only does obesity diminish children's quality of life, but its costs pose a lifetime of high expenses to Texas.

- **Costs to children's health:** The health consequences of childhood obesity are so severe that researchers believe the childhood obesity epidemic will lower life expectancy within a generation. During childhood, obese and overweight children have increased risk of joint problems, gallbladder problems, and obstructive sleep apnea. Obese children are especially prone to metabolic syndrome, a key precursor to chronic disease in adulthood: 29% of obese adolescents have metabolic syndrome, compared to 0.1% of normal-weight adolescents.
- **Medical costs:** Childhood obesity-associated health care is expensive. During childhood, obese children's hospitalization expenses are higher, due to longer lengths of stay and other increased costs. Obese children with asthma have 29% higher hospitalization costs than other children hospitalized for asthma. When children become obese adults, their medical costs are 42% higher than for normal-weight adults. In 2005, obesity-related medical costs in Texas exceeded \$1.37 billion.
- **Costs at school and work:** Childhood obesity is associated with increased absences, lower grades, and lower TAKS scores. Children, and especially adolescents, who are overweight and obese suffer from stigma, which can diminish self confidence, resulting in lowered goals and performance. When obese children grow up, their productivity and wages are lower than for people who were healthy-weight as children. Continued stigma takes a toll, reducing obese females' wages by as much as 15%. Chronic diseases translate to absences and presenteeism.

## Policy solutions for childhood obesity in Texas

The most promising policy solutions for childhood obesity address the unhealthy environment in which children live. The childhood obesity epidemic was brought on by changes in this environment, beginning in the 1970s. Some changes led children to consume more calories; for example, shifts in food availability, marketing, and prices all pushed diets to include more edible oils, animal-derived foods, and sweeteners. Other changes led children to burn off fewer calories; the proliferation of new technologies such as air conditioning, television, video games and computers all contributed to an increase in sedentary behaviors, and a decrease in physical activity. The result of these changes is an energy imbalance of 110 to 165 Calories per day that children consume, but do not burn off.

The goal of childhood obesity policies is to bring children's Energy-in (food intake) back in balance with their Energy-out (calories burned throughout the day). This may be accomplished in the medical setting by changing behaviors, and treating symptoms, or in the community, by tackling those aspects of children's environments that promote unhealthy choices.

- **Medical treatment:** Childhood obesity interventions in the health care setting show promise, though the optimal medical solution remains unclear. Obesity is a medical problem, so the health care system is a natural choice for solution. Many programs and research projects are underway at Texas children's hospitals and elsewhere, searching for the best medical intervention. However, today medical care for obese children is costly and rarely reimbursed, thus it is frequently reserved for the most severely obese children, and those children suffering from co-morbidities.
- **Energy-in policies:** Energy-in policies encourage healthy diets for children. Texas policies already ensure that school meals are healthy, and restrict the availability of unhealthy food sold on campus. Recent data show that as a result, Texas' children are eating healthier food at school than in the past. However, children obtain the majority of their food from non-school sources, and that food remains unhealthy. Texas' energy-in policies have only recently begun to address away-from-school food, and more work remains.
- **Energy-out policies:** Energy-out policies encourage children to engage in physical activity rather than sedentary behaviors. Texas' energy-out policies focus on physical activity at school. The average elementary and middle schools exceed 135 minutes of physical activity per week, and almost all schools test and report children's physical fitness each year. Still, Texas' energy-out policies could be strengthened to further promote physical activity.
- **Comprehensive strategies:** The goal of anti-obesity policy is to strike a balance between energy-in and energy-out, thus the most effective policies are comprehensive, incorporating both sides of the equation. Texas has taken a strong first step in requiring Coordinated School Health Programs (CSHPs), which push schools to consider the big picture of child health. CSHPs include nutrition, physical activity, health care, and parent involvement components, and when implemented well, they can reduce Body Mass Index (BMI). Through high-quality, community-wide CSHP implementation, El Paso has already become the first region in the nation to show a population-wide reduction in childhood obesity. Texas could implement new policies to make the most of CSHPs.

## Recommendations for Texas

Texas can do more to reduce childhood obesity by addressing gaps and strengthening current policies.

- 1. Address away-from-school food:** Texas can help families obtain healthier foods for children. Texas could increase access to grocery stores and farmers markets, such as by creating incentives to build grocery stores in underserved areas. Crucially, Texas could solve children’s energy imbalance by helping eliminate one 150 Calorie can of soda from their diets each day. A fee on sugar-sweetened beverages could reduce soda consumption by as much as 20%, and raise over \$1 billion in revenue for the state.
- 2. Strengthen in-school physical activity:** Texas can strengthen the effect of its existing physical activity policies. Requiring more physical activity in higher grades—an additional two semesters in middle school, and an additional half credit in high school—could improve low levels of fitness among older children. New reporting and analysis of existing Fitnessgram data could motivate schools to improve the quality of children’s physical activity.
- 3. Capitalize on the promise of CSHPs:** Texas can get more out of CSHPs. Encouraging community involvement in CSHPs could help ensure that children have a healthy environment both in and out of school. Extending CSHPs to childcare settings could teach families and teachers to start healthy habits early. In all grades, Texas could encourage high-quality CSHP implementation by holding schools accountable and rewarding top-performing schools.

Table 1 (next page) summarizes the state of anti-childhood obesity policy in Texas today, showing Texas’ early accomplishments, areas that Texas has begun to address, and new issues Texas must take on to effectively reduce childhood obesity.

**Table 1.** The state of anti-childhood obesity policy in Texas.

Policy goal	Texas has already accomplished	Room for improvement	Future step for Texas
<b>Energy-in policies:</b> Reduce the number of unhealthy calories that children consume.			
<b>Healthy food at school</b>			
Require healthier school menus	<b>x</b>		
Restrict and prohibit competitive foods at schools (vending machines, snack bars, etc.)	<b>x</b>		
<b>Healthy food away from school</b>			
Provide healthy food to families on WIC	<b>x</b>		
Increase access to farmers markets		<b>x</b>	
Increase access to grocery stores			<b>x</b>
Promote healthy beverage choices			<b>x</b>
<b>Energy-out policies:</b> Increase the number of calories that children burn off.			
<b>Physical activity at school</b>			
Require pre-K and elementary school PE	<b>x</b>		
Require middle school PE		<b>x</b>	
Require high school PE		<b>x</b>	
Support high-quality PE instruction		<b>x</b>	
<b>Physical activity away from school</b>			
Promote active transport to/from school	<b>x</b>		
Encourage community support for after-school physical activity			<b>x</b>
Implement strategies to reduce sedentary behavior at home			<b>x</b>
<b>Comprehensive Policies:</b> Address both sides of the energy imbalance at once.			
Implement Coordinated School Health Programs (CSHPs)	<b>x</b>		
Incentivize high-quality CSHP implementation			<b>x</b>
Strengthen community involvement to enhance CSHP effects			<b>x</b>
Extend CSHP to childcare settings in early childhood			<b>x</b>

## INTRODUCTION

Obesity is an epidemic facing Texans, and children are no exception. Childhood obesity poses high costs to the well-being of young Texans: obesity negatively affects children's health, and causes chronic disease as children grow older. Childhood obesity also incurs high economic costs to individuals, the public, and private businesses in Texas. Further, people who are obese during childhood have a very high likelihood of remaining obese as adults, so many children suffer the negative consequences of obesity throughout their lives. In 2009, the Texas State Demographer wrote that "If we do not arrest the increase of the burden of obesity, we will lower the quality of life for Texas' population, decrease the economic competitiveness of the state by increasing the burden of health care costs on the state's employers, and increase the burden on the health care system."<sup>1</sup>

But there is good news too. The Institutes of Medicine (IOM) calls childhood obesity "a largely preventable condition."<sup>2</sup> Though some obesity prevention strategies are costly, prevention is dramatically cheaper compared with the costs of allowing children to become obese adults.<sup>3</sup> Interventions like the CATCH comprehensive health program in schools have shown to be cost-effective for reducing obesity rates among children. Fortunately for Texas children, their state is a national leader on anti-childhood obesity policy.

Texas' focus on children is a smart obesity intervention strategy. First, interventions that reach children early can prevent children from ever becoming overweight or obese. Second, interventions in childhood can reverse the obesity trend by preventing already overweight and obese children from becoming overweight and obese adults. Intervening during childhood can have a bigger impact than later action, because it reverses children's weight trajectory before they have suffered a lifetime's worth of health and economic consequences from obesity. The first section of this report documents the extensive costs of obesity that children incur throughout their life course. Texas' goal of reducing childhood obesity will avert these substantial costs. Keeping children from becoming obese adults gives Texas a healthier and more productive future.

At its root, childhood obesity comes from an imbalance of energy-in and energy-out. That is, children consume more calories than they expend each day.<sup>4</sup> Texas policies address both energy-in and energy-out, reducing the unhealthy calories children consume, and increasing the calories they expend through physical activity. The goal of the policies, according to Texas Comptroller Susan Combs, is to "ensure tomorrow's adults develop healthy minds and bodies by eating nutritious food and engaging in physical activity."<sup>5</sup>

Yet Texas' childhood obesity rates remain high. The second section of this report documents the steps Texas has already taken, and seeks to explain why these steps have not yet resulted in a reduction in childhood obesity. The report concludes with several recommendations for improving Texas' childhood obesity policies. These recommendations, along with the inevitable future evolution of policies, could lead to real reductions in Texas' childhood obesity rate.

## **Defining overweight and obesity**

This report uses the official Centers for Disease Control and Prevention (CDC) definitions for the terms “overweight” and “obese” (See Table 1). The CDC thresholds are based on Body Mass Index (BMI) distributions from national surveys that were gathered prior to the obesity epidemic.<sup>6</sup> Some of the childhood obesity literature uses alternate definitions for “overweight” and “obese,” as well as alternate terms, such as “at risk for overweight.” In this report, any alternate terminology from cited research has been adapted to conform to the CDC definitions.

