

**Starting Earlier:**  
**What We Know About Preventing**  
**Overweight In Children**  
**from Birth to Five Years Old**

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## **Starting Earlier: What We Know About Preventing Overweight in Children from Birth to Five Years Old**

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## Executive Summary

Obesity among adults and overweight among children are worsening problems throughout California and the country. What isn't as obvious is that far too many of our youngest children—those under the age of six—are also overweight (10.4 percent of children nationally) or, equally distressing, at risk for becoming overweight (10.7 percent of two- to five-year-olds). As is well known, being overweight can cause serious health problems for both children and adults. Perhaps of greatest concern is that those who are overweight as children tend to continue to be overweight into adulthood.

There are a number of interventions for school-aged children aimed at reducing overweight. While important, these may come too late to prevent long-term weight problems for the many children, especially those in low-income families, who are already overweight when they reach school.

For that reason, many experts have recommended that public health initiatives to prevent children from becoming overweight begin with our very youngest children. It is far easier to influence eating habits (and parents' feeding habits) when a child is beginning to eat than to change bad habits once formed.

There is universal acknowledgment that breastfeeding provides the healthiest nourishment for infants. However, many women do not receive the support they need in the hospital to begin breastfeeding successfully. Others are discouraged from continuing breastfeeding once back at home by the lack of community support either for breastfeeding or for providing expressed milk for their infants in day care. Much more needs to be done to encourage women to begin and continue breastfeeding their infants.

Once they transition to table foods, far too many low-income preschoolers are not eating fresh fruits and vegetables. Their parents face a number of problems in trying to promote healthy food choices for toddlers. Although most low-income children are in two-parent families, both parents are likely to be working. In many low-income neighborhoods, fresh fruits and vegetables are rarely available, and parents have neither time, cooking skills, nor money to purchase and prepare them. As a result, inexpensive, readily available, and less healthy high-fat foods and take-out foods too often fill the gap.

Their physical environments and other outside forces also make it hard for low-income families to eat well and stay active. Lacking safe or adequate neighborhood places to play outdoors, too many children end up in front of the TV. Besides being sedentary, they are exposed to seemingly endless commercials for high-fat, high-sugar foods, cleverly advertised to appeal to young children who do not have the discrimination to judge the information.

We can do better to help children start off with healthier choices. A number of federal and state programs—including WIC, Head Start, Food Stamps, the Child and Adult Care Food program, and California's First Five programs—already have a role in the nutrition of children under six and their families. There are a number of ways they could strengthen those roles. In addition, localities can implement planning and zoning changes that would contribute to making neighborhoods safer and healthier.

If we start earlier, attention to healthy living at the youngest ages will help Californians grow into healthy, productive adults.

# Overweight: A Worsening Problem

Overweight and obesity have become epidemic in the United States. Perhaps most disturbing, overweight has increased dramatically among children from two to five years old, doubling from 5 percent in the early 1970s to more than 10 percent in 2000. Moreover, nearly 11 percent of preschool-age children are at risk for becoming overweight.<sup>140</sup>

Weight in early childhood sets the stage for overweight throughout childhood and into adolescence. Studies show that infants who are overweight for their length are likely to become overweight for their height in childhood. Similarly, children who are overweight in early childhood have a higher risk of being overweight as adults.<sup>99</sup> Poor diet and inactivity in both adolescence and adulthood have been linked to overweight in early childhood.<sup>96</sup>

It's clear, then, that activities to prevent overweight need to begin in the early childhood years. Because behavior patterns—including eating patterns—are established during the preschool years, it is especially important to encourage healthy choices about diet and activity as early as possible. Studies have demonstrated that interventions in early childhood, when eating and activity behaviors have not yet been consolidated, are more successful than behavior modification strategies aimed at reducing weight among older children and adults.<sup>61</sup> For this reason, preschoolers who are *at risk* of becoming overweight also need to be reached early.

A number of factors contribute to overweight among the preschool-age population. Even before birth, the mother's pre-pregnancy weight has an influence, as does whether she breastfeeds after birth and whether infants and young children are fed foods high in calories, sugar, and fat. The number of hours children spend watching television and videos, the family's income, access to healthy foods, and opportunities for physical activity, along with the way foods and beverages are marketed and advertised, all play a role in contributing to preschool-age children becoming overweight.

Experience with other public health issues, such as the use of tobacco and alcohol, has shown that effective prevention initiatives must focus not only on individual counseling and support, but also on the institutions, policies, and norms that influence behavior. The environment in which children and families live, play, and work has a significant impact on whether they can change behaviors related to nutrition and physical activity.

As described in this report, studies have begun to link obesity with certain factors in neighborhood environments.<sup>24</sup> Making changes that increase access to healthy foods and opportunities for physical activity in these environments can be an important step in preventing overweight.

## Guide to this Report

This literature review provides a profile of overweight among children from birth to five years old, describes current approaches to preventing overweight for these children, and discusses the potential role of various programs and policies in advancing the goal of prevention. The primary focus is on environmental causes of overweight among young children and the strategies that involve environmental or policy changes that can help prevent overweight in the earliest years.

The risk for overweight is greater in certain racial and ethnic groups (independent of physical activity), in families living in poverty, and in those children with a family history of diabetes. A review of **early childhood demographic trends**—including ethnicity, poverty, trends in overweight and experience of breastfeeding—provides a context for understanding overweight in California. Through an understanding of these risk factors that contribute to overweight, prevention efforts can be directed to reduce the risk of becoming overweight and focus resources on the groups at greatest risk.

Both **individual and environmental factors** can be counted among the causes of early childhood overweight. Two sections sort these out so as to help identify those that can be most usefully addressed.

The paper next examines a number of **promising strategies** to promote healthy eating and prevent overweight among young children. Particular attention is focused on the areas of breastfeeding, foods available in childcare and preschool settings, opportunities for physical activity, and reducing television-viewing time and its associated marketing of unhealthy foods.

Finally, we explore **the role of government programs** in preventing overweight.

Advocates and policy makers will find this background paper useful as a primer in understanding the epidemic of obesity and overweight in California. For them and for others who provide services to young children, the wealth of information reviewed here constitutes a trove of reference material to buttress the policies and actions that can help our youngest citizens have a better nutritional start in life.

### **Please Note**

Superscript numbers throughout this report refer to the alphabetical list of references found at the end.

## Terms and Major Studies

Because the term “obesity” is fraught with negative connotations, the terms “overweight” and “at risk of overweight” are preferred when referring to children and adolescents whose excess body weight could pose medical risks.

**At risk of overweight:** Body Mass Index (BMI)-for-age between the 85th and 95th percentiles on the 2000 CDC growth charts.

**Body Mass Index (BMI):** Weight in kilograms divided by height in meters squared ( $\text{kg}/\text{m}^2$ ).<sup>47</sup>

**Energy-dense food:** The amount of energy stored in a given food per unit volume or mass (expressed in metabolic studies as kilocalories). Fat stores 9 kilocalories/gram (gm), alcohol stores 7 kilocalories/gm, carbohydrate and protein each store 4 kilocalories/gm, fiber stores 1.5 to 2.5 kilocalories/gm, and water has no calories. Foods that are almost entirely composed of fat with minimal water, such as butter, are more energy dense than foods that consist largely of water, fiber, and carbohydrates, such as fruits and vegetables.<sup>58</sup>

**Overweight:** For infants and children less than two years old, overweight, defined as a weight-for-length greater than the 95th percentile, does not pose the same risk as it does among older children. For infants and young children, CDC growth charts of weight-for-length, weight-for-age, and length-for-age must be considered when determining overweight status.

For children between two and twenty years old, overweight means BMI-for-age at or above the 95th percentile on the 2000 CDC growth charts.<sup>47</sup>

**Obesity:** For adults, a BMI of 30 or higher.<sup>47</sup>

### Studies Related to Nutrition and Health Referred to in this Report

**California Health Interview Survey (CHIS):** A telephone survey conducted every two years and administered to adults, adolescents and children from all parts of California. The survey provides statewide and local information on population, health, and access to health services. (California Health Interview Survey. 2005. About CHIS. Accessed Nov 2005. <http://www.chis.ucla.edu/about.html>.)

**Continuing Survey of Food Intake by Individuals (CSFII):** A one-year survey designed to measure foods and beverages consumed by Americans conducted by the Agricultural Research Service of the USDA in 1989, 1990, and 1991. (Agricultural Research Service. 2005. The Continuing Survey of Food Intakes by Individuals (CSFII) and the Diet and Health Knowledge Survey (DHKS) 1989-91. United States Department of Agriculture. Accessed Nov 2005. <http://www.ars.usda.gov/Services/docs.htm?docid=7797>.)

**Feeding Infants and Toddlers Study (FITS):** A survey commissioned to Mathematica Policy Research Inc. by Gerber. The survey, conducted over five months in 2002, assessed the eating habits and nutrient intake of more than 3,000 children between four months and two years of age. (Gerber. FITS FAQ. [http://www.gerber.com/content/usa/bin/pdf/press/FITS\\_FAQ.pdf](http://www.gerber.com/content/usa/bin/pdf/press/FITS_FAQ.pdf).)

**National Health and Nutrition Examination Survey (NHANES and NHANES II):** A population-based survey designed to collect information on the health and nutrition of households in the United States. The survey began with periodic assessments in 1960; since 1999 it has been conducted continuously. It consists of two parts, the home interview and the health examination, which provide information on a variety of health-related data including but not limited to chronic disease prevalence, risk factors, and diet and nutritional status. (National Center for Health Statistics. 2005. National Health and Nutrition Examination Survey. Accessed Nov 2005. <http://www.cdc.gov/nchs/nhanes.htm>.)

**Nationwide Food Consumption Survey (NRCS):** Nationwide Food Consumption Survey was conducted by the Agricultural Research Service of the USDA in 1977-78 and again in 1987-88. The survey asked about household food use and individual food intake. (Agricultural Research Service. 2005. The 1987-88 Nationwide Food Consumption Survey (NFCS). United States Department of Agriculture. Accessed Nov 2005. <http://www.ars.usda.gov/Services/docs.htm?docid=7804>.)

**Pediatric Nutrition Surveillance System (PedNSS):** The (PedNSS) is a child-based public health surveillance system that describes the nutritional status of low-income U.S. children who attend federally-funded maternal and child health and nutrition programs. PedNSS provides data on the prevalence and trends of nutrition-related indicators. (Accessed Nov 2005. <http://www.cdc.gov/pednss>.)

## Early Childhood Demographic Trends

Several factors have been identified that place young children at greater risk of becoming overweight, including being a member of certain racial and ethnic groups (independent of physical activity) and having a family history of diabetes. A third important factor, and one that is more amenable to intervention, is living in poverty.<sup>58</sup> Understanding the risk factors that contribute to overweight is the first step to designing prevention efforts to reduce this risk and to focusing resources on the groups at greatest risk.

### **California's Youngest Children: Ethnicity and Geographic Distribution**

The latest available data from the California Department of Health Services (2003) document more than a half a million (540,790) births in the state, with half of those occurring in the Latino population. Los Angeles County had the highest number of births (152,175) and Alpine the lowest number (14). The majority of births occurred in Los Angeles, San Diego, Orange, San Bernardino, Riverside, Santa Clara, and Alameda counties.<sup>176</sup>

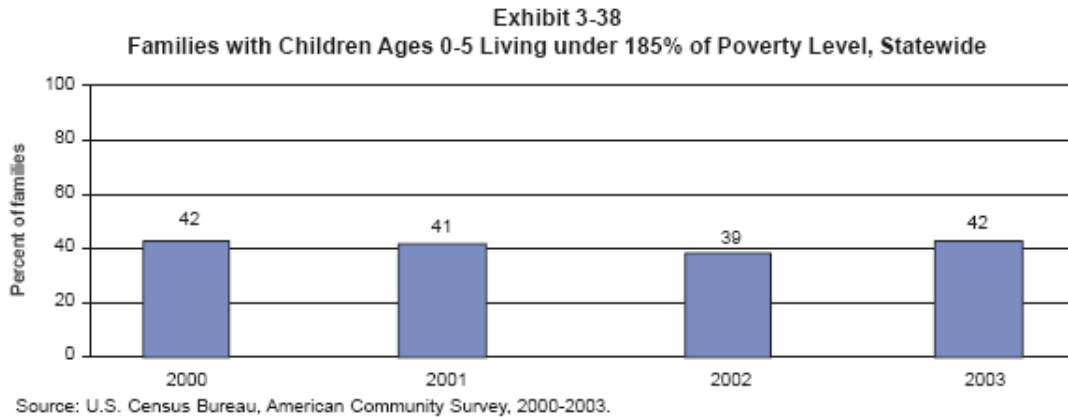
Of the 33 million people living in California in 2003, just over 3 million were children under the age of six, and nearly half of them (49 percent) were identified as Latino.<sup>73</sup>

In counties with the highest populations of children from birth to five years old—Los Angeles, Orange, San Diego, San Bernardino, Santa Clara, and Riverside—at least 35 percent of this population was Latino.<sup>176</sup> According to the 2001 California Health Interview Survey (CHIS), most of these young children live in urban areas.<sup>99</sup>

### **California's Youngest Children: Poverty**

According to 2003 U.S. Census data, more than 20 percent of California's children from birth to five years old live in poverty.<sup>176</sup> As a group, young children are more likely to be poor than older children, adults, or seniors.<sup>53</sup> About 42 percent of families in California with children from birth to five years old were living at less than 185 percent of the federal poverty level in 2003 (up from 2002 and 2000, and higher than the corresponding national figure of 37 percent in 2004) (Figure 1).<sup>176</sup>

**Figure 1**



Poverty and its associated conditions, particularly in early childhood, can have significant effects on children’s development, health, and well-being.<sup>73</sup> Material resources are needed to care for and support young children, including providing healthy foods. Young children in poverty are at risk for lower cognitive abilities and lower performance levels in school. Lower income in adults has also been associated with overweight,<sup>154</sup> and children from families with overweight or obese parents are more likely to be overweight themselves.<sup>155</sup>

### **California’s Parents of Young Children: Demographics**

Demographic trends among parents of young children can illuminate a number of the barriers and challenges that parents may face in encouraging healthy eating and physical activity.

