Introduction

In 2013, the New England Journal of Medicine conducted a roundtable on the role of government in promoting health and preventing disease (Rosenthal, Farley, Gortmaker, & Sustein, 2013). The problem, as identified in many earlier chapters in this book, is that people’s lifestyles can be a strong determinant of the diseases they will suffer and the length and quality of life that they will live. Both tobacco use and obesity are causally associated with multiple diseases, and the highest treatment costs are frequently borne by the state during the senior years. According to the roundtable:

“U.S. policymakers at all levels of government are struggling to find ways to intervene and promote wellness and prevent these health problems, without overstepping the bounds of government intervention or infringing on personal liberties.”

In this concluding chapter, we will review relevant objectives from the U.S. Department of Health and Human Services Healthy People initiative. This initiative has become a critical document that focuses the health promotion priorities for professionals at the national, state, and local level. We will limit our review to objectives that relate to tobacco use and obesity, as well as the two behaviors that are major determinants of obesity: nutrition and physical activity/sedentary behavior.

Since 1979, the Healthy People initiative has set comprehensive 10-year goals and objectives to promote health and prevent disease in the U.S. Following the first publication of Healthy People (U.S. Department of Health and Human Services [USDHHS], 1979) subsequent iterations Healthy People 2000 (USDHHS, 1990) Healthy People 2010 (USDHHS, 2000) and Healthy People 2020 (USDHHS, 2011) have continued to set evidence-based objectives to provide benchmarks and monitor progress over the course of a decade. Thus, the Healthy People documents provide an important historical record of health promotion/disease prevention in the United States. Comparing different reports enables the reader to identify the evolution in public health thinking over the past four decades while documenting successes and challenges that have faced the field. Many state and local public health departments use Healthy People to set priorities, allocate funds, measure performance, and compare state and local data. At the federal level, Healthy People helps identify high priority health issues, critical areas of research, and needs for data collection. Healthy People is an evolving initiative, and new topics and objectives reflect changing science, societal norms, evidence-based technologies, and political or social concerns (Green & Fielding, 2011).

Each report identifies an overarching goal that guides the development of the objectives for the next decade. Table 10-1 presents the overarching goals, the number of topic areas, and the number of objectives for the four Healthy People reports. The topic areas covered have increased with each report and, most recently, number 42. The number of objectives has also increased substantially, with Healthy People 2020...
identifying nearly 600 objectives with 1,200 measures to improve the health of Americans.

<table>
<thead>
<tr>
<th>Table 10-1 Healthy People Over the Years</th>
</tr>
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<tbody>
<tr>
<td><strong>Target Year</strong></td>
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<tr>
<td><strong>Overarching Goals</strong></td>
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<td></td>
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<tr>
<td><strong>Number of Topic areas</strong></td>
</tr>
<tr>
<td><strong>Number of Objectives/Measures</strong></td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS, 2011)

The earlier reports focused mainly on setting goals for behaviors. Healthy People 2020 is the first report to emphasize setting objectives for strategies that the socio-ecological framework predicts will influence the determinants of health. Thus, the overarching goal of this latest report aims to create social and physical environments that promote good health. Topics covered range from cancer and diabetes to family planning and physical activity. This chapter will focus on the objectives from this most recent report and the data on progress in recent years.

**Overview of Healthy People 2020**

Healthy People 2020 prepared the following schematic (Figure 10-1) that demonstrates how the socio-ecologic framework informed their discussions and recommendations. It recognizes the interrelationships between the different determinants of health. An important message from this graphic is that to achieve a health outcome goal at the population level, interventions/actions will be required at multiple levels in society.
Further, objectives need to address population groups across the lifespan. For problem behaviors (e.g., tobacco use, sedentary behavior, overeating) and their sequelae (e.g., obesity), it is not just overall or age-specific prevalence that is important. We need to understand how and when the problem behavior develops before an intervention can successfully prevent it. Preventing initiation is critical for behaviors that are very difficult to change once they have become habituated. Changing habituated behaviors depends on the motivation of the individual. On a population level, both the prevalence of an expressed desire to change, and the existence of recent change attempts are markers of the level of this motivation to change. A number of objectives also focus on the health system ensuring that motivated people have access to treatment to help them change their behavior.

Social norms can influence an individual’s ability to change an addictive habit, as was highlighted by longitudinal studies of United States veterans of the Vietnam War. Many people had noted the serious problem of heroin use by US military personnel during the waning years of the war. Heroin use was not unfamiliar to health professionals in the United States and it was well accepted that it was extremely difficult for habituated users (addicts) to quit. Thus, health professionals in the field of addiction were astounded when Robins, Davis, and Goodwin (1974) documented that so many veterans who were
heroin users in Vietnam appeared to be able to go “cold turkey” when they returned to the social environment of their former civilian life.

A focus on changing the social and environmental influences that support a problem behavior is a critical approach suggested from the socio-ecological model. In this chapter, we will explore what Healthy People 2020 says about modifying environmental incentives for particular behaviors, about controlling access to products or healthy environs, about the use of mass media to encourage or discourage behavioral use (including placing restrictions on business marketing to vulnerable populations). The importance of creating an environment that promotes healthy choices by youth in school settings is also an approach supported by the socio-ecological model and a common theme in the Healthy People initiative over the years. As the New England Journal roundtable suggested, governments can also regulate products that they consider unhealthy, however, such regulations can be challenged in court if they infringe on personal liberties.

**Tobacco Use**

As indicated in Chapter 6, tobacco use is the single most preventable cause of death and disease in the United States. Well over 80% of current lung cancer and respiratory diseases such as Chronic Obstructive Pulmonary Disease (COPD) are caused by excessive exposure to tobacco smoke. It is estimated that one in five deaths each year are tobacco-related. A series of five papers in 1950 started the scientific quest to prove that smoking caused lung cancer (Doll & Hill; Levin, Goldstein & Gerhardt; Mills & Porter; Schrek, Baker, Ballard, & Dolgoff; Wynder & Graham) and the definitive Surgeon-General’s report documenting causality was published in 1964 (USDHEW, 1964). Since then, reducing tobacco use has been a major public health priority in the United States (as depicted in Table 10-2).

<table>
<thead>
<tr>
<th>Number</th>
<th>Objective</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>TU-1.1</td>
<td>Reduce cigarette use by adults</td>
<td>12.0%</td>
<td>20.6%</td>
</tr>
<tr>
<td>TU-2.2</td>
<td>Reduce cigarette use (30 day) by adolescents</td>
<td>16.0%</td>
<td>19.5%</td>
</tr>
<tr>
<td>TU-3.2</td>
<td>Reduce the initiation of cigarettes among adolescents aged 12 to 17 years</td>
<td>4.2%</td>
<td>6.2%</td>
</tr>
<tr>
<td>TU-3.5</td>
<td>Reduce the initiation of cigarettes in 18-25 year old young adults</td>
<td>8.8%</td>
<td>10.8%</td>
</tr>
<tr>
<td>TU-4.1</td>
<td>Increase smoking cessation attempts by adult smokers</td>
<td>80%</td>
<td>48.3%</td>
</tr>
<tr>
<td>TU-5.1</td>
<td>Increase recent smoking cessation success by adult smokers</td>
<td>8.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td>TU-6</td>
<td>Increase smoking cessation during pregnancy</td>
<td>30.0%</td>
<td>11.3%</td>
</tr>
<tr>
<td>TU-7</td>
<td>Increase smoking cessation attempts by adolescent smokers</td>
<td>64.0%</td>
<td>58.5%</td>
</tr>
<tr>
<td>TU-11.1</td>
<td>Reduce the proportion of nonsmokers children (3-11 years) exposed to secondhand smoke</td>
<td>47.0%</td>
<td>52.2%</td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS, 2011)

**Adult Prevalence**

In 2014, it will be 50 years since the first Surgeon-General’s report (USDHEW, 1964) concluding that smoking caused disease and death. The decline in smoking behavior is considered one of the great public health success stories; however, the U.S. population is still a long way from a smoke-free society. The first Healthy People 2020 objective for tobacco use behavior focuses on adult use, and, for our example, we focus on the sub-objective (TU-1.1) addressing cigarette use. In 2010, prevalence was 20.6% and the 2020
target is set at an ambitious 12% — indeed this was the same target that was set for Healthy People 2010. In the previous decade (2000-2010), the prevalence of tobacco use declined significantly, with the vast majority of the decrease attributable to cigarette smoking. Cigarette smoking declined from 24% to 20.6%, at a rate of about 0.4% per year. Although this is a bit slower than the rate of decline seen in the 1970s and 1980s (Pierce, Fiore, Novotny, Hatziandreou, & Davis, 1989), it still indicates that progress towards a smoke-free society is continuing.

**Adolescent Prevalence**
The second tobacco use objective focuses on adolescent prevalence of tobacco use and, again, our example focuses on cigarette smoking (TU-2.2). In 2009, the Youth Risk Behavior Surveillance System noted that 19.5% of adolescents self-reported smoking in the past month and this objective sets a 2020 target of 16.6%. Again, this was the same target that was previously set for 2010. Over the past decade, there was little change in adolescent smoking rates; however, the decline in teen prevalence appears to have started again in 2011 (down to 18.1%). If the trend continues, this objective may meet its target for 2020.

**Initiation**
It has long been known that the initiation of smoking mainly occurs between the ages of 12 and 25 years (Gilpin et al, 1999). Without any new young smokers replacing those who quit (or die), then the epidemic of tobacco use would disappear quickly. A clear example of the importance of this effect on prevalence was seen with medical students in the United States. Almost half smoked in 1964, but, by 1980, the initiation rate had dropped to a very low 2% (Pierce & Gilpin, 1995). This change resulted in a major reduction in physician smoking prevalence within a very few years. Objectives TU-3.2 and 3.5 target initiation of cigarettes (experimentation with or first use) in the past year. In 2003, the experimentation rate among 12- to 17-year-olds and 18- to 25-year-olds was equivalent at 6.6% per year (Figure 10-2). Over the next 5 years experimentation among 12- to 17-year-olds declined to 6.2% in 2008. However, this decline was more than counterbalanced by a 25% increase in the experimentation rate among 18- to 25-year-olds, which reached 8.3% in 2008. Using 2008 as the baseline year, Objective TU-3.2 sets a target of 4.2% experimentation rate among 12- to 17-year-olds by 2020 and Objective TU-3.6 sets a target of 6.3% for 18-to 25-year-olds.
Cessation

For most smokers, quitting for good takes time and multiple quit attempts. The next set of objectives focuses on an increase of smoking cessation attempts by adult smokers (TU-4.1). In 2010, 48.3% of recent smokers reported making a quit attempt in the previous year. The target for 2020 is to increase this to 80%. However, over the decade ending in 2010, there was little change in this proportion. Between 45% and 48% of all smokers reported making such an attempt during each year in the decade.

There is a priority on encouraging early onset smokers to make a quit attempt before they ramp-up their habit to a higher daily dose of nicotine. Studies suggest that quitting success is higher among motivated smokers who smoke fewer cigarettes. High school smokers were more likely than adult smokers to report making a quit attempt. In 2010, 58.4% reported making an attempt, which was slightly lower than the proportion who reported an attempt in 2003 (60%). The 2020 objective (TU-7) is to increase the proportion who make a quit attempt to 64%.