**Table 2.** CDC Definitions for child weight status, for children ages 2-19

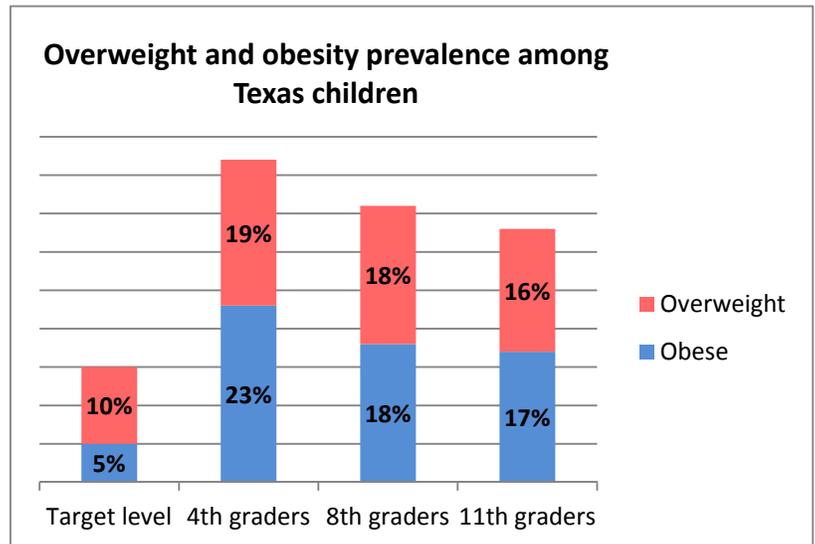
Underweight	At or below 5 <sup>th</sup> BMI percentile for age/sex/height
Normal Weight	6 <sup>th</sup> -84 <sup>th</sup> BMI percentile for age/sex/height
Overweight	85 <sup>th</sup> -94 <sup>th</sup> BMI percentile for age/sex/height
Obese	At or above 95 <sup>th</sup> BMI percentile for age/sex/height

Source: CDC (2010)

## **Childhood obesity in Texas**

The rate of childhood obesity increased dramatically after the 1970s, across age, income, racial and ethnic groups. Between 1971-1974 and 1999-2000, the national obesity rate more than doubled for children ages 2 to 5 and 12 to 19, and tripled for children ages 6 to 11.<sup>7</sup> While preliminary evidence indicates that the national childhood obesity rate may have stabilized in the past decade (since 1998), the rate of childhood obesity remains very high.<sup>8</sup>

As of 2007, national surveys show that 32% of Texas children between the ages of 10 and 17 are overweight or obese, putting Texas in the worst-performing half of states for obesity prevalence.<sup>9</sup> Data from the School Physical Activity and Nutrition (SPAN) study, which monitors childhood obesity in Texas using more rigorous methodology than national surveys, present an even starker picture. The SPAN III study, representing a statewide sample of children enrolled in public schools in 2004-05, showed that 40% of Texas 4th graders, 39% of Texas 8th graders and 36% of Texas 11th graders are overweight or obese.<sup>10</sup>



Source: DSHS Obesity Data Sheet (May 2010), data from SPAN III 2004-2005. Target level based on CDC guidelines.<sup>10</sup>

In Texas, Hispanic children have the highest rates of overweight and obesity: 47% of Texas Hispanic children were obese based on 2007 national data, compared to 26% of black non-Hispanic children, and 23% of white non-Hispanic children.<sup>11</sup> This is echoed in the SPAN studies.<sup>12</sup> In Texas and nationally, Hispanic boys have the highest rate of obesity among boys, and black non-Hispanic girls have the highest rate of obesity among girls.<sup>13,14</sup> This fact is particularly troubling given that the share of Texas children who are Hispanic is increasing rapidly.<sup>15</sup>

It is important to consider the rate of adult obesity when discussing childhood obesity, for the simple reason that children will become adults. Today, two-thirds of Texas adults are either overweight or obese, including almost 30% of adult Texans who are obese.<sup>16,17</sup> The rate of adult obesity in Texas increased 120% between 1990 and 2005.<sup>18</sup> The Office of the State Demographer projects that by 2040, 15 million adult Texans (or 43% of all adult Texans) will be obese.<sup>19</sup>

Today's obese children are tomorrow's obese adults. One rigorous study shows that obese children and adolescents have a greater than two-thirds chance of being overweight at age 35.<sup>20</sup> While today most obese adults became obese in adulthood, as the proportion of obese children increases, a greater share of obese adults will have begun their obesity during childhood.<sup>21</sup>

## COSTS OF CHILDHOOD OBESITY

Obesity is considered a disease because of its strong negative impact on health. This negative impact costs children physically. In addition, childhood obesity poses high economic costs to Texans not only from direct medical expenses, but by detracting from performance at school and at work. This section explores the costs of childhood obesity on health and productivity, with two important considerations in mind. First, it is important to consider both costs incurred during childhood and costs incurred over the life course. Therefore, this section includes information on obesity-attributable costs for adults, as well as for children. Second, policymakers need to know who bears the costs of obesity. Thus, where possible, this section breaks down the proportions of costs borne by the public sector, the private sector, and individuals.

### Health costs

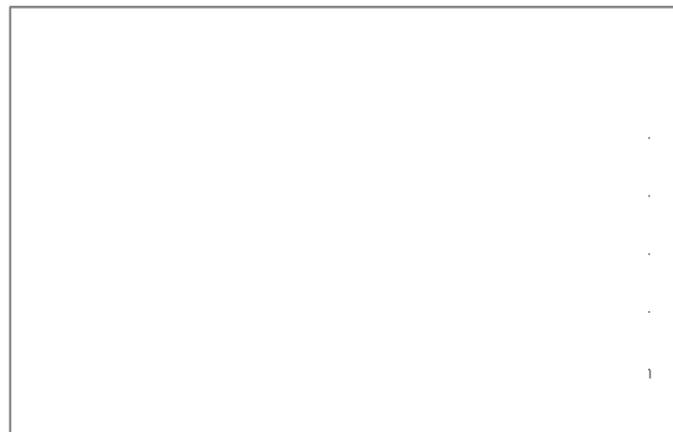
#### *Obesity's effect on a child's body*

Obesity is a disease with lifelong health consequences; these consequences are so severe that the obesity epidemic is expected to lower life expectancy for children born today. According to the IOM, "this generation of children is the first to have shorter lives than their parents."<sup>22</sup>

Even in childhood, obese and overweight children have increased risk of joint problems, gallbladder problems, and obstructive sleep apnea.<sup>23</sup> In its seminal 2005 report, *Preventing Childhood Obesity: Health in the Balance*, the IOM summarized what researchers know about the health consequences of childhood obesity (emphasis added):

"Several thorough reviews...have found childhood obesity to be associated with a wide array of disorders that affect multiple organ systems. These disorders include hypertension, dyslipidemia, glucose intolerance/insulin resistance, hepatic steatosis, cholelithiasis, sleep apnea, menstrual abnormalities, impaired balance, and orthopedic problems. Some of these conditions produce clinical symptoms in obese children, while others do not; however, **the metabolic and physiologic changes associated with childhood obesity, along with the obesity itself, tend to track into adult life and eventually enhance the risks of disease, disability, and death.**"<sup>24</sup>

Of particular concern is the high rate of metabolic syndrome among obese and overweight children. Metabolic syndrome is diagnosed when a person has at least 3 of 5 metabolic abnormalities (elevated blood pressure, a low high-density lipoprotein (HDL) cholesterol level, a high triglyceride level, a high fasting glucose level, and abdominal obesity). Studies in adults show that metabolic syndrome often



progresses to type 2 diabetes and atherosclerosis. Adults with metabolic syndrome have a dramatically increased risk for morbidity and mortality from cardiovascular disease.<sup>25</sup>

In *Health in the Balance*, the IOM states that “Ultimately, it may be the association of childhood obesity with the metabolic syndrome, rather than exclusively with diabetes, that may comprise the greatest physical health threat of childhood obesity.”<sup>26</sup>

### ***Medical costs of childhood obesity***

Due to its severe health consequences, obesity has become a major determinant of medical costs in Texas. Many of these costs are seen in adulthood; increasingly, the medical costs of obesity also accrue during childhood.

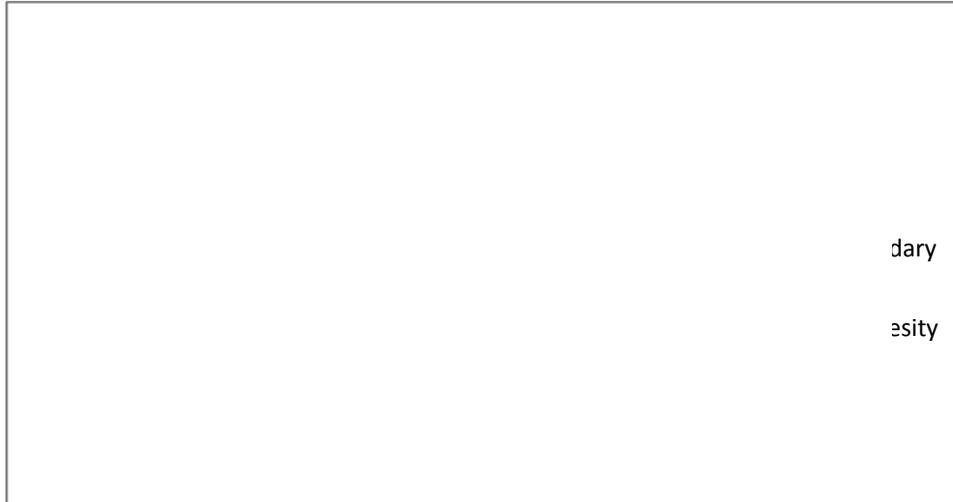
According to the 2007 report *Counting Costs and Calories* by Texas Comptroller Susan Combs, the medical costs in Texas attributable to adult obesity exceeded \$1.37 billion for 2005. This accounted for 4.7% of all medical spending in Texas that year.<sup>27</sup> In 2006, medical spending was \$1429 greater for each obese person compared with a normal-weight person. Medical costs are 42% higher for each obese person than for persons of normal-weight.<sup>28</sup> Multiple studies show that for adults over 18, inpatient costs, outpatient costs, and prescription drug costs are higher for obese people than for normal-weight people.<sup>29</sup> Most of these adult medical costs are due to treating the diseases that result from obesity, rather than from treating obesity itself.<sup>30</sup> Over the next few decades, the medical costs of obesity are expected to increase, when today’s obese children become obese adults.<sup>31</sup>

During childhood, the most expensive obesity-related medical costs are due to hospitalization. Nationwide, obesity-associated\* hospital costs for children ages 6 to 17 were 7 times higher in 2005 than in 1979 (adjusting for inflation).<sup>32</sup> By 2005, obesity-associated hospital costs for children were \$237.6 million per year.<sup>33</sup> This increase was not only due to rising medical costs, but also because a greater proportion of children’s hospitalizations are now associated with obesity.<sup>34</sup> The hospitalization rate for children with a primary diagnosis of obesity increased 24% per year between 1999 and 2005, while the hospitalization rate for children with a secondary diagnosis of obesity increased 12% per year.<sup>35</sup>

Crucially, the cost of hospitalizing obese children is higher than the cost of hospitalizing a normal-weight child. Children hospitalized with a secondary diagnosis of obesity have 29% higher costs for asthma, 26% higher costs for pneumonia, and 28% higher costs for appendicitis, than children with the same primary diagnoses, but no obesity diagnosis.<sup>36</sup> With asthma and pneumonia the second and third most common causes for childhood hospitalizations, the increased costs due to obesity are cause for concern.<sup>37</sup> Obese children remain hospitalized longer than normal-weight children: on average children with a secondary diagnosis of obesity stay .85 days longer than normal-weight children with the same primary diagnosis.<sup>38</sup>

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\* In reference to hospitalization costs, “obesity” refers to the medical diagnosis of obesity as an illness, based on the judgment of providers and payers. The clinical definition of obesity differs from the CDC standard definition. (Trasande et al., 2009)



Source: Woolford et al. (2007)

The reported hospitalization costs are conservative estimates, because they are based on claims data. While the coding of obesity as a primary or secondary diagnosis has increased in recent years (especially following the federal government's recognition of obesity as an illness in 2004), obesity remains undercoded as a diagnosis.<sup>39</sup> For instance, less than 2% of asthma hospitalizations of children between 1999 and 2005 listed obesity as a co-morbidity; one would expect the proportion of obese asthma patients to mirror or exceed the proportion of obese children in the general population, which was about 20% between 1999 and 2005.<sup>40</sup>

Recently, researchers have begun to estimate obesity-related medical costs incurred during childhood besides hospitalization. According to one new study, when compared to normal-weight children, obese and overweight children have higher outpatient visit expenditures, higher prescription drug expenditures, and higher emergency room expenditures. The cost increases range from an average of \$25 more to \$194 more per year, depending on age and expense-type.<sup>41</sup> In addition, obese children are likely to have more office visits per year than other children.<sup>42</sup>

Considered as a whole, the population of obese children may not actually incur higher medical costs than normal weight children. Because obese and overweight children are overrepresented in poor and minority groups who are less likely to access care, these children are less likely to accumulate outpatient expenditures, yet more likely to accumulate inpatient expenditures.<sup>43</sup> If access to care were improved, and obese children began to be treated according to expert recommendations, the medical cost of obesity during childhood could increase.<sup>44</sup>