**Marital status:** According to the California Health Interview Survey (CHIS) 2001 data, about 72 percent of young children up to five years old in California live with married parents. Another 10 percent are in households with one parent living with a partner. The remaining 18 percent live in single-parent households.<sup>99</sup>

**Education level:** Nearly half of the mothers of young children (47 percent) in California have less than or the equivalent of a high school education.<sup>99</sup>

**Employment status:** Most of the fathers and about half the mothers of young children in California are working.<sup>99</sup> Nationally 79 percent of single-parent mothers are in the labor force.<sup>189</sup>

**Language abilities:** One-third of parents of young children in California report low English proficiency, either not speaking English at all or not speaking it very well. Half of young children in California have either a naturalized parent (22 percent) or a non-citizen parent with or without a green card (27 percent),<sup>99</sup> from which may be inferred that many have limited proficiency in English.

These demographic trends imply much for the health of the youngest children. Working mothers are less likely to breastfeed, and parents may have less time or money to prepare healthy meals and engage in physical activity with their children. Stressed for time and money, parents may introduce unhealthy foods early and feed their family cheaper, more

readily available fast food. Furthermore, the level of parental education and language abilities offer information about how efforts to prevent overweight should be structured for families of young children.

### **Overweight Among Children from Birth to Five: National Trends**

Over the past two decades, overweight has become two to three times more common in children and youth than in previous years. Overweight is seen in both boys and girls, and in all age, race, and ethnic groups throughout the United States.<sup>141</sup>

Data from the National Health and Nutrition Examination Survey (NHANES) for children under six years of age show that between the surveys conducted in 1971–1974 and in 1999–2000 the prevalence of childhood overweight in two- to five-year-olds has more than doubled (from 5 percent to 10 percent) for both boys and girls.<sup>141</sup> The greatest increases in overweight are among children who are four and five years old. In particular, between 1976 and 1994, at least twice as many four- and five-year-old African-American children were overweight—from 3 percent to nearly 9 percent for boys, and from 7 percent to nearly 13 percent for girls.<sup>60</sup>

Weight-for-length data from NHANES II for infants from six to twenty-three months also suggest an upward trend.<sup>140</sup>

#### *Overweight and income*

Among low-income children from birth to five years old, 13.5 percent were overweight in 2002. When only low-income children from two to five are considered, that figure goes up to 14.3 percent. The highest rates of overweight for low-income children from this age group were among Hispanic (19 percent) and American Indian or Alaskan Native (18 percent) children. Both black and white children had the lowest rate (12 percent).<sup>148</sup>

Findings from the Pediatric Nutrition Surveillance System (PedNSS) are consistent with overall trends of increasing overweight in children from two to five years old. However, among U.S. children overall in this age group, their findings in 2002 of 10.4 percent overweight and 10.2 percent at risk of overweight are considerably lower<sup>140</sup> than for low-income children of this age group.

#### *Overweight trends among racial and ethnic groups*

Children of all racial and ethnic groups are increasingly overweight, with the greatest absolute increase among white and Hispanic children.<sup>148</sup> In the 1999–2000 NHANES survey, the highest prevalence of overweight among two- to five-year-old children was in Mexican-American boys and non-Hispanic white girls.<sup>140</sup>

The *risk* of overweight in low-income children two to five years old among all racial and ethnic groups increased from 14 percent in 1994 to 16 percent in 2003.<sup>148</sup> The risk of overweight for American Indian and Alaskan Native children (19 percent) is consistently higher than that for all other groups.<sup>148</sup>

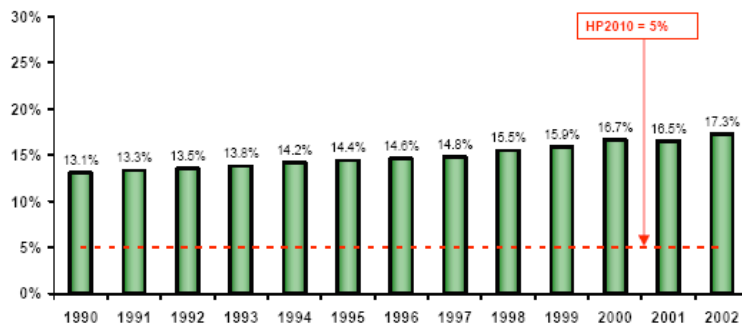
## Overweight Among Young Children: California Trends

Using a standard based on weight for age rather than BMI, CHIS 2001 data show 14 percent of all California children from birth to five years old overweight in 2001. Of these, infants and toddlers have the highest rates of overweight (18 percent and 17 percent, respectively).<sup>99</sup>

The Healthy People 2010 Objectives regarding overweight are to decrease the percent of overweight children two to four years old nationwide to 5 percent. Figure 2 shows that in 2002, overweight children represented 17.4 percent of this age group in California compared to the national rate of 14.3 percent. Furthermore, the proportion of California children in this age group who are *at risk* of being overweight has been increasing.<sup>176</sup>

**Figure 2**

Percent of Overweight Children 2-4 years,  
California 1990 - 2002



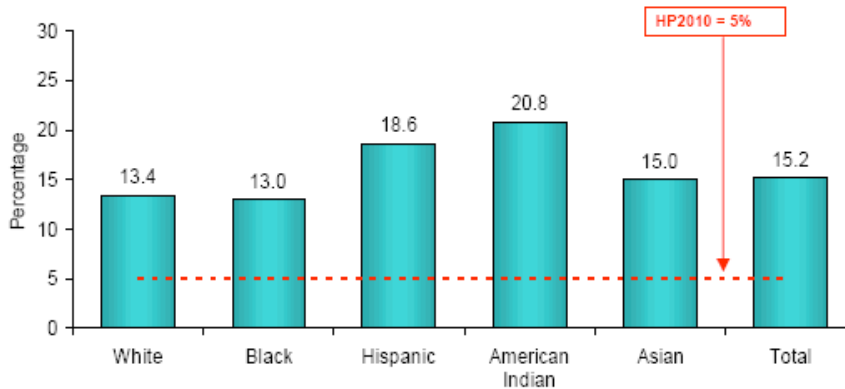
Data Source: PedNESS California 2002, Table 12C  
\*% 95% BMI-for-age, CDC Growth Charts, 2000

### *Overweight trends among racial and ethnic groups*

In 2002, rates of overweight in children between two and five years varied by race/ethnicity, with all groups surpassing the HP 2010 objective. Figure 3 shows that Native Americans had the highest proportion of overweight children (20.8 percent—four times higher than HP 2010), while African-Americans had the lowest proportion (13 percent—still two times higher than HP2010). Other race/ethnic rates are Hispanic (18.6 percent), Asian/Pacific Islanders (15 percent), and white (13.4 percent).<sup>176</sup>

**Figure 3**

**Prevalence of overweight\***  
among children aged 2 to <5 years, by race and ethnicity

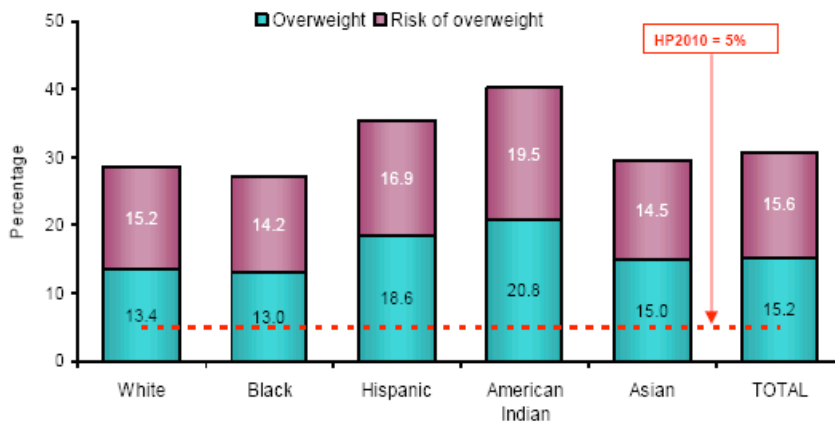


Data Source: PedNESS California 2002, Table 8C  
\* $\geq$  95% BMI-for-age, CDC Growth Charts, 2000

Similar rates were reported by race/ethnicity for children between two and five years old who are *at risk* of being overweight (Figure 4).<sup>176</sup>

**Figure 4**

**Prevalence of overweight and risk of overweight\***  
among children aged 2 to <5 years, by race and ethnicity



Data Source: PedNESS California 2002, Table 8C  
\*Overweight:  $\geq$  95th percentile BMI-for-age, at risk of overweight:  $\geq$  85th-95th percentile BMI-for-age, CDC Growth Charts, 2000.  
\*15% of children are expected to fall above the 85th percentile (5% above the 85th percentile and 10% between the 85th and 95th percentiles).

### *Overweight trends among children in programs for low-income children*

More than one-third of children from three to five years old participating in California WIC in 2003 were either overweight (19 percent) or at risk for overweight (17 percent). Similarly, in 2003 just over 10 percent of children enrolled in California Head Start were overweight.<sup>37, 36</sup>

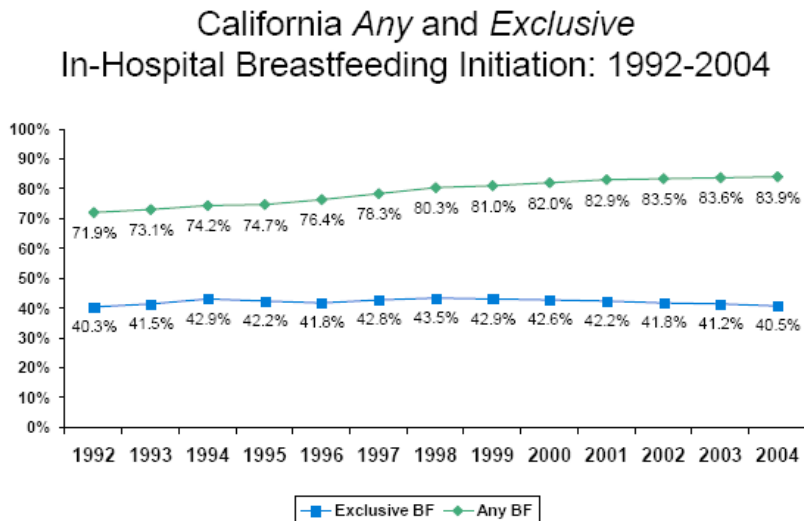
## **Breastfeeding**

Breastfeeding has long been considered a way to prevent overweight, obesity, and type 2 diabetes. Much depends on how long breastfeeding continues and whether it is used exclusively in the early months. The decision of whether to breastfeed, for how long, and whether to supplement with formula are influenced by a number of factors, reviewed in “Causes of Overweight” later in this paper. Breastfeeding rates appear to vary by racial and ethnic groups. Strategies to prevent obesity that attempt to increase initiation, duration, and exclusivity of breastfeeding may have the earliest impact on a child’s later weight. Both the American Academy of Pediatrics and Healthy People 2010 have recognized the protective benefits of breastfeeding in preventing obesity and have set goals, objectives, and recommendations for breastfeeding rates.

### *Breastfeeding in California*

More mothers delivering in California hospitals are breastfeeding, with rates increasing from 72 percent in 1992 to 84 percent in 2004 (Figure 5). These rates reflect *any* level of breastfeeding, regardless of whether the mother supplements with formula.

**Figure 5**

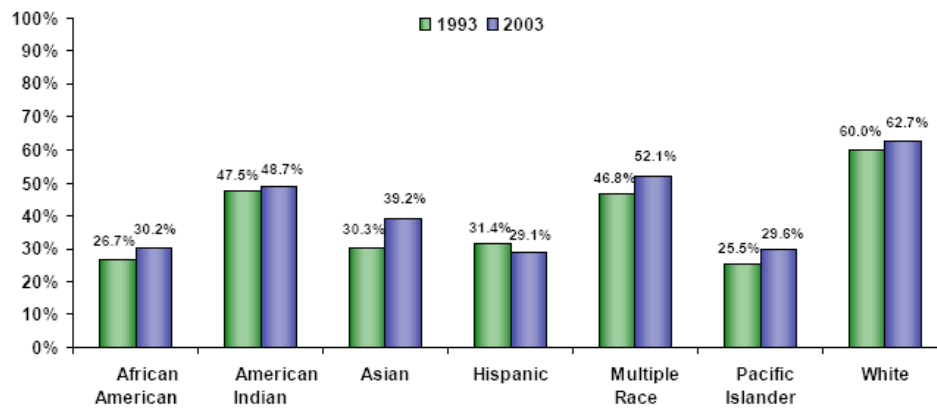


Data Source: Newborn Screening Database, Genetic Disease Branch, 1992-2004

Although there were small to modest increases in breastfeeding for most race/ethnic groups, breastfeeding rates among Hispanic women, who make up about half of all California births, actually declined slightly over ten years—from 31 percent in 1993 to 29 percent in 2003 (Figure 6). In fact, Hispanic women in 2003 were the least likely of all racial/ethnic groups to begin breastfeeding exclusively.<sup>176</sup> The overall decline in exclusive in-hospital breastfeeding rates shown in Figure 5 (from a high of 44 percent in 1998 to 41 percent in 2004)<sup>176</sup> is thus likely due to the large numbers of births to Hispanic women and the decline among these women in initiating any or exclusive breastfeeding while in the hospital.