It has been argued that the proportion of recent smokers who have quit for at least 6 months is a reasonable marker of future success in staying off smoking (Hughes et al., 1992; Pierce et al., 1998), even though at least 20% will still relapse. The proportion of recent smokers who indicated that they had quit for 6 months was 6.0% in 2008 and 6.7% in 2011. The 2020 objective (TU-5.1) is to increase this further to 8.0%.

Cessation and Pregnancy. Given that maternal smoking also affects the unborn child, a separate objective (TU-6) highlights the importance of increasing cessation during pregnancy. This is assessed among women of child-bearing age who had a child in the past 5 years. Smoking during pregnancy has been a huge health promotion success with rates decreasing from 42% in 1990 to 10.7% in 2005. Of these smokers in 2005, 11% reported stopping smoking during the first trimester of their pregnancy and staying quit for the rest of their pregnancy. By 2010, this proportion had increased to just over 18%. This excellent progress suggests optimism that the 2020 objective of 30% (same as 2010) might be reached.

Secondhand Smoke

Children and adults exposed to secondhand tobacco smoke are at increased risk for illness and chronic disease. In the early 1990s, the Environmental Protection Agency declared secondhand smoke to be a class A carcinogen. There was apparent rapid progress in the proportion of self-reported nonsmokers indicating that they were not exposed across the United States. In the decade to 2010, in-person reports of exposure to secondhand smoke among children under age 6 years decreased rapidly from 27% to 8%, while reported exposure among nonsmokers dropped in half from 84% to 41%. However, there are concerns about the validity of this self-reported measure of exposure. Fortunately, new measures of blood concentrations of key nicotine metabolites are available — and inhalation of nicotine is confined mainly to cigarette smoke. Accordingly, this measure has become the gold standard for measuring secondhand smoke exposure. Exposure is indicated by the proportion with a blood cotinine level above the accepted detection limit (0.05ng/ml) but below 10 ng/ml (cut-point for defining smoking).

Between 2005 and 2008, 52% of 3- to 11-year-olds measured in the National Health and Nutrition Examination Survey (NHANES) were categorized as exposed to secondhand smoke. The 2020 objective is to reduce this exposure level by 10%.
Interventions that Use Incentives to Decrease Tobacco Use

Healthy People 2020 has two objectives that aim to decrease tobacco use through the use of incentives (see Table 10-3).

<table>
<thead>
<tr>
<th>Number</th>
<th>Objective</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>TU-17</td>
<td>Increase the number of states where the Federal and State tax on cigarettes increases by $1.50.</td>
<td>51 states</td>
<td>1 state</td>
</tr>
<tr>
<td>TU-8</td>
<td>Increase the number of states with comprehensive Medicaid insurance coverage of evidence-based treatment for nicotine dependency in states and the District of Columbia</td>
<td>51 states</td>
<td>6 states</td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS, 2011)

Increasing Tobacco Taxes. Increasing the price of tobacco through higher taxes is widely thought to be the single most effective way to encourage tobacco users to quit and prevent nonsmokers from starting to smoke. Price elasticity is an estimate of how likely a population subgroup will respond to price increases. There are consistent estimates indicating that tobacco products have a positive price elasticity, with teens being much more responsive to price than addicted smokers. The World Health Organization recommends that the excise tax share of the final consumer price for tobacco products should be as high as 70%. In the United States, Phillip Morris currently lists all taxes, including federal, state, local, and sales taxes, as 56.6% of the total cost of a pack of cigarettes (Phillip Morris, n.d.). Thus, the average cigarette taxes in the US would need to increase by almost 50% to reach the recommended level.

Tobacco taxes have been used for centuries by governments worldwide. Tobacco is not an essential good nor is it a great contributor to most state economies in the United States. Further, there are already taxes that are “user fees” in place and increasing taxes can be directly tied to reducing future health consequences. Even in recent times when there is an abhorrence of raising taxes, increasing cigarette taxes are still reasonably well accepted by both the public and political leadership. The 2020 objective is to have every state increase the combined federal and state excises taxes on cigarettes by $1.50 per pack. In 2010, the average combined federal and state excise taxes on cigarettes was $2.30, so the objective is to move this to $3.80.

The level of state taxes on cigarettes varies widely. While a number of states have taxes above $2, in 2012, the following 20 US states had a state cigarette excise tax of less than $1 (in descending order of state tax): Indiana, California, Colorado, Nevada, Kansas, Mississippi, Nebraska, Tennessee, Kentucky, Wyoming, Idaho, South Carolina, West Virginia, North Carolina, North Dakota, Alabama, Georgia, Louisiana, Virginia, and Missouri. The lowest state tax was 0.17c. This tax discrepancy across states can create a significant price difference that has been associated with tax avoidance activities by smokers (e.g. driving to buy in cheaper jurisdictions), particularly by those who live close to borders. It also provides an incentive for smuggling (and tax evasion) where cigarettes are knowingly sold in jurisdictions without the requisite tax stamps. Thus, high taxes need to be accompanied by enforcement of product sales that include the state tax stamp. California led the way when, at the start of the last decade, it introduced an electronic tax stamp can that be easily scanned by inspectors.

Tax Avoidance vs. Tax Evasion. The price of cigarettes includes both federal and state taxes. All citizens have the right to reduce the amount of taxes they pay as long as it is
by legal means. Tax avoidance/minimization is the use of legal methods to reduce cigarette taxes. Thus, visiting another state with lower state cigarette taxes to buy a pack or carton is one way to reduce the amount of state tax. Taxes can also be minimized by purchasing cigarettes on the sovereign land of Native American Tribes or from duty-free stores while traveling.

Tax evasion, however, is an illegal activity. It involves the sale of cigarettes within a state jurisdiction without the state tax stamp. Those caught evading taxes are generally subject to criminal charges and substantial penalties. This usually involves some type of smuggling of cigarettes - the illicit transportation of cigarettes from an administrative division with low taxation to a division with high taxation for purposes of sale and consumption. A truckload of cigarettes smuggled into a high tax state could be associated with a profit of as much as $2 million

**Increase Insurance Coverage for Medical Treatment.** More than 45 million Americans smoke, and 70% report wanting to quit. The vast majority of quit attempts end in relapse. Overwhelming evidence from randomized trials shows that pharmaceutical treatments and state-of-the-art behavioral coaching result in almost twice the likelihood of quitting successfully compared with usual care. Based on these data, CDC recommends full coverage of all tobacco-dependence treatments (FDA-approved medications and counseling).

According to the National Center for Health Statistics, 32.6% of adult Medicaid recipients smoke, compared to 22.0% of the general population. Tobacco related healthcare costs for Medicaid programs averaged $607 million per state in 2004. When health insurance covers a treatment such as smoking cessation, this is an incentive to doctors to take a much stronger role in advising smokers to quit. For smokers who have seen a physician in the past year, just over 60% report being advised to quit. Providing this as a covered service should mean that physicians may provide more than brief advice. Many are convinced that this will result in a measurable increase in use of pharmaceutical aids which should result in greater cessation success.

However, there is still considerable controversy around the **efficacy vs. effectiveness** of pharmaceutical treatment for cessation. Efficacy has clearly been demonstrated in the randomized trials. However, no study has yet been able to demonstrate that the considerable increase in usage of these aids has been associated with an increase in successful cessation (Pierce, Cummins, White, Humphrey, & Messer, 2012). Indeed, some argue that the medicalization of cessation has been associated with a decline in population success (Chapman & Wakefield, 2012). Currently, only 5 states provide the full range of services needed to help Medicaid smokers quit and some states provide no assistance at all.

**Interventions that Control Access to Tobacco or Facilities Related to Tobacco Use**

Healthy People 2020 has three objectives that focus on interventions that control access to tobacco, related to smoke-free workplaces and reducing illegal sales to minors.
Table 10-4 Healthy People 2020 Tobacco Use Objectives Focusing on Interventions that Control Access to Tobacco

<table>
<thead>
<tr>
<th>Number</th>
<th>Objective</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>TU-12</td>
<td>Increase the proportion of persons covered by indoor worksite policies that prohibit smoking</td>
<td>100%</td>
<td>75.3%</td>
</tr>
<tr>
<td>TU-13</td>
<td>Increase the number of states with laws on smoke-free indoor air that prohibit smoking in public worksites</td>
<td>51 states</td>
<td>34 states</td>
</tr>
<tr>
<td>TU-19</td>
<td>Increase the number of states who have less than 5% illegal sales rate to minors in required compliance checks</td>
<td>51 states</td>
<td>5 states</td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS, 2011)

**Smoke-free Workplaces.** Compelling evidence shows that non-smokers who are exposed to secondhand smoke, often at work, will have higher rates of lung cancer, heart disease, and other smoking-related diseases (Pierce, 2009). In 1992, the Environmental Protection Agency declared environmental tobacco smoke a class A carcinogen, which created the impetus for many large businesses to implement policies to limit exposure. California introduced the first statewide law mandating smoke-free workplaces, and evaluations demonstrated its effectiveness (Farkas, Gilpin, White, & Pierce, 2000; Gilpin, Farkas, Emery, Ake, & Pierce, 2002). As a result, such a requirement was also included in the WHO Framework Convention for Tobacco Control (FCTC) in 2003. Many signatories to the FCTC have implemented smoke-free workplace laws over the past decade. In 2012, 34 US states had laws that prohibited smoking in public workplaces. Thirty states mandated smoke-free private workplaces and 40 required smoke-free daycare centers. The 2020 objective is to get full coverage across the country.

**Model Smoke-free workplace law:** A good example of a comprehensive smoke-free workplace law is the one developed by the Americans for Non-smokers Rights. This law has been used in hundreds of localities. Read this law at [http://www.nosmoke.org/pdf/modelordinance.pdf](http://www.nosmoke.org/pdf/modelordinance.pdf)

**Enforcement of “No sales to minors” laws.** Another issue of access is the control of sales of tobacco products to minors. Most states have had such laws since the early years of the 20th century, however, they were rarely enforced. In the mid-1990s, the federal government tied some block grant monies to states to performance on enforcement of laws banning sales to minors (called the Synar amendment (Landrine, Klonoff, & Reina-Patterson, 2000)). To receive their annual Substance Abuse Prevention and Treatment (SAPT) block grant, under this amendment, states are required to report their performance on sales-to-minors compliance checks. In 2009, only five states passed this criterion for having low levels of sales to minors. However, by 2011, this had more than doubled to 12 states. Objective TU-19 aims for compliance across all states by 2020.

**Compliance checks on sales to minors.** State attorneys general and other experts have recommended that any effort to reduce youth access to tobacco products include the following key elements:

- Designating an agency with clear responsibility for enforcement
- Providing adequate, guaranteed funding for enforcement
- Making frequent and realistic compliance checks, with a goal of sustained 95 percent compliance
• Meaningful penalties including graduated fines and ultimately, prohibiting sales of tobacco products
• No preemption of local ordinances
• Education and awareness efforts for merchants and the public

There is a concern that the tobacco industry could simply pay a vendor’s fine if the vendor is caught in a compliance check. To avoid this, a number of states have considered a retail license as a way to incentivize businesses that sell tobacco. If a retail license is required to sell tobacco products over the counter, then enforcement agencies could revoke the right to sell to any business not in compliance with local, state, and federal tobacco laws. For many small stores, tobacco sales make a large difference in the profitability of the business. As of June 30, 2012, 37 states require licensure for over-the-counter cigarette sales, and 29 states require licensure for smokeless tobacco product sales. The fee for licensure in the 37 states ranges from $0 in Massachusetts and Nevada to $200 in Indiana.