The biggest cost-driver for childhood obesity is the fact that children are young. Because they become unhealthy at an early age and remain so throughout their lifetime, obese children incur many more years' worth of obesity-related costs than obese adults. One study estimates that the cohort of obese children in the U.S. who were 12 years old in 2005 would incur \$6.24 billion over their lifetime, in direct medical expenditures alone.<sup>45</sup> Conversely, a reduction in obesity among children has huge cost-saving potential, because it saves costs over children's entire lifetime. The same study estimates that a 1 percentage point reduction in obesity among this 12-year-old cohort would result in \$260.4 million savings over their lifetime, with \$86 million of the savings achieved during childhood, and the remainder achieved during adulthood.<sup>46</sup>

### Who pays the medical costs of childhood obesity?

Childhood obesity has a high price-tag, and the medical costs are paid by multiple payers. Both the public and private sectors pay significant portions of the cost, while individuals bear the remaining cost. Because children often do not develop obesity-associated chronic disease until adulthood, obesity frequently goes untreated during childhood. However, the underuse of outpatient care in childhood could lead to higher medical costs from obesity-attributable disease during adulthood. In 2004, the Centers for Medicare and Medicaid Services (CMS) issued a statement classifying obesity as a disease, although diagnosis remains low, particularly for privately insured children.<sup>47</sup> One study found that in 2004, about 1% of privately and Medicaid-insured children were treated for a diagnosis of obesity, with a slightly lower rate for privately insured children. This rate was far below the 16% of all children who were obese in 2004.<sup>48</sup> Researchers have only recently begun to examine how costs are divvied up among payers, so the complete breakdown is not yet clear.

#### *Public sector*

Medicaid is the primary public payer of obesity costs incurred during childhood. Medicaid children are treated for obesity at higher rates than privately insured children. Medicaid's share of children diagnosed with obesity is 5 to 10% higher than Medicaid's share of children in the general population.<sup>49</sup>

Even with only a small fraction of obese children actually being treated for obesity, total national Medicaid spending in 2004 for children diagnosed as obese was \$470 million, almost double the \$280 million paid by private insurers.<sup>50</sup> Childhood obesity-related hospitalizations cost Medicaid \$118.1 million in 2005, a 120% increase since 2001.<sup>51</sup> If this rate of increase continued, Medicaid would have spent \$260 million on obesity hospitalizations in 2009. The large increase in spending appears to be driven by the increasing number of obese children.<sup>52</sup>

Short of hospitalization, obesity-related Medicaid costs incurred during childhood remain low. For children on Texas Health Steps (Texas Medicaid's Early and Periodic Screening Diagnosis and Treatment (EPSDT) program), only treatment of obesity's co-morbidities is covered; Texas Health Steps does not cover treatment of obesity itself. A study of all states' EPSDT programs in 2008 found that Texas is one of 10 states *unlikely* to cover recommended childhood obesity treatment in its program. The study, which examined states' EPSDT-specific documents, found that Texas does "not address reimbursement of nutritional assessment and treatment in [its] published materials and did not include relevant CPT codes in [its] fee schedules." The study concluded that EPSDT could cover all of the expert recommended prevention, assessment, and treatment for childhood obesity, but very few states actually do.<sup>53</sup> Texas Health Steps only "requires Body Mass Index (BMI) measurement, nutritional counseling, and anticipatory guidance for every well-child visit."<sup>54</sup> Medicaid's costs for obesity during childhood might increase if the program began to fully cover expert-recommended obesity care under Texas Health Steps; however, as the baseline costs are unknown, the degree of cost increase is difficult to estimate.

As children age and their medical expenses increase, public insurance pays much more substantial amounts. Nationally, Medicare and Medicaid pay about half of the cost of obesity in adults.<sup>55</sup> In Texas, in 2003 adult obesity accounted for 11.7% of Medicaid expenditures, or \$1.1 billion. That same year, Medicare spent \$1.2 billion for adult obesity in Texas.<sup>56</sup>

### *Private sector*

Researchers predict that privately insured children are less likely to be diagnosed with obesity than Medicaid children.<sup>57</sup> Thus, the cost of obesity during childhood to private insurers is most likely low. When obese children are hospitalized, private payers do pay a larger share than Medicaid if obesity is listed as a primary diagnosis; however, the reverse is true when obesity is listed as a secondary diagnosis.<sup>58</sup> Beyond hospitalization, private insurers typically do not cover recommended treatment. A survey in 2005 found that just 1 of 11 major health insurers had a comprehensive weight management program for children, although several more insurers had similar programs in development as of 2006.<sup>59</sup>

In adulthood, private insurers pay substantial costs for obese patients. In 2006, researchers estimate that 12.9% of all private payer medical spending went toward obesity-attributable causes, accounting for between \$49 billion and \$74 billion in medical spending that year.<sup>60</sup> In Texas, adult obesity accounted for \$1.4 billion in private insurer medical spending in 2005.<sup>61</sup>

Insurers might pass on obesity-related costs incurred during childhood to employers, as employers pay the cost of covering obese children on employee health plans. For one large national employer in 2008, children accounted for 28% of enrollees and 17% of gross claims cost. For the same company, average claims for obese children were \$2,970, almost twice as much as for non-obese children (\$1,640).<sup>62</sup>

### *Individuals*

Few analyses measure the proportion of medical costs of childhood obesity that falls to individuals, but it is conceivable that individual Texans bear at least some of the medical cost. For example, any increases in insurance rates might be passed on to employees. Given that insurers might be unlikely to cover recommended treatment, some families might choose to pay out-of-pocket for recommended treatment.

### **Costs at school and work**

Beyond health costs, childhood obesity costs Texans in other ways. At school, obesity increases absenteeism and lowers academic performance. Parents of obese children lose productivity and time at work. When obese children grow up and enter the workforce, as obese adults their productivity and (for females) their wages, will be low compared with normal-weight adults. In

short, obese children not only face a less healthy, shorter life than their normal-weight counterparts, but also a less productive life.

### *Costs at school*

Obesity imposes costs on schools by lowering academic achievement and by increasing absenteeism. Not only do schools suffer the consequences of diminished performance, but children themselves achieve lower, thereby reducing their productivity later in life. According to the National Association of State Boards of Education, “Health and success in school are interrelated. Schools cannot achieve their primary mission of education if students and staff are not healthy and fit physically, mentally, and socially.”<sup>63</sup>

First, obesity is associated with increased absenteeism. In one study of over 1000 students in Philadelphia, obese and overweight children spent significantly more time absent from school than normal-weight children.<sup>64</sup> The consequences of increased absenteeism include lowered academic performance, as well as loss of daily attendance payments for schools.

In addition, obesity is thought to directly lower academic achievement. Several studies show that obese children score lower on standardized tests than non-obese children.<sup>65</sup> One study of nearly 1000 middle schoolers in an urban Texas district found that course grades in Math, Reading, Science and Social Studies, and Texas Assessment of Knowledge and Skills (TAKS) scores in Reading, Writing, and Math were lower for obese students.<sup>66</sup> A similar study for children in elementary schools also found that both course grades and TAKS scores were lower for obese children, and the effect persisted when researchers controlled for race, socioeconomic status, and conduct.<sup>67</sup> The extent to which obesity lowers achievement is unclear. Because of the high prevalence of obesity in disadvantaged groups, the effect of obesity is difficult to separate from the effect of other forms of disadvantage. At the same time, obesity takes an emotional toll which likely diminishes student performance.

Obesity is strongly stigmatized, especially among adolescents.<sup>68</sup> Several studies demonstrate that obesity can cause low self esteem and result in diminished life goals, particularly for adolescent and pre-pubescent girls. Body weight appears to be a “primary factor” in causing depressive symptoms in these girls.<sup>69</sup> Obese adolescents are more likely to self-report that they are poor students than non-obese adolescents.<sup>70</sup> Some evidence suggests that effects of obesity on academic performance depend on the school context. If overweight or obesity is the norm at a school, then heavier students perform as well as their lighter-weight peers.<sup>71</sup> This finding singles out the negative effect of stigma on a child’s academic performance, and supports the hypothesis that the emotional costs of obesity indeed lower academic achievement.

The emotional toll, in addition to the effects of diminished health and increased absenteeism, likely lowers academic performance, beyond the effects of disadvantage. In future years, researchers will work to disentangle the complex interrelationship of low socioeconomic status, low self-esteem, low academic performance, and obesity.<sup>72</sup>

### *Costs at work*

Children with reduced performance in school become less productive adults. There is strong evidence that for females, obesity decreases wages. Thus, a girl who is obese faces a lifetime of lower earning potential, compared to a normal-weight child. The magnitude of the wage decrease ranges in studies from a 2% to 15% reduction in wages, compared to non-obese females.<sup>73</sup> For example, if a normal-weight woman earned \$30,000, her obese counterpart experiencing a 6% wage reduction would earn \$1,800 less, or \$28,200. The evidence that obesity has a similar effect on wages for males is mixed, and the effect may be insignificant for males.<sup>74</sup>

Having obese children takes a toll on their parents' productivity, which costs parents' employers. For example, parents of obese children may spend more time away from work taking their children to receive health care services. The number of annual physician and hospital visits is higher for obese children: one study showed that privately insured obese children had 4.4 visits per year, compared to 2.4 visits per year for all privately insured children. For Medicaid-insured children, the increase was 3.6 visits per year for obese children compared to 1.7 visits for all Medicaid children.<sup>75</sup>

## **POLICY SOLUTIONS FOR CHILDHOOD OBESITY**

Texas policymakers recognize the importance of halting the childhood obesity epidemic. The state's commitment to ending childhood obesity is reflected in numerous legislative and regulatory actions in the past decade (see Appendices A and B). Texas leaders share a goal of lowering childhood obesity rates, through shared public, private, and individual actions.<sup>76</sup>

Yet, it remains unclear whether Texas' groundbreaking policies of the past 10 years have had an effect on the childhood obesity rate. Over the past decade, Texas' year-to-year childhood obesity rates might have declined for some groups, but there was no consistent trend for any group. According to SPAN III data, between 2000-02 and 2004-05, the prevalence of obesity increased for 8<sup>th</sup> and 11<sup>th</sup> graders, but dropped slightly for 4<sup>th</sup> graders.<sup>77</sup> More recent data is not yet available, so changes in obesity prevalence since 2005 cannot yet be determined.

The following section seeks to answer three questions on many policymakers' minds: What has Texas done; where are the gaps in Texas's efforts; and what more should Texas do to substantially lower childhood obesity rates?

### **Treatment**

Obesity is a medical condition, thus many intervention proposals involve medical care. Yet, after decades of research, effective clinical treatment remains elusive. Part of the reason why treatment is limited is that medical payers have not treated obesity as a disease, thus funding for medical treatment is scarce. The difficulty of funding treatment is keenly felt at smaller practices that are unable to absorb costs. Accordingly, much of the treatment that does exist occurs in the hospital

setting. As a result, medical treatment has been reserved for severely obese children, children with co-morbidities, and for children whose obesity is the result of medical treatment of a different disease. Today, many in the medical system see medical treatment as a last resort for obesity, when other interventions have failed.