**Figure 6**

*Exclusive In-Hospital Breastfeeding Initiation in California by Race/Ethnicity: 1993 vs. 2003*

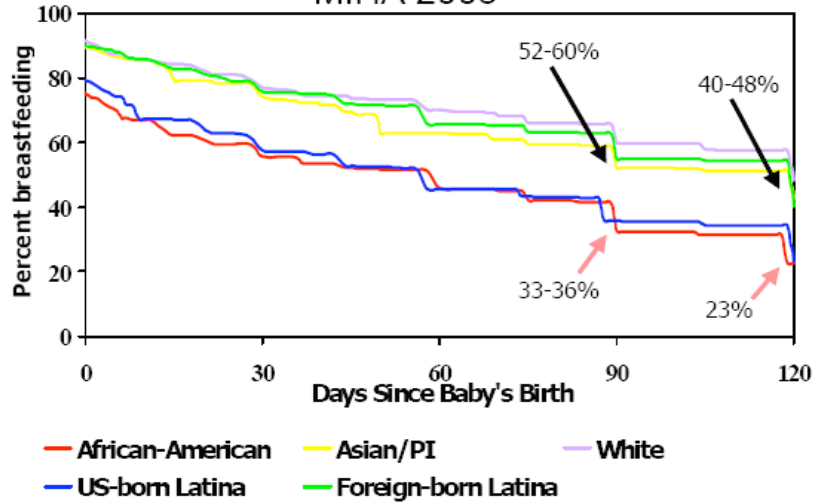


Rates of breastfeeding initiation and duration vary across California’s enormous racial, ethnic, geographic, and cultural diversity (Figure 7). U.S.-born Latina and African-American women are least likely to undertake breastfeeding; white, foreign-born Latina, and Asian women are most likely to initiate and continue *any* breastfeeding.<sup>176</sup>

**Figure 7**

Data Source: Newborn Screening Database, Genetic Disease Branch, 1993-2003

Percent of Mothers Breastfeeding Since Birth,  
MIHA 2003



Looked at geographically, the lowest breastfeeding initiation rates (70 percent) are in Kings and Yuba counties; the highest (100 percent) are in Alpine County. The lowest initiation rates are traditionally found in the Central Valley, Los Angeles, and southeastern counties, areas that are more densely populated and have high numbers of nonwhites compared to the coastal and mountain regions.<sup>54,79</sup>

# Causes of Early Childhood Overweight:

## Individual Factors

### Parents' Nutrition and Weight

#### *Prenatal period*

Many of the body's systems that regulate eating and body weight initially develop in utero during critical periods in brain development; these may affect a child's eating and body weight—in particular, body fat—later in life.<sup>194</sup>

#### *Maternal weight prior to and during pregnancy*

Being overweight prior to pregnancy can delay conception and increase a woman's risk of having gestational diabetes and producing less milk. Women who are overweight before pregnancy are also less likely to initiate breastfeeding and more likely to stop breastfeeding earlier than women of normal weight.<sup>14</sup>

A recent large study of low-income children found that if their mothers were obese during the first trimester of pregnancy, the child's risk of being overweight at two to four years old more than doubled.<sup>197</sup> Maternal obesity in pregnancy may promote overweight in the fetus by affecting the ability of the fetus to regulate appetite and to secrete or be sensitive to insulin, and by increasing fat cell growth in the fetus.<sup>194,111,142</sup> Overweight mothers are more likely to experience diabetes in pregnancy; there are concerns that the children of mothers with gestational diabetes mellitus may be at higher risk for obesity, but the results to date are inconsistent.<sup>169,194,195,86</sup>

#### *Parents' weight and their children's risk of obesity*

A recent study found that a child is at much greater risk of being overweight by the age of seven when one parent was obese; with two obese parents, the risk was even higher.<sup>155</sup> When parents are obese, a child also has more than twice the risk of being obese as an adult (60 percent), regardless of whether he or she was obese before ten years old. By contrast, a preschool child with parents of normal weight has only about a 25 percent chance of being overweight as an adult.<sup>196</sup>

#### *Parents' attitudes toward their children's weight*

While overweight mothers in focus groups did see themselves as overweight, the majority of mothers whose children were overweight did not see them as overweight, a misperception that was even more common in mothers with less education.<sup>17</sup> Many mothers think their children are not overweight if they are active and have a healthy diet or good appetite.<sup>40, 96</sup> Mothers are more likely to consider their child overweight if the child is teased about their weight or if their physical activity becomes limited.<sup>96</sup>

In fact, many parents, particularly recent immigrants, felt that a little extra weight indicated good health in a child and that a tendency toward overweight could be inherited, regardless of environmental factors.<sup>96</sup>

## **Breastfeeding**

### *Protection against overweight*

Breastfeeding may provide a degree of protection against children becoming overweight, although the mechanism is unclear, as is the extent to which other factors may confound this finding. In a recent review of eleven epidemiologic studies, eight of the studies showed breastfed children to be less likely to be overweight.<sup>67</sup> Studies published since that review have generally confirmed that finding, though not in all subpopulations. None of the studies has found formula feeding to be protective against childhood overweight.

One study that examined a cohort of children at six years old found that those who were bottle fed as infants were more likely to be overweight than those who were breastfed.<sup>19</sup>

A recent study examining the factors that contributed to overweight at seven years of age found that children whose mothers breastfed and did not smoke during pregnancy were significantly less likely to be overweight.<sup>155</sup>

In research on low-income four-year-olds, children who were breastfed for a longer time were less likely to be overweight if they were non-Hispanic whites, but this did not hold true for non-Hispanic blacks or Hispanics.<sup>89</sup> The reasons for differences among ethnic groups are not clear; the study did not look at supplementation by formula or other foods, nor at varying patterns of physical activity or eating.<sup>89</sup>

### *Breastfeeding and hunger cues*

Breastfeeding may allow infants to respond better to their own feelings of hunger and satiety,<sup>74</sup> whereas a caregiver who is formula feeding may “encourage” the infant to finish the bottle, potentially fostering overfeeding.

### *Breastmilk composition*

The composition of breast milk changes during each feeding and from one feeding to the next over the course of lactation. Children who are receiving formula or other foods along with breastmilk, or who are only breastfed for a short period of time do not get the full effects of this variation.<sup>110</sup>

### *Breastmilk and food flavors*

By the time complementary foods are introduced, the breastfed infant has already experienced a variety of flavors, as many flavors from the mother's diet are transmitted to her breast milk.<sup>122, 125</sup> This experience may help the child accept more foods during weaning, including healthy fruits and vegetables.<sup>181, 124, 110</sup> Experience with numerous flavors in breast milk (as opposed to the lack of variety experienced by formula-fed infants) may also promote the infant's acceptance of a wide range of new foods.<sup>123, 110</sup>

### *Breastfeeding guidelines and recommendations*

The American Academy of Pediatrics recommends exclusive breastfeeding for the first four to six months of life and breastfeeding, along with the age-appropriate introduction of complementary foods, for the first year of life.<sup>5</sup> The World Health Organization 2003 recommendation encourages exclusive breastfeeding for the first six months of life to the extent that this is practical for the mother and family.<sup>203</sup>

Healthy People 2010 breastfeeding goals include 75 percent of mothers initiating breastfeeding, 50 percent breastfeeding when the infant is six months of age, and 25 percent continuing to breastfeed at one year of life. In October 2000, the U.S. Surgeon General identified breastfeeding as a national health priority; also in 2000, the Centers for Disease Control made the promotion of breastfeeding one of its four priority areas for preventing overweight among children.

### *Barriers to starting and continuing breastfeeding*

Some of the key barriers to mothers beginning breastfeeding are negative social attitudes toward breastfeeding, hospital policies and procedures that obstruct breastfeeding soon after birth, and insufficient professional support and encouragement for breastfeeding.<sup>173</sup> Women who are encouraged to breastfeed in the hospital after their babies are born have higher rates of beginning breastfeeding (74 percent) than women who are not encouraged to breastfeed (43 percent).<sup>173</sup>

Health care providers, including physicians, nurses, and other health professionals, often do not get receive adequate training and education in breastfeeding counseling. This leads to lack of support and encouragement for breastfeeding at all levels in the health care system.<sup>138, 70</sup>

Once they return home, women often stop breastfeeding for a number of reasons: they lack the appropriate education and knowledge, they do not have support from traditional support networks (including family and friends), there are no postpartum support services in the community or they have trouble finding or connecting with such services.<sup>173, 174</sup>

Lack of support in the workplace or in childcare environments are also barriers to women continuing to breastfeed and are discussed later in this paper.

## **Complementary and Early Feeding Practices with Infants and Toddlers**

Low birthweight followed by rapid weight gain during early infancy may play a part in later obesity.<sup>177, 178</sup> Higher birthweight, too, has been associated with overweight by the age of seven. In addition, a diet of unhealthy foods at three years old has been directly associated with overweight during the early school years.<sup>155</sup>

### *Moving to Solid Foods*

During the first two years after birth, infants and toddlers consume an increasingly complex diet, moving from a largely milk-based diet to one that includes a variety of table foods consumed by other family members.<sup>80</sup> There are few authoritative guidelines for feeding solid foods to children younger than two years of age. Existing infant feeding recommendations merely encourage parents and caregivers to introduce complementary foods as children show signs of readiness and as they expand their eating skills. Food preferences, which develop early in life, have been shown to predict later eating habits.<sup>61</sup>

### *Portion sizes for infants*

One issue regarding infant feeding is serving size—the need to ensure that infants receive appropriate amounts of milk or foods. Early in life infants respond to the energy density of

food and are capable of controlling the volume taken during a feeding. The practice of coaxing infants to eat beyond satiety is thought to contribute to childhood overweight.<sup>19,110</sup>

### *Introducing new foods*

During the transition from the exclusive milk diet of infancy to a highly modified adult diet, virtually all foods are new to the child. Fortunately, it has been found that if children have opportunities to try new and healthy foods without being coerced to eat them, many of these foods, even if initially rejected, will become part of their diet.<sup>21, 114</sup>

Early experience with new options is especially important in a child learning to accept fruits, vegetables, and other nutrient-rich foods later in life.<sup>22,170</sup> Food-flavor preferences are powerful determinants for children. Because infants are predisposed to prefer sweet and salty tastes, they tend to readily accept foods with these characteristics.<sup>123</sup> In contrast, preferences for foods that lack such tastes are learned, requiring repeated positive experiences.

It's normal for children to reject new foods initially. They may have to encounter certain new foods as many as five or ten times before accepting them, and repeated experience is most critical during the first few years of life. Parent role-modeling of enjoying food such as vegetables can increase the chance that their children will accept this food group.<sup>191,110</sup>

### *Introducing high-fat, high-sugar foods*

Feeding infants sweetened beverages and high-fat or sweet-tasting foods may introduce early preferences for such foods and beverages, contributing to children becoming overweight.<sup>80,110</sup> The Feeding Infants and Toddlers Study (FITS) found that soft drinks and French fries are being fed to infants as young as seven months of age.<sup>80</sup>

Because children's preferences for high-fat, energy-dense foods are, in part, learned, providing children with frequent exposure to such foods may reinforce their liking for them.<sup>103</sup>

In the 2002 FITS study, which examined what 3,022 infants and toddlers had been fed during the previous 24 hours, parents reported that 23 percent of infants and 33 percent of toddlers had not consumed any fruit during that time; similarly, 18 percent and 33 percent of infants and toddlers, respectively, had not consumed any vegetables. At seven to eight months of age, the vegetables they ate most often were deep-yellow vegetables, such as carrots, sweet potatoes, and squash; at 15 to 18 months, however, French fries or other fried potatoes were the vegetables these children ate most of.<sup>80</sup>

## **What Parents Know and Think About Feeding Their Young Children**

Research has shown that preschoolers' families have a strong influence on the children's eating habits. During early and middle childhood, children's food preferences, patterns and styles of eating, and preferences and patterns of activities are predominantly shaped by their family environments.

### *Parents' attitudes toward children's eating*

In focus groups conducted with low-income parents of preschool children participating in regular child care, the parents thought that their preschool children ate enough fruits and

vegetables daily.<sup>40,96,100</sup> When asked to think about how young children might become overweight, parents generally blamed genetics and behaviors such as inadequate physical activity and consuming too much food or the “wrong” foods.<sup>100</sup>

Although parents did not seem concerned about overweight, they did express concern about the health and welfare of their children and were interested in learning skills to help them lead healthier lives. Many parents reported having a basic understanding of nutrition and exercise, and they acknowledged the importance of establishing good eating habits in their children at an early age.<sup>96</sup>

### *Trying to limit or encourage how children eat*

When adults try to restrict feeding for preschool-aged children who are at risk for overweight, the strategy may backfire, causing the children to gain even more weight.<sup>72</sup> In particular, parents who are themselves overweight, who have problems controlling their own food intake, or who are concerned about their children's risk of becoming overweight may try to limit their children's eating in an attempt to keep them from becoming overweight.<sup>20</sup> Mothers reported trying to restrict their daughters' diets when they themselves were invested in weight and eating issues and when they perceived their child to be overweight or were concerned about their child becoming overweight.<sup>81</sup>

When parents are overly controlling of their children's eating, children tend to eat less healthful foods.<sup>39,75</sup> Children who are overly controlled at meal and snack times seem to lose some of their inherent ability to self-regulate, to feel full, and to respond to their internal cues that might direct their eating.<sup>39</sup> Preschool children appear to develop the best eating habits if they are allowed to govern how much food they eat while choosing from among healthful offerings.<sup>39</sup>

A study of low-income Latino parents whose children were enrolled in a preschool program found that the most common strategies used to *encourage* children to eat were another controlling practice: bribes. The parents viewed bribes as a way to discipline their children, rather than force,<sup>104</sup> but bribes may also restrict the child's ability to self-regulate and may keep children from eating healthy foods unless they are rewarded for doing so.

One study found that when parents ate fruits and vegetables, this behavior encouraged similar habits in their five-year-old daughters, leading to higher intake of micronutrients and lower intake of dietary fat. Conversely, pressure to eat may discourage young girls from eating fruits and vegetables.<sup>76</sup> When African-American parents frequently modeled healthy eating, their preschool children were more likely to establish low-fat eating patterns and eat more fruits and vegetables.<sup>182</sup>

## **Feeding Two- to Five-Year-Olds**

### *High-fat, high-sugar foods*

Several recent studies have shown that preschool children are eating a lot of fast foods and foods and beverages high in sugar. In one study, foods most commonly eaten by preschoolers were fruit drinks, carbonated beverages, 2-percent milk, and French fries.<sup>171</sup>

### *Fruits and vegetables*

Data from the Nationwide Food Consumption Survey of 1977 to 1978 and several years of the Continuing Survey of Food Intake by Individuals (CSFII) (1989 to 1991, 1994 to 1996, and 1998) were used to determine trends in the quality of preschoolers' diets. The review found that quality of diet had improved only marginally since 1977: preschoolers were eating more grains, fruits, and vegetables, but also more juice and foods with added sugar.<sup>108</sup> A New York study found that preschool-age children consumed, on average, about 80 percent of the daily recommended fruit servings, but only 25 percent of daily recommended vegetable servings.<sup>64</sup>

### *Fruit juice*

A study of four- to five-year-old Latino children found that they ate far fewer fruits and vegetables than recommended and that fruit juice accounts for a disproportionate amount of that intake.<sup>16</sup> Although a serving of juice is considered to be a serving of fruit in the USDA Food Guide, it is not a perfect substitute for actual fruit. The American Academy of Pediatrics (AAP) has stated that toddlers and young children easily drink too much fruit juice and fruit drinks because they taste good.<sup>2</sup> In addition, they are conveniently packaged or can be placed in a bottle and carried around during the day. Because juice is viewed as nutritious, parents don't usually set limits on how much of it children drink. Like soda, however, too much fruit juice can contribute to energy imbalance.

The AAP recommends juice not be introduced into the diets of infants before six months of age, and infants should not be given juice from bottles or easily transportable covered cups that allow them to consume juice continuously throughout the day.<sup>2</sup> Infants should also not be given juice at bedtime, and juice should be limited to four to six ounces per day for children between one and six years old.<sup>2</sup>

### *Breakfast and low-fat milk*

The American Academy of Pediatrics recommends that parents begin offering children reduced-fat milk instead of whole milk at two years of age.<sup>1</sup> This change can reduce the child's overall intake of fat and saturated fat; however, no studies have made a link between this switch and overweight, nor have any studies examined this as a strategy to prevent overweight among the preschool-age population.