Interventions Using Media to Discourage Tobacco Use
Healthy People 2020 has three objectives focusing on media interventions to discourage tobacco use.

<table>
<thead>
<tr>
<th>Table 10-5</th>
<th>Healthy People 2020 Tobacco Use Objectives Focusing on Media Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Objective</td>
</tr>
<tr>
<td>TU-14</td>
<td>Increase the proportion of smoke-free homes</td>
</tr>
<tr>
<td></td>
<td>87.0% 79.1%</td>
</tr>
<tr>
<td>TU-18</td>
<td>Reduce the proportion of adolescents and young adults in grades 6 through 12</td>
</tr>
<tr>
<td></td>
<td>who are exposed to tobacco advertising and promotion on the internet</td>
</tr>
<tr>
<td></td>
<td>33.1% 36.8%</td>
</tr>
<tr>
<td>TU-20</td>
<td>Increase the number of States with sustainable and comprehensive evidence-based tobacco control programs.</td>
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<tr>
<td></td>
<td>51 5</td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS 2011)

Smoke-free Homes. In the United States, generally speaking, governments do not have the right to dictate policies for individuals in their own homes. What they can do is encourage individuals to take action on their own. Smoke-free homes have been shown to have a considerable influence on both initiation of smoking in the young (Pierce, 2009), on the intensity of smoking among continuing smokers (Pierce, 2009), and on the likelihood of success in smokers trying to quit (Gilpin, White, Farkas, & Pierce, 1999). Accordingly, many governments use mass media to encourage people to make their home smoke-free. Such campaigns have been associated with more rapid diffusion of smoke-free homes (Gilpin, Lee, & Pierce, 2004). In the United States, in 2006-2007, 79% of adults reported that their homes were smoke-free. The 2020 objective is to increase this to 87%.

Exposure to Tobacco Marketing Among Teens. Since the early days of the tobacco industry (late 1880s), mass media marketing has been a key strategy to encourage sales and, indeed, the tobacco industry was one of the industries that led marketing innovations. (Pierce & Gilpin, 1995) Whenever there were setbacks to the industry, they increased their marketing budgets and tried new approaches. In the 1930s when concerns about throat irritation were raised, tobacco industry campaigns used the medical profession in advertising to calm public concerns. When the first Surgeon-General’s report concluded that smoking caused lung cancer, they quickly pointed out that the
studies focused only on men and introduced the first women’s cigarette with the Virginia Slims campaign. (Pierce, Lee, & Gilpin, 1994) When Congress passed a ban on broadcast media advertising of cigarettes, the tobacco industry dramatically increased expenditures and innovations using print and billboards and turned around the decline in adolescent initiation that had followed the broadcast ban (Pierce, Gilmer, Lee, Gilpin, de Beyer, & Messer, 2005). Numerous countries now restrict tobacco marketing. A comparative analysis of the experience of 22 high-income countries concluded that the more comprehensive bans reduced tobacco consumption by up to 7.4%.

In recent times, the tobacco industry has continued its position as one of the leading innovators in marketing practice. As people have become more interested in social media and the use of the internet, tobacco industry marketing has moved with them. This has meant that exposure to tobacco advertising and promotion among students increased from 28% to 37% over the decade to 2010, at the same time as industry expenditures on more traditional media decreased substantially. Exposure on the internet alone increased from 36.8% to 40.6% between 2009 and 2011. The 2020 objective (TU-18) is that this exposure will decline to 33.1% by 2020.

Comprehensive Tobacco Control Programs. The first statewide counter-advertising campaigns against cigarettes were conducted in the early1980s in Australia and were associated with a major reduction in smoking prevalence (Pierce, Dwyer, Frape, Chapman, Chamberlain, & Burke (1986); Pierce, Macaskill, & Hill (1990). In 1988, California introduced the first comprehensive campaign that included mass media as well as training and mobilization of local activists. A major aim of the California program was to counter the tobacco industry’s effective marketing. This program was also associated with a successful decline in smoking prevalence (Pierce et al., 1998) and particularly adolescent initiation (Messer & Pierce, 2010). Although many states introduced campaigns, maintaining them at effective levels proved to be difficult politically. Successful national campaigns have been conducted by the American Legacy Foundation with money from the Master Settlement Agreement between the tobacco companies and the state attorneys general and, more recently by the federal Centers for Disease Control (CDC). The Institute of Medicine concluded that fully funding such comprehensive tobacco control programs is a critical component to decreasing tobacco use (IOM 2007). Objective TU-20 targets all states to have such programs by 2020.

Part of such a comprehensive tobacco control program is a mass media counter marketing campaigns. CDC’s best practices note that campaigns need to be well-designed with “hard-hitting” messages. Further they need to have sufficient reach, duration, and frequency to affect smoking behavior. In 2010, no states were able to mount a campaign that met the criteria recommended in CDC’s best practices. These campaigns require sufficient funding and placement so that 80% of youth are reached with 10 exposures each (800 youth targeted rating points). However, nine states met the criterion for an effective adult campaign — 80% of adults reached with an average of 15 exposures each (1200 general audience gross rating points). In both 2012 and 2013, the CDC ran a national campaign meeting these requirements. Since the start of this campaign, smoking prevalence, which had been stalled at just above 20% for a number of years, dropped to 18% in 2012.
Interventions that Promote Healthy Behaviors in Schools

Schools are in a uniquely powerful position to play a major role in reducing smoking initiation. Children spend almost a third of their waking time in school, or about 135 hours per month, and much of the peer pressure kids feel regarding whether or not to use tobacco occurs in school.

Table 10-6 Healthy People 2020 Tobacco Use Objectives Targeting Schools

<table>
<thead>
<tr>
<th>Number</th>
<th>Objective</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>TU-15</td>
<td>Increase tobacco-free environments in schools, including all school facilities, property, vehicles, and school events</td>
<td>100.0%</td>
<td>65.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Junior high schools</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TU-15</td>
<td>Increase tobacco-free environments in schools, including all school facilities, property, vehicles, and school events</td>
<td>100.0%</td>
<td>65.4%</td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS, 2011)

Tobacco-Free Schools. Most current smokers started smoking before leaving high school (USDHHS, 2012). Initially, tobacco control researchers focused their efforts to reduce initiation on the school curriculum. The best programs included curriculum content on the short- and long-term negative health effects, social acceptability, social influences, negative social consequences, peer norms and peer pressure, resistance and refusal skills and media literacy as it relates to tobacco marketing and advertising. However, the consensus assessment of these studies was that curriculum alone was not sufficient to obtain a long-term impact on initiation (Glynn, 1989).

For schools to effectively prevent and reduce youth tobacco use among their students, they must create an environment that encourages anti-tobacco beliefs and behaviors. The 2020 objective recognizes this and requires that schools have tobacco-free policies that are clearly and consistently communicated, applied, and enforced to reduce tobacco use among students. In 2006, two thirds of junior high schools reported to the CDC that no smoking and no smokeless tobacco use was allowed by students, staff, or visitors on school facilities, property, vehicles, and school events. This proportion had increased from less than half in 2000. Objective TU-15 targets to increase this to 100% by 2020.

Interventions to Regulate Tobacco Products

There are currently no 2020 objectives in this area as this is a federal government responsibility and not one that cannot be implemented at the state level. The enactment by Congress and the President of the Family Smoking Prevention and Tobacco Control Act in 2009 granted the Food and Drug Administration the authority to regulate the manufacturing, marketing, and distribution of tobacco products and to set performance standards for tobacco products to protect the public’s health. In addition, the Tobacco Control Act grants authority to state and local governments to regulate tobacco products in certain specific respects. For example, the Tobacco Control Act partially rescinded federal preemption and now allows state and local governments to place some restrictions on the time, place, and manner of cigarette advertising and promotion. Frequently, the most stringent laws are placed at the local level where people are most affected by them. A number of states legislatures have pre-emption laws — these require that no city or county can have stronger laws than that of the state as a whole. Currently, 12 states preempt local community retail display laws, and 13 preempt promotion laws, and 14 preempt sampling laws.
The images on cigarette packages are a major part of product marketing, and the industry has ensured that required warnings about the product are not prominent on the package and are difficult to read. Despite the evidence of the dangers of tobacco, relatively few users appear to fully understand the risks to their health. One of the first actions of the FDA under this new authority was to require that cigarette packs have much larger and more graphic warning labels, as outlined by the Framework Convention for Tobacco Control. However, the tobacco industry sued and the courts told the FDA that it needed more evidence than currently available on the effectiveness of such labels in reducing smoking rates before they could take such action.

Another early action of the FDA related to electronic cigarettes as potential nicotine delivery devices. Companies effectively sued to prevent the FDA taking this action and the FDA was limited to regulating the product as a tobacco product, as long as the products were not marketed as a cessation aid. Recently, the major tobacco companies have announced that they are entering the e-cigarette market with large marketing budgets.

Weight Status and Obesity

Excess body weight is linked with many health problems, including Type 2 diabetes, heart disease, several types of cancer, hypertension, stroke, sleep apnea, and respiratory problems. Table 10-7 lists the Health People 2020 objectives dealing with weight status.

<table>
<thead>
<tr>
<th>Number</th>
<th>Objective</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWS-8</td>
<td>Increase the proportion of adults who are at a healthy weight</td>
<td>33.9%</td>
<td>30.8%</td>
</tr>
<tr>
<td>NWS-9</td>
<td>Reduce the proportion of adults who are obese</td>
<td>30.6%</td>
<td>34.0%</td>
</tr>
<tr>
<td>NWS-10</td>
<td>Reduce the proportion of children and adolescents who are obese</td>
<td>14.6%</td>
<td>16.2%</td>
</tr>
<tr>
<td>NWS-11</td>
<td>Prevent inappropriate weight gain in youth and adults</td>
<td>Developmental</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS, 2011)

Adult Prevalence

Healthy People 2020 sets targets for the proportion of the adult population who are at a healthy weight using body mass index (BMI). Healthy weight is defined as a BMI between 18.5 and 25 while obesity is defined as a BMI ≥ 30. The data to assess performance on these objectives come from NHANES, which includes measures of weight in an examination gown and height without shoes. Between 2000 and 2010, the proportion of adults (aged 20+) who were at a healthy weight decreased from 42% to 31% and the proportion who were obese increased from 23% to 34%. These changes reflect time trends over the past 30 years as Americans increasingly get heavier. The 2020 targets are ambitious as they propose to turn around this trend so that the proportion of the adult population at a healthy weight is 33.9% (NWS-8) and the proportion who are obese is 30.6% (NWS-9).

Youth Prevalence

Adolescent obesity rates have also been increasing for a long time, similarly to the long-term trend for adults (Wang, Orleans, & Gortmaker, 2012). The Healthy People Initiative
uses the NHANES data, and obesity is assessed as the number of persons aged 2 to 19 years with a BMI at or above the sex-and age-specific 95th percentile from the Centers for Disease Control Growth Charts for the United States. Among people in this age group, 16.2% were classified as obese at the 2005-2008 survey and objective (NWS-10) is to reduce this proportion to 14.6% for 2020.