Intervention messages have the potential to be very strong in the medical setting, because families trust their medical providers on health issues. However, the most successful clinical treatments are often intensive, and possibly impractical for generalization to a large population of children. Those in the health care system, including hospitals and physician groups in Texas, have begun to pursue solutions beyond medical care because, in the words of one national researcher, “The magnitude of obesity in most societies has already surpassed the ability of any healthcare system to cope with it from the clinical perspective.”<sup>78</sup>

The medical system remains an important tool for fighting obesity, thus efforts are underway to implement more effective treatment practices. Both the Texas Pediatric Society and the American Academy of Pediatrics have spent the past decade developing toolkits for providing obesity care; these toolkits are used by physicians across the state.<sup>79</sup> In 2007, the CDC, along with the American Medical Association and the U.S. Health Resources and Service Administration, jointly released expert clinical recommendations for the prevention and treatment of childhood overweight and obesity. The expert recommendations break childhood obesity treatment into four stages, depending on the severity of weight status, and the child’s responsiveness to treatment. Each stage requires increased office visits for physician monitoring, along with progressively more intensive lifestyle interventions, with the final stage including drastic steps such as medication or surgery.<sup>80</sup>

Although expert recommendations now exist, truly effective treatments for childhood obesity have not yet been discovered. In the preface to the recommendations, the panel of experts explains:

“Scientists continue to study obesity but, given its complex causes, years or decades may pass before the most effective intervention or prevention strategies are identified. The recommendations presented here are evidence based where evidence is available; where evidence is not available or is incomplete, the expert committee has combined data with clinical judgment, including selected interventions when such interventions are reasonable and are unlikely to cause harm.”<sup>81</sup>

In addition, the cost of fully implementing the expert recommendations would be very high. For every overweight or obese child, the recommendations call for 1 to 6 additional office visits per year, plus many additional lab tests. The additional laboratory tests would cost \$820 million, for all children under age 10.<sup>82</sup>

Several current projects in Texas seek to identify new, cost-effective methods of obesity treatment. Texas Children’s Hospital’s Center for Childhood Obesity provides coordinated care including nutrition, medical, and mental health treatment, to overweight and obese children. The Center provides individualized weight management programs, and its researchers use Electronic Health Record information to investigate new, effective treatments for childhood obesity. Dell Children’s Medical Center of Central Texas runs a similar treatment and research center, the Texas Center for the Prevention and Treatment of Childhood Obesity. In Tarrant County, Cook

Children’s Hospital subsidizes obese children to participate in a 14 week physical activity and nutrition program, with parent involvement. Driscoll Children’s Hospital’s Healthy Kidz Obesity project partners with a large primary care practice to serve 300 overweight and obese children in Nueces and San Patricio counties.

The State of Texas is helping to advance obesity treatment as well. In 2009, the Texas Legislature appropriated \$1.5 million (the amount was reduced to \$1.1 million in 2010), for a pilot project within Medicaid to “evaluate the effectiveness of prevention efforts within primary care settings in reducing the rate of obesity, improving nutritional choices, and increasing physical activity levels of participants.”<sup>83</sup> The pilot, which began in Travis County in November, 2010 will serve overweight and obese Medicaid children who have no co-morbidities. A key component of the project will be the evaluation of cost-effectiveness for treating obesity in the primary care setting.<sup>84</sup>

Clinicians generally agree that medical treatment is warranted for the most severe cases of childhood obesity. The ACES (Activating Children Empowering Success) program at Dell Children’s Medical Center of Central Texas works with severely obese children ages 2-18. The comprehensive program includes medical monitoring, nutrition counseling, physical therapy and activity counseling, social services, and behavior change and mental health counseling.<sup>85</sup> Similarly, Children’s Medical Center of Dallas recently decided to re-focus its childhood obesity efforts on the most severely obese children, and those with co-morbidities.

Despite recent efforts for effective treatment, clinicians find that the pervasive causes of obesity often supersede clinical intervention efforts. According to the expert recommendation committee, “providers often feel overwhelmed by obesity care in the face of the environmental forces that promote it.”<sup>86</sup> Texas children’s hospitals recognize this reality as well and have turned to community-based programming for prevention and early intervention of childhood obesity, partnering with schools and community organizations to educate families, and promote healthy lifestyles.

### **Upstream interventions**

By turning to community outreach beyond the hospital, children’s hospitals recognize that upstream interventions may be a feasible approach for reducing childhood obesity. Medical care is a “downstream” intervention, because it treats obesity once it has already occurred; conversely, “upstream” interventions tackle the root causes of obesity. By focusing on changing the unhealthy factors which cause obesity in the first place, upstream policies make effective use of resources to prevent and reverse obesity in the broader population of children.<sup>87</sup>

Researchers generally agree that environment is the cause of the obesity epidemic. Obesity is genetically linked, with almost 250 known genes working in a complex interplay to determine a person’s susceptibility to obesity.<sup>88</sup> However, genes have not changed since the start of the obesity epidemic in the 1970s—what has changed is environment.<sup>89</sup> Shifts in food availability, marketing, and prices have all pushed diets to include more edible oils, animal-derived foods, and sweeteners.<sup>90</sup> At the same time, the proliferation of new technologies such as air conditioning,

television, video games and computers contributed to an increase in sedentary behaviors, and a decrease in physical activity.<sup>91</sup>

Obesity occurs when a child’s energy intake (amount of calories consumed) is not balanced with his energy output (amount of calories expended). The environmental changes of the past 30 years have translated to a well-documented increase in energy intake and decrease in energy output. While a healthy, growing child’s “energy-in” normally surpasses “energy-out,” today children’s energy-in exceeds their energy-out by 110 to 165 Calories more than it should, each day.<sup>92</sup>

Upstream policies focus on changing the environment in which children live, as well as children’s responses to their environment, in order to reduce their energy-in and increase their energy-out. The following section breaks down Texas’ upstream policies into three categories: those attempting to reduce energy-in, those designed to increase energy-out, and policies which take a comprehensive approach, integrating both energy-in and energy-out strategies.

### ***Energy-In policies***

#### *Texas Public School Nutrition Policy*

In 2004, the Texas Department of Agriculture (TDA) issued the Texas Public School Nutrition Policy (TPSNP), regulating food served at all Texas public schools. The TPSNP restricts schools from serving minimally nutritious foods and requires schools to serve nutritious foods such as fruit, vegetables, and milk. In 2008-09, these policies affected meals served to an average of 2.9 million children in public and private schools across Texas each day.<sup>93</sup> For all children, TPSNP also limits the availability of unhealthy food, by prohibiting unhealthy competitive foods in vending machines and at snack bars.<sup>94</sup> (See Appendix C for a detailed description of TPSNP). The Texas school food regulations are some of the strictest in the U.S.<sup>95</sup>

According to TDA, Texas schools have “overwhelmingly complied with state nutrition policies,” and many schools have adopted even stricter policies.<sup>96</sup> A statewide study corroborates TDA’s findings. The study examined

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Source: Hangriff and Murphy (2007)

implementation of TPSNP guidelines in the first year of the policy (2004-05) at primary and secondary schools in 11 large and small school districts in Texas. Fewer portions of high-fat vegetables such as french fries, were served to students in reimbursable meals (school lunch and breakfast), with larger districts reducing servings more than small districts. For other fruits and vegetables, servings were unchanged. The percentage of schools selling large bags of chips decreased from 43% of secondary schools immediately prior to TPSNP to 9% one year later; after TPSNP, sales of baked chips increased.<sup>97</sup> The study's findings demonstrate that schools adhered to the restrictions, although the schools did not encourage students to eat more fruits and vegetables (which was not a TPSNP requirement). Similarly, an analysis of 186 school menus at elementary and secondary schools in the 2006-07 school year (the 3<sup>rd</sup> year of TPSNP implementation) found that nutrients served at schools changed significantly after TPSNP. In accordance with the prior study, the 2006-07 menus study found the biggest changes were in nutrients directly impacted by TPSNP.<sup>98</sup> The menu study also found decreases in available calories, which demonstrates the success of portion size control.<sup>99</sup>

While the aforementioned studies concluded that schools indeed changed their food offerings to comply with TPSNP, neither study examined whether student eating habits changed correspondingly. An additional study indicates that student eating habits indeed changed. A study of middle school students at three schools in Southeast Texas found that two years after implementation (2005-06), the TPSNP positively affected student nutritional intake. The percentage of energy intake from fat was significantly lower, and the consumption of protein, fiber, calcium, Vitamins A and C, vegetables, and milk were significantly higher. Consumption of sweetened beverages decreased as well.<sup>100</sup>

Of the three schools in the study, intake of energy-dense foods decreased the most at the moderate- and high-socioeconomic status (SES) schools, while the TPSNP had a smaller, but still significant, effect on nutritional intake at the predominantly low-SES school. This may be because students at the higher SES schools had more money to spend on vending machines and snacks prior to TPSNP, thus the new restrictions on competitive foods affected their diets more. Finally, the study found that students consumed significantly more federally reimbursable meals (i.e., National School Lunch Program meals), and consumed less food from vending machines and school snack bars.<sup>101</sup> Additional larger-scale studies will be needed to fully ascertain the effect of TPSNP on Texas children's eating habits.

### *WIC guidelines*

Recently, Texas has begun another new energy intake initiative, with an update to the Texas Women Infants Children Nutrition Program (WIC). In October, 2009 the WIC food package was revised to align with the Dietary Guidelines for Americans and the American Academy of Pediatrics' current dietary guidance for feeding infants. The package of food is available to at-risk children between the ages of 0 and 5 and their mothers, with incomes lower than 185% of the federal poverty level.<sup>102</sup> According to the Texas Department of State Health Services, "The overall goals of the changes were to encourage consumption of fruits and vegetables, emphasize the need for whole grains and to lower saturated fat intake, in addition to promoting the

establishment of long-term breastfeeding and adapting the food packages to appeal to diverse populations.”<sup>103</sup> (See Appendix D for a detailed description of the new WIC food package).

Researchers at the Texas A&M School of Rural Public Health expect that the new WIC guidelines will lead retailers in high-WIC areas to dedicate greater shelf space and increase display profiles of the healthy foods in the new WIC food packages. The researchers also expect that WIC consumers will change purchasing and consumption behaviors to include healthier foods.<sup>104</sup> Over the next three years, the A&M researchers will evaluate the actual impact of the WIC guidelines, as part of the Texas Childhood Obesity Prevention Policy Evaluation Project (T-COPPE), a \$1 million initiative funded by the Robert Wood Johnson Foundation. In 2009, T-COPPE evaluators completed the first round of surveys, with 5,000 completed questionnaires from all 73 local WIC agencies in Texas; the second round of surveys rolled out in Summer 2010.<sup>105</sup> In addition to the updated food package, the Texas WIC program has also implemented a protocol for WIC dieticians to identify and counsel children over age 2 who are obese.<sup>106</sup>

#### *TDA Nutrition Outreach grants*

The TDA Nutrition Outreach Program gives two types of grants to support nutrition education. Best Practices in Nutrition Education grants provide up to \$10,000 to a public school campus for expanding existing nutrition education programs. Nutrition Education grants provide up to \$5,000 to schools (public and private) and childcare institutions, to implement new nutrition education programs.<sup>107</sup> TDA awarded its first round of grants in August, 2010; the second round application opened in October, 2010.<sup>108</sup>