Eating breakfast has been somewhat associated with helping school-aged children maintain weight. Breakfast eaters generally eat more calories per day, yet were less likely to be overweight, although not all studies associated skipping breakfast with overweight.<sup>153</sup> No research related to eating breakfast and weight has been conducted with preschool-aged children.

## **Degree of Acculturation**

The degree to which adult immigrants adapt to the values, behaviors, attitudes, and beliefs of their new culture has been shown to affect what they eat. However, because there is little research on the impact of this change in young children other than on breastfeeding, there are as yet no clear conclusions.

### *Breastfeeding and acculturation*

Women who were less acculturated to the United States were more likely to begin breastfeeding their children at birth.<sup>11</sup> In fact, immigrants of all races/ethnicities start breastfeeding more often than their U.S.-born counterparts.<sup>42</sup>

### *Child overweight and maternal acculturation*

There is inconclusive evidence that the level of maternal acculturation has an impact on the weight of the young child. The amount of sweetened beverages a child consumes and how many hours they spend watching television appear to have a greater impact on weight than the degree of maternal acculturation.<sup>12</sup>

## **Portion Sizes**

There is concern that portion sizes have become excessively large in recent years, particularly for foods that are consumed outside the home. A recent report indicates that restaurant portions may offer close to the total recommended daily number of food group servings in a single entrée.<sup>143</sup> Because the average U.S. family spends one of every three food dollars eating away from home, many children have extensive exposure to large portions.

Portion sizes of many types of foods and beverages became progressively larger from 1977 to 1998, the same period during which obesity has been on the rise.<sup>58</sup> Portions sizes served and consumed at home, and particularly away from home, may be several times the USDA-recommended serving size or calorie level.<sup>185</sup>

Children younger than four years old seem to be relatively unresponsive to the size of the portions of foods they are served.<sup>119</sup> By contrast, the food intake of older children and adults is strongly influenced by portion size, with larger portions often promoting overeating. When presented with portion sizes that were double an age-appropriate standard, children from three to five years old consumed more of an entrée and 15 percent more total energy at lunch. Physiological satiety cues, if they are present, are overridden by environmental cues (such as larger portion sizes) that stimulate them to eat more, even if they are not hungry.<sup>158</sup>

Other supporting research has found that large entrée portions do encourage overweight in preschool-age children by allowing them to overeat at meals. Allowing children to select their own portion size may help them eat more appropriate amounts.<sup>143</sup>

As children transition from being toddlers to preschoolers, in addition to the size of food portions, how often and what types of foods they eat are important predictors of calories consumed.<sup>119</sup>

# Causes of Early Childhood Overweight:

## Environmental Factors

The scientific literature suggests that a number of individual, social, and environmental factors contribute significantly to young children being overweight. These factors include, but are not limited to, increasingly high consumption of soft drinks and foods high in fat and sugar; larger portion sizes in fast food chains and restaurants; easy availability of fast food, soda, and junk food;<sup>162,33</sup> limited access to healthy and affordable foods in low-income communities;<sup>31</sup> aggressive marketing of junk food to children and their families; a lack of access to safe spaces to play and exercise, such as community playgrounds and parks; and communities that are not designed to encourage walking and physical activity.<sup>201</sup>

### **Intersection Between Income, Hunger, and Obesity**

Although Americans of all racial/ethnic backgrounds and economic levels are overweight or obese, lower-income families may face greater obstacles when trying to prevent their children from becoming overweight. These families are periodically short of money for food, lack easily accessible and affordable healthy foods, and lack safe, accessible places for their children to engage in physical activity.

Despite the fact that hunger—associated with eating too little—and obesity—associated with eating too much—are often viewed as mutually exclusive, emerging research suggests that hunger, poverty, and obesity may in fact be intricately linked.

#### *Food insecurity*

Food insecurity exists when individuals cannot afford to buy enough food to fully meet basic needs. With less money, low-income households are much more likely than others to suffer from hunger and food insecurity.<sup>44</sup> More than one in ten households in the United States experiences food insecurity. In 2001, 33 million Americans—including 13 million children—were not always sure when or where they would get their next meal.<sup>44</sup>

In California, more than 2.9 million low-income adults live with hunger or make daily decisions about whether to eat or to pay for other essential needs.<sup>92</sup> Among low-income adults in households with children, 38 percent are insecure about their next meal, and hunger affects 11 percent. Rates are higher in single-parent households with children.<sup>154</sup>

#### *Food insecurity and adults*

In the United States, low-income adults who are more at risk for food insecurity are also more likely to be overweight,<sup>154</sup> with obesity more prevalent among adults with less education and lower income.<sup>166</sup> Women in the “below-poverty-level” category are considerably more likely to be overweight than women earning the highest incomes; moreover, they are more than twice as likely to be obese (29 percent versus 14 percent for high-income women).<sup>166</sup>

Before reducing the quantity of food eaten, food-insecure households reduce food spending by changing the quality or variety of food consumed.<sup>44</sup> As a result, while families may get

enough food to avoid feeling hungry, they may not get the nutrients needed to be properly nourished.

Overweight can also be an adaptive response to periods when people are unable to get enough to eat. Research indicates that chronic ups and downs in food availability can cause individuals to eat more when food is available than they normally would. Over time, this cycle can result in weight gain.<sup>44</sup>

### *Food insecurity and children*

Generally, children with overweight mothers and low family income also tend to be overweight compared with higher-income households that are secure about food.<sup>180</sup> However, when parents were asked to report on whether their child was overweight, food insecurity by itself did not seem to play a role.<sup>44</sup> Other studies, too, have been unable to show a clear relationship between childhood overweight and food insecurity.<sup>105,118</sup>

### *Access to healthy foods*

Several studies found that, for low-income populations and low-income neighborhoods, healthy food options are more likely to be periodically inadequate, unpredictable, or of lower quality.<sup>6,78,131,132,183</sup>

The lack of farmers markets, full-service supermarkets, and grocery stores in low-income neighborhoods has been well documented,<sup>127</sup> and in recent decades supermarket chains have been reluctant to locate in poor neighborhoods that are perceived to offer less profit.<sup>168</sup> Grocery stores in low-income African-American neighborhoods are less likely than those elsewhere to sell healthful items such as fruits, vegetables, non- and low-fat milk, and low-fat snacks.<sup>172</sup>

Meanwhile, access to high-fat, high-calorie foods is easy at the large number of fast food restaurants, liquor stores, and convenience stores that are more common in lower-income neighborhoods. In contrast, many rural areas offer virtually no stores or restaurants, and residents (for example, migrant workers) often lack transportation to shop in nearby towns.<sup>164</sup>

### *Cost of foods*

The price of healthy foods is also a factor for many low-income families—healthier foods are often significantly more expensive than a diet high in sugar, fat, and refined grains,<sup>69</sup> even when access to healthy foods exists, many low-income families cannot afford to purchase them.

## **Barriers to Breastfeeding in Hospital and Work Environments**

Evidence shows that prolonged breastfeeding may have a greater preventive effect on overweight later in life than short-term nursing or nursing along with supplemental formula feeding (see section A. ii on for a more in-depth discussion).<sup>89, 67</sup>

### *Factors affecting whether mothers breastfeed and for how long*

Mothers may refrain from breastfeeding for a number of reasons: the aggressive marketing of formula; lack of support from family and friends; insufficient knowledge among medical

professionals about breastfeeding techniques and challenges; maternity hospital practices such as short maternal stays, and insufficient support from hospital personnel for breastfeeding; not fully understanding the nutritional needs of an infant; questioning their ability to maintain an adequate milk supply; cultural attitudes; and lack of public acceptance of breastfeeding.<sup>116,192</sup>

### *Hospital barriers to breastfeeding*

A mother's first attempts at breastfeeding are critical, and non-supportive hospital experiences and lack of support from health care providers have been identified as imposing barriers to breastfeeding.<sup>97,98,85</sup> A number of hospital routines are potentially detrimental to breastfeeding, including policies and procedures that separate mother and infant after delivery, supplementation of breastfeeding with glucose water or formula in the nursery,<sup>62</sup> and distribution of free formula by hospital staff.<sup>174</sup> Moreover, early discharge of generally no more than 48 hours after delivery precludes a mother from getting sufficient breastfeeding support and education from the postpartum staff.

The World Health Organization (WHO) has recognized that healthcare professionals and maternity care and newborn facilities should follow practices conducive to proper lactation,<sup>202</sup> even when in-hospital maternity care is of short duration. In 1989, WHO developed a baby-friendly hospital initiative for hospitals and healthcare professionals to support breastfeeding of lactating mothers.<sup>202</sup>

### *Hospitals marketing infant formula*

In-hospital marketing of infant formula to new parents also may influence a woman's decision to breastfeed and/or supplement with formula. Although the majority of U.S. hospitals do not purchase infant formula, they do receive free samples from formula companies. Many institutions also accept discharge bags, supplies, literature, videos, and other gifts from formula companies, such as staff lunches, pens, calendars, and trips.<sup>126</sup>

Products such as hospital discharge bags that contain formula samples have been shown to decrease the likelihood of a mother beginning or continuing with breastfeeding.<sup>84</sup> The International Code of Marketing of Breast Milk Substitutes (see Appendix A) and a subsequent World Health Organization (WHO) Resolution delineate guidelines for marketing formula to ensure that it does not interfere with the establishment of lactation. The International Code stipulates the responsibilities of manufacturing industries regarding their role in promoting breastfeeding and appropriate infant feeding practices.<sup>27</sup>

### *Lack of support for breastfeeding families in the workplace and childcare settings*

Breastfeeding is thought to have the greatest beneficial effect on children's weight when it is exclusive and of prolonged duration. For many women, however, returning to work can make meeting both of these goals difficult. Many breastfeeding mothers choose to wean their infants rather than endure the added stress of expressing and storing their breast milk while working. A woman who works outside the home must have a place and time to nurse her baby or express and store her milk for bottle feeding.

Early return to work, lack of information about breastfeeding at work, lack of sufficient maternity leave, and lack of flexible schedules and on-site facilities for expressing and storing breast milk are consistently the most frequently cited barriers to continuing breastfeeding.<sup>175</sup>

Generally, women who work start breastfeeding as often as women who do not work, but increased participation of women in the labor force is frequently cited as one reason for the low rates of continuing breastfeeding.<sup>56</sup>

Although there are no data on breastfeeding rates in childcare settings, childcare support of breastfeeding also plays a role in allowing the working mother to continue to breastfeed. Infant feeding in child care, including breastfeeding, is regulated under state licensing standards. In California, these recommendations include only a proviso that parents be permitted to provide formula or breast/mother's milk for their babies while in daycare centers.<sup>173</sup>

## **Child Care and Preschool Environments**

Young children may spend a large amount of time each day in either child care or preschool. The foods available and opportunities for physical activity in these settings may have a considerable impact on the young child's weight, nutrition, and fitness.

### *Children enrolled in child care and preschools in California*

Child care for young children in California may be provided by licensed, center-based care or licensed family childcare homes or may be available through informal or unlicensed sources.

Close to half of California's children between three and five years old (approximately 550,000 children) are enrolled in some type of licensed preschool or child care. Children whose families tend to be in lower income groups primarily attend public preschool or childcare programs, including the federally funded Head Start and Early Head Start programs for very-low-income children and their families. Children whose families earn higher incomes are more likely to attend private preschool or childcare programs.<sup>115</sup>

Nearly 30 percent of children in California are in full-time (35 hours or more) out-of-home child care. While this is a lower percentage than most other states, it is still a significant proportion of young children. Among California's three- and four-year-old children, 33 percent are in full-time child care, 28 percent in child care for 15 to 34 hours per week, and 16 percent with caregivers one to 14 hours per week. The vast majority of children are in child care for at least some part of the week. As a result, non-parent caregivers have considerable influence on young children's nutrition and physical activity.<sup>41</sup>

### *Healthy foods in preschool and childcare settings*

Two studies that looked at nutrient intake of children while in child care concluded that meals or snacks at childcare centers have more protein and fat and fewer fruits and vegetables than desired.<sup>23,28</sup> One study recommended that nutrient density—not fat density—of meals and snacks served to children in day care increase, as these young children may be exceeding requirements for fat intake.<sup>23</sup>

Though research has shown that childcare and preschool settings can be effective locations for helping children accept new foods and that child care can influence young children to choose healthier foods,<sup>139</sup> it is difficult to link any particular kind of eating with any particular type of child care.<sup>39</sup>

Teacher modeling in preschool has been shown to have some effect on eating practices for young children, although peers' attitudes toward the food often influenced the result. Caregivers can also model family-style meals and provide positive eating experiences.<sup>39</sup>

### *Physical activity in preschool and child care settings*

Several studies have looked at physical activity levels of preschool-age children at preschool.

One study found that the preschool that a child attended was a significant predictor of the intensity of physical activity.<sup>146</sup> Another study compared the physical activity levels of three- to five-year-old children while attending preschool and found that a significant proportion of overweight preschool-age children may be at increased risk for further gains in weight because of low levels of physical activity during the preschool day.<sup>184</sup> Many childcare centers have good climbing, sliding and riding equipment, but there is a dearth of documentation about children's actual activity using the equipment.<sup>39</sup>

Children's physical activity levels are highly variable among preschools, which suggests that preschool policies and practices have an important influence on the overall activity levels of the children the preschools serve.

### **Opportunities for Physical Activity**

In addition to a lack of access to healthy foods, the increase in sedentary activities among children, even among preschoolers, has contributed to increasing rates of overweight among them.<sup>146</sup> Preschool-aged children with low levels of physical activity gain more weight as fat than do more active children.<sup>130</sup> Moreover, children who are more physically active during early childhood are likely to have less body fat by the time of early adolescence.<sup>129</sup>

Recognizing that low levels of physical activity are related to more young children being overweight, both the American Academy of Pediatrics and the National Association for Sport and Physical Education have recently released physical activity guidelines for preschool children.<sup>132 \*</sup>

### *Barriers to physical activity*

Many factors play important roles in determining when, where, and how children engage in physical activity. Children from birth to five years of age are less active when they are restricted to infant seats, strollers, and small play spaces for long periods of time; when they are allowed to watch television or videos for more than two hours per day; and when they lack of at least one hour of moderate physical activity per day.<sup>66,133</sup>

In addition, work demands and concern for neighborhood safety can both limit the amount of time parents have to be physically active with their children. Moreover, the design of suburban neighborhoods often discourages walking, and the development and marketing of television and computer programs geared for young children also foster sedentary behavior.<sup>137</sup>

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\* A policy statement from the American Academy of Pediatrics on physical activity and organized sports for children recommends that, since preschool children have short attention spans, exercise should consist of a mixture of structured and free play. Structured activities should be roughly 15 to 20 minutes in duration followed by 30 minutes of free play. Exercise should also be focused on playfulness and exploration of movement.