**Onset of Obesity**

Healthy People 2020 has an objective focused on preventing inappropriate weight gain in youth and adults; however, so far the word “inappropriate” has not been defined. Even so, time periods of weight gain can be deduced from obesity prevalence at different ages. At the 2005-2008 baseline assessment, the prevalence of obesity was 10.7% among 2- to 5-year-olds, 17.4% among 6- to 11-year-olds and only slightly higher among 12- to 19-year-olds, suggesting that over half of the onset of obesity in youth may occur during the first 5 years of life with most of the rest occurring prior to puberty. While it is true that obese children are more likely to become obese adults (Freedman, Khan, Serdula, Dietz, Srinivasan, & Berenson, 2005), many people also become obese for the first time when they are already adults. Times to look for significant weight gain are when the body’s metabolic rate slows down, such as happens with menopause in women and when levels of physical activity are decreased in both genders.

**Weight Loss**

Following the tobacco model, we might have expected that there would be an objective that focused on attempts to lose weight among those who were overweight or obese, as well as a focus on increasing success among such change attempts. These measures were available from the NHANES study (Duncan, Wolin, Scharoun, Ding, Warner, & Bennett, 2011). Of the 4784 people in the 2005-2008 NHANES who were measured as overweight (51%) or obese (49%), over 80% indicated that they wanted to lose weight and 47% indicated that they had tried to lose weight in the past year. These attempt proportions are not that different to those seen among current smokers (see Objective TU-4 above). Just as in tobacco use, most attempts to change weight are not associated with a professional program or therapy. Best practices suggest that weight loss therapy can achieve a 10% weight loss over a 6-month period; however, without an appropriate maintenance program, the majority of that weight will be regained (USDHHS, 1998).

**Strategies to Reduce Overweight and Obesity**

Many organizations have put forth recommendations to address the obesity epidemic. The World Health Organization recommendations on obesity notes “Supportive environments and communities are fundamental in shaping people’s choices and preventing obesity. Individual responsibility can only have its full effect where people have access to a healthy lifestyle, and are supported to make healthy choices.” (World Health Organization, 2013). The Institute of Medicine (IOM) reported that addressing the obesity crisis would require a substantial increase in public and private sector investment (IOM, 2006), and recommended interventions that include government, industry, media, communities, schools, and families (IOM, 2005; IOM, 2006). Most of the emphasis is focused on a
Energy Dense vs. Nutrient Dense
As explained in Chapter 4, energy dense foods are high in calories and low in nutritional value, often containing added sugars, salt, and fat. Nutrient-dense foods are typically low in calories, but rich in vitamins, minerals, and other substances with potential health benefits. These foods exclude or limit added solid fats, sugars, starches, and sodium. Examples of nutrient-dense foods include vegetables, fruits, whole grains, seafood, eggs, legumes, unsalted nuts and seeds, fat-free milk products, and lean meats and poultry. A healthful diet that emphasizes nutrient-dense foods will help Americans meet their nutrient needs without excessive calories. However, one randomized trial suggested that changing to a nutrient dense dietary pattern did not lead to weight loss, possibly because the volume of food eaten increased (Saquib, Natarajan, Rock, Flatt, Madlensky, Kealey, & Pierce, 2008).

Table 10-8. Healthy People 2020 Weight Status Objectives Involving Physicians

<table>
<thead>
<tr>
<th>Number</th>
<th>Objective</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWS-5.1</td>
<td>Increase the proportion of primary care physicians who regularly assess body mass index (BMI) in their adult patients</td>
<td>53.6%</td>
<td>48.7%</td>
</tr>
<tr>
<td>NWS-5.2</td>
<td>Increase the proportion of primary care physicians who regularly assess body mass index (BMI) for age and sex in their child or adolescent patients</td>
<td>54.7%</td>
<td>49.7%</td>
</tr>
<tr>
<td>NWS-6</td>
<td>Increase the proportion of physician office visits made by adult patients who are obese that include counseling or education related to weight reduction, nutrition, or physical activity</td>
<td>31.8%</td>
<td>28.9%</td>
</tr>
<tr>
<td>NWS-7</td>
<td>Increase the proportion of worksites that offer nutrition or weight management classes or counseling</td>
<td>Developmental</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS, 2011)

In the background to these objectives, Healthy People notes that in 2008 physicians reported monitoring body mass index in approximately half of the patients seen. The target objective for 2020 (NWS-5.1) was to increase this by 10%. Less than one third of obese patients who attended physicians were counseled about the need to reduce weight. Again the 2020 target (NWS-6) is to increase this by 10%. However, Healthy People was silent about how these desired increases would be achieved.

Nutrition
Many Americans eat a diet centered on refined and processed foods. This refined diet tends to have limited intake of foods like vegetables, fruits, whole grains, and legumes — foods that are nutrient-rich and may play important roles in maintaining health and preventing disease. Such foods are also naturally higher in fiber, lower in fat (but contain healthy fats), and are less calorically dense. On the other hand, processed foods and beverages, particularly those rich in refined carbohydrates, are often energy dense, higher in unhealthy fats and sodium, and lower in fiber and protective nutrients. Consuming large quantities of these foods increases the risk of weight gain and chronic diseases.

Energy Dense vs. Nutrient Dense
As explained in Chapter 4, energy dense foods are high in calories and low in nutritional value, often containing added sugars, salt, and fat. Nutrient-dense foods are typically low in calories, but rich in vitamins, minerals, and other substances with potential health benefits. These foods exclude or limit added solid fats, sugars, starches, and sodium. Examples of nutrient-dense foods include vegetables, fruits, whole grains, seafood, eggs, legumes, unsalted nuts and seeds, fat-free milk products, and lean meats and poultry. A healthful diet that emphasizes nutrient-dense foods will help Americans meet their nutrient needs without excessive calories. However, one randomized trial suggested that changing to a nutrient dense dietary pattern did not lead to weight loss, possibly because the volume of food eaten increased (Saquib, Natarajan, Rock, Flatt, Madlensky, Kealey, & Pierce, 2008).
Healthy People 2020 sets objectives for intakes of foods that would lead to better nutrition habits and overall health. A number of objectives focus on increasing intake (e.g. fruits, vegetables, grains, including whole grains, and calcium) while other objectives focus on a decreasing intake (e.g. saturated fat, total fat, and total sodium).

### Table 10-9 Healthy People 2020 Food and Nutrient Consumption Objectives

<table>
<thead>
<tr>
<th>Number</th>
<th>Objectives</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWS-14</td>
<td>Increase the contribution of fruits to the diets of the population aged 2 years and older (cup equivalent/day)</td>
<td>0.9</td>
<td>0.5</td>
</tr>
<tr>
<td>NWS-15</td>
<td>Increase the contribution of total vegetables to the diets of the population aged 2 years and older (cup equivalent/day)</td>
<td>1.1</td>
<td>0.8</td>
</tr>
<tr>
<td>NWS-16</td>
<td>Increase the contribution of whole grains to the diets of the population aged 2 years and older (ounce per 1,000 calories)</td>
<td>0.6</td>
<td>0.3</td>
</tr>
<tr>
<td>NWS-17</td>
<td>Reduce consumption of calories from solid fats and added sugars (% of total calories)</td>
<td>29.8</td>
<td>34.6</td>
</tr>
<tr>
<td>NWS-19</td>
<td>Reduce consumption of sodium in the population aged 2 years and older</td>
<td>2,300mg</td>
<td>3,641mg</td>
</tr>
<tr>
<td>NWS-20</td>
<td>Increase consumption of calcium in the population aged 2 years and older</td>
<td>1,300mg</td>
<td>1,118mg</td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS, 2011)

### Adult Prevalence

Food or nutrients targeted to be increased are fruits, vegetables, whole grains, and calcium. Increasing fruit and vegetable intake will increase intakes of a series of nutrients (e.g. folate, magnesium, potassium, dietary fiber, vitamins A, C, and K) where current intakes in the average American are below recommended levels. Evidence suggests that consuming these at the higher levels should reduce the risk of chronic disease. There is also some evidence suggesting that replacing energy dense foods with fruits and vegetables (much less energy dense) could result in weight loss (USDHHS 2010) although this is not always the case (Saquib et al., 2008).

Fruit and vegetable intake remained stable over the 2000-2010 decade, well below the Healthy People 2010 targets: about 39 to 40% of Americans were consuming two fruit servings per day, and only 4% of Americans were achieving the Healthy People objective of consuming at least three daily servings of vegetables with at least 1/3 dark green or orange. Similar to vegetable intake, only a small proportion of Americans (4%) were meeting the grain intake objective at baseline (at least six daily servings with at least three being whole grains). At the end of the decade, only 3% of Americans met the grain target. Achieving the 2020 targets will be challenging for each of these objectives and will require some powerful interventions.

Calcium is well known for its role in maintaining strong bones, but this mineral is also important for muscle contraction, blood clotting, transmitting nerve impulses, preventing hypertension, and possibly lowering the risk of colon cancer. Calcium intake is the only nutrition objective that improved over the previous decade. To achieve the 2020 target of a 16% increase (NWS-20) will require a faster rate of increase than seen in the past decade.
Food or nutrients targeted to be decreased are saturated fat, total fat, added sugar and sodium. Objective NWS-17 aims to reduce consumption of calories from solid fats and added sugars, recognizing that these foods account for a sizable portion of the calories that Americans consume, without contributing important nutrients. Solid fats include foods like butter, beef fat, and shortening that are solid at room temperature. Solid fats are high in saturated fats and/or trans fats, which can raise blood Low Density Lipoprotein levels. Reducing intake of these will be an important component of most weight management interventions as well as efforts to reduce disease risk.

NHANES reported that the average American consumed 18.9% of total calories from solid fat in 2001-2004. The 2020 target is that solid fats will be limited to 16.7% of calories. The other component of this goal is to reduce calories from added sugars. At baseline in 2001-2004, Americans consumed 15.7% of calories from added sugars, and the use of sugar-sweetened beverages to meet hydration needs was a major component of this. The 2020 goal is to reduce added sugars to 10.8% of calories – a very ambitious target as this would require a one third reduction in the consumption of these calories from the baseline measure.

Americans consume a lot more sodium than their bodies require, which can lead to hypertension, a risk factor for heart disease and stroke (Institute of Medicine, 2013). Processed foods and restaurant meals account for about three quarters of the sodium consumed. Sodium intake among Americans was 3861 mg/day in 2003-2006 and this decreased by only 1.5% by the 2007-2010 assessment. Thus the target of 2300 mg/d by 2020 (NWS-19) is very ambitious.

Adolescent Prevalence. On the whole, the background data for the Healthy People objectives indicates that adolescents consume similar patterns of nutrients to adults.