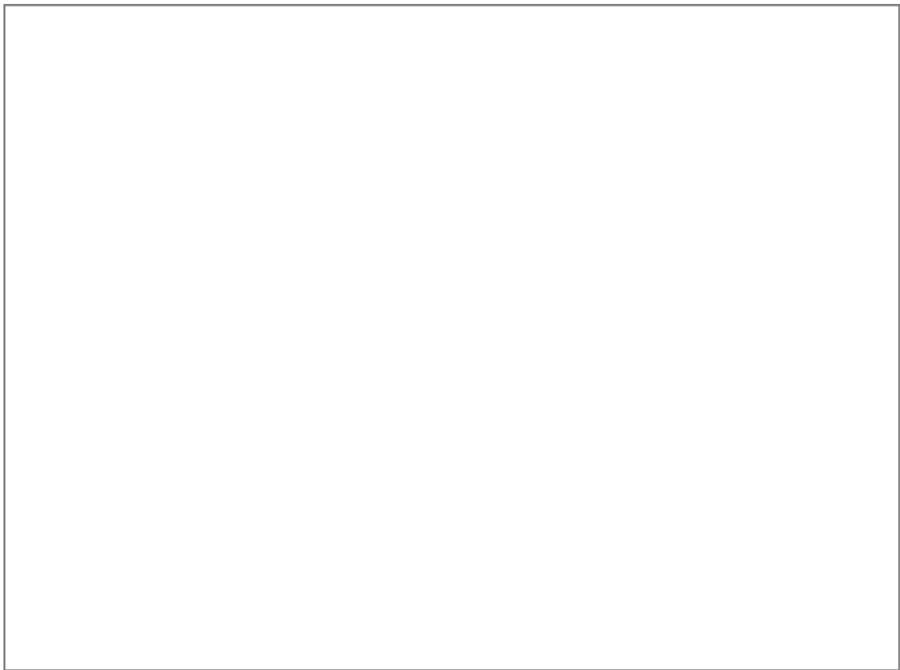
#### *What's missing from Texas energy-in policy?*

Today, Texas children eat more nutritious food at school than in decades past, yet their obesity rate remains high. Most likely, TPSNP's lack of impact on obesity rates is because children receive most of their calories from non-school sources; Texas children's away-from-school caloric intake remains unhealthy. Two areas for improvement are sugar-sweetened beverage consumption, and access to healthy foods.

#### *Consumption away from school*

Research shows that for adolescents, home is the main source of calories, followed by food from restaurants/fast food, while school sources account for only 8% of their calories.<sup>109</sup> Younger children may receive more of their calories from school sources than adolescents, but even younger children receive the majority of their calories from non-school sources.<sup>110</sup> Thus, healthier food at school does not lead to fully healthy diets for children. For example, the TPSNP study on three middle schools in southeast Texas found that after TPSNP, when schools provided healthier food, students brought significantly more soft drinks, desserts, and chips from home.<sup>111</sup>

Another type of study also suggests that children's unhealthy increases in BMI occur away from school. The study analyzed data on children in kindergarten and first grade, comparing BMI increases during the school year with increases during summer vacation. Increases in BMI were slower, with less variation across racial and ethnic groups, during the school year.



During the summer, when children spent most of their time at home, the BMI increases accelerated, with especially high rates of increase for black and Hispanic children.<sup>112</sup> The study's author speculates that the less-structured environment at home allows children to continuously consume food throughout the day, rather than during scheduled eating times. If this were the case, structured programming during non-school hours, such as summer and after school programs, might lead to reductions in caloric intake, and possibly reductions in obesity. Research to confirm this hypothesis is underway.

### *Access to healthy foods*

Many children in Texas have limited access to healthy food when they are not at school. Studies show that fewer grocery stores and more fast-food restaurants in a neighborhood increase the population's BMI, although the size of this effect remains unclear.<sup>113</sup> In Texas, grocery stores are unevenly distributed, with preliminary data showing that low-income neighborhoods in both rural and urban areas have disproportionately low supermarket access.<sup>114</sup>

One solution for increasing the availability of out-of-school healthy food would be to provide incentives for establishing grocery stores in underserved areas. For example, grocery store incentives in Pennsylvania and New York have led to increased healthy food access, as well as job creation.<sup>115</sup> Another way to increase access to healthy foods is through farmers market programs. Already, TDA and the Texas Health and Human Services Commission have initiated a pilot project in which participants can use their electronic SNAP (food stamps) and Temporary Assistance for Needy Families (TANF) benefits at farmers markets.<sup>116</sup> Further expansion of farmers markets into underserved areas could increase healthy food access even more.

### *Sugar-sweetened beverages*

One notable source of away-from-school calories is sugar-sweetened beverages (SSBs), including soft drinks, sports drinks, and sugar-sweetened juices. Children primarily obtain SSBs from home (55-70% of all SSB calories are from home, compared with 7-15% from school sources).<sup>117</sup> In Texas, the proportion SSBs from school sources is likely lower, due to TPSNP's restrictions on SSB availability at schools.

At 150 Calories per can, SSB consumption could account for most or all of children's daily energy imbalance.<sup>118</sup> On a typical day, 79% of all US children consume SSBs, and, along with fruit juice, SSBs account for 10-15% of children's total caloric intake. Adolescents have the highest SSB intake of any child age group; adolescents consume an average of 30 oz. of SSB each day, accounting for 16% of their total energy intake.<sup>119</sup>

Excess calories derived from SSBs are particularly dangerous because sugar in liquid form does not satiate the soda drinker. That is, a child does not feel full after consuming SSB calories, so the child still consumes the food calories he ordinarily would, *plus* the additional SSB calories.<sup>120</sup> Because of this effect, according to Yale researcher Dr. Kelly Brownell, the scientific link between obesity and SSB consumption is stronger than for any other food or beverage.<sup>121</sup> For each additional can of SSB a child drinks per day, the child's risk of obesity increases by 60%.<sup>122</sup> While the complexity of the body's metabolism makes proving a causal relationship between SSB consumption and obesity very complicated, many studies show that an increase in SSB consumption leads to an increase in BMI, while other methodologies show no effect on BMI.<sup>123</sup> However, studies showing that sweetener-derived calories are no different health-wise than other calories have been funded by the beverage industry.<sup>124</sup> According to the World Health Organization, it is "probable" that SSB consumption increases obesity risk.<sup>125</sup> Perhaps most tellingly, a steep increase in SSB intake coincided with the obesity epidemic—daily intake more than doubled since the 1970s.<sup>126</sup> Further, SSBs account for 80% of the increase in sweetener consumption since the 1970s.<sup>127</sup> For this reason, the CDC identifies decreased SSB consumption as a target area for the reduction of obesity in states.<sup>128</sup>

Since a substantial portion of children's excess energy-in comes from SSBs (10-15% of all calories), and this SSB intake most likely leads to obesity, it makes sense that limiting SSB intake would be a goal of anti-childhood obesity policy. Further, because children obtain the vast majority (over 90%) of their SSB calories from non-school sources, anti-SSB policies must limit SSB intake beyond the school environment. One commonly suggested means for limiting away-from-school SSB consumption is a fee on SSBs.

The idea behind an SSB fee is that it forces consumers to opt-in to unhealthy choices, rather than having unhealthy choices be their default option.<sup>129</sup> Currently, SSBs cost equal or less than healthier beverage options—SSB prices have fallen 34% relative to the Consumer Price Index since 1978.<sup>130</sup> Thus, a consumer saves money by making the unhealthy choice of drinking an SSB. Moreover, consumers, especially children, often fail to realize how unhealthy SSB consumption can be.<sup>131</sup> For these reasons, both an increase in price relative to healthier options, plus education on the harmful health impacts of SSBs, would theoretically cause consumers to more carefully consider whether they are willing to undertake the health risks associated with SSBs. Making healthy choices the default option reflects Texas' Nutrition, Physical Activity &

Obesity Prevention Program's vision of ensuring that "healthy foods and an active lifestyle are the easy choice throughout Texas communities."<sup>132</sup>

Studies of SSB fees uphold the theory. First, a review of 14 studies found that, on average a 10% price increase for SSBs leads to an 8-10% decrease in consumption.<sup>133</sup> An exploratory study of children in the 26 states that already apply a higher tax on soda than on other food, gives an idea of the effect of an SSB fee on reducing children's SSB consumption. In most of these states, including Texas, soda is not exempt from sales tax while other food is exempt.<sup>134</sup> As a result, the tax difference between soda and healthier options averaged at only 3.5 percentage points, much lower per ounce than proposed fees specifically designed to reduce SSB consumption. Still, the study found that even the modest price increases for SSBs had a small effect on reduced consumption and reduced BMI, with the largest effects among at-risk subgroups such as low-income, and black children. The effects in the study were small, because the taxes on SSBs were low. Based on the results of this study, a higher tax rate, such as the 18% proposed by New York, would have a population-wide 20% reduction on excess BMI gain.<sup>135</sup>

The most promising effects of an SSB price increase occur when SSB shelf prices are raised, rather than when taxes are applied at the cash register.<sup>136</sup> A recent study of a 45-cent fee on SSBs in a hospital cafeteria showed that SSB purchases declined by 26%. Moreover, when the 45-cent fee was combined with education about the negative health consequences of SSB consumption, purchases declined an additional 10 percentage points, for an overall consumption decline of 36%.<sup>137</sup>

If the hospital study were replicated in Texas, with an approximately 2-cent per ounce fee on all SSBs sold in 2010, Texas would collect \$1.7 billion in revenue.<sup>138</sup> Even a 1-cent per ounce fee would generate \$1.1 billion in revenue for Texas, based on 2010 SSB consumption.<sup>139</sup> A flat fee, as in the hospital study, rather than a percentage-based tax, would allow for predictable revenue, because the amount collected would not fall if beverage companies adjusted prices.<sup>140</sup> Part of this revenue could be used for an education campaign, which appears to strengthen the effect of a fee acting alone. In addition, revenue from a fee on SSBs could offset the state's additional costs for obesity-related health care caused by SSB consumption. For instance, the American Heart Association estimates that heart disease related to SSB consumption added as much as \$550 million in health care spending over the past decade.<sup>141</sup> With Medicaid and Medicare paying about half of obesity-attributable medical costs nationally, SSB consumption poses a significant cost that could be recouped through an SSB fee. To the extent that reduced SSB consumption would prevent future cases of obesity, the fee could further avert additional Medicaid costs.

Some important considerations arise when considering the practicality of a fee to promote healthy SSB consumption decisions. First, the fee must be designed in such a way that promotes healthy substitution. For instance, if sports drinks were exempted from the fee, people might replace soft drinks with sports drinks that are equally high in sweetener-calories. Thus, the fee must ensure that healthy options such as water and diet soda remain cheaper, while all unhealthy options are affected by the fee.<sup>142</sup> Next, revenue predictions must take into account reductions in SSB consumption that would result from the fee. Because fewer SSBs would be consumed under a higher fee, the 2-cent fee is not predicted to generate twice as much revenue as a 1-cent fee (\$1.7 billion predicted for a 2-cent fee compared to \$1.1 billion for a 1-cent fee).<sup>143</sup> Finally, an equity issue arises, because a flat fee applied equally for all Texans purchasing SSBs would impact

lower-income Texans more strongly. However, in this case the regressive nature of the fee is desirable, because the fee would most burden those families at greatest risk for obesity.<sup>144</sup> These families are also heavily represented in publicly financed health care programs.<sup>145</sup> The higher burden means that low-income, disproportionately minority consumers would react most strongly to the fee, and reduce their SSB consumption more than other groups.<sup>146</sup>

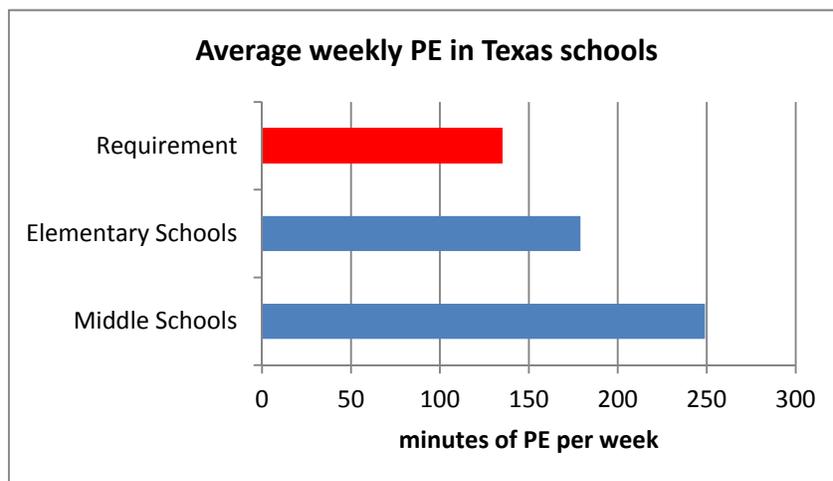
## ***Energy-Out policies***

### *Physical activity in schools*

As with public school nutrition, Texas is a national leader in public school physical activity. Texas has three policies in place which require physical activity for public school students. The state requires elementary students to participate in physical activity for 30 minutes per day, or 135 minutes per week. Middle schoolers also must participate in physical activity for 30 minutes per day, 135 minutes per week, or 225 minutes every two weeks, during four of their six semesters in middle school. High school students are required to complete one credit of physical education (PE) in order to graduate.