In focus groups with parents of preschool children in child care, parents mentioned their own lack of time for physical activity, concern about how safe the neighborhood was, and concern about the size of the available outdoor play areas as barriers to adequate physical activity for their children.<sup>40</sup>

### *Environmental factors that promote physical activity*

How much time children spend outdoors is strongly related to how much physical activity they engage in.<sup>107,15,161</sup> Young children who don't have access to recreational facilities,<sup>90</sup> and preschool children who don't have access to outdoor play spaces, such as public playgrounds, may engage in less physical activity as a result.<sup>161</sup>

### *Family factors that promote physical activity*

Because young children are so directly affected by their parents' behavior, whether their parents are overweight and how active their parents are play an important role in how much physical activity a preschool child engages in.

Family participation in physical activities, parents role-modeling an active lifestyle, and children experiencing activities that are varied, short in duration (five- to fifteen-minute bursts), and perceived as fun have all been demonstrated to encourage greater levels of physical activity and to promote healthy weight among young children.<sup>133</sup>

### *Environmental factors that affect physical activity*

Across income levels, the built and natural environments influence families' opportunities for physical activity—higher street-connectivity, diversity of land uses,<sup>91</sup> and the presence of viable parks affect how physically active community residents can be.<sup>83</sup>

In low-income communities, residents depend more on public parks for physical activity than do high-income urban dwellers or suburban and rural residents.<sup>145</sup> However, lower-income communities have less space devoted to parks and less funding for recreation programs;<sup>200</sup> safe, appealing places to play and be physically active are concentrated primarily in high-income areas.<sup>71</sup>

Even where public playgrounds are available, neighborhood safety often dictates how often preschoolers go there. Low-income preschoolers, who are at a greater risk for later overweight, may be more likely to live in urban neighborhoods where there are fewer places for safe outdoor play.

## **Television and Video Viewing**

Of the sedentary behaviors that may be linked to increasingly overweight children, television watching has been the most widely studied. Overweight in younger, preschool-age children has now been associated with television viewing.<sup>63</sup> Although they share many similarities with television, other types of screen time, such as computer use and video game playing have not been researched as extensively with regard to overweight among young children.

Television viewing may displace active play and physical activity time; many studies have found that the more time spent in watching television, the greater the likelihood of a child being overweight. Moreover, many families snack while watching television, often consuming unhealthy foods while doing so.<sup>39</sup>

Television viewing begins at a young age. National survey data show that an increasing percentage of youngsters watch more than two hours of television per day: 17 percent of children less than one year old, 48 percent of children between one and two years old, and 41 percent of children between two and three.<sup>50</sup> One study found that time spent watching real-time television, taped television shows, or commercial videos averaged 2.5 hours per day for children between the ages of two and seven.<sup>157</sup>

The chance of having a body-mass index greater than the 85th percentile increases with each additional hour of TV/video viewed. Preschoolers who have a television set in their bedroom watch even more of it and are even greater risk of being overweight.<sup>63</sup>

Data from the National Longitudinal Survey of Youth 1990-1998 indicate that children who watch more than two hours of television per day at age two were more likely to watch more than two hours per day at age six.<sup>50</sup> One study that followed television-viewing habits from preschool to early adolescence found that children who watch the most television during childhood have the greatest increase in body fat over time.<sup>151</sup>

Recognizing the negative effects of television on children, the American Academy of Pediatrics recommends children two years and older watch less than two hours of television per day and children younger than two years watch no television at all.<sup>3</sup>

## **Marketing and Advertising Food and Beverages to Children**

Since the 1980s, the food and beverage industry has made children and adolescents the target of intense and specialized food marketing and advertising. The proliferation of electronic media, the deregulation of and declining support for public service advertising, and the booming economy of the 1990s all contributed to the transformation of children into a sought-after consumer group.

The amount of money spent on marketing to children doubled during the 1990s—in the late 1990s it had reached about \$12 billion a year<sup>121</sup>—as corporations competed for what marketers call “share of mind”<sup>149</sup> and “cradle to grave” brand loyalty. Multiple techniques and channels—including television advertising, product placements in television programs, and toys and products with brand logos—are used to build brand identification and influence what foods toddlers and youth encourage their families to buy.

### *Children’s understanding of advertising and marketing*

Numerous studies have documented that young children have little understanding of the persuasive intent of advertising.<sup>179,109,102</sup> Children younger than five cannot distinguish between programs and advertisements,<sup>175</sup> making this age group easily exploited because they do not understand that commercials are designed to sell products and because they do not yet possess the cognitive ability to comprehend or evaluate advertising. Even children at eight to ten years, though possessing the cognitive ability to process advertisements, do not necessarily do so.<sup>179</sup>

### *Foods marketed to young children and marketing techniques used*

Unfortunately, the foods being marketed to children—from highly sweetened cereals to cookies, candy, fast foods, and soda—are predominantly high in calories, sugar, and fat.<sup>163</sup>

The largest source of media messages about food and beverages to children, especially to younger children, is television. Children view between 20,000 and 40,000 commercials each year,<sup>179</sup> with the heaviest food advertising targeted to young children.<sup>205</sup> Food companies increasingly market branded toys and products to preschoolers and young children to promote brand awareness and preference.

Preschoolers respond to food advertising on television. Their short-term food preferences are significantly affected by the television commercials they view,<sup>113</sup> and their food preferences tend to reflect the television commercials they see.<sup>25</sup> Even brief exposure to commercials can influence preschoolers to choose low-nutrition junk food.<sup>25</sup>

One example of partnerships between the food industry and children's television programming is that between Teletubbies and Burger King. In 1999, Burger King began a licensing agreement with producers of Teletubbies—a program shown on public television stations aimed at toddlers and preschoolers—to promote its fast food on the show. McDonald's has announced similar plans.<sup>156</sup>

### *American Academy of Pediatrics and marketing to young children*

The American Academy of Pediatrics has recognized the effects of food advertising on children and has shown their concern about the influence over children's knowledge, attitudes and behaviors by stating: "Advertising directed toward children is inherently deceptive and exploits children under eight years of age."<sup>9</sup>

# Most Promising Strategies to Prevent Overweight Among Young Children

Although studies have looked at interventions to prevent overweight among school-age children, and there is little published research on successful strategies to prevent overweight among children from birth to five years of age, this literature review to this point suggests a number of interventions that may prove productive.

## **Improving Access to Affordable Food in Low-Income Communities**

A number of changes can be made in communities to increase accessibility and availability of healthy foods for low-income families.

### *Zoning and community design ordinances*

Communities can establish zoning guidelines, design policies, and conduct environmental assessments to increase community access to healthy foods and decrease the numbers of fast food outlets.<sup>152</sup> Land use and zoning policies can also limit the prevalence of liquor stores and fast food outlets or require a more acceptable ratio of stores carrying healthy versus unhealthy foods.

### *Supermarkets*

Low-income communities have used many strategies to recruit full-service supermarkets into their neighborhoods successfully, with community advocacy and involvement bolstering local political leadership and advocacy by appropriate public agencies.<sup>127</sup> In southeast San Diego, for example, the Jacobs Center for Neighborhood Innovation led a comprehensive community initiative that resulted in a highly profitable Food-4-Less store (a price-impact, warehouse-format supermarket) opening in a district that had had no supermarket for twenty years. Most of the employees in the store's unionized workforce now come from the neighborhood.<sup>134</sup>

### *Small Stores*

California Food Policy Advocates, a statewide public policy and advocacy organization, conducted a pilot project to improve access to fresh fruits and vegetables in a low-income African-American neighborhood in Oakland. Aimed at turning the corner grocery store into a distribution network for fresh produce, the project provided technical assistance on purchasing and handling produce and helped the store with refrigeration and signage. Produce sales in the pilot store rose from less than \$50 per week to \$600–700 per week. Based on this success, the county health department has expanded the project to other neighborhoods.<sup>127</sup>

### *Farmers Markets*

Many communities and organizations have introduced farmers markets as a way to bring fresh fruit and vegetable produce to low-income urban communities. New York State recently expanded its Farmers Market Nutrition Program by increasing the number of participants in the Special Supplemental Program for Women, Infants, and Children (WIC)

who can redeem their WIC food coupons for fresh produce. As a result, WIC participants are buying more fresh food, and local farmers' incomes have increased.<sup>59</sup>

## **Increasing Breastfeeding**

Helping more women to begin and maintain breastfeeding may help to keep their preschool-age children from becoming overweight. The strategies presented in this section primarily focus on changing environments that affect whether women breastfeed and for how long.

### *Supportive healthcare providers and hospital environments*

Some of the most successful strategies to change breastfeeding practices have involved changing related institutional practices, including hospital practices. Women who are encouraged to breastfeed by a doctor or nurse after the birth of their baby are four times more likely to initiate breastfeeding than mothers who don't receive such encouragement.<sup>173</sup> Healthcare providers can also help delay weaning by providing information in advance about ways to incorporate pumping and/or nursing into the working day. Expressing and storing breast milk is a skill that should be taught to all new mothers, in case of separation.<sup>10</sup>

Some hospitals have even applied for the "Baby-Friendly" designation assigned by the Baby-Friendly Hospital Initiative. Begun in 1991 by UNICEF and the World Health Organization, this initiative works to ensure that hospital maternity wards become centers of breastfeeding support. WHO/UNICEF published ten steps of maternal and infant hospital care which, when implemented, greatly increase the probability that breastfeeding families will get off to a successful start and are the major steps in a hospital becoming designated as "Baby-Friendly" (see Appendix B).<sup>202</sup>

Federal researchers have found that the more steps that mothers experienced, the greater the likelihood they would continue breastfeeding at and beyond six weeks postpartum. Mothers who experienced none of the steps were nearly eight times more likely to discontinue breastfeeding before six weeks postpartum. The strongest risk factors for mothers stopping breastfeeding early were beginning breastfeeding late and supplementing with formula.<sup>68</sup>

The inner-city Boston Medical Center met the requirements to achieve baby-friendly status in 1999. In the first year, the percentage of all women beginning breastfeeding there rose from 58 percent to 87 percent, with 33 percent of mothers breastfeeding exclusively (up from only 6 percent previously). Among U.S.-born African-American mothers, rates of beginning breastfeeding increased from 34 percent to 74 percent.<sup>147</sup>

Other hospitals have opted to develop independent lactation support programs. The Lactation Center at Cedars-Sinai Medical Center in Los Angeles, for example, reports that in 1998, 81 percent of women came to the hospital expecting to breastfeed but only 69 percent were doing so at discharge. In 2000, after the medical center developed a breastfeeding support program, 93 percent of women delivering there expected to breastfeed and 91 percent were breastfeeding at discharge.<sup>101</sup>

Increasing the number of hospitals in California that have received WHO "Baby-Friendly" certification will increase the number of mothers who begin and continue breastfeeding after hospital discharge. As of May, 2005, 11 hospitals in California had received such certification.<sup>13</sup> (For a list of certified baby-friendly hospitals in California, see Appendix B.)

### *Legislation and policy*

California has passed several pieces of legislation to support breastfeeding mothers. These include legalizing a woman's right to breastfeed in public, allowing breastfeeding mothers to defer jury duty, and requiring all hospitals and maternal care facilities to provide either lactation services or information on lactation.<sup>26</sup>

AB1025, passed in 2001, addresses breastfeeding accommodations for employed breastfeeding mothers. This law requires "all California employers to provide a reasonable amount of break time and make a reasonable effort to provide a private space, other than a toilet stall, close to the employee's work area, to accommodate an employee desiring to express breast milk for her baby."<sup>26</sup> Both the California WIC Branch and the LA Breastfeeding Coalition have developed resources for employers on how best to implement this law.<sup>27</sup>

### *Work environments*

Given the large numbers of women in California who are working mothers, employers who support breastfeeding can significantly help nursing mothers balance the demands of work with their desire to continue to breastfeed their infant.<sup>144</sup>

A number of organizations in California have chosen to support women in their decision to return to work and continue to breastfeed; these offer corporate or on-site lactation programs or support. (See Appendix C for a list of organizations that have been recognized for breastfeeding support).

### *Peer counseling*

Other education strategies, particularly peer counseling programs, can also help to increase breastfeeding rates. A number of studies have demonstrated the effectiveness of peer counseling programs in helping more women begin and continue breastfeeding and avoid supplementing with formula.<sup>30</sup> Many of these successes have been with low-income women,<sup>117,165</sup> and a number of them have focused on Latina women.<sup>51,52</sup> Many of these successful peer counseling programs are primarily conducted by WIC programs.<sup>128,165</sup>

Given California's large and varied ethnic populations and various levels of breastfeeding among them, strategies such as peer counseling that are sensitive to particular cultural beliefs and the needs and barriers to breastfeeding for a specific population may be the most worthwhile. Special effort should be made to reach Hispanic women with information about the importance of breastfeeding.

## **Improving Feeding and Eating Practices for Young Children**

Research has identified a number of elements overall that can help programs change the eating behaviors of young children:<sup>39</sup>

- Work toward specific behaviors
- Focus on changing behavior rather than knowledge
- Provide clear messages about eating more fruits and vegetables
- Actively involve the families
- Provide longer, more intensive interventions rather than one or two contacts

### *Healthy Start Program*

On the environmental front, the Healthy Start Program, a project designed to evaluate the effectiveness of cardiovascular risk reduction in Head Start preschool centers, has shown promise.<sup>198</sup> The program has two primary interventions: a preschool food service intervention program and a comprehensive preschool health education curriculum. The food service program is designed to reduce the total fat in preschool meals and snacks to less than 30 percent of calories and to reduce the saturated fat to less than 10 percent of calories. The education program focuses on teaching about nutrition.

Evaluation findings indicate that the program was effective in reducing the fat and saturated fat content of preschool meals and reducing children's consumption of saturated fat at preschool without compromising energy intake or intake of essential nutrients. Further studies demonstrated that the program was effective in reducing cholesterol levels in all children participating in the study, and specifically children “at risk,” those with initial elevated serum cholesterol.<sup>199</sup>

Originally designed to fit with Head Start programs, Healthy Start is now available for any preschool site.