Initiation of Poor Dietary Pattern
Other than the evidence that young people have poor dietary patterns, there is little evidence suggesting key times that people who start with a healthy dietary pattern might change to a poorer dietary pattern or vice versa. On the other hand, people who have had a health event, such as diagnosis of cancer, become motivated to make major changes in their behavior. A high proportion indicate that shortly after they finished treatment, they made major changes to their dietary pattern with a goal of reducing their risk of recurrence.(ref)

Change in Dietary Pattern. Unlike the evidence for tobacco use and obesity, there is little data suggesting that the many people with a poor quality dietary pattern express an intention to make a major change to consume a healthy dietary pattern, nor is there any evidence of the population success rates among those who try to change. However, dietary intervention studies have shown that people can achieve major changes in dietary pattern should they be motivated to do it and have adequate support. Studies with marked changes in dietary pattern include the DASH feeding study, which achieved a dietary pattern high in vegetables, fruit and fiber, and low in energy from fat. The intervention was limited to 8 weeks; however, this was sufficient to show an impact of the dietary pattern in reducing blood pressure levels (Conlin, Chow, Miller, Svetkey, Lin, Harsha, & Moore, 2000). The follow-up PREMIER study achieved and maintained a similar dietary pattern in a free-living population for 6 months, replicating the reduced hypertension effect (Appel et al., 2003). The WHEL Study tested the role of a plant-based dietary
pattern in delaying cancer recurrence and death among over 3000 breast cancer survivors (Pierce 2007). This study achieved and maintained through 6 years at least 30% difference between intervention and comparison groups in daily intakes of vegetables, fruit and fiber along with a reduction in energy from fat of almost 10%. These differences were achieved within two months of randomization and persisted throughout the study. Of importance, the patterns persisted for another 4 years after the completion of all study activities.

**Strategies to Improve Nutrition**

The Healthy People 2020 objectives aim to improve the diets of Americans, including interventions that (1) incentivize people to improve their dietary pattern, (2) increase access to healthy foods, (3) use media to promote healthy eating, (4) promote healthy eating in schools, and (5) regulate food and beverage products.

**Interventions that Incentivize People to Improve their Dietary Pattern.** Healthy People 2020 includes no objectives that focus on incentivizing change in food intake patterns, but research suggests that such strategies could be effective and modifying food intake. Health experts have proposed taxes for sweetened beverages because they offer no health benefits, are associated with diabetes and obesity, and the calories may displace nutritionally superior foods and beverages. California considered implementing such a tax in 2013. Americans are consuming 250-300 calories more per day than they were 20 years ago, and almost half of the increase in attributable to soda consumption (Brownell & Frieden 2009). One review suggested that a 10% tax on soft drinks could lead to an 8% to 10% reduction in soft drink purchases (Andreyeva, Long, & Brownell, 2010). More recently, Powell and colleagues (2013) found that the price elasticity of demand for sugar sweetened beverages was -1.21; fast food, -0.52; fruits, -0.49; and vegetables, -0.48, suggesting that higher prices would impact soda purchases. They also found that pricing might influence body weight: higher fast-food prices were associated with lower body weight, particularly among adolescents, and lower fruit and vegetable prices were associated with lower body weight among both low-income children and adults. A controlled field experiment showed that a 30% tax on less-healthy items (with items also labeled as less healthy) motivated people to make healthier food purchases (Ebel, Taksler, Mijanovich, Abrams, & Dixon, 2013).

**Interventions that Increase Access to Healthy Foods.** Our surrounding food environment has a great influence on what we eat. People who live close to full-service grocery stores tend to eat healthier foods, including more fruits and vegetables, and have lower rates of obesity (Larson, Story, & Nelson, 2009). However, for a number of Americans, healthier food choices are not as accessible as less healthy choices. A **food desert** is a new term to describe a district with little or no access to large grocery stores that offer fresh and affordable foods needed to maintain a healthy diet. Food deserts disproportionately affect socially segregated groups in urban areas, specifically single mothers, children, and the elderly living in underprivileged urban neighborhoods. Sometimes such a food desert occurs when there has been an exodus of middle-class residents and grocery stores have either closed or relocated as well. In such places, local food choices are often restricted to inexpensive, high calorie, nutrient-poor foods and the local environment has been termed “obesogenic.”
Healthy People 2020 has two objectives aimed at increasing access to healthy foods.

**Table 10-10 Healthy People 2020 Objectives to Increase Access to Healthy Foods**

<table>
<thead>
<tr>
<th>Number</th>
<th>Objective</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWS-3</td>
<td>Increase the number of States that have State-level policies that incentivize food retail outlets to provide foods that are encouraged by the Dietary Guidelines</td>
<td>18</td>
<td>8 states</td>
</tr>
<tr>
<td>NWS-4</td>
<td>Increase the proportion of Americans who have access to a food retail outlet that sells a variety of foods that are encouraged by the Dietary Guidelines for Americans</td>
<td>Developmental</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS 2011)

Objective NWS-3 focuses on state level policies that incentivize food retail outlets to be located within “food deserts”. In 2009, eight states had such policies and the target is to increase this to 18 by 2020. Progress on this objective looks promising, with the new national-level “**Healthy Food Financing Initiative**” that offers grant opportunities for increasing access to healthier foods in underserved communities.

The **Healthy Food Financing Initiative (HFFI)** supports projects that increase access to healthy, affordable food in communities that currently lack these options. Through a range of programs at the U.S. Departments of Agriculture (USDA), Treasury, and Health and Human Services (HHS), HFFI will expand the availability of nutritious food, including developing and equipping grocery stores, small retailers, corner stores, and farmers markets selling healthy food.

Providing access to healthier foods for Americans at other venues can help change eating behavior: surrounding individuals with healthy foods and limiting unhealthy foods helps make the default choice a healthy one. Workplaces, restaurants, and schools are good targets for such interventions. For example, workplaces could have cafeterias or vending machines that limit or restrict unhealthy foods and provide healthy food and beverage choices that are affordable. Some experts consider policies that help create a healthy food and eating environments to be among the most effective strategies for improving the eating habits of Americans (Story, Kaphingst, Robinson-O’Brien, & Glanz, 2008).

**Interventions that Use Media to Promote Healthy Eating and Discourage Unhealthy Eating.** Healthy People 2020 has no objectives related to regulating food industry marketing or promotion, although the available data show that such policies could have profound influences on eating behavior. Health organizations have been urging countries to take action for over a decade: In 2010 the World Health Organization called on governments worldwide to reduce children’s exposure to food and beverage advertising, and to reduce the use of powerful marketing techniques (WHO, 2010). There are lots of parallels between tobacco industry marketing and fast food and sweetened beverages marketing (Dorfman, Cheyne, Wadud, & Gottlieb, 2012; Brownell & Warner, 2009). Nestle (2002) comments “it is not just Big Tobacco anymore. Public health must also contend with Big Food, Big Soda, and Big Alcohol.”

The US lags behind other countries in regulating marketing directed at children, and the industry defends its right to market to whom it pleases as they claim it is
commercial speech protected under the First Amendment to the U.S. Constitution. The food and beverage industry have huge marketing expenditures (~$2 billion/year), and the placement of these advertisements make it clear that children and teens are a main target of their efforts. In 2006, the fast food industry spent approximately $5 million each day (Kovacic, 2008). As young people have migrated from television to social media, food industry expenditures have followed: television expenditures have decreased by 19.5% and been replaced by a 50% increase in new media (online, mobile, and viral) marketing in 2009 (Federal Trade Commission, 2012). From television, internet, social media, cell phones, interactive video games, and contests, children are surrounded by food industry messages at home, school, and in their community. Brand placement in movies is prevalent, and another largely overlooked source of marketing (Sutherland, Mackenzie, Purvis, & Dalton, 2010).

Food marketing influences children’s stated preferences, their requests to parents, and the foods that they consume (Federal Trade Commission, 2012). Almost all food ads (98%) targeting children are for products that are high in sugar, fat, or sodium; most ads (79%) are for products that are low in fiber (Larson, Story, & Nelson, 2009). And the influence of marketing may be long lasting: one study suggested that television viewing including promotion of unhealthy foods during adolescence predicts future eating habits as adults (Barr-Anderson, Larson, Nelson, Neumark-Sztainer, & Story, 2009). A recent study investigating the influence of fast food and soft drink television advertising on elementary school children (Andreyeva, Kelly, & Harris, 2011) found that exposure to this advertising was associated with increased consumption of those foods, and that exposure to fast food advertising was significantly associated with BMI for overweight and obese children. More research demonstrating the importance of food and beverage marketing to consumption patterns is needed to support policies that limit or restrict the marketing of unhealthy foods to youth.

In 1988, the California Department of Health Services and the National Cancer Institute created the first 5-a-day for Better Health program, designed to encourage consumption of fruits and vegetables. A few years later (1991), NCI launched a national 5-a-Day campaign, partnering with the nonprofit Produce for Better Health Foundation, and in 2005, the CDC became the lead agency for this campaign. The current version of the campaign is called ‘Fruits & Veggies – More Matters’ health initiative, and encourages adults to consume at least 7–13 servings (3½–6½ cups) of fruits and vegetables daily: it is promoted through supermarket advertisements, brochures, on food packages, and the internet. Erinosho and colleagues (Erinosho, Moser, Oh, Nebeling, & Yaroh, 2012) investigated the awareness of the Fruits and Veggies—More Matters campaign, and knowledge of fruit and vegetable recommendations (7–13 servings). Using data from NCI’s Food Attitudes and Behaviors Survey, they found that only 2% of adults were aware of the “More Matters” campaign, and 6% were aware of the recommendations. In contrast, they found greater awareness of the former 5-a-Day campaign (29%) and recommendations (30%). Awareness of the 5 A Day/Fruits and Veggies—More Matters campaigns was associated with greater fruit and vegetable consumption. Given the food industry’s clever marketing tactics and the barrage of advertisements for unhealthy foods that compete with this campaign, an emphasis on increasing awareness of the current national fruit and vegetable campaign is needed.

Counter-Marketing Campaigns
Counter-marketing campaigns have been an important component of successful tobacco control programs, especially when the campaigns influenced social norms. Frieden, Dietz, & Collins (2010) recommended that nutrition counter-marketing should follow tobacco’s lead and focus on the harm caused by the product. Current counter-marketing campaigns for nutrition are few and fragmented. The Center for Science in the Public Interest (CSPI) launched a counter-marketing campaign after Coca-Cola released a series of commercials to appease growing public concern about the link between sugary drinks and obesity. CSPI used tobacco control strategies and had Alex Bogusky create an anti-soda video; Bogusky was the creator of the successful anti-tobacco “Truth®” campaign for the American Legacy Foundation, which received many awards for advertising efficacy, and was praised by tobacco researchers for its ability to change smoking-related attitudes and beliefs and reduce smoking initiation (Farelly, Nonnemaker, Davis, & Hussin, 2009). CSPI’s social media project features an animated music video called “The Real Bears” (www.therealbears.org). In the video, cute polar bears drink too much soda, gain weight, and the father develop diabetes, injects insulin, suffers erectile dysfunction, loses teeth, and has a paw amputated. The website campaign responds with evidence to industry quotes (called LIIES) such as “There is no scientific evidence that connects sugary beverages to obesity.”
Interventions that Promote Healthy Eating in Schools. The school environment is an ideal setting for nutrition education and creating a healthy food environment, as children spend much of their day at school, and foods consumed at school contribute significantly to daily nutrient intake (Weschler, Devereaux, Davis, & Collins, 2000). When unhealthy foods are available children respond to the marketing and consume less fruit and more fat and sugar (Neumark-Sztainer, French, Hannan, Story, & Fulkerson, 2005). Meals served in national lunch or breakfast programs follow federally defined nutrition standards; however, the sale of other “competitive” foods such as those sold in vending machines, a la carte, and at school stores is not strictly regulated. Vending machines are the most common provider of unhealthy foods, and, given that some of the profits go to the schools, these have become a fixture in most middle and high schools. Between 1991 and 2008, vending machines in middle schools increased from 42% to 77% and from 76% to 96% in high schools (USDA 2007). Access to vending machines increases consumption of high fat and sugared foods and drinks (Rovner, Nansel, Wang, & Jannotti, 2011), and school policies that limit access to foods high in sugars and fat result in children and teens who are less frequent purchasers of these foods (Neumark-Sztainer, French, Hannan, Story, Fulkerson, 2005).