The first of the policies, the elementary school requirement, was passed as Senate Bill (SB) 19 in 2001, in response to concerns that schools were reducing PE time in order to make room for standardized test preparation.<sup>147</sup> Four years later, in 2005, the Legislature passed SB 42, the middle school requirement.<sup>148</sup> The Legislature did not appropriate funding to schools for implementing either requirement.<sup>149</sup>

In the years following SB 19 and SB 42, two studies examined their implementation, and found that the majority of Texas schools were adhering to, or exceeding, the physical activity time requirements. While SB 42 allows middle schools to exempt students from the requirement, the study found that most schools did not permit exemptions. Both elementary and middle school officials reported high levels of awareness about the requirements.



Source: Elementary Schools, data from 2005-06, Kelder et al. (2009); Middle Schools, data from 2006-08 Barroso et al. (2009)

In particular, the studies closely examined implementation at schools in two border regions. In these border regions, most schools met the federally recommended goal of spending at least 50% of PE class time engaged in moderate-to-vigorous physical activity. Despite the adherence to physical activity requirements, the studies found no corresponding decrease in childhood obesity rates in either of the border regions.<sup>150</sup>

### *Fitnessgram*

In 2007, legislation (SB 530) added an assessment component to Texas' physical activity policy. The state selected Fitnessgram, a battery of fitness tests, to be administered to all children in grades 3 to 12 each year.<sup>151</sup> By the 2009-10 school year, 92% of districts in Texas were submitting Fitnessgram data.<sup>152</sup> Currently, the Texas Education Agency (TEA) publicly reports Fitnessgram data aggregated at the statewide level.

### *Texas Fitness Now grants*

Also in 2007, the Texas Legislature began appropriating money to TEA for economically disadvantaged middle schools to implement high-quality physical activity programs. Since 2007, the Texas Fitness Now grants have provided \$10 million per year, based on a noncompetitive formula, to those Texas middle schools in which more than 60% of students are economically disadvantaged.<sup>153</sup> Typical funding ranges from \$11 to \$27 per student.<sup>154</sup> As of 2010, the grants have been awarded to 85% of eligible schools, reaching 41% of all middle school children in Texas.<sup>155</sup> Grant guidelines emphasize encouraging moderate-to-vigorous physical activity for as many students as possible.<sup>156</sup> In the upcoming budget cycle, TEA has slated the grants for reduction.<sup>157</sup>

### *Safe Routes to School*

Texas benefits from the federal Safe Routes to School (SRTS) program, which is designed to encourage children to use active transport (walking or riding their bicycles) to get to school. Since federal funding commenced in 2005, Texas has received \$44.8 million, with an additional \$15 million expected in 2010. The Texas Department of Transportation (TxDOT) distributes the SRTS funds, which may be used for engineering and enforcement (to ensure safety of active transport), encouragement (to motivate children to use active transport), or evaluation.<sup>158</sup> The majority of SRTS funds go to infrastructure improvement projects. In 2009, TxDOT awarded SRTS funds to 119 infrastructure projects, 82 non-infrastructure projects, and 4 statewide non-infrastructure projects.<sup>159</sup>

In three studies in California, SRTS programs have indeed increased the number of children using active transport.<sup>160</sup> Research shows that active transport to school increases moderate-to-vigorous physical activity by about 20 minutes per day. While the same research shows that active transport has a positive effect on children's cardiovascular fitness, evidence of a direct link between active transport and BMI is weak.<sup>161</sup> In Texas, T-COPPE (the same Robert Wood Johnson initiative that is evaluating the WIC updates) is supporting a team at The University of Texas School of Public Health to evaluate the effect of SRTS on childhood obesity; the evaluation will be complete by 2013.<sup>162</sup>

### What's missing from Texas energy-out policies?

Texas' energy-out policies reach every child in Texas public schools. Children in Texas elementary and middle schools regularly participate in moderate to vigorous activity at school, and some children actively commute to and from school. Yet today, almost a decade after Texas policymakers began their push for physical activity with the passage of SB 19, childhood obesity rates remain high. Texas' physical activity requirements have not yet reduced childhood obesity; for example, after the middle school requirements were enacted, no significant change in BMI took place.<sup>163</sup>

The lack of physical activity impact is not limited to Texas. A broad literature review shows mixed results of the effects of in-school physical activity programs on BMI and weight status. Some studies show weak evidence of a reduction in weight, while others demonstrate no impact.<sup>164</sup> For example, in a systematic review of 15 different physical activity interventions for children, researchers find that only 3 had a significant effect on BMI for all children (and 2 more had a significant effect on BMI for girls only).<sup>165</sup> The lack of impact could be that the "dose" of physical activity is too low—Texas requires 30 minutes of moderate-to-vigorous physical activity, while the US Department of Health and Human Services recommends 60 minutes of moderate-to-vigorous physical activity per day for children and adolescents.<sup>166</sup>

Although it may not yet directly reduce obesity, physical activity remains an important component of child health. Many studies show that physical activity built into the school day improves fitness and has positive health benefits such as reducing blood pressure, increasing muscle mass, increasing bone density, increasing aerobic capacity, and improving flexibility.<sup>167</sup><sup>168</sup> Many studies demonstrate that increased physical activity at school improves children's academic performance.<sup>169</sup> Further, schools seem to be particularly effective at ensuring physical activity policy has a broad reach.<sup>170</sup>

Beyond "dosage," perhaps weaknesses in Texas' energy-out policies have precluded dramatic results on childhood obesity. Researchers point to three areas in which the policies fall short: physical activity programs are not well-implemented in schools, the physical activity requirements weaken as children age into adolescence, and Texas policies do not address out-of-school physical activity.

### *Low-quality implementation*

Implementing high-quality PE programs is costly for schools; most likely, this prevents some schools in Texas from complying with physical activity rules in a way that benefits students. According to the director of the Texas Association for Health, Physical Education, Recreation and Dance, "There are two major challenges for our professionals to deliver a quality physical education program in Texas schools; one is funding, and the other is the large teacher to student ratio."<sup>171</sup> Other evidence shows that many PE teachers in Texas obtain professional development in sports coaching, rather than in delivering PE.<sup>172</sup>

Some researchers suggest that increased accountability would lead schools to implement higher-quality physical activity programs.<sup>173</sup> Much as how public reporting and sanctions based on

TAKS scores drive schools to improve their academic performance, Dr. Steven Kelder of The University of Texas School of Public Health, contends that accountability for physical activity would drive schools to improve the quality of PE. The first step to accountability might be to publicly report Fitnessgram results at the school level, and to send children's individual Fitnessgram results home to their parents. Dr. Kelder further suggests adding a PE test to the TAKS battery, so that schools would be subject to the same sanctions and incentives for physical activity as they are for other subjects.<sup>174</sup>

### *Weaker requirements as children age*

Texas requires physical activity for all elementary-age children, yet middle school children are permitted to forgo physical activity for two of their six semesters in middle school. At the high school level, the PE credit requirement for graduation was reduced by half a credit in 2009; starting this year, high schoolers are only required to complete one credit of PE throughout their four years of high school. TEA's analysis of Fitnessgram data hints at the importance of maintaining strong physical activity requirements across all grades: 78% of Texas 4<sup>th</sup> graders are in healthy cardiovascular fitness zone, compared with only 20% of 12<sup>th</sup> graders.<sup>175</sup> Senator Jane Nelson (R-Flower Mound) called the high school Fitnessgram results "alarming," and claimed the results "show why this is a bad time to be cutting PE requirements."<sup>176</sup>

Texas could remedy the issue by strengthening physical activity standards for middle and high schools. For instance, middle schoolers might be required to participate in physical activity for all six of their semesters in middle schools. Similarly, the high school PE credit requirement might be reinstated at 1.5 credits, or higher. These policy changes would not cost state funds, although they could create scheduling conflicts for schools and children.<sup>177</sup> Further, strengthening physical activity requirements might improve obesity rates in older children, but it would not remedy the already-high overweight and obesity rates for elementary-age children.

### *Out-of-school physical activity*

Though children in Texas spend time during the school day engaged in physical activity, at home they continue to engage in sedentary behaviors, such as TV viewing, video game playing, or computer use. For example, the study of SB 42 implementation at Texas middle schools showed that while physical activity indeed increased, there was no change in time spent watching TV. The study's authors conclude that this "underscore[es] the continued challenges for changing individual-level behavior change outside the school setting."<sup>178</sup> Some physical activity programs, including CATCH and Spark which are used at many schools in Texas, show encouraging results in decreasing sedentary behaviors. Still, communities can take additional steps to ensure that children are occupied in healthy activities rather than sedentary behaviors. For example, opening school gymnasiums before and after school allows children to take advantage of existing facilities, and has been shown to increase physical activity.<sup>179</sup>

## **Comprehensive strategies**

Perhaps the reason why Texas' strong physical activity policies have not led to a decrease in childhood obesity is that energy-in is much more influential in determining obesity than energy-out. For perspective, the 110 to 165 Calorie energy gap at the root of childhood obesity could be eliminated by removing one can of soda (150 Calories) per day from a child's diet. On the other hand, a child would need to spend almost 2 hours walking to school to burn off 150 Calories in energy-out.<sup>180</sup>

That physical activity alone cannot make up for the excess calories from unhealthy diets underscores the importance of a comprehensive childhood obesity strategy. The relationship between poor diet, lack of physical activity, and childhood obesity is too complex to tackle by focusing on energy-in or energy-out in isolation. While the correlation between reduced physical activity and childhood obesity is well-documented, some evidence indicates that increased BMI from poor diet leads to a reduction in physical activity, and not the other way around.<sup>181</sup> This indicates that children become obese because of their diets, and subsequently abandon physical activity. Thus, increasing physical activity without addressing diet cannot counter the underlying cause of children's obesity. This conclusion is supported by studies demonstrating that even those physical activity programs which reduce children's BMI in the short-run do not create lasting changes in children's BMI.<sup>182</sup> Without addressing crucial dietary changes, physical activity efforts will be overpowered by poor nutrition.<sup>183</sup>

For this reason, the most successful anti-obesity policies recognize that healthy weight is a balance of multiple factors. These policies take a comprehensive approach, incorporating nutrition, physical activity, and education. By unifying the energy-in and energy-out policies, children learn the connection between the nutritious food in the cafeteria, and their participation in physical activity. The best comprehensive strategies tie together the reforms at school, and include parents and community members in the effort.