### *Home visiting to address parenting practices*

Home visiting programs that use peer educators to change lifestyle behaviors and improve parenting skills to prevent overweight among Native American children have also shown promise. Participants in these programs have modified their eating and engaged in less restrictive child feeding practices over time.<sup>93</sup>

### *Role of healthcare providers*

The healthcare provider can often have a profound impact on the health of a child. Recognizing the importance of the healthcare provider in preventing overweight among children, Kaiser Permanente has developed several key messages that each pediatrician is encouraged to discuss with families during clinic visits:

- Get up and play hard
- Cut back on TV and video games
- Eat five helpings of fruits and vegetables every day
- Cut down on sodas and juice drinks

Kaiser has developed and placed a poster in each pediatric clinic room to remind the pediatrician to discuss these key messages with families.

### **Increasing Opportunities for Physical Activity**

Strategies to increase physical activity among young children involve creating more opportunities for free play and encouraging parents to model and engage in physical activity with their children.

### *Access to physical activity in the community*

Neighborhoods can be designed in ways that encourage physical activity for the entire family. These changes in community design have not been evaluated in terms of their effect on children's weight, but they have been shown to promote physical activity.<sup>24</sup>

Landscape design for new and revitalized neighborhoods alike should provide both sidewalks and bike paths as well as green space and playing fields. Designing neighborhoods that are more oriented toward public transportation than toward automobiles increases the number of people who walk and bike during their commute to work.

Community bike programs that include funding to improve street safety features (crime, lighting, traffic) and connect bikeways can increase the number of people using bicycles for recreation and for transportation.<sup>190</sup>

### *Programs and policies that encourage community physical activity*

Local officials can develop policies and programs that assure access to safe and appealing opportunities for physical activity for families in low-resource neighborhoods. These programs may include developing safe and expanded access to parks and walking trails or establishing after-hours access to public recreational facilities. A health center in a low-income neighborhood of Oakland, for example, has had great success charging a low monthly fee for membership to a gym that is associated with the local health center.<sup>204</sup>

### *Programs that promote physical activity*

AAP and the NASPE guidelines for programs that promote physical activity for young children recommend types of activities and amounts of time for physical activity appropriate for specific ages and levels of development.<sup>8,133</sup>

Very few physical activity programs for preschool-age children have been evaluated. There is some evidence, however, that children who participate in aerobic exercise programs improve their fitness, agility, and self-esteem.<sup>7</sup> Programs that have successfully increased physical activity in the school-age child may also provide similar benefits to the younger child. (For examples of programs adapted for preschoolers that are being implemented and tested in preschool centers see Appendix D.)

## **Reducing Television Watching and Marketing Unhealthy Foods to Children**

### *Time spent watching television*

Although researchers have explored interventions to reduce television viewing among school-age children, little research in this area has been published with regard to preschoolers. In one intervention conducted with preschoolers and their families in rural upstate New York, television viewing declined by three hours per week.<sup>65</sup> Focus groups with parents of preschool-aged children in child care found that parents, often tired or busy after work, encourage preschoolers to watch television as a way of occupying them. Mothers in these focus groups, however, did state they would be willing to limit television-viewing time.<sup>40</sup>

### *Marketing unhealthy foods to young children: Laws and regulations*

Many countries have policies restricting food and beverage advertising to very young children. Sweden, Norway, and part of Belgium have banned television advertising directed at children, including advertising during or immediately before and after children's programs. Austria prohibits advertising during children's programming, and Australia does not allow advertising during programs for preschoolers.<sup>94</sup>

Other countries have regulations specific to food advertising aimed at children, such as that such advertising should not encourage excessive intake, contain misleading information about the nutritional value of a product, or discourage children from choosing fresh fruits or vegetables.<sup>94</sup>

In the United States, regulation of advertising to children has been a federal responsibility under the jurisdiction of the Federal Trade Commission (FTC) and the Federal Communications Commission (FCC). Because in recent years the FTC denied having this power, in 2005 Senator Harkin (Iowa), chair of the Senate Agriculture Committee, introduced legislation that would give the FTC power to restrict advertising of junk food to children under age eighteen. Senator Harkin also introduced federal legislation giving the U.S. Secretary of Agriculture the authority to prohibit all advertising of junk food in schools where parents are not present.<sup>167</sup>

In 2005, the FTC sponsored a two-day federal hearing to discuss issues related to food and beverage advertising and marketing to children.

### *Marketing unhealthy foods to young children: Self-regulation and advocacy*

#### **Children's Advertising Review Unit (CARU)**

CARU, the children's arm of the advertising industry's self-regulation program, evaluates child-directed advertising and promotional material in all media. CARU has published guidelines for companies to self-regulate advertising and marketing directed at children.<sup>54</sup>

#### **Center for Science in the Public Interest**

The Web site of the nonprofit education and advocacy organization Center for Science in the Public Interest has links to several reports describing food and beverage marketing and advertising to children. The site also contains examples of model state resolutions addressing advertising and marketing along with guidelines for responsible food marketing to children and tools to assist parents and others in using these guidelines.<sup>43</sup>

#### **Campaign for a Commercial-Free Childhood**

Campaign for a Commercial-Free Childhood is a national coalition attempting to counter the harmful effects of marketing to children through action, advocacy, education, research, and collaboration. They have a number of resources and recommendations for taking action to reduce marketing and advertising to children, including a fact sheet, "Marketing to Babies and Toddlers."<sup>38</sup>

#### **American Academy of Pediatrics (AAP)**

The AAP initiative "Media Matters" comments on food advertising or media messages about food: "Media heavily promote unhealthy foods while at the same time telling people they need to lose weight and be thin. Heavy media use can also take time away from physical

activity.”<sup>9</sup> The AAP has published brochures for parents, provides resource information for those who are interested in media and children, takes an activist role in advocating for protection of children from advertising, and encourages pediatricians to include media education in their work with families.<sup>9</sup>

# Role of Government Programs in Preventing Overweight

A number of government-funded programs provide nutrition related services to low-income families. They all have the potential to play an important role in preventing overweight among young children. This section describes the major programs and suggests ways they could expand or improve services that could affect overweight among young children.

## **WIC (USDA Food and Nutrition Services)**

Nationally, the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) provides nutrition information, supplemental nutritious foods, and referrals to other health, welfare, and social service agencies. Each month WIC serves about eight million low-income pregnant women, infants, and children up to age five.

### *Overweight children enrolled in WIC*

National rates of overweight in preschool children enrolled in WIC range from 10 to 16 percent, depending on age or ethnicity. Among children enrolled in WIC, Hispanic and Native American children have higher rates of overweight than other racial/ethnic groups. Of particular concern are the 11 to 19 percent of children enrolled in WIC who fall into the *at risk* category, depending on age or ethnicity.<sup>96</sup>

### *Role of WIC in preventing overweight*

Almost half of U.S. children are enrolled in WIC at some point during infancy; nearly one-fourth of U.S. children are enrolled at two to four years of age. The WIC Program thus provides an ideal setting for identifying newborns who are at highest risk for later overweight and for using different approaches to preventing overweight in preschoolers.

### *Mothers of WIC children*

Nearly one-third of mothers in WIC are overweight when they conceive. The period before a mother conceives, during her pregnancy, and in the early years of her child's life may provide important opportunities to prevent overweight in her preschool-aged child. For the WIC program, developing interventions with overweight mothers that begin at or before the birth of their children may offer the most potential to prevent overweight among WIC-enrolled preschool-age children.

### *FitWIC*

California was one of five state WIC agencies that participated in the USDA-funded initiative to prevent childhood overweight, called FitWIC, from 1999 to 2002. FitWIC demonstration projects incorporated a new focus on the importance of physical activity among WIC participants. California FitWIC strengthened workplace supports for frontline staff seeking to address their own physical activity, diet, and weight issues so that they could be role models for WIC families, including improving their skills in counseling WIC participants. Empowered to change their own behaviors related to nutrition and physical

activity, FitWIC staff reported being more skilled and successful in addressing overweight issues with WIC participants.<sup>96</sup>

### *WIC food package*

In general, WIC benefits appear to have a positive effect on reducing overweight since participants substitute WIC foods for empty-calorie “junk” foods in their usual diet.<sup>188</sup> However, a recent national study found that WIC infants consume more juices and other high-calorie foods and eat fewer fresh fruits and vegetables as they transition to table foods than a comparison group.<sup>150</sup>

Staff members in FitWIC focus groups expressed frustration that WIC foods available to participants were inconsistent with an obesity-prevention message, being too high in fat and not reflecting current nutrition recommendations for children.<sup>96</sup> The USDA commissioned the Institute of Medicine to review the WIC food package and make recommendations for changing it to be in more in line with current dietary guidelines and to address the fact that increasing numbers of preschool-aged children in WIC families are overweight and at risk for overweight. The USDA is currently considering the IOM recommendations, especially those that pertain to lower-fat foods, more culturally appropriate foods, and offering fruits and vegetables as part of the WIC package.<sup>57</sup>

### *WIC and breastfeeding support*

The WIC program provides a number of services to promote breastfeeding among its participants. These practices vary from state to state and even from agency to agency within states. A 2003 survey of WIC state breastfeeding coordinators found that 29 of the 48 respondents provide funding beyond what was federally mandated to support breastfeeding-related activities.<sup>120</sup>

Despite WIC’s efforts to promote breastfeeding and recent increases in breastfeeding rates among WIC participants, these rates continue to remain lower than those for non-WIC participants. One of the strategies that may increase these rates is greater use of peer counselor programs. Thirty-six states have peer counselor programs in at least some local agencies, and the USDA has recently developed materials and tools to assist agencies with developing and evaluating peer counselor programs.<sup>120</sup>

## **Food Stamps (USDA Food and Nutrition Services)**

The Food Stamp Program (FSP) is the largest federal food program in the United States helping low-income Americans buy food. In 2004, the Food Stamp Program served 10.3 million households and 23.9 million individuals each day. Food stamps protect more children — 1.1 million — from extreme poverty than any other program.<sup>159</sup> In 2002, approximately 19 million Americans received food stamps every month; about 1.7 million of them were Californians.<sup>154</sup>

Participants may purchase breads and cereals, fruits and vegetables, meats, fish and poultry, and dairy products at most grocery stores and at farmers markets that accept food stamps. To minimize the stigma of using food stamps, many states, including California, issue recipients an electronic debit card instead of paper vouchers.

### *Food stamps and overweight children*

Very few studies have examined the relationship between participation in the Food Stamp Program and overweight among children. One study found no such relationship in older children;<sup>86</sup> another study found no differences in children between two and nineteen years old receiving or not receiving food stamps in terms of mean BMI or the proportion of children at risk of being overweight or actually overweight.<sup>112</sup> A third study found that, compared with higher-income children, however, that study found that girls between twelve and nineteen years old in the Food Stamp Program were heavier and more likely to be overweight.<sup>112</sup>

### *Food stamps and nutrient intake*

Only a few studies have looked at the impact of using food stamps on nutrient intake. One study found that preschoolers whose families participated in the Food Stamp Program consumed significantly fewer servings of grains and grain products than comparably aged nonparticipants. Moreover, they were significantly less likely to meet the USDA Dietary Guidelines recommending less than 10 percent of total energy from saturated fat.<sup>88</sup>

One study found that preschool children and older girls who participated in the Food Stamp Program were less likely to eat breakfast than their higher-income counterparts.<sup>82</sup>

### *Food stamps and farmers markets*

Farmers markets are a good source of healthy foods, particularly when they exist in neighborhoods with few stores that carry fresh fruit and vegetables. Most farmers markets have traditionally accepted food stamps, but California's Electronic Benefits Transfer (EBT) cards present a challenge in these cash-only settings, which lack access to electricity and phone lines. A consortium of certified farmers markets in Los Angeles County recently worked out a way for twenty-two of the county's farmers markets to accept payment using the EBT cards.<sup>35</sup>

### *Food Stamp Nutrition Education Program (FSNEP)*

In 2003, California qualified for \$62 million in federal matching funds to implement nutrition education among food stamp recipients in California through the Food Stamp Nutrition Education Program (FSNEP) and the California Nutrition Network. The Network serves all 58 counties through 12 regional lead agencies; in 2004 the Network funded more than 180 projects in nearly 4,000 school and community sites.<sup>154</sup>

The goal of the Food Stamp Nutrition Education Program is to improve the diet and nutrition-related skills of food stamp recipients and their families so that they rely less on emergency food resources, are better able to plan meals and budget for food, have healthier diets that include more fruits and vegetables and more variety, and are more physically active.

### **Child and Adult Care Food Program (CACFP)**

The Child and Adult Care Food Program (CACFP) of the USDA provides reimbursement for food and meal preparation costs, ongoing training in the nutritional needs of children, and onsite assistance in meeting the program's nutritional requirements. Services are

available to participating childcare centers, family childcare homes, Head Start, and after-school programs.

Although very few studies have evaluated the quality of the foods available in the Child and Adult Care Food Program (CACFP), existing research indicates that children in daycare centers participating in the program consume more servings of milk and vegetables and significantly fewer servings of fats/sweets than children who bring their meals from home.<sup>32</sup> A USDA study indicated that childcare programs that participate in CACFP provided more nutritious meals for low-income children than those programs that do not participate.<sup>187</sup>

However, CACFP providers are not required to meet specific nutrient standards for fat, saturated fat, or sugar in the food they serve—requirements are in the form of meal pattern standards that require certain food groups (breads and grains, proteins, and so on) for breakfast, lunch, and snacks. CACFP also strongly encourages family-style meals, but these are not required.<sup>187</sup>

Many childcare centers and family daycare homes do not participate in the CACFP program and therefore are not required to follow any types of nutrition standards when providing food to young children. Limited outreach, licensing problems, language barriers, the need for more technical assistance for providers, and the massive amount of paperwork may discourage many childcare operators from participating in this program.<sup>39</sup> Increasing the number of daycare centers and homes that participate in this program may be a way to improve the nutritional intake of preschool children in licensed daycare settings. At the same time, policies around food choices, in CACFP for example, could be tightened up to provide more direction toward consumption of fruits and vegetables.

## **Child Care**

As noted earlier, close to half of California's children between three and five years old (approximately 550,000 children) are enrolled in some type of licensed preschool or child care. Many more are in informal daycare arrangements. Given the amount of time children spend in child care each day, these settings could provide an optimum opportunity to prevent overweight.

California currently has no major campaigns to include childcare settings in efforts to prevent overweight. However, childcare providers could serve as role models for preschool children by providing nutritious foods, family-style mealtimes, and substantial amounts of time for physical activity.

Childcare providers need financial and technical support to enhance their physical environments to encourage physical activities and there need to be policies that mandate active play for a certain amount of time each day.

### *Child care and breastfeeding*

Several states have taken a proactive stance in supporting breastfeeding in childcare settings. For example, Delaware stipulates that “every effort shall be made to accommodate the needs of the child who is being breast-fed.”<sup>175</sup> Mississippi’s regulations explicitly support breastfeeding: “Breast milk is the recommended feeding for infants and should be encouraged and supported by child care facility and staff.”<sup>136</sup> California should also support policies that encourage stronger support for breastfeeding in childcare settings.

Through its Child and Adult Care Food Program, USDA provides reimbursement for feeding expressed breast milk in childcare centers and daycare homes. Daycare providers and childcare centers should be encouraged to take advantage of this provision and encourage parents to bring expressed breast milk to daycare.

### **Head Start (US Dept. of Health and Human Services)**

Head Start is a federally funded child development program for very low-income young children and their families; it serves as a preschool program for low-income families with children between the ages of three and five years old.

Head Start provides child development and health services; Early Head Start provides comprehensive services, including child development, health, and nutrition services to eligible pregnant women and low-income families with infants or toddlers. Both programs work through locally defined service delivery models, such as center-based preschool services, home-based services, family childcare services, and locally designed models.

In both programs, health services are comprehensive and include nutrition services and a nutrition assessment for each participant. Children and families are involved in health and nutrition education through classroom curriculum, parent or family education activities, and home visits. Children who receive center-based child development services also receive nutritious meals on site.

#### *Nutrition and physical activity in Head Start*

Head Start agencies must design and implement a nutrition program that meets the nutritional needs for each child, agencies must use USDA funding for meals and meet USDA meal-pattern requirements, and the meals must meet between one-third and two-thirds of the children's daily nutritional needs, depending on the length of time they spend each day at Head Start.<sup>186</sup>

The Head Start program, like many public, licensed childcare centers and licensed family daycare homes, is required to provide food to young children through the USDA-sponsored Child and Adult Care Food Program (CACFP).

Head Start agencies are also required to provide sufficient time and space for active play that supports the development of gross motor skills. Centers are required to have 35 square feet of indoor space and 75 square feet of outdoor space usable for each child.<sup>95</sup>

#### *Initiatives to prevent overweight*

In perhaps the only campaign to prevent overweight among Head Start children, the National Head Start Association has formed a partnership with the Nike Go Campaign to promote physical activity in its sites (see Appendix D).

There are several ways that Head Start agencies could play a role in preventing overweight:

- Head Start's mandatory nutrition assessments could identify and tally children who are overweight or at risk for overweight.
- Head Start could integrate overweight prevention strategies and messages into its health and nutrition education to children and families, with particular focus on families with children at risk for overweight.

- Where on-site meals are provided, Head Start could ensure that they are healthy and nutritious and that the food served is consistent with messages related to preventing overweight.
- Early Head Start could add information about preventing obesity specifically for pregnant mothers and those whose children are infants and toddlers.
- Head Start programs could take advantage of pilot strategies tested with Head Start to develop campaigns about preventing overweight. For example, SPARK Early Childhood is testing physical activity interventions with Head Start children; also, and the well-evaluated Healthy Start curriculum was developed for use at Head Start sites.

Though a coordinated campaign is lacking, several local Head Start agencies throughout the country have programs and activities to prevent overweight among the preschool children they serve (see Appendix E). In California, four WIC-Head Start collaboration projects (in Salinas, Merced, Sacramento, and Oxnard) make nutrition education of children and families a priority.<sup>39</sup>

### **California's "First Five" Commissions**

The California Children and Families Commission, created by Proposition 10 in 1998, supports children from the prenatal period to age five by creating a comprehensive and integrated system of information and services to promote early childhood development and school readiness. The initiative added a 50 cent-per-pack tax to cigarettes and a comparable tax to other tobacco products, with two goals for the funds raised from these taxes:

- Provide funding for community health care and quality childcare and education programs for young children and families, customized to meet local needs
- Provide a statewide public education campaign on the importance of early childhood development

Because the First Five Commissions throughout California target young children and their parents, they could have a major role in funding programs and strategies to prevent overweight among this age population.

Several reports have described how First Five Commissions could partner with WIC programs to promote healthy eating to young children and their families and how they could improve breastfeeding rates throughout California.<sup>173,193</sup> The major initiatives of the First Five Commissions, however, while addressing important issues of childcare, school readiness, and health care, have not included a focus on preventing overweight.

#### *County programs and initiatives*

Despite the lack of a statewide initiative, a number of counties have established programs that incorporate several of the strategies discussed in this paper related preventing overweight among young children. Many of these local initiatives either partnered with or were led by WIC programs. Several counties (San Bernardino, Santa Cruz, Sacramento, and Tehama) have funded programs that focus on prenatal education and improving breastfeeding rates; other programs (in Calaveras County and Sacramento) have focused on increasing access to fruits and vegetables for families with young children (see Appendix F for specific examples of local programs and initiatives).

## Conclusion

Many of the most effective strategies for preventing overweight among children from birth to five—and those in which the state, counties, and federal agencies can play a role—involve taking the leap from focusing solely on individual behavior change to encouraging changes in environments that may help prevent overweight for young children.

Although few reports explore how such things as access to fresh fruits and vegetables in the home and in daycare settings and opportunities for physical activity might affect overweight in young children, it is clear that the context in which families struggle to achieve healthy eating and adequate physical activity play an important role in their success.

Federal and state agencies and organizations can participate by improving nutrition education and the foods available to low-income families through their programs, and by strengthening regulations pertaining to childhood environments, including childcare. Developing educational messages must involve careful consideration of the cultural and language needs of the families with children most at risk for becoming overweight.

This literature review has identified and defined early childhood environments and some promising environmental and policy strategies that should be considered when planning strategies to prevent overweight for the youngest children.

# **Appendixes**

# Appendix A: The International Code of Marketing of Breastmilk Substitutes

Art. 1. Aim of the Code

Art. 2. Scope of the Code

Art. 3. Definitions

Art. 4. Information and education

Art. 5. The general public and mothers

Art. 6. Health care systems

Art. 7. Health workers

Art. 8. Persons employed by manufacturers and distributors

Art. 9. Labelling

Art. 10. Quality

Art. 11. Implementation and monitoring

## **The Member States of the World Health Organisation:**

Affirming the right of every child and every pregnant and lactating woman to be adequately nourished as a means of attaining and maintaining health;

Recognising that infant malnutrition is part of the wider problems of lack of education, poverty, and social injustice;

Recognising that the health of infants and young children cannot be isolated from the health and nutrition of women, their socio-economic status and their roles as mothers;

Conscious that breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants; that it forms a unique biological and emotional basis for the health of both mother and child; that the anti-infective properties of breast milk help to protect infants against disease; and that there is an important relationship between breastfeeding and child spacing;

Recognising that the encouragement and protection of breastfeeding is an important part of the health, nutrition and other social measures required to promote healthy growth and development of infants and young children; and that breastfeeding is an important aspect of primary health care;

Considering that when mothers do not breastfeed, or only do so partially, there is a legitimate market for infant formula and for suitable ingredients from which to prepare it; that all these products should accordingly be made accessible to those who need them through commercial or noncommercial distribution systems; and that they should not be marketed or distributed in ways that may interfere with the protection and promotion of breastfeeding;

Recognising further that inappropriate feeding practices lead to infant malnutrition, morbidity and mortality in all countries, and that improper practices in the marketing of

breastmilk substitutes and related products can contribute to these major public health problems;

Convinced that it is important for infants to receive appropriate complementary foods, usually when the infant reaches four to six months of age, and that every effort should be made to use locally available foods; and convinced, nevertheless, that such complementary foods should not be used as breastmilk substitutes;

Appreciating that there are a number of social and economic factors affecting breastfeeding, and that, accordingly, governments should develop social support systems to protect, facilitate and encourage it, and that they should create an environment that fosters breastfeeding, provides appropriate family and community support, and protects mothers from factors that inhibit breastfeeding;

Affirming that health care systems, and the health professionals and other health workers serving in them, have an essential role to play in guiding infant feeding practices, encouraging and facilitating breastfeeding, and providing objective and consistent advice to mothers and families about the superior value of breastfeeding, or, where needed, on the proper use of infant formula, whether manufactured industrially or home prepared;

Affirming further that educational systems and other social services should be involved in the protection and promotion of breastfeeding, and in the appropriate use of complementary foods;

Aware that families, communities, women's organisations and other nongovernmental organisations have a special role to play in the protection and promotion of breastfeeding and in ensuring the support needed by pregnant women and mothers of infants and young children, whether breastfeeding or not;

Affirming the need for governments, organisations of the United Nations system, nongovernmental organisations, experts in various related disciplines, consumer groups and industry to cooperate in activities aimed at the improvement of maternal, infant and young child health and nutrition;

Recognising that governments should undertake a variety of health, nutrition and other social measures to promote healthy growth and development of infants and young children, and that this Code concerns only one aspect of these measures;

Considering that manufacturers and distributors of breastmilk substitutes have an important and constructive role to play in relation to infant feeding, and in the promotion of the aim of this Code and its proper implementation;

Affirming that governments are called upon to take action appropriate to their social and legislative framework and their overall development objectives to give effect to the principles and aim of this Code, including the enactment of legislation, regulations or other suitable measures;

Believing that, in the light of the foregoing considerations, and in view of the vulnerability of infants in the early months of life and the risks involved in inappropriate feeding practices, including the unnecessary and improper use of breastmilk substitutes, the marketing of breastmilk substitutes requires special treatment, which makes usual marketing practices unsuitable for these products;

**THEREFORE:**

The Member States hereby agree the following articles which are recommended as a basis for action.

### **Article 1. Aim of the Code**

The aim of this Code is to contribute to the provision of safe and adequate nutrition for infants, by the protection and promotion of breastfeeding, and by ensuring the proper use of breastmilk substitutes, when these are necessary, on the basis of adequate information and through appropriate marketing and distribution.

### **Article 2. Scope of the Code**

The Code applies to the marketing, and practices related thereto, of the following products: breastmilk substitutes, including infant formula; other milk products, foods and beverages, including bottle-fed complementary foods, when marketed or otherwise represented to be suitable, with or without modification, for use as a partial or total replacement of breastmilk; feeding bottles and teats. It also applies to their quality and availability, and to information concerning their use.

### **Article 3. Definitions**

For the purposes of this Code:

"Breastmilk substitute" means any food being marketed or otherwise represented as a partial or total replacement for breast milk, whether or not suitable for that purpose.

"Complementary food" means any food, whether manufactured or locally prepared, suitable as a complement to breast milk or to infant formula, when either becomes insufficient to satisfy the nutritional requirements of the infant. Such food is also commonly called "weaning food" or "breastmilk supplement".

"Container" means any form of packaging of products for sale as a normal retail unit, including wrappers.

"Distributor" means a person, corporation or any other entity in the public or private sector engaged in the business (whether directly or indirectly) of marketing at the wholesale or retail level a product within the scope of this Code. A "primary distributor" is a manufacturer's sales agent, representative, national distributor or broker.

"Health care system" means governmental, nongovernmental or private institutions or organisations engaged, directly or indirectly, in health care for mothers, infants and pregnant women; and nurseries or childcare institutions. It also includes health workers in private practice. For the purposes of this Code, the health care system does not include pharmacies or other established sales outlets.

"Health worker" means a person working in a component of such a health care system, whether professional or nonprofessional, including voluntary, unpaid workers.

"Infant formula" means a breastmilk substitute formulated industrially in accordance with applicable Codex Alimentarius standards, to satisfy the normal nutritional requirements of infants up to between four and six months of age, and adapted to their physiological characteristics. Infant formula may also be prepared at home, in which case it is described as "home prepared".

"Label" means any tag, brand, mark, pictorial or other descriptive matter, written, printed, stencilled, marked, embossed or impressed on, or attached to, a container (see above) of any products within the scope of this Code.

"Manufacturer" means a corporation or other entity in the public or private sector engaged in the business or function (whether directly or through an agent or through an entity controlled by or under contract with it) of manufacturing a product within the scope of this Code.

"Marketing" means product promotion, distribution, selling, advertising, product public relations, and information services.

"Marketing personnel" means any persons whose functions involve the marketing of a product or products coming within the scope of this Code.

"Samples" means single or small quantities of a product provided without cost.

"Supplies" means quantities of a product provided for use over an extended period, free or at a low price, for social purposes, including those provided to families in need.

#### **Article 4. Information and education**

4.1 Governments should have the responsibility to ensure that objective and consistent information is provided on infant and young child feeding for use by families and those involved in the field of infant and young child nutrition. This responsibility should cover either the planning, provision, design and dissemination of information, or their control.

4.2 Informational and educational materials, whether written, audio, or visual, dealing with the feeding of infants and intended to reach pregnant women and mothers of infants and young children, should include clear information on all the following points:

1. the benefits and superiority of breastfeeding;
2. maternal nutrition, and the preparation for and maintenance of breastfeeding;
3. the negative effect on breastfeeding of introducing partial bottle feeding;
4. the difficulty of reversing the decision not to breastfeed; and
5. where needed, the proper use of infant formula, whether manufactured industrially or home prepared.

When such materials contain information about the use of infant formula, they should include the social and financial implications of its use; the health hazards of inappropriate foods or feeding methods; and, in particular, the health hazards of unnecessary or improper use of infant formula and other breastmilk substitutes. Such materials should not use any pictures or text which may idealise the use of breastmilk substitutes.

4.3 Donations of informational or educational equipment or materials by manufacturers or distributors should be made only at the request and with the written approval of the appropriate government authority or within guidelines given by governments for this purpose. Such equipment or materials may bear the donating company's name or logo, but should not refer to a proprietary product that is within the scope of this Code, and should be distributed only through the health care system.

#### **Article 5. The general public and mothers**

5.1 There should be no advertising or other form of promotion to the general public of products within the scope of this Code.

5.2 Manufacturers and distributors should not provide, directly or indirectly, to pregnant women, mothers or members of their families, samples of products within the scope of this Code.

5.3 In conformity with paragraphs 1 and 2 of this Article, there should be no point-of-sale advertising, giving of samples, or any other promotion device to induce sales directly to the consumer at the retail level, such as special displays, discount coupons, premiums, special sales, loss leaders and tie-in sales, for products within the scope of this Code. This provision should not restrict the establishment of pricing policies and practices intended to provide products at lower prices on a long-term basis.

5.4 Manufacturers and distributors should not distribute to pregnant women or mothers of infants and young children any gifts of articles or utensils which may promote the use of breastmilk substitutes or bottle feeding.