Healthy People 2020 recognizes that schools are important venues for reversing childhood obesity.

Table 10-11 Healthy People 2020 School Policies Objectives

<table>
<thead>
<tr>
<th>Number</th>
<th>Objectives</th>
<th>Target (%)</th>
<th>Baseline (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NWS-1</td>
<td>Increase the number of States with nutrition standards for foods and beverages provided to preschool-aged children in child care</td>
<td>34 states</td>
<td>24 states</td>
</tr>
<tr>
<td>NWS-2</td>
<td>Increase the proportion of schools that offer nutritious foods and beverages outside of school meals</td>
<td>21.3</td>
<td>9.3</td>
</tr>
<tr>
<td>NWS-2.1</td>
<td>Increase the proportion of schools that do not sell or offer calorically sweetened beverages to students</td>
<td>18.6</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS 2011)

Food preferences and dietary habits are formed early in life. Given the large numbers of children in child care programs, this setting presents an ideal opportunity for fostering healthy eating habits. An analysis in 2009 found that there is little research on the nutritional quality of foods and beverages provided in child care settings, and studies that investigated child care nutrition show cause for concern (Kaphingst & Story, 2009). In 2009, less than half of US states had standards for food and beverage choices that could be provided in preschools. The target for 2020 (NWS-1) is to increase this to 34 states.

NWS Objective 2 focuses on increasing the proportion of schools that offer nutritious foods and beverages outside of school meals. In 2006, less than 10% of schools restricted the sale of calorically sweetened beverages to students and the 2020 target focuses on doubling this proportion. In 2006, only 7% of school districts required schools to make fruits or vegetables available where other food is offered or sold. The target is to increase this to more than 18% by 2020 (NWS-2.2). Currently less than 25% of students are covered by such policies.
In February 2013, the US Department of Agriculture proposed updated federal standards for competitive foods that would mean healthier snack foods and less junk food served to students. As adherence to such standards could influence federal grants, this could provide a much needed incentive to change local policies. Some states have already implemented stricter food and beverage policies, providing evidence for investigators to evaluate their likely effectiveness. Taber and colleagues (2013) investigated the influence of states with policies for healthier school lunches and found that students in states with stricter standards were less likely to be obese, suggesting that new USDA standards have the potential to improve weight status among children eating school lunches. Chriqui et al. (2013) also reported that policies are effective: elementary schools that had state or school district policies limiting the sale of unhealthy foods (e.g., candy, ice cream, sugar-sweetened beverages, cookies, cakes) were less likely to sell those foods.

**Interventions that Regulate Food and Beverage Products.** *Healthy People 2020 has no objectives related to regulating food and beverage products to improve nutrition. However, there are numerous examples that such approaches are effective.* Faced with demonstrated high incidence rates of diabetes and cardiovascular disease, the government of Mauritius regulated the composition of cooking oil to reduce saturated fat levels. Disease risks declined within 5 years (Uusitalo et al. 1996). In the United States, governments have encouraged voluntary industry wide changes as well as regulated usage at the local level. Recent examples include the reduction in usage of trans fat and sodium reductions in foods.

The use of trans fats in product manufacturing increased substantially in the 20th century, but evidence on the health consequences of trans fats (Mozaffarian, Katan, Ascherio, Stampfer, & Willet 2006) and mandatory nutrition labeling in 2006 prompted many manufacturers to reduce trans fats in their products. The average trans fat exposure of Americans from food products decreased about 50% between 2000 and 2009 (Vesper, Kuiper, Mirel, Johnson, & Pirkle 2012), but a more recent analysis suggests the pace of the decline in usage of trans fats is slowing (Otite, Jacobson, Dahmubed, & Mozaffarian, 2013). New York City took things a step further by legislating against trans fats in restaurants, and this resulted in an estimated reduction in the use of trans fats from 50% to less than 2% (Angell et al. 2009). Given that even low levels of trans fats are harmful (Mozaffarian & Stampfer, 2010), some experts recommend that the US should follow the lead of other countries, and ban any trans fats from food manufacturing (Coombes, 2011). National and local bans were more effective at removing trans fats from the food supply than mandatory trans fat labeling, and, in countries with labeling policies but no bans, trans fat intake exceeds WHO recommendations (Downs, Thow, & Leeder, 2013).

High sodium intake can increase the risk for high blood pressure, a condition that predisposes individuals to cardiovascular disease. An Institute of Medicine report concluded that voluntary efforts to reduce sodium are ineffective, and that new government standards to reduce the sodium content of the food supply should include manufacturers and restaurants (Henney, Taylor, & Boon, 2010). Experts recommend reducing sodium in the food supply gradually to allow consumers’ palates time to adjust. A gradual reduction in sodium intake over 10 years has been estimated to potentially prevent more than 280,000 to 500,000 deaths in the US each year (Coxson et al., 2013).
Some countries regulate salt, many following the UK’s example. In 2003 the UK set sodium targets for key food categories and reported that salt level in bread was reduced by 20% from 2001 to 2011 (Brinsden, Feng, Jenner, & MacGregor, 2013). The authors report that “a voluntary target-based approach works to encourage industry reductions, but the targets need to be coupled with the forceful government or quasi-government agency.” Sodium is an unregulated food ingredient in the US, although some local governments have launched efforts to reduce sodium. Because the food industry is responsible for about 80% of the sodium Americans consume, regulatory approaches could have powerful health implications.

New York City at Forefront of Public Health Policy

Cities and states are playing an important role in public health policy, with former New York City Mayor Michael Bloomberg often leading the charge and grabbing headlines for his bold and sometimes controversial initiatives. Here are some of the public health policies implemented in New York:

- New York was the first city to limit the use of trans fats in restaurants and other food vendors in 2005. Other cities followed suit, and some countries and states implemented stricter trans fat regulations.
- In 2006, the city replaced whole milk with low fat or nonfat milk in the public school system, and in 2012 the USDA announced federal legislation that will remove whole milk from all public schools in the nation.
- In 2008, New York was the first city to legislate calorie counts on menus; now more than 20 cities or states have passed local ordinances requiring calorie counts on menus, and federally eateries with 20 outlets or more are now required to post calorie counts on menus.
- In 2010, mayor Bloomberg proposed disallowing the use of food stamps to purchase soda, and tried to legislate a state soda tax – however, neither of these proposals were implemented.
- The mayor launched an initiative to reduce sodium by 25% over 5 years in packaged and restaurant foods. This initiative focused on getting an industry wide agreement to gradually reduce sodium levels in food. Recent evidence suggests that it is leading to lower sodium levels.
- In 2012, New York City’s board of health approved Bloomberg’s proposal banning the sale of “supersized sugary beverages” in New York City food establishments. The American soft-drink industry launched a multimillion dollar campaign to block the ban and took this issue to court: a day before the law was to take effect, a state Supreme Court judge invalidated the ban. Los Angeles, CA and Cambridge, MA have put forward similar proposals.
Physical Activity
From Chapter 5, we know that physical activity is any movement of the human body that increases energy expenditure above resting levels. Being physically active can help control weight, reduce the risk of chronic disease (diabetes, cancer, heart disease), fight fatigue, improve muscular and skeletal health, improve mental health and mood, improve sleep, and increase the chances of healthy aging. The quantity of physical activity needed to attain these benefits has been the subject of national guidelines (U.S. Department of Health and Human Services, 2008). The guidelines for adults recommend two types of physical activity: at least 150 minutes of moderate-intensity aerobic activity (or equivalent) weekly, and muscle strengthening activity twice weekly.

The main behavioral objectives related to physical activity are to reduce sedentary behavior in adults, and to increase the proportion of adults and adolescents who meet the national guidelines for physical activity.

<table>
<thead>
<tr>
<th>Number</th>
<th>Objectives</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA-1</td>
<td>Reduce the proportion of adults who engage in no leisure-time physical activity</td>
<td>32.6%</td>
<td>36.2%</td>
</tr>
<tr>
<td>PA-2</td>
<td>Increase the proportion of adults who meet current Federal physical activity guidelines for aerobic physical activity and for muscle-strengthening activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-2.1</td>
<td>Increase the proportion of adults who engage in aerobic physical activity of at least moderate intensity for at least 150 minutes/week, or 75 minutes/week of vigorous intensity, or an equivalent combination</td>
<td>47.9%</td>
<td>43.5%</td>
</tr>
<tr>
<td>PA-2.2</td>
<td>Increase the proportion of adults who engage in aerobic physical activity of at least moderate intensity for more than 300 minutes/week, or more than 150 minutes/week of vigorous intensity, or an equivalent combination</td>
<td>31.3%</td>
<td>28.4%</td>
</tr>
<tr>
<td>PA-2.3</td>
<td>Increase the proportion of adults who perform muscle-strengthening activities on 2 or more days of the week</td>
<td>24.1%</td>
<td>21.9%</td>
</tr>
<tr>
<td>PA-2.4</td>
<td>Increase the proportion of adults who meet the objectives for aerobic physical activity and for muscle-strengthening activity</td>
<td>20.1%</td>
<td>18.2%</td>
</tr>
<tr>
<td>PA-3</td>
<td>Increase the proportion of adolescents who meet current Federal physical activity guidelines for aerobic physical activity and for muscle-strengthening activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-3.1</td>
<td>Aerobic physical activity</td>
<td>20.2%</td>
<td>18.4%</td>
</tr>
<tr>
<td>PA-3.2</td>
<td>(Developmental) Muscle-strengthening activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-3.3</td>
<td>(Developmental) Aerobic physical activity and muscle-strengthening activity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS 2011)

Adult Prevalence
Physical inactivity is associated with greater risk for chronic diseases and early death. The first objective (PA-1) focuses on physical inactivity, and uses data from the National Health Interview Survey (NHIS) to track the proportion of adults who report never doing light or moderate physical activity for at least 10 minutes and that they never do vigorous physical activity for at least 10 minutes. The baseline year for this measure was 2008 when 36.2% responded that they were physically inactive, which was down from 40% in 1997. However, this proportion of inactive American has been decreasing yearly since
then: in 2009 and 2010 it was 32.3% and in 2011 it was 31.6%. Thus, the Healthy People 2020 target has already been achieved.

Objective PA-2 targets aerobic physical activity at the level recommended in the national guidelines. In the 2008 NHIS, 43.5 percent of adults reported undertaking either 150 minutes a week of light or moderate physical activity or 75 minutes a week of vigorous physical activity. Healthy People 2020 targeted a 10% increase. However, in 2008-2009, over 47% reported this level of activity and in 2011, 48.8% reported this level of activity, meeting the national guidelines. Indeed, in 2011, 33.1% exceeded the minimum national guideline recommendations and reported a level of aerobic activity associated with even greater health benefits: either light or moderate physical activity for more than 300 minutes a week, or vigorous physical activity of 150 minutes a week or an equivalent combination of moderate and vigorous-intensity activity.

Strength training can help reduce body fat, control weight, and stabilize blood glucose readings. It can also help strengthen bones, slow age-related muscle loss, and improve balance, coordination, and mobility. Objective PA-2.3 targets the proportion of adults who report doing physical activities specifically designed to strengthen muscles at least twice per week. In 2008 (baseline), 21.9% reported some form of muscle strengthening activities on 2 or more days per week, and the 2020 target was set for a 10% increase. However, just like the aerobic physical activity measures, this proportion increased to 22.6% in 2009 and climbed to 24.2% in 2010-2011, exceeding the 2020 target.

Objective 2.4 measures combined aerobic activity and strength training. This is a “Leading Health Indicator,” meaning it is part of a smaller set of objectives that communicates a high-priority health issue. In 2008, 18% of adults met the federal guidelines for aerobic and muscle strengthening activities. Healthy People targeted that 1 in 5 American adults would meet this recommendation by 2020, but American adults exceeded this target in 2010 with 20.6% of adults meeting the combined physical activity and muscle strengthening recommendation.

However, there is some concern that the NHIS self-reported physical activity may overestimate of the population level of physical activity, particularly as the physical activity trend is in the opposite direction expected, given the clear obesity trends. To provide an objective measure of physical activity, NHANES introduced accelerometer-based assessments in 2003. Troiano and colleagues found that adherence to physical activity recommendations using these accelerometer-based measures was substantially lower than self-report measures (2008), with only 5% of adults meeting the national guidelines. Another evaluation of NHANES physical activity measures between 2003 and 2006 focused on accelerometer-based sedentary behavior. Healy, Matthews, Dunstan, Winkler, & Owen (2011) defined sedentary time as <100 accelerometer counts per minute (cpm) and noted that sedentary time accounted for 8.44 hours (58%) of an average of 14.6 hours/day, while time spent in light or greater activity (>100 cpm) was .34/hours a day. The average person took non-sedentary breaks (mean=4 minutes) approximately every half hour. Both total sedentary time and prolonged sedentary time without breaks were associated with adverse cardio-metabolic risk profiles.
Youth Prevalence
 Objective PA-3.1 targets assessed aerobic activity, using data from the Youth Risk Factor Behavior Surveillance System, which asks 9-12 grade students if they were physically active for at least 60 minutes per day on seven of the past seven days. In 2009, 18.4% responded positively and the 2020 target was set for 20.2%.

Recognizing the benefits of muscle strengthening activity, Objective 3.2 will assess the proportion of adolescents who include muscle-strengthening as part of their daily physical activity on at least 3 days of the week. For children, these muscle-strengthening activities will often be unstructured and part of play, for example, climbing trees, or using playground equipment, for adolescents, these might involve play, or be something more structured like lifting weights or using resistance bands. Healthy People 2010 did not assess muscle strengthening activity in youth.

As with adults, Healthy People 2020 will track adolescents who engage in both aerobic physical activity and muscle-strengthening activity.

Screen Time. Time spent in front of a screen is most often sedentary and takes away from physical activity time. Also, more screen time is associated with adolescent obesity (Mitchell, Rodriguez, Schmitz, Audrain-McGovern, 2013), and potentially adverse health outcomes (Chinapaw, Proper, Brug, van Mechelen, & Singh, 2011). Objective PA-8 focuses on amount of screen time, and sets age-specific targets relative to recommendations for screen time.

Table 10-13 Healthy People 2020 Screen Time Objectives

<table>
<thead>
<tr>
<th>Number</th>
<th>Objectives</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA-8</td>
<td>Increase the proportion of children and adolescents who do not exceed recommended limits for screen time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-8.1</td>
<td>Increase the proportion of children aged 0 to 2 years who view no television or videos on an average weekday</td>
<td>44.7%</td>
<td>40.6%</td>
</tr>
<tr>
<td>PA-8.2</td>
<td>Increase the proportion of children and adolescents aged 2 years through 12th grade who view television, videos, or play video games for no more than 2 hours a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-8.2.1</td>
<td>Children aged 2 to 5 years</td>
<td>83.2%</td>
<td>75.6%</td>
</tr>
<tr>
<td>PA-8.2.2</td>
<td>Children and adolescents aged 6 to 14 years</td>
<td>86.8%</td>
<td>78.9%</td>
</tr>
<tr>
<td>PA-8.2.3</td>
<td>Adolescents in grades 9 through 12</td>
<td>73.9%</td>
<td>67.2%</td>
</tr>
<tr>
<td>PA-8.3</td>
<td>Increase the proportion of children and adolescents aged 2 years to 12th grade who use a computer or play computer games outside of school (for nonschool work) for no more than 2 hours a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-8.3.1</td>
<td>Children aged 2 to 5 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-8.3.2</td>
<td>Children aged 6 to 14 years</td>
<td>97.4%</td>
<td></td>
</tr>
<tr>
<td>PA-8.3.3</td>
<td>Adolescents in grades 9 through 12</td>
<td>82.6%</td>
<td>75.1%</td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS 2011)

The above baseline estimates for children and adolescents meeting the “screen time” objectives seem high, and at odds with a recent survey that reported that children and adolescents (eight to eighteen years old) average more than 7.5 hours a day with media, which outweighs time spent at almost any other activity (except maybe sleeping) (Kaiser Family Foundation, 2010). In the Kaiser survey, “screen time” includes all use of computer monitors, television screens, and handheld devices. Perhaps this discrepancy is
due to the Healthy People data source (questions from the Youth Risk Behavior Surveillance System), which may not have addressed screen time related to phones or other handheld devices where texting, checking social media, e-mail, etc. are common and likely occupy a large percentage of children’s time (see Table 10-13).

**Developmental Objectives for Active Transportation in Youth and Adults**

New Healthy People 2020 objectives recognize the importance of active transportation for increasing opportunities to be physically active (see Table 10-14). Walking or cycling to destinations also integrates physical activity into a daily routine, which helps overcomes the time barrier that many experience. Although walking to school used to be commonplace, this mode of active transport has decreased dramatically in the last 30 years, with only 16% of students walking or cycling to school in 2001 (Environmental Protection Agency, 2003). Objectives 13 and 14 focus on active transportation. Separate sub-objectives for youth and adults with the youth target to increase walking to school (if the trip is 1 mile or less) or cycling to school (if the trip is 2 miles or less). Walking or bicycling to school is an easy way for children to be physically active. This active transport is also associated with health benefits: children and youth who walk or bicycle to school have overall higher activity levels (Dollman & Lewis, 2007) as well as better body composition and cardiorespiratory fitness (Lubans, Boreham, Kelly, & Foster, 2011).

Table 10-14 Healthy People 2020 Active Transportation Objectives

<table>
<thead>
<tr>
<th>Number</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA-13</td>
<td>(Developmental) Increase the proportion of trips made by walking</td>
</tr>
<tr>
<td>PA-13.1</td>
<td>(Developmental) Adults aged 18 years and older, trips of 1 mile or less</td>
</tr>
<tr>
<td>PA-13.2</td>
<td>(Developmental) Children and adolescents aged 5 to 15 years, trips to school of 1 mile or less</td>
</tr>
<tr>
<td>PA-14</td>
<td>(Developmental) Increase the proportion of trips made by bicycling</td>
</tr>
<tr>
<td>PA-14.1</td>
<td>(Developmental) Adults aged 18 years and older, trips of 5 miles or less</td>
</tr>
<tr>
<td>PA-14.2</td>
<td>(Developmental) Children and adolescents aged 5 to 15 years, trips to school of 2 miles or less</td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS 2011)

**Onset of Inactivity**

The typical American is active as a toddler and child, less active as an adolescent, and increasingly sedentary as they move through their adult years. Technological innovations have been focused on reducing the effort and physical activity needed in daily life. There are clear life events that are associated with the onset of increased inactivity and sedentary behaviors. Examples include the following: when the adolescent gets a car to drive, when the adolescent or young adult stops playing competitive sport, when someone who is physically active sustains a permanent injury (e.g. knee for runners). A cross-sectional analysis using accelerometer-based data suggests that adolescence may be a critical period to intervene to prevent inactivity (Troiano, Berrigan, Dodd, Masse, Tilert, & McDowell 2008). Comparing children ages 6–11 with those aged 12–15, researchers noted that adherence to physical activity recommendations decreased from 49% to 12%
for boys and from 35% to 3% for girls. A focus on identifying critical periods and situations that increase the risk for inactivity will help identify potential interventions. Such a focus could also encourage people to make alternate plans to maintain their physical activity level through a substitute behavior.

Getting Sedentary People Active Again

Once a year, it is common for people who have become more sedentary than they would like to make a New Year’s Resolution to become more active, and this may represent as many as three quarters of those who are not physically active. Many purchase gym memberships. However, by February the enthusiasm has waned and it’s just the “regulars” in the gym. Of those who intend to increase their physical activity, approximately half achieve a meaningful increase. Very few of those who say they have no intention to change will actually increase their activity level (Rhodes & De Bruijn, 2013). There are many programs that help coach people to increase their physical activity level. Indeed, increasing physical activity is seen as a necessary component in most weight loss programs and has been identified as an essential ingredient in successful weight loss programs.

Strategies to Improve Physical Activity

Healthy People strategies to improve physical activity among Americans include objectives to improve access to physical activity facilities and promoting physical activity in schools.

Provide Incentives for Physical Activity. Although there are no objectives in Healthy People 2020 that focus on providing incentives to increase physical activity, it has been proposed in the literature (Hill, Peters, & Wyatt, 2007). Some countries are considering tax incentives to promote physical activity. Canada was the first country to institute a “Children’s Fitness Tax Credit” in 2007 (parents can claim up to $500 per child on their annual income tax returns for registration in sport and recreation activities). In the U.S., a proposed Personal Health Investment Today (PHIT) Act would allow tax deductions for athletic activities (for example, health club memberships or youth sports programs) (PHIT, 2009).

Currently there is limited data to suggest that income tax incentives change health behaviors. Criticisms are that the benefit is likely to be small (the Canadian credit is only around $75 per child), and isn’t a significant incentive. The substantial public funds for such programs might have greater influence is they were directed toward more immediate rewards (i.e., sales tax exemptions, rebates at point-of-sale, subsidized programing), or used to improve recreational facilities or physical activity programs in schools (von Tigersrom, Larre, & Sauder, 2011).

Interventions that Improve Access to Facilities Related to Physical Activity. Using the socio-ecological model, Healthy People 2020 recognizes the importance of access to facilities within the community that would make it easier to be physically active. Three objectives focus on this area (Table 10-14).
Table 10-14 Healthy People 2020 Objectives that Improve Access to Physical Activity Facilities

<table>
<thead>
<tr>
<th>Number</th>
<th>Objective</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA-10</td>
<td>Increase the proportion of the Nation’s public and private schools that provide access to their physical activity spaces and facilities for all persons outside of normal school hours (that is, before and after the school day, on weekends, and during summer and other vacations)</td>
<td>31.7%</td>
<td>28.8%</td>
</tr>
<tr>
<td>PA-12</td>
<td>(Developmental) Increase the proportion of employed adults who have access to and participate in employer-based exercise facilities and exercise programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-15</td>
<td>(Developmental) Increase legislative policies for the built environment that enhance access to and availability of physical activity opportunities, specifically, (15.1) community-scale policies; (15.2) street-scale policies; and (15.3) transportation and travel policies</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Healthy People 2020 (USDHHS 2011)

Most schools have playgrounds, tracks, playing fields, gyms, and pools that could provide opportunities for community members to be active, but most remain vacant beyond school hours. Joint use policies are a way for schools and communities to share spaces and facilities, but unfortunately, often there are no policies to encourage use of school facilities. Objective PA-10 focuses on joint use policies. In 2006, 28.8 percent of schools provided access to their physical activity spaces after hours: Healthy People 2020 targets 31.7 percent of schools accessible by 2020.

As many American adults spend most of their waking hours at work, workplaces are another setting that can play an important role in encouraging physical activity. Some research suggests that employment that encourages sitting for long hours may be contributing significantly to the high rates of obesity (Church, et al., 2011). Objective PA-12 addresses the need for occupational settings to encourage physical activity in workers, and aims to increase the proportion of employed adults who have access to and participate in employer-based exercise facilities and exercise programs. Workplaces could also consider “flextime” to give employees opportunities to be physically active while maintaining their work hours.

Although providing greater access to opportunities for aerobic or strength based activities in the workplace is important, the workplace is also an ideal setting for implementing strategies to reduce sitting time, or sedentary behavior. Workplace architectural design has not been well studied, but may provide another venue for discouraging sedentary behavior (McGann, Jancey, & Tye, 2013). For example, many buildings have prominently displayed elevators, with shiny and inviting doors that open with a finger touch to good lighting, music and carpeting; in contrast, stair entrances are harder to find, behind doors labeled as fire or emergency, that often open to concrete uninviting structures. Reducing sitting with workstations such as “standing” desks (height-adjustable workstations) or treadmill desks (employees work while walking at slow speed) is another new area of research targeting sedentary behavior that shows promise (Koepp et al., 2013). Behavior modification strategies are likely more feasible, and could include “walk-and-talk” meetings instead of conference room meetings, moving trash cans out of cubicles to make people walk to throw out garbage, or promoting standing when it is possible (for example, when talking on the telephone).

Objective 15 aims to increase legislative policies for the built environment that enhance access to and availability of physical activity opportunities, and will focus on
community-scale, street-scale, and transportation and travel policies. Policies that influence the design of a community can encourage physical activity. Policies that enhance access to physical activity opportunities include the following design elements: street crossing, lighting, parks, sidewalks, cycling lanes, walking trails, recreational facilities, and playgrounds. Several studies show that community, street, and transportation design can positively influence activity: people are 65% more likely to walk when sidewalks are available (Giles-Corti & Donovan, 2002); residents with safe places to walk were more likely to meet physical activity recommendations than those without safe places to walk (Powell, Martin, & Chowdhury, 2003), and residents of walkable neighborhoods report more weekly aerobic physical activity and are less likely to be overweight than residents of low-walkable neighborhoods (Sallis et al., 2009).

Transportation and travel policies are another way to encourage physical activity as part of a daily routine through active transportation. Examples of such policies could be (1) discouraging or reducing access to motor vehicle use (taxes, tolls, congestion pricing in downtown areas; reduce parking availability); (2) enhancing infrastructure to support bicycling (bike lanes, shared-use paths, bike racks); (3) enhancing infrastructure supporting walking (sidewalks, trails, pedestrian crossings); (4) improving access to public transportation (this could encourage physical activity as transit users walk or cycle to transit points); (5) enhancing traffic safety in areas where people could be physically active. Encouraging active transport to school for youth is another critical area that could benefit from policies. National funding through the Federal Highway Administration National Safe Routes to School Program should help the success of these policies and programs.

**Using Media to Promote Physical Activity.** Promoting physical activity through media campaigns is a way to encourage children or adults to become more active. An example of such a campaign in the $339 million VERB™ campaign to “help children develop habits to foster good health over a lifetime.” The campaign ran from 2002 to 2006 and targeted 9- to 13-year-olds using marketing strategies popular within this age group, with the goal of successfully competing with the multitude of other marketing directed at these children. The campaign positively influenced physical activity, built lasting awareness of the VERB brand with effects that persisted through teen years (Huhman et al, 2010), and was considered a great success on many fronts. Unfortunately funding for the campaign ended in 2006. Healthy People has no objectives related to using media to promote physical activity.

**Promoting Physical Activity in Schools.** This Healthy People 2020 emphasis reflects research and expert opinions that targeting the school environment to increase physical activity in youth should be a key strategy in health promotion (Pate, Davis, Robinson, Stone, McKenzie, & Young, 2006; National Research Council, 2013). The objectives in Table 10-15 address time for recess, regularly scheduled school recess, daily physical education in elementary schools, and physical activity policies in child care settings.
### Table 10-15 Healthy People 2020 Objectives to Promote Physical Activity in Schools

<table>
<thead>
<tr>
<th>Number</th>
<th>Objective</th>
<th>Target</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA-4</td>
<td>Increase the proportion of the Nation’s public and private schools that require daily physical education for all students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-4.1</td>
<td>Elementary schools</td>
<td>4.2%</td>
<td>3.8%</td>
</tr>
<tr>
<td>PA-4.2</td>
<td>Middle and junior high schools</td>
<td>8.6%</td>
<td>7.9%</td>
</tr>
<tr>
<td>PA-4.3</td>
<td>Senior high schools</td>
<td>2.3%</td>
<td>2.1%</td>
</tr>
<tr>
<td>PA-5</td>
<td>Increase the proportion of adolescents who participate in daily school physical education</td>
<td>36.6%</td>
<td>33.3%</td>
</tr>
<tr>
<td>PA-6</td>
<td>Increase regularly scheduled elementary school recess in the United States</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-6.1</td>
<td>Increase the number of States that require regularly scheduled elementary school recess</td>
<td>17</td>
<td>7 states</td>
</tr>
<tr>
<td>PA-6.2</td>
<td>Increase the proportion of school districts that require regularly scheduled elementary school recess</td>
<td>62.8%</td>
<td>57.1%</td>
</tr>
<tr>
<td>PA-7</td>
<td>Increase the proportion of school districts that require or recommend elementary school recess for an appropriate period of time</td>
<td>67.7%</td>
<td>61.5%</td>
</tr>
<tr>
<td>PA-9</td>
<td>Increase the number of States with licensing regulations for physical activity provided in child care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA-9.1</td>
<td>Require activity programs providing large muscle or gross motor activity, development, and/or equipment</td>
<td>35 states</td>
<td>25 states</td>
</tr>
<tr>
<td>PA-9.2</td>
<td>Require children to engage in vigorous or moderate physical activity</td>
<td>13 states</td>
<td>3 states</td>
</tr>
<tr>
<td>PA-9.3</td>
<td>Require number of minutes of physical activity per day or by length of time in care</td>
<td>11 states</td>
<td>1 state</td>
</tr>
</tbody>
</table>

**Source:** Adapted from Healthy People 2020 (USDHHS 2011)

Children and youth spend more time in schools than almost any other setting — with the exception of their homes — and if the child’s home environment does not encourage physical activity, the school may be the only chance for a child to be active. Another factor to consider is that much of the time at school is spent sitting, which is increasingly being recognized as a contributing to health problems, even in active individuals (Owen, Bauman, & Brown, 2009). Counteracting the effects of these extended periods of sedentary behavior in the school environment is critical. Increased time for recesses and regular physical activity classes are strategies that can help improve physical activity in schools, and Healthy People 2020 will monitor these measures.

Low levels of physical activity are common in child care settings, and levels of sedentary behavior are very high (Reilly, 2010). Healthy People 2020 recognizes that the child care environment is an ideal opportunity to promote physical activity, with objectives specifically related to the child care setting (Objective PA-9).

The lack of improvement in school physical activity in the last decade is cause for concern, since this venue has the potential to have a dramatic influence on physical activity in youth, hopefully establishing habits they’ll sustain through adulthood. Although schools have been faced with increasing pressure to focus on test scores and academic achievement since 2001’s No Child Left Behind Act (U.S. Department of Education, 2001), reducing resources and time allocated to physical activity might not be
in the best interest of children or schools. Besides the health consequences, youth who spend more time in physical education class do not have lower test scores than youth who spend less time in physical education class (Sallis, McKenzie, Kolody, Lewis, Marshall, & Rosengard, 1999) and some evidence suggests that being physically active can improve youth’s concentration, memory, and classroom behavior (Strong et al., 2005) and possibly promote higher levels of academic performance (Carlson et al., 2008).

The latest Institute of Medicine report (National Research Council, 2013) calls on the U.S. Department of Education to develop a consistent nationwide policy to help reverse the trend that has had schools reduce recess and physical education time to focus on standardized testing.

**Summary**

Government has an important interest in promoting health and preventing disease and strives to accomplish this interest without infringing on personal liberties. In the United States, the Healthy People initiative is the key document that addresses disease prevention and health promotion issues of public health significance. The Healthy People Initiative sets objectives for the decade and provides benchmarks to monitor progress for various health areas. An overarching goal of Healthy People 2020 is to create social and physical environments that promote good health, highlighting the importance of the socio-ecological model that informed the development and objectives of Healthy People 2020. This chapter reviewed progress on the Healthy People objectives for the areas of tobacco use, nutrition and weight status, and physical activity, and examined how policies can influence these lifestyle behaviors.

The influence of tobacco control policies on cigarette smoking has been a health promotion success story, with smoking rates continuing to decline over time. Although much progress still needs to be made (for example, over 50% of 3 – to 11-year olds were still exposed to secondhand smoke between 2005 and 2008), tobacco control efforts provide examples of strategies that can be used to influence change in other lifestyle behaviors. This chapter provided examples of policies that (1) provide incentives for healthy behaviors and disincentives for unhealthy behaviors, (2) control access to either products or facilities related to the behavior, (3) use media to promote healthy behaviors or discourage unhealthy behaviors and regulate industry marketing and promotion, (4) promote healthy behaviors in schools, and (5) regulate behavior-related products. Obesity has been increasing among adolescents and adults for at least the past 30 years, and there is little sign that the peak has been reached. Increases in childhood obesity are also a great concern. To change the overweight/obesity proportion requires reductions in calorie intake and increases in physical activity. Clearly, improvements in these behaviors have not been sufficient to influence the prevalence of overweight/obesity in the desired direction.

Overall, Americans are not consuming a health-promoting dietary pattern, and Healthy People set objectives focusing on increasing fruits, vegetables, whole grains, and calcium and decreasing intakes of saturated fat, total fat, and total sodium. Healthy people has no objectives that focus on incentivizing change in food intake patterns, or limiting advertising of unhealthy foods, although the evidence suggests such policies would be effective.
Self-reported physical activity has remained stable or increased slightly over the past decade, and progress toward Healthy People 2020 targets has already been achieved for several objectives, although there is worrying evidence of significant over-reporting. New objectives reflect the importance of the socio-ecological model for physical activity, and target environmental changes to make activities for physical activity more accessible to all.

It can be expected that the socio-ecological model will play an even bigger part in the next Healthy People Initiative. Also, the strategies that have been so well implemented in the tobacco control field will likely be increasingly used as a model for novel strategies to improve health in other major topic areas.

References


Giles-Corti, B., & Donovan, R. J. (2002). Relative influences of individual, social environmental, and physical environment determinants of physical activity. Social Science and Medicine, 54, 1793–1812.


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