### *Obesity Prevention grants*

The Texas Department of State Health Services (DSHS) Obesity Prevention grant program takes a holistic view of obesity prevention, awarding competitive grants to communities across Texas. Of the 11 grants awarded in 2010, in amounts ranging from \$150,000 to \$300,000, at least five focused on improvements to the built environment to promote physical activity, and four focused on improving access to healthy foods. In the previous cycle, in 2009, two grants focused on breastfeeding promotion, one supported a farmers market, and another grant supported nutrition education. The 81<sup>st</sup> Legislature appropriated \$4.7 million for the grants in the 2010-11 biennium; DSHS has requested \$4 million for the grants in the next biennium.<sup>184</sup>

### *Coordinated School Health Programs*

In addition to physical activity requirements, SB 19 and SB 42 required districts to adopt Coordinated School Health Programs (CSHPs). A CSHP must include eight elements (See sidebar). In 2007, TEA approved four CSHPs that districts may implement in grades K-8, or districts may develop their own program.<sup>185</sup> The four approved programs are Bienestar Health Program, CATCH, Spark + Healthy and Wise, and The Great Body Shop. Of these, CATCH is the most popular, having been implemented at over half of Texas elementary schools.<sup>186</sup>

#### **Eight (8) required CSHP elements:**

1. Nutrition Services
2. Physical Education
3. Health Education
4. Health Services
5. Healthy and Safe School Environment
6. Counseling and Mental Health Services
7. Staff Wellness Promotion
8. Parent and Community Involvement

Source: DSHS (2008)

All four of the approved CSHPs have been shown to influence healthy behaviors in children. Of the four, CATCH is the only program that has shown to have an effect on BMI, by reducing the rate of children's BMI increase. CATCH is also the most cost-effective childhood obesity intervention available, considering the low cost of implementation, and the high value of a lifetime of reduced medical costs and increased productivity.<sup>187</sup> Research shows that both Bienestar and The Great Body Shop reduce target unhealthy behaviors, although they have not shown to affect BMI. Healthy and Wise (the coordinated health element of the Spark + Healthy and Wise CSHP) has not been peer reviewed.<sup>188</sup>

Some evidence indicates that schools have had difficulty adhering to the CSHP requirements. A study in elementary schools conducted three years after the requirement was announced, and one year before enforcement began, found that while most school officials were aware of the CSHP requirement, substantial numbers of school officials did not know the components that a CSHP entailed. For example, over 40% of surveyed school officials did not know that CSHPs must include a parental involvement component.<sup>189</sup> At the time (one year prior to enforcement) only 43% of surveyed schools reported having adopted a CSHP.<sup>190</sup> A different survey of districts in southeast Texas found that shortly before the 2007 deadline, 79% had adopted a CSHP.<sup>191</sup>

### *Community-school partnership approaches*

Of all the comprehensive strategies for reducing childhood obesity, those that have shown the most success include a community element, in partnership with school involvement. Three community-school partnership studies have shown stronger results in reducing childhood obesity than any other programs yet studied.

Results from the first year of the *Shape Up Somerville* program show decreases in children's BMI: participating children gained one pound less than the control group children (because children are growing, it is expected that they will gain a certain amount of weight each year). *Shape Up Somerville* is a community-wide childhood obesity reduction effort in Somerville, Massachusetts. The program's extensive community component involves many community

organizations, the local media, city government, local restaurants and health care providers. The effort has led to changes in zoning laws to promote active transport, reduced portion sizes at local restaurants, and farmers market promotion.<sup>192</sup>

In three years between 2003 and 2006, the slightly less-intensive *Be Active Eat Well* program in Australia also reduced weight gain, and flattened the social gradient of obesity. The program took a community capacity-building approach, working to build both skills and relationships between community organizations, health organizations, schools, and other stakeholders. The program cost approximately \$100,000 per year for each of the three years of intervention.<sup>193</sup>

A third community-school partnership, CATCH El Paso, showed the strongest results of any program yet. In addition to implementing CATCH in El Paso schools, the Paso del Norte Health Foundation spent over \$1.4 million to fund a media campaign, the Walk El Paso walking encouragement program, and Que Sabrosa Vida, a healthy eating program.<sup>194</sup>

Two separate evaluations documented the program's significant effects. In the first three years of implementation, for girls in CATCH schools there was only a 2% increase in overweight/obesity prevalence, compared to a 13% increase for girls in control schools. That is, CATCH lowered the rate of increase for overweight/obesity prevalence by 11 percentage points. For boys, CATCH lowered the rate of prevalence increase by 8 percentage points.<sup>195</sup> Two years later, researchers documented an actual decrease in overweight/obesity prevalence. SPAN III results from the fifth year of CATCH El Paso show that El Paso's 4<sup>th</sup> graders dropped from 25.8% obese in 2000 to 18.8% obese in 2005, a 7 percentage point decrease in obesity prevalence. The SPAN results are the first US documentation of a population-wide decrease in childhood obesity prevalence.<sup>196</sup>

It is not surprising that adding intensive community involvement to a school-based program leads to strong results in reducing childhood obesity. Studies of children's eating habits show that the environment out of school—at home, and in the broader community—matters as much or more than the school environment. A community-school partnership ensures that a child's environment supports healthy living both at school, and beyond school. The Somerville model made structural changes to the community environment, such as increased walkability and availability of healthy foods. The El Paso format ensures that families and community members participate in modeling and encouraging healthy choices for children.

To achieve their remarkable results, the Somerville, Australia, and El Paso programs each took advantage of substantial funding and community buy-in. Yet, many communities in Texas would be unable to sustain such an intensive approach. Recently, researchers at The University of Texas School of Public Health sought to implement a community-school partnership with a much less intensive community role.

The CATCH Travis County study compared 30 schools, half of which had the typical CATCH program, and half of which included CATCH plus a minimal community involvement component. At the community partnership schools, a Community Action Team made up of community partners attended community workshops and put on one evidence-based activity per semester. Examples of activities included after-school physical activity programs, school gardening programs, and healthy food tastings.<sup>197</sup>

The school-community partnership schools had results similar to CATCH El Paso, with an 8.3 percentage point decrease in overweight/obesity prevalence after one year of intervention. This impact was much greater than the 1.3 percentage point decrease in prevalence at the schools with CATCH but no community partnership. The researchers found that children at community-partnership schools changed their diets more drastically, and the classroom component of the CATCH curriculum was implemented more fully than at non-partnership schools.<sup>198</sup>

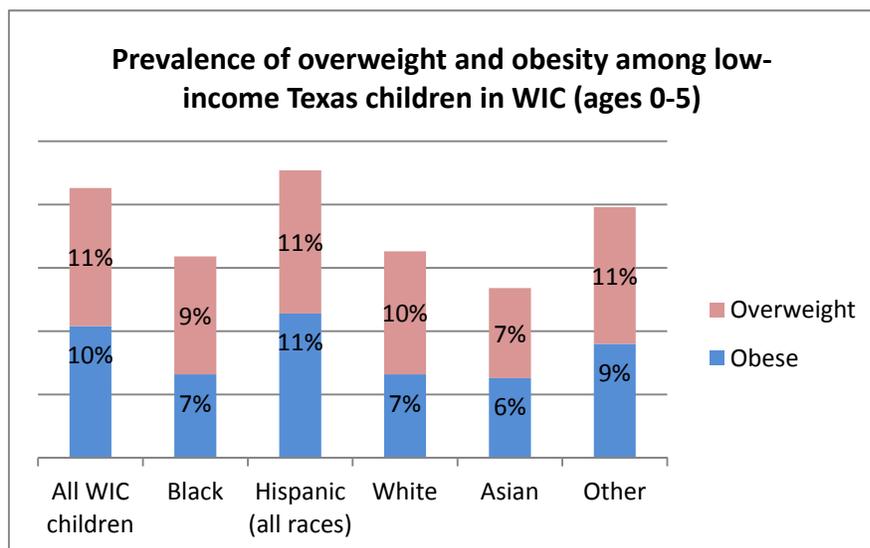
Both El Paso and Travis County studies showed success in reducing obesity among the most at-risk children, in predominantly low-income, minority schools. These two communities were highly receptive to the efforts, thus their programs showed great success. Not every Texas community could support a program in the way that El Paso and Travis County did. Schools should have the flexibility to work with their own community to tailor the solution that works best for them.

### *Early childhood coordinated health*

Implementing coordinated health programs for young children in the child care setting would have important benefits. First, it is easier to intervene as early as possible in a child’s life, so that he develops healthy behaviors from the start, and does not have to overcome bad habits later in life. In addition, early childhood is a crucial physiological period to the development of obesity.<sup>199</sup> Even before kindergarten, Texas children show high rates of overweight and obesity. Finally, coordinated health programs would provide much needed caregiver training. Often child care providers are unaware of how to encourage healthy behaviors in children; educator training is a key element of coordinated health programs.<sup>200</sup>

CSHPs have shown to positively affect the energy-in and energy-out behaviors of older children. These same programs have already been translated into programs for younger children. Spark has developed an early childhood physical activity program, and CATCH has developed a comprehensive early childhood program.<sup>201</sup> As with Texas policies in older grades, early childhood coordinated health would

include nutrition, physical activity, parent and child education.



Source: DSHS (2010) based on 2007 WIC data

## CONCLUSIONS AND RECOMMENDATIONS

In the past decade, Texas has worked hard to reduce obesity among its children. This dedication stems not only from concern for the well-being of Texans, but from an acknowledgement of the high costs of obesity to the state. Texas leaders realize that obesity leads to chronic diseases that carry a high medical price tag for both public and private payers. Obesity also reduces productivity, both at work, and for the next generation, at school. To reduce these costs, Texas policymakers have made the smart decision to focus on reducing obesity in children. Not only do children incur medical and productivity costs themselves, but they are very likely to become costly obese adults.

Texas has turned to upstream solutions that address the root, environmental causes of obesity. While medical treatment of obesity is crucial for certain children, clinical intervention remains a costly and impractical solution for the large-scale epidemic of childhood obesity. By addressing the causes of obesity, upstream solutions show promise as cost-effective population-based approaches. In the past decade, Texas has done much to change the environment at public schools, to ensure that children eat healthy and exercise during the school day. According to one of the state's leading childhood obesity researchers, Dr. Deanna Hoelscher, "The programs and policies implemented in Texas helped to stabilize the prevalence of obesity among all grade levels in all regions. However, the rate of child obesity in all counties is greater than the targeted national health goal of 5 percent prevalence."<sup>202</sup>

In light of unchanging childhood obesity rates, Texas must do more to strengthen and support its current childhood obesity policies.

- **Address away-from-school food:** Texas must address the calories children consume from non-school sources, in addition to those consumed at school. While healthy food at school is important, children obtain most of their food away from school. For too many children, that food remains unhealthy. Two recommendations could alleviate this reality. First, Texas could increase access to healthy food by promoting farmers markets and grocery stores in underserved areas. Second, Texas could discourage consumption of unhealthy foods such as by imposing a fee on sugar-sweetened beverages. Healthy choices could be cheaper than soda and push families to confront their unhealthy consumption decisions. This option would also create significant revenue for the state, as well as avert future health care costs.
- **Strengthen in-school physical activity:** Texas must strengthen its existing physical activity policies, to ensure that all children are physically fit and expend appropriate amounts of energy. Such policy improvements might include increasing the required number of physical activity semesters for middle school and high school students. In addition, Texas could enhance the quality of physical activity offerings by leveraging the Fitnessgram as an accountability tool, to motivate schools to improve quality. Resources, such as the Texas Fitness Now grants are vital components of ensuring that schools are able to offer high-quality physical activity programming.
- **Capitalize on the promise of CSHPs:** Texas must build on the promise of CSHPs as effective, comprehensive strategies to reduce childhood obesity. In all grades, Texas could encourage high-quality CSHP implementation by holding schools accountable and rewarding

top-performing schools. Following best-practice evidence, Texas could encourage schools to incorporate community involvement into their CSHPs, through public-private partnerships, or with community advisers. Finally, already-available early childhood versions of CSHPs could be implemented in childcare settings, in order to help the youngest Texans develop healthy habits early.

## APPENDICES

**Appendix A: Selected enacted Texas legislation relating to childhood obesity (1993-2010)**

Session	Bill	Area of Impact				Detailed Description
		Treatment	Energy-In	Energy-Out	Comprehensive	
77R	SB 19			x	x	Permits State Board of Education to enact a 135 minute/week physical activity requirement for elementary schools. Requires school districts to establish a School Health Advisory Council. Requires elementary schools to implement a Coordinated School Health Program (CSHP).
78R	SB 474		x		x	Establishes a joint interim committee to study nutrition and health in public schools.
	SB 1357		x	x	x	Requires school districts to make publicly available policies regarding physical activity requirements, vending machine and food service guidelines, and penalties for the use of tobacco products by students. Clarifies composition and role of School Health Advisory Councils (SHACs).
79R	SB 42		x	x	x	Permits State Board of Education to enact a physical activity requirement at the middle school level. Requires CSHPs at the middle school level. Requires schools to report health and physical activity requirements, and enacts measures for ensuring greater compliance with TDA nutrition policies. Establishes a state-level SHAC.
80R	HB 2313				x	Designates the second full week in September as Obesity Awareness Week.
	HB 3618	x				Requires DSHS to adopt criteria for the development of a diabetes intervention pilot program for school districts that are located on the Texas-Mexico border and that have a population of less than 600,000.
	SB 415	x				Updates Risk Assessment for Type II Diabetes program, which screens public school children for Type II diabetes risk factors.
	SB 530			x		Requires districts to assess physical fitness [using Fitnessgram]. Requires TEA to analyze Fitnessgram results to find correlations between results, academics, behavior, and school policies. Requires TEA and the state-level SHAC to research and report on ways to provide 30 minutes of physical activity outside the school day.
	SB 556				x	Establishes Interagency Obesity Council including TDA, DSHS, and TEA.

Session	Bill	Area of Impact				Detailed Description
		Treatment	Energy-In	Energy-Out	Comprehensive	
81R	HB 3			x		Reduces high school PE requirement from 1.5 credits to 1 credit.
	HB 1622		x			Requires TDA to develop and implement a children's access to nutritious food program to award grants to nonprofit organizations for the purpose of allowing food banks to provide children at risk of hunger or obesity with access to nutritious food outside the school day.
	SB 282		x			Authorizes TDA to develop an outreach program to promote better health and nutrition programs and prevent obesity among children in Texas. Requires TDA to develop grants to public school campuses and participants in the Child and Adult Care Food Program, Head Start program, or other early childhood education programs.
	SB 343		x			Requires HHSC and TDA to jointly establish a healthy food advisory committee to study and provide recommendations regarding areas of Texas where the availability of healthy foods is limited ("food deserts") and the impact of the limited availability on proper nutrition and on obesity and related chronic illnesses.
	SB 395		x	x	x	Establishes the Early Childhood Health and Nutrition Interagency Council, charged with researching, reporting, and creating a statewide plan on health, nutrition, and physical activity for children under 6, including practices in childcare settings.
	SB 870	x			x	Makes changes to Interagency Obesity Council's duties and requires HHSC and DSHS to establish an obesity prevention pilot program in one or more health care service regions in the state. [Travis County Pilot]
	SB 891			x		Specifies requirements for PE curriculum, including emphasis on promoting a lifetime of physical activity, in and out of school. Extends elementary school physical activity requirements to pre-kindergarten. Requires schools to establish goals, objectives, and safety plans for PE classes.
	SB 1016		x			Authorizes TDA to develop an outreach program to promote better health and nutrition and prevent obesity among Texas children.
	SB 1027		x			Establishes an interagency farm-to-school coordination task force (including TDA, TEA, and DSHS) charged with developing and implementing a plan to facilitate the availability of locally grown food products in public schools.

**Appendix B: Selected Texas rules and regulations relating to childhood obesity**

<b>Agency</b>	<b>Rule</b>	<b>Effective Date</b>	<b>Rule Description</b>
TDA	4 T.A.C. Subchapter A	2/26/09	Sets forth Texas Public School Nutrition Policy (see Appendix C for details)
TEA	19 T.A.C. Section 103.1003	8/28/08	Sets student physical activity requirements and exemptions for grades K-8
TEA	19 T.A.C. Chapter 74 (f)	8/23/10	Sets physical education requirements and exemptions for high schools
DSHS	Nutrition Services Policy No. FD: 12.0	10/1/09	Sets forth new WIC food packages (see Appendix C for details)

**Appendix C: Texas Public School Nutrition Policy**

From "Texas Public School Nutrition Policy at a Glance," Texas Department of Agriculture SY09-10

Type of food	Elementary Schools	Middle Schools	High Schools
<b>Foods of minimal nutritional value, including any carbonated beverage, and all candy</b>	Not allowed to be provided to students any time anywhere on school premises by anyone until after the end of the last scheduled class.		Not allowed to be provided to students any time anywhere until after the end of the last scheduled class.
<b>Competitive foods (All food and beverages that are not provided by school food service.)</b>	Not allowed to be provided to students any time anywhere on school premises until after the end of the last scheduled class.	Not allowed anywhere on school premises from 30 minutes before to 30 minutes after meal periods. All food, beverages and snack items must comply with the nutrition standards and portion size restrictions in this policy.	Not allowed during meal periods in areas where reimbursable meals are served and consumed. All food, beverages and snack items must comply with the nutrition standards and portion size restrictions in this policy.
<b>Fats</b>	Individual food items must not contain more than 23 grams of fat with an exception of one individual food item per week. No food items can exceed 28 grams of fat at any time. (See the full policy for peanut butter exemption.)		
<b>Deep-fat frying</b>	Must be eliminated as a method of on-site preparation at all schools (end of transition period for facilities requiring extensive changes).		
<b>French fries and other previously fried potato products (Baked potato products that have not been pre-fried, flash-fried or deep-fat fried may be served without restriction.)</b>	Not allowed to be provided to students any time anywhere on school premises until after the end of the last scheduled class.	Portions may not exceed 3 oz., may only be served three times per week, and may only be purchased by students one serving at a time. Must be baked for on-site preparation.	Portions may not exceed 3 oz. and may only be purchased by students one serving at a time. Must be baked for on-site preparation.
<b>Trans fats</b>	Trans fat information must be requested in all product specifications and the purchase of products containing trans fats must be reduced.		
<b>Fruits and vegetables</b>	Must be offered daily on all points of service, preferably fresh. Frozen and canned fruits should be packed in natural juice, water or light syrup whenever possible.		
<b>Milk</b>	Schools may offer whole milk but must also offer 2 percent, 1 percent or skim milk at all points where milk is served.		
<b>Fruit and vegetable juices</b>	All beverages must be milk, unflavored water and 100% fruit/vegetable juice. No electrolyte replacement beverages (sports drinks) may be served or sold.		

Type of food	Elementary Schools	Middle Schools	High Schools
<p>The maximum portion size and nutrient restrictions below apply to all foods and beverages served or made available via vending machines, fundraisers, snack bars, a la carte or any other service point. These restrictions do not apply to food items served as part of a reimbursable school meal unless they are individually sold.</p>			
<b>Chips (fried or baked)</b>	1.5 oz (no more than 7.5 grams of fat per bag)		
<b>Other (crackers, popcorn, cereal, trail mix, nuts, seeds, dried fruit, jerky, pretzels)</b>	1.5 oz		
<b>Cookies/cereal bars</b>	2 oz. Total fat must not exceed 30 percent of calories or 3 grams per 100 calories; saturated fat must not exceed 10 percent of calories or 1 gram per 100 calories; sugar must not exceed 10 grams per ounce. See the full policy for grain/bread exemptions at breakfast.		
<b>Bakery items (e.g. pastries, muffins)</b>	3 oz. (see note for Cookies/cereal bars)		
<b>Frozen desserts, ice cream, frozen yogurt, pudding, or gelatin</b>	4 oz.		
<b>Whole milk, flavored or unflavored</b>	8 fl. oz. Flavored milks must not contain more than 30 grams of sugar per 8 fl. oz.		
<b>Reduced fat milk, flavored or unflavored</b>	16 fl. oz. Flavored milks must not contain more than 30 grams of sugar per 8 fl. oz.		
<b>Beverages other than milk</b>	6 fl. oz. Must not contain more than 30 grams total sugar per 6 fl. oz. Juices must be 100 percent fruit and/or vegetable juice. No limit on non-carbonated, unflavored water. Electrolyte replacement beverages are not allowed.	12 fl. oz. Must not contain more than 30 grams of sugar per 8 fl. oz. No limit on non-carbonated, unflavored water.	
<b>Frozen fruit slushes (must contain at least 50 percent fruit juice)</b>	6 fl. oz.	8 fl. oz.	12 fl. oz.

## **Appendix D: WIC food package updates**

From Texas Department of State Health Services, WIC “Summary of Food Changes” (2010)

### **Alignment with national dietary recommendations**

- Increases fiber by adding:
  - Fresh and frozen fruits, and vegetables;
  - Whole grain bread, oatmeal, brown rice, corn and whole wheat tortillas;
- Reduces saturated fat and cholesterol by decreasing amounts of:
  - Milk (low-fat milk for women and children age 2 and over);
  - Eggs;
  - Cheese;
- Delays introduction of infant cereal
- Adds infant foods, including fruits, vegetables, and meats
- Eliminates infant juice

### **Better promotion and support for the establishment of long-term breastfeeding**

- Breast pumps and breastfeeding support provided, as needed
- For exclusively breastfeeding women,
  - Increased amount of food;
  - Addition of salmon
- For exclusively breastfed infants,
  - Increased amounts of infant fruits and vegetables;
  - Addition of infant meats

### **Accommodate cultural food preferences**

- Tofu and soy milk as an option instead of milk

### **Better accommodate special needs participants**

- Supplemental foods in addition to formula

## **Appendix E: List of acronyms**

BMI	Body Mass Index
CATCH	Coordinated Approach to Child Health
CDC	Centers for Disease Control and Prevention
CMS	Centers for Medicare and Medicaid Services
CSHP	Coordinated School Health Program
DSHS	Texas Department of State Health Services
EPSDT	Early and Periodic Screening Diagnosis and Treatment
HB	House Bill
HRSA	Health Resources and Services Administration
IOM	Institute of Medicine
MVPA	Moderate-to-Vigorous Physical Activity
PA	Physical Activity
PE	Physical Education
SB	Senate Bill
SES	Socioeconomic status
SNAP	Supplemental Nutrition Assistance Program (food stamps)
SPAN	School Physical Activity and Nutrition study
SRTS	Safe Routes to School program
SSB	Sugar-Sweetened Beverage
T-COPPE	Texas Childhood Obesity Prevention Policy Evaluation
TAKS	Texas Assessment of Knowledge and Skills
TDA	Texas Department of Agriculture
TEA	Texas Education Agency
TPSNP	Texas Public School Nutrition Policy
TxDOT	Texas Department of Transportation
WIC	Texas Women Infants Children Nutrition Program

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