5.5 Marketing personnel, in their business capacity, should not seek direct or indirect contact of any kind with pregnant women or with mothers of infants and young children.

#### **Article 6. Health care systems**

6.1 The health authorities in Member States should take appropriate measures to encourage and protect breastfeeding and promote the principles of this Code, and should give appropriate information and advice to health workers in regard to their responsibilities, including the information specified in Article 4.2.

6.2 No facility of a health care system should be used for the purpose of promoting infant formula or other products within the scope of this Code. This Code does not, however, preclude the dissemination of information to health professionals as provided in Article 7.2.

6.3 Facilities of health care systems should not be used for the display of products within the scope of this Code, for placards or posters concerning such products, or for the distribution of material provided by a manufacturer or distributor other than that specified in Article 4.

6.4 The use by the health care system of "professional service representatives", "mothercraft nurses" or similar personnel, provided or paid for by manufacturers or distributors, should not be permitted.

6.5 Feeding with infant formula, whether manufactured or home prepared, should be demonstrated only by health workers, or other community workers if necessary; and only to the mothers or family members who need to use it; and the information given should include a clear explanation of the hazards of improper use.

6.6 Donations or low-price sales to institutions or organisations of supplies of infant formula or other products within the scope of this Code, whether for use in the institutions or for distribution outside them, may be made. Such supplies should only be used or distributed for infants who have to be fed on breastmilk substitutes. If these supplies are distributed for use outside the institutions, this should be done only by the institutions or organisations concerned. Such donations or low-price sales should not be used by manufacturers or distributors as a sales inducement.

6.7 Where donated supplies of infant formula or other products within the scope of this Code are distributed outside an institution, the institution or organisation should take steps to ensure that supplies can be continued as long as the infants concerned need them. Donors, as well as institutions or organisations concerned, should bear in mind this responsibility.

6.8 Equipment and materials, in addition to those referred to in Article 4.3, donated to a health care system may bear a company's name or logo, but should not refer to any proprietary product within the scope of this Code.

### **Article 7. Health workers**

7.1 Health workers should encourage and protect breastfeeding; and those who are concerned in particular with maternal and infant nutrition should make themselves familiar with their responsibilities under this Code, including the information specified in Article 4.2.

7.2 Information provided by manufacturers and distributors to health professionals regarding products within the scope of this Code should be restricted to scientific and factual matters, and such information should not imply or create a belief that bottle feeding is equivalent or superior to breastfeeding. It should also include the information specified in Article 4.2.

7.3 No financial or material inducements to promote products within the scope of this Code should be offered by manufacturers or distributors to health workers or members of their families, nor should these be accepted by health workers or members of their families.

7.4 Samples of infant formula or other products within the scope of this Code., or of equipment or utensils for their preparation or use, should not be provided to health workers except when necessary for the purpose of professional evaluation or research at the institutional level. Health workers should not give samples of infant formula to pregnant women, mothers of infants and young children, or members of their families.

7.5 Manufacturers and distributors of products within the scope of this Code should disclose to the institution to which a recipient health worker is affiliated any contribution made to him or on his behalf for fellowships, study tours, research grants, attendance at professional conferences, or the like. Similar disclosures should be made by the recipient.

### **Article 8. Persons employed by manufacturers and distributors**

8.1 In systems of sales incentives for marketing personnel, the volume of sales of products within the scope of this Code should not be included in the calculation of bonuses, nor should quotas be set specifically for sales of these products. This should not be understood to prevent the payment of bonuses based on the overall sales by a company of other products marketed by it.

8.2 Personnel employed in marketing products within the scope of this Code should not, as part of their job responsibilities, perform educational functions in relation to pregnant women or mothers of infants and young children. This should not be understood as preventing such personnel from being used for other functions by the health care system at the request and with the written approval of the appropriate authority of the government concerned.

### **Article 9. Labelling**

9.1 Labels should be designed to provide the necessary information about the appropriate use of the product, and so as not to discourage breastfeeding.

9.2 Manufacturers and distributors of infant formula should ensure that each container has a clear, conspicuous, and easily readable and understandable message printed on it, or on a label which cannot readily become separated from it, in an appropriate language, which includes all the following points:

1. the words "Important Notice" or their equivalent;
2. a statement of the superiority of breastfeeding;
3. a statement that the product should be used only on the advice of a health worker as to the need for its use and the proper method of use;
4. instructions for appropriate preparation, and a warning against the health hazards of inappropriate preparation.

Neither the container nor the label should have pictures of infants, nor should they have other pictures or text which may idealise the use of infant formula. They may, however, have graphics for easy identification of the product as a breastmilk substitute and for illustrating methods of preparation. The terms "humanised", "maternalised" or similar terms should not be used. Inserts giving additional information about the product and its proper use, subject to the above conditions, may be included in the package or retail unit. When labels give instructions for modifying a product into infant formula, the above should apply.

9.3 Food products within the scope of this Code, marketed for infant feeding, which do not meet all the requirements of an infant formula, but which can be modified to do so, Should carry on the label a warning that the unmodified product should not be the sole source of nourishment of an infant. Since sweetened condensed milk is not Suitable for infant feeding, nor for use as a main ingredient of infant formula, its label should not contain purported instructions on how to modify it for that purpose.

9.4 The label of food products within the scope of this Code should also state all the following points:

1. the ingredients used;
2. the composition/analysis of the product;
2. the storage conditions required; and
3. the batch number and the date before which the product is to be consumed, taking into account the climatic and storage conditions of the country concerned.

#### **Article 10. Quality**

10.1 The quality of products is an essential element for the protection of the health of infants and therefore should be of a high recognised standard.

10.2 Food products within the scope of this Code should, when sold or otherwise distributed, meet applicable standards recommended by the Codex Alimentarius Commission and also the Codex Code of Hygienic Practice for Foods for Infants and Children.

#### **Article 11. Implementation and monitoring**

11.1 Governments should take action to give effect to the principles and aim of this Code, as appropriate to their social and legislative framework, including the adoption of national legislation, regulations or other suitable measures. For this purpose, governments should seek, when necessary, the cooperation of WHO, UNICEF and other agencies of the United Nations system. National policies and measures, including laws and regulations, which are adopted to give effect to the principles and aim of this Code should be publicly stated, and should apply on the same basis to all those involved in the manufacture and marketing of products within the scope of this Code.

11.2 Monitoring the application of this Code lies with governments acting individually, and collectively through the World Health Organisation as provided in paragraphs 6 and 7 of this Article. The manufacturers and distributors of products within the scope of this Code, and appropriate nongovernmental organisations, professional groups, and consumer organisations should collaborate with governments to this end.

11.3 Independently of any other measures taken for implementation of this Code, manufacturers and distributors of products within the scope of this Code should regard themselves as responsible for monitoring their marketing practices according to the principles and aim of this Code, and for taking steps to ensure that their conduct at every level conforms to them.

11.4 Nongovernmental organisations, professional groups, institutions, and individuals concerned should have the responsibility of drawing the attention of manufacturers or distributors to activities which are incompatible with the principles and aim of this Code, so that appropriate action can be taken. The appropriate governmental authority should also be informed.

11.5 Manufacturers and primary distributors of products within the scope of this Code should apprise each member of their marketing personnel of the Code and of their responsibilities under it.

11.6 In accordance with Article 62 of the Constitution of the World Health Organisation, Member States shall communicate annually to the Director General information on action taken to give effect to the principles and aim of this Code.

11.7 The Director General shall report in even years to the World Health Assembly on the status of implementation of the Code; and shall, on request, provide technical support to Member States preparing national legislation or regulations, or taking other appropriate measures in implementation and furtherance of the principles and aim of this Code.

# Appendix B: UNICEF and the World Health Organization's Baby-Friendly Hospital Initiative

## Ten Steps to Successful Breastfeeding

- Have a written breastfeeding policy that is routinely communicated to all health care staff.
- Train all health care staff in skills necessary to implement this policy.
- Inform all pregnant women about the benefits and management of breastfeeding.
- Help mothers initiate breastfeeding within one half-hour of birth.
- Show mothers how to breastfeed and maintain lactation, even if they should be separated from their infants.
- Give newborn infants no food or drink other than breastmilk, unless medically indicated.
- Practice rooming in - that is, allow mothers and infants to remain together 24 hours a day.
- Encourage breastfeeding on demand.
- Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
- Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

<http://www.unicef.org/programme/breastfeeding/baby.htm>, accessed 11/3/05

## Certified "Baby Friendly" Hospitals in California

Community Hospital of the Monterey Peninsula , Monterey

Glendale Memorial Hospital and Health Center, Glendale

Goleta Valley Cottage Hospital, Santa Barbara

Inland Midwife Services—The Birth Center, Redlands

Kaiser Permanente Medical Center, Hayward

Kaiser Permanente Riverside Medical Center, Riverside

Robert E. Bush Naval Hospital, Twentynine Palms

Scripps Memorial Hospital Encinitas, Encinitas

Ventura County Medical Center, Ventura

Weed Army Community Hospital, Fort Irwin

Women's Health & Birth Center, Santa Rosa

# Appendix C: Employers Recognized for Breastfeeding Support

## **Kaiser Permanente Baldwin Park**

Kaiser Permanente operates a breastfeeding clinic at the Baldwin Park hospital for its members and employees who need assistance with breastfeeding and counseling about parenting. The program has resulted in less absenteeism due to child-related illness and has increased the number of employees returning to work after the birth of their child.<sup>27</sup>

## **PricewaterhouseCoopers (PwC)**

PricewaterhouseCoopers' New Mom's Corporate Lactation Program provides support for new mothers at PwC who choose to continue to nurse their babies after returning to work, as well as for PwC spouses and domestic partners who are breastfeeding. These services include the ability to purchase a high-end breast pump for a nominal co-pay and twenty four hours per day access to a certified lactation consultant by phone. Mothers Rooms in all PwC offices enable employees to pump at work.<sup>27</sup>

## **CIGNA**

The UCLA Center for Healthier Children, Families, and Communities studied CIGNA's corporate lactation program and found that breastfeeding duration rates for participants are 72 percent at 6 months and 36 percent at 12 months, significantly higher than those of control groups and the U.S. overall.<sup>27</sup>

## **Other California Employers**

Other California employers that have received recognition for their worksite support of breastfeeding include the following:

- Los Angeles Department of Water and Power
- Mattel, Inc.
- PHFE Management Solutions WIC Program
- REI WIC Program
- Northeast Valley Health Corporation WIC Program
- Westside Children's Center

# Appendix D: Physical Activity Programs

## Adapted for Preschoolers

The following programs are being implemented and tested in preschool centers:

### **Hip-Hop to Health, Jr.**

This overweight prevention program for preschool minority children has been modeled after a successful, community-based cardiovascular risk-reduction program (Hip-Hop to Health) conducted with six- to ten-year-old African-American children and their families. Research is underway to evaluate this program.<sup>77</sup>

### **SPARK Early Childhood**

SPARK Early Childhood has been developed for Head Start, public and private preschools, daycare/childcare providers, and WIC agencies. It is designed to provide high-energy, enjoyable activities that enhance motor development and school readiness skills in children ages three to five. Research is currently underway to evaluate this program.<sup>39</sup>

Project SPARK Elementary Physical Education program has been shown to increase elementary schoolchildren's physical activity at school, although the program did not show any significant effects outside of school.<sup>160</sup>

### **NikeGO Head Start**

Nike and the National Head Start Association have teamed in a physical activity program designed for preschool children and their families at Head Start sites throughout the country. Currently the largest private funder of NHSA, Nike has issued a series of one-year grants, with specific performance requirements, totaling \$2.5 million over five years. Head Start instructors will receive a "playbook" of activities meant to be fun, inclusive, developmentally appropriate and aligned with Head Start Child Outcomes.<sup>135</sup>

To date, all pilot sites in California are based in Los Angeles. First implemented in the 2004-2005 school year, the program has not yet been evaluated for effectiveness in preventing overweight or increasing activity among preschool children.

## Appendix E: Head Start Agencies Involved in Obesity Prevention

**New York City:** The Children's Aid Society's (CAS) Early Childhood Obesity Prevention Program, Go! Kids, is a comprehensive preschool health education program that focuses on improving overall nutrition and increasing physical activity in preschool children and their families. The program provides a 24-week curriculum on healthy eating and physical activity for the three- to five-year-old children and their families participating in Head Start programs in three sites in New York City.<sup>55</sup>

**Kern County, California:** The Head Start Agency's "Fitness Pays" initiative promotes physical activity among children and their families. The agency hosted a six-week competition between classrooms for minutes of structured physical activity time, with a goal of ten minutes of physical activity per hour. The agency explained to Site Supervisors that because children who struggle with overweight often choose a sedentary activity, such as sitting in the sandbox, during outdoor free play time, adding some structured physical activity time where all members of the class are active is important. Classrooms that participated received "prizes," which were tools to encourage physically active games and learning. Approximate one-third of Head Start classes participated in the program.<sup>106</sup>

# Appendix F: California’s “First Five” Commissions

## *Local Programs and Initiatives*

### **Napa County: Healthy Moms & Babies (HM & B) operates Sweet Success**

The Sweet Success Gestational Diabetes Program in Napa County is an official affiliate of “Sweet Success” diabetes and pregnancy self-management programs within provider sites throughout California. Napa’s Sweet Success program provides preconception counseling to women with diabetes or a history of gestational diabetes in prior pregnancies, and postpartum checkups to women with gestational diabetes.<sup>73</sup>

### **Sacramento County: The Stone Soup Community Garden**

This Sacramento County WIC program runs this community gardening and nutritional education program in response to community interest in growing vegetables and promoting healthy eating habits for children from birth to five and their families, particularly among the Hmong community. Program staff members also provide case management support and referrals.<sup>73</sup>

### **San Bernardino: The Perinatal Services Network**

Coordinated through the Loma Linda University Children’s Hospital, this program focuses on ensuring that parents and babies form early attachments. Follow-up centers provide mothers with information about baby care and community resources. As a result of this program, one hospital has moved from having one of the lowest exclusive breastfeeding rates in the state to meeting the national Healthy People 2010 goals for the proportion of mothers who breastfeed their babies.<sup>73</sup>

### **Shasta County: Healthy Beginnings**

This program to reduce the number of overweight and anemic preschool-aged children has taught nutrition and physical activity to early childhood educators at 25 preschools. As a result, several schools changed their menus to increase children’s intake of calcium, iron, vitamin A, and vitamin C and to decrease their intake of saturated fats, trans fats, and added sugars.<sup>73</sup>

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