



# The Role of Law and Policy in Achieving the Healthy People 2020 Nutrition and Weight Status Goals of Increased Fruit and Vegetable Intake in the United States



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### Preface

Law and policy are effective tools to improve health. However, many people may not be aware of the precise impact these tools can have on population health. Healthy People 2020 (HP2020) is a comprehensive set of 10-year national goals and objectives for improving the health of all Americans. This report is part of the Healthy People 2020 Law and Health Policy Project, which seeks to increase awareness about the role law and policy play in improving health. The project includes this series of reports to showcase evidence-based legal and policy interventions that impact public health and help to reach the HP2020 national health objectives. The reports highlight the practical application of law and policy to improve health in a variety of settings and across topic areas and are intended for diverse audiences including: community leaders, tribal leaders, government officials, public health professionals, health care providers, lawyers, and social service providers.

The Law and Health Policy Project seeks to raise awareness and understanding of the role of legal and policy strategies as tools to leverage to meet our national health goals and to help to create a society in which all people live long, healthy lives. Within the U.S. Department of Health and Human Services, the Office of Disease Prevention and Health Promotion (ODPHP) in the Office of the Assistant Secretary for Health leads the Law and Health Policy Project effort with guidance and support from the Centers for Disease Control and Prevention (CDC), including the CDC Public Health Law Program. The project was launched by the CDC Foundation with funding from the Robert Wood Johnson Foundation.

The series of reports, as well as other evidence-based products developed by this project, highlights laws and policies related to a diverse set of HP2020 topic areas. Each report discusses legal or policy strategies supported by empirical evidence that can help achieve specific HP2020 targets or objectives, focusing where possible on state, tribal, and local settings, and demonstrating how these approaches can improve health. The reports also feature community examples or “bright spot” case studies that illustrate how communities can use law and policy to meet their health improvement goals and achieve Healthy People targets. Up to 4 co-authors work on each report with assistance from a working group of experts from varying disciplines and practice areas relevant to the report; all parties involved are selected based on their background and subject matter expertise. Other groups, including the Healthy People 2020 Federal Interagency Workgroup (FIW)—the lead entity that guides the Healthy People 2020 process—the Healthy People 2020 topic area workgroups, and other project partners, provide input and support for these reports during their development.

## Introduction

Healthy People 2020 (HP2020), a comprehensive set of 10-year national goals and objectives for improving the health of Americans, has identified increasing intake of fruits and vegetables by individuals ages 2 years and older as important targets for overall population health.<sup>1,2</sup> Fruits and vegetables are key components of a healthful diet, which in turn is associated with lower risk for micronutrient deficiencies, being overweight or obese,<sup>3</sup> and chronic diseases such as heart disease,<sup>4</sup> diabetes,<sup>5,6</sup> stroke, and certain cancers.<sup>7,8,9,10,11</sup> The impact on health outcomes has been demonstrated across the lifespan, including for older adults.<sup>12</sup>

Despite this, only 1 in 10 U.S. adults eat the recommended amount of fruits or vegetables each day.<sup>13</sup> One in 10 American children between the ages of 2 and 17 do not consume fruits or vegetables at all on a daily basis.<sup>14</sup> Perhaps most concerning is that there was little or no detectable change in intake between 2005–2008 and 2009–2012 in the following areas: 1) the age-adjusted mean daily intake of fruits by persons ages 2 years and older; 2) the age-adjusted mean daily intake of total vegetables by persons ages 2 years and older; or 3) the age-adjusted mean daily intake of dark green vegetables, red and orange vegetables, and beans and peas by persons ages 2 years and older.<sup>15,16</sup>

Increased intake of all vegetable subgroups, especially dark green, red, and orange vegetables and legumes, and increased intake of whole fruits is needed.<sup>17</sup> For these reasons, HP2020 calls for the Nation to increase the mean daily intake of fruit per person from 0.53 to 0.93 cup equivalents\* per 1,000 calories and vegetables from 0.76 to 1.16 cup equivalents per 1,000 calories by 2020.<sup>18</sup>

Along with low levels of fruit and vegetable intake in the U.S. population overall, there are significant disparities by race, ethnicity, geography, and socio-economic status. Disparities in access to and intake of healthier foods and beverages exist across a variety of demographic characteristics including age, race and ethnicity, educational attainment, income level, and geographic location.<sup>19,20,21</sup> Individuals with lower

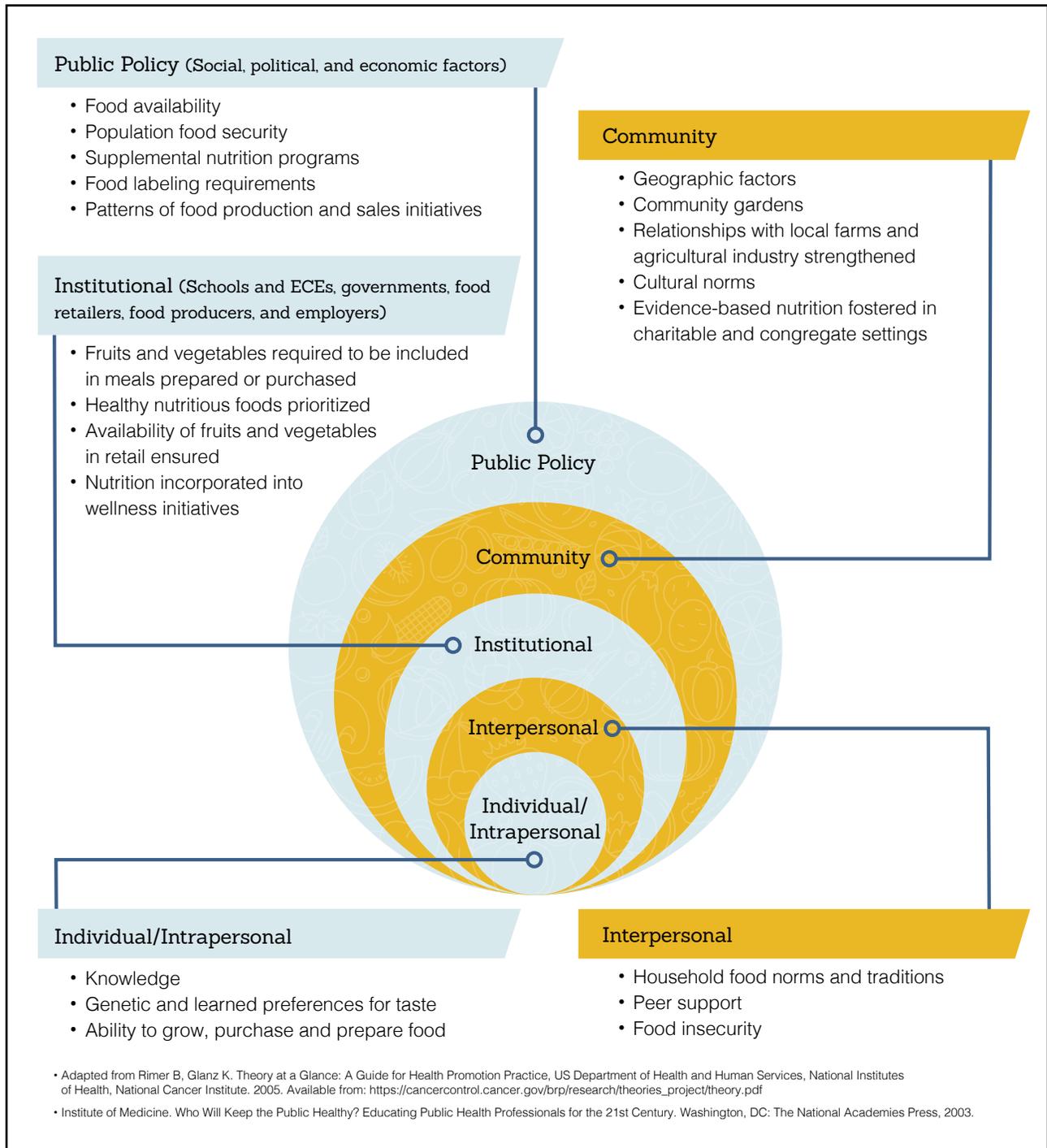
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\*A cup-equivalent identifies the amount of various foods from the same food group with an equivalent nutrient content. For more detail see the 2015-2020 Dietary Guidelines for Americans, which is discussed later in the report.

socio-economic status are less likely than individuals from other groups to consume the recommended number of servings of fruits and vegetables.<sup>22, 23</sup> There is also variation between states.<sup>24</sup> For example, adults in Oregon and the District of Columbia have the highest median times per day of consuming vegetables and Oregon and Alaska have the highest rates of meeting recommendations for vegetable intake.<sup>25</sup> Additionally, at a national level, some progress is occurring as policy and law change to support fruit and vegetable consumption. The proportion of school districts that required schools to offer fruits or vegetables to students increased from 6.6% in 2006 to 16.3% in 2016, moving toward the HP2020 target, and 29% of schools recommended the practice.<sup>26</sup> The number of states that had state-level policies to incentivize food retail outlets to provide foods encouraged by the Dietary Guidelines for Americans (objective NWS-3) increased from 8 states in 2009 to 10 states in 2011, moving toward the HP2020 target.<sup>27</sup>

Dietary patterns, including fruit and vegetable intake, are influenced by many factors, not only individual behavior. These factors include: household and family norms; the ability to prepare foods; genetic or learned taste preferences; the availability of foods where people live, work, and study; community resources, such as public transit or sidewalks to access grocery stores; cultural norms and determinants of health; and the social, political, and economic factors that shape the overall food environment (Figure 1). These interrelated factors, reflected in the social-ecological model (SEM) of health, emphasize linkages and relationships among these multiple factors or determinants affecting health. This includes factors that influence healthy dietary patterns to help individuals consume the recommended amounts of fruits and vegetables.<sup>28</sup> Laws and policies shape all layers of the SEM and influence a wide range of health outcomes, including fruit and vegetable intake.<sup>29, 30</sup> Laws and policies also both positively and negatively influence prevention and disparities across racial and ethnic groups, geography, and socio-economic status.<sup>31, 32</sup>

Figure 1. Factors that shape fruit and vegetable access and intake



This report focuses on the major laws and policies associated with the Nutrition and Weight Status (NWS) topic area of HP2020 and specific objectives related to increasing fruit and vegetable intake for those in the U.S. ages 2 years and older.<sup>33</sup> Objective NWS-14 addresses total fruit intake.<sup>34</sup> NWS-15.1 targets total vegetable intake, and NWS-15.2 recommends increasing intake of dark green vegetables, red and orange vegetables, and beans and peas in the diets of the population ages 2 years and older.<sup>35, 36</sup> This report also includes information relevant to objectives NWS-12, which calls to “eliminate very low food security among children,” and NWS-13, which focuses on reducing household food insecurity and hunger. These 2 objectives are also included in the HP2020 Social Determinants of Health (SDOH) topic area to reflect food insecurity—one of the 19 key issues identified by the topic area as part of its overall place-based approach to the SDOH.<sup>†37</sup> Improving food security and strengthening communities by increasing access to healthy foods are important ways to increase fruit and vegetable consumption in the U.S.<sup>38</sup>

This report aims to provide information to decision-makers, public health professionals, educators, scientists, researchers and stakeholders, and others about law and policy strategies that can increase the supply of, access to, and consumer demand for fruits and vegetables. The report is particularly focused on children, where there are significant opportunities to shape lifelong health behavior, and on underserved communities and in community settings where there is increased potential to reach a wide population of all ages. This includes early care and education (ECE) settings, public schools, and other institutions, such as those that may serve older adults. Public schools are given special attention in this report due to the large number of children able to be reached; the proportion of a child’s time spent in school; and recent comprehensive changes to school nutrition policy.

The report also discusses laws and policies that shape community-based access to fruits and vegetables. These types of laws and policies include retail access and major U.S. Department of Agriculture (USDA)

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† As described in Healthy People, social determinants of health are conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks. Conditions (e.g., social, economic, and physical) in these various environments and settings (e.g., school, church, workplace, and neighborhood) have been referred to as “place.” In addition to the more material attributes of “place,” individuals’ patterns of social engagement and sense of security and well-being are also impacted by where they live.

programs, specifically the National School Lunch Program (NSLP) and the National School Breakfast Program (NSBP); Supplemental Nutrition Assistance Program (SNAP); SNAP-Nutrition Education and Obesity Prevention Grant Program (SNAP-Ed); Child and Adult Care Food Program (CACFP); Commodity Supplemental Food Program and Senior Farmers' Market Nutrition Program (SNMP); the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); Cooperative Extension programs such as the Expanded Food and Nutrition Education Program (EFNEP); and the major HHS nutrition programs for older adults—the Older Americans Act Title III Nutrition Program and Title VI Nutrition Program. The report concludes with a summary of emerging policy opportunities and recommended areas for additional research.

## How Law and Policy Influence Fruit and Vegetable Intake

Laws and policies at the federal, state, tribal, and local levels can shape the environment and systems that influence health behaviors, access to healthful choices, and population-level health outcomes, including fruit and vegetable intake. The mechanisms by which this influence occurs can be grouped into the following broad categories or models for legal interventions by governments to promote and protect the public's health:

- Taxing and spending on specific programs
- Direct regulation of persons, professionals, and businesses
- The power to alter the built (or existing) environment
- The power to alter the socio-economic environment
- The power to alter the informational (and educational) environment
- Deregulation when laws act as a barrier to health.<sup>39</sup>

**Examples of each are listed in Table 1.**

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† Parentheticals added for explanatory purposes.

### Role of Government in Enacting Law and Policy

Federal, state, tribal, and local governments each have unique opportunities to use these powers as policy levers to shape access to fruits and vegetables. For example, while public health is primarily a state issue, Congress has the authority to influence public health through the authority provided by the U.S. Constitution and has historically exercised it when necessary. This includes the wide-reaching authority to impose taxes and spend funds, and the ability of the legislative branch to regulate interstate commerce. The power to tax and spend enables the federal government to drive policy at the state level by setting conditions that states must accept, within limits, in order to receive federal funds.<sup>41</sup> For example, in the 1970s, recognizing the important role of nutrition in early brain development, Congress enacted the laws that enable the operation of state WIC programs.<sup>40</sup> In another example, to participate in the NSBP and NSLP, states must ensure that participating school districts and schools follow national nutrition standards that include requirements related to offering and serving fruits and vegetables.

The power to regulate interstate commerce allows the federal government to engage in activities such as regulating food processing and distribution. When the federal government exercises its authority to regulate a field such as food processing, less stringent or conflicting regulation by lower levels of government is generally limited or preempted. Preemption is a legal principle that provides that a higher level of government may limit, or even preclude, the authority of a lower level of government to regulate a certain issue. While the term preemption is often used to describe federal laws that supersede state law, thus eliminating the state's ability to act, preemption can also occur when state laws prevent localities from regulating certain issues.<sup>41</sup>

Tribal governments also have the authority to enact laws, policies, and regulations with the potential to increase fruit and vegetable intake.<sup>42, 43</sup> For example, several tribes participating in the Healthy Native North Carolinians Network, which collaborates to facilitate sustainable community changes around healthy eating and active living,<sup>§44</sup> are currently committing tribal lands to community gardens. Others are

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§The tribes participating in the Healthy Native North Carolinians Network are the Coharie Indian Tribe, Haliwa-Saponi Indian Tribe, Lumbee Tribe of North Carolina, Meherrin Indian Nation, Occaneechi Band of the Saponi Nation, Sappony, and the Waccamaw Siouan Tribe.

operating tribal-led farmers' markets, and have considered relevant legal issues such as zoning.<sup>43</sup> Both of these examples demonstrate how tribes may use laws and policies to increase fruit and vegetable consumption.

State governments play a central role in the development and execution of public health laws and policies. In the U.S., states have the primary responsibility and authority for protecting and promoting the health, safety, morals, and general welfare of their inhabitants.<sup>45</sup> This authority, known as “police power,” is an implicit and inherent power of state governments and is clearly reserved to the states under the Tenth Amendment to the U.S. Constitution.\*\* The ability to protect public health is a traditional function of police power.<sup>46</sup> State authority on public health matters is generally considered to be primary unless preempted by federal law.

Similar to the federal government, states can use their power to tax and spend to shape public health policies that enhance fruit and vegetable intake. Conditional funding for programs and interventions is one common way that states execute this authority. Conditional funding occurs when states set requirements that entities must meet in order to receive certain funds. For example, if a state provides funding for a Healthy Food Financing Initiative (HFFI), it might require recipients to agree to provide fresh fruits and vegetables in grocery stores that will be developed or upgraded using HFFI funding. Another example is within Administration for Community Living (ACL) programs funded by the Older Americans Act (OAA). The OAA requires State Units on Aging identified in OAA §305 to codify a process that ensures funded meals comply with the most recent Dietary Guidelines for Americans. It also requires these units to provide to each participating older individual a minimum of 33.3% of the dietary reference intakes established by the Food and Nutrition Board of the National Academy of Medicine (formerly the Institute of Medicine).<sup>47</sup>

Local governments are political subdivisions of states and generally have only those powers authorized under state constitutions or by statutes passed by a state legislature. Nearly all states delegate at least some police power authority to counties, county equivalents, and

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\*\* Specifically, under the Tenth Amendment of the Constitution, “The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.”

sometimes municipalities; some state constitutions have delegated significant authority to counties and large cities, usually known as “home rule” authority, which can be used to address public health matters.<sup>48</sup> Questions about the scope of this authority and the extent to which local authority is preempted by state or federal law occur regularly. Nonetheless, issues such as land use and zoning laws, which are most often decided at the local level, play a significant role in access to fruits and vegetables. For example, zoning laws determine where grocery and other food retail establishments may be located; the walkability of access routes to grocery and food retail establishments; where farmers’ markets may be held; and whether food may be sold on farmland. How land use is zoned dictates what the land can be used for. Zoning and land use laws can allow uses that increase access to fruits and vegetables by allowing the development of food retail and encouraging urban agriculture and community gardens. Conversely, laws can prohibit these types of uses in certain neighborhoods, which limits access.

**Table 1. Examples of Use of Policy Levers to Promote Fruit and Vegetable Access and Intake**

Policy Lever	Example
<p>Taxing and spending on specific programs</p>	<p>Navajo Nation: Government’s power to tax and spend can be used to influence consumer behavior. In 2014, the Navajo Nation used tax policy to incentivize healthy foods.<sup>49</sup> They eliminated the existing 5% sales tax on healthy foods<sup>††</sup> such as fresh fruits and vegetables, nuts, water, and culturally significant foods. A separate public ruling enacted a 2% sales tax on foods and beverages of “minimal-to-no nutritional value” sold within the borders of the Navajo reservation. The items taxed are “sweetened beverages and prepackaged and non-prepackaged snacks stripped of essential nutrients and high in salt, saturated fat, and sugar....”<sup>50</sup> The proceeds of the tax are used for community wellness projects, including farming and vegetable gardens, farmers’ markets, and convenience stores stocking healthful products. Both of these initiatives were designed to change the eating behaviors of tribal members and to further efforts at eliminating food deserts and other barriers to healthy food access.</p>
<p>Direct regulation of persons, professionals, and businesses</p>	<p>Minneapolis, MN: Local governments may use their licensing authority to set stocking requirements for food stores. In one Minnesota jurisdiction, Minneapolis, a Staple Foods Ordinance was adopted by the City Council. The Ordinance requires most small food stores and grocery stores to stock a minimum number of healthy “staple foods” with specific requirements for fruits and vegetables.<sup>51</sup></p>
<p>The power to alter the built (or existing) environment</p>	<p>Washington, D.C.: To help increase access to grocery stores and establishments such as restaurants and food stands that sell fresh fruits and vegetables, communities can adopt ordinances that prevent property owners from restricting future development of grocery stores on their land.<sup>52</sup> In 2015, Washington, D.C., adopted a temporary resolution to prevent the lease or sale of retail locations with a covenant prohibiting another grocer from opening, in order to encourage access to fresh fruits and vegetables.<sup>53</sup></p>

†† On July 1, 2018, Navajo Sales Tax increased from 5% to 6%. See <http://www.tax.navajo-nsn.gov/>.

<p>The power to alter the socio-economic environment</p>	<p>Illinois: States and localities can alter the socio-economic environment by providing access to resources. For example, the Illinois Farmers' Market Technology Improvement Program Act established a program to increase access to fresh fruits and vegetables and other eligible food products by allowing SNAP recipients to redeem benefits at farmers' markets. The Act also created a fund to help purchase or rent wireless Electronic Benefit Transfer terminals, pay for fees associated with SNAP card use, and provide education and outreach to SNAP recipients.<sup>54</sup></p>
<p>The power to alter the informational (and educational) environment</p>	<p>Nationwide: Government has the power to provide information to consumers. Congress passed a national menu labeling law in March 2010. On December 1, 2014, the Food and Drug Administration finalized and published the federal menu labeling rule. The rule required calorie count information to be posted on menus at certain chain restaurants and other venues by May 2018. Consumers now have more information to make healthy food choices at restaurants and similar retail food establishments with 20 or more outlets nationally, as well as settings such as sports arenas and movie theaters. The federal law preempts most state and local menu labeling laws.<sup>55, 56, 57</sup></p>
<p>Deregulation when laws act as a barrier to health</p>	<p>San Francisco, CA: Local governments can update land use and zoning codes to support healthy food access goals. In 2011, San Francisco revised old zoning laws that made it illegal to sell homegrown produce without a costly permit and a hearing in front of the City Planning Commission. The revised planning code streamlines the process for produce sales and encourages edible gardening and urban farming in the city.<sup>58</sup></p>

## Legal Barriers to Fruit and Vegetable Intake

Laws and policies may also decrease access to and intake of fruits and vegetables, directly or indirectly. While direct limitations or barriers in laws are not common, there are several notable examples of laws that indirectly reduce intake. For example, before 2012, federal school meal standards did not reflect the daily serving recommendations in the 2010 Dietary Guidelines for Americans. This contributed to lower intake of fruits and vegetables among children, particularly those from low-income families who consumed the majority of their calories through school meals.<sup>59</sup>

In another example, researchers have found that in many low-income communities, zoning laws may serve as a barrier to the development of healthy and affordable food retail outlets. While at times zoning laws may proactively allow or prohibit food retail establishments, it is important to keep in mind that zoning ordinances that do not specifically reference particular types of use or needs (meaning that they are “silent” on a use) may also be barriers to property owners, as processes for granting variances can be cumbersome and time consuming.<sup>60</sup> For example, after 2013 in Los Angeles County, farmers’ markets are defined in the zoning code and allowed by right in many different zones, and are thus no longer required to pay zoning permit fees; for farmers’ markets seeking to locate in particular residential zones, a minor conditional use permit is required, at a cost of \$1,621.<sup>61</sup> While this cost is significant, if the use were not defined and a conditional use permit process were required to receive a zoning permit prior to operation, the cost would be \$9,473.<sup>62</sup> Alternatively, if a temporary use permit were to be required, instead of a conditional use permit, the cost would range up to \$3,094, there would be restrictions on frequency of operation, and additional temporary use fees would need to be paid annually. These types of costs, as well as the complexity of related processes, may contribute to systematic disparities in access to, and therefore intake of, fruits and vegetables in some communities.

## Laws and Policies Across Various Types of Community Settings

The next section of this report explores laws and policies that influence fruit and vegetable access and intake in a variety of community settings. The settings selected include places recognized for the potential to reach large segments of the population, including vulnerable populations. This includes ECE settings, public primary and secondary schools, government-owned properties, public and private worksites, and retail settings.

### Early Care and Education Settings

Infancy and early childhood have a significant influence on a child's lifelong health, education, and employment trajectories.<sup>63, 64</sup> Among all 2- to 5-year-olds, in 2013–2016, 11.6% were obese, which is defined as a body mass index (BMI) at or above the 95th percentile.<sup>65</sup> The problem was more pronounced among Hispanic (16.5% obese) than black (11.6% obese) and white (9.9%) 2- to 5-year-olds. One of the first studies to estimate prevalence among American Indians/Alaskan 4-year-olds found these children experience obesity twice as often as non-Hispanic white or Asian children.<sup>66</sup> Healthy eating in early childhood, including consuming recommended levels of fruit and vegetables, is critical to the establishment of subsequent healthy dietary patterns. Less-healthy patterns in early childhood are also associated with children's fruit and vegetable intake and weight status.<sup>67</sup>

Young children's dietary patterns, including fruit and vegetable intake, are influenced significantly by child care providers.<sup>68</sup> To provide care for infants and young children, the majority of working families rely on ECE settings, including pre-kindergarten education.<sup>69</sup> In fact, an estimated 75% of children under the age of 6 attend some type of ECE program. Nationally, around 13% of children ages 0–4 years participating in all ECE programs were served in settings that are not licensed.<sup>‡‡70</sup> ECEs offer a critical opportunity to influence a child's lifelong health.<sup>§§</sup>

‡‡Weighted calculation using estimates of child population ages 0–4 years from KidsCount data center (child population by age group) and Administration for Children and Families, FY2015 Final Data Table 4 - Average Monthly Percentages of Children Served in Regulated Settings vs. Settings Legally Operating Without Regulation (published March 8, 2018).

§§ Unlicensed home or other child care settings are also important opportunities to influence children's nutrition and weight status; however, due to the limited data available and the lack of regulation of non-licensed settings, this report uses the term ECE to mean licensed child care providers.

While laws and regulations at the federal and state level play an important role in ECE food and nutrition environments, institution-level policies can also play a significant role. Licensed ECEs, which are generally located in commercial stand-alone centers, schools, or homes, must comply with requirements and standards imposed by the state. In some cases, these sites must also comply with requirements for federal sources of funding, such as Head Start or USDA's Child and Adult Care Food Program (CACFP). The CACFP provides assistance to day care institutions (child and adult) for nutritious foods that contribute to health and wellness, and it sets minimum requirements for dietary meal patterns at participating sites.<sup>71</sup> The CACFP reimburses providers for the daily meals of more than 4 million infants and children in ECE settings.<sup>72</sup> The CACFP also provides meals annually for more than 130,000 older and chronically ill adults. Evidence suggests centers participating in the CACFP serve more nutritious meals and snacks than those not participating in the program.<sup>73</sup> Regulations governing CACFP meal patterns were updated in 2016 to ensure a greater variety of fruits and vegetables, more whole grains, and less added sugars and saturated fat.<sup>74</sup>

In addition to the CACFP and the nutrition standards put forth for Head Start child care centers, states play a significant role in regulating child care settings through licensure statutes and regulations.<sup>75, 76, 77</sup> All states operate programs to license ECE settings, although the requirements for licensure vary significantly, especially as they pertain to nutrition.<sup>78</sup> Many states have also implemented quality rating and improvement systems (QRIS) to incentivize providers to improve quality. While most QRIS programs do not include nutrition standards, 9 states have set QRIS standards for nutrition and physical activity.<sup>79</sup> To address the need for these types of approaches nationally, policy research organizations have created a variety of documents, including the Model Childcare Licensing Statute for Obesity Prevention to guide state policymakers and state-level advocates in identifying opportunities to adopt legislation that could reduce childhood obesity through child care licensing approaches.<sup>80, 81</sup> Many states have adopted laws restricting the availability of low-nutrition, energy-dense foods in schools and mandating physical activity in schools. Yet few states have similar policies for child care settings. The Model Childcare Licensing Statute for Obesity Prevention sets standards for physical activity, nutrition, and screen time as part of child care providers' licensing requirements.

In addition, some state health departments are developing innovative partnerships with their ECE regulatory agencies to promote policy approaches to nutrition, including fruit and vegetable intake, at the facility level. For example, state health departments operate initiatives in collaboration with ECE state regulatory agencies to promote adoption of voluntary policies and practices to increase fruit and vegetable intake within ECEs.<sup>82, 83</sup> These can include center-level policy change training programs and efforts to connect ECEs to fresh fruits and vegetables, such as Georgia's Growing Fit and Farm to Preschool programs. In addition, some state and local non-profit organizations offer voluntary accreditation criteria for early learning programs and facilities that adopt standards designed to increase intake of healthy foods.<sup>84</sup> For example, the Healthy Apple Program of the San Francisco Child Care Wellness Collaborative formally recognizes providers for meeting best practices, including a focus on healthy eating.<sup>85</sup> The recognition standards and process used in the Healthy Apple Program appear to increase attention on and awareness of healthy eating among staff and families at participating centers.

### Public Primary and Secondary Schools

Public primary and secondary schools provide an unparalleled opportunity to influence the eating habits of millions of children from kindergarten through grade 12, including the intake of fruits and vegetables. Through the NSLP and NSBP, participating schools provide meals and snacks to millions of students across the country. In 2015, 30.5 million children participated in the NSLP and 14 million participated in the NSBP on a daily basis.<sup>86</sup> Precursors of the national child nutrition programs began in the 1850s; their purpose was to ensure adequate minimum nutrition in the U.S. for children living in poverty.<sup>87</sup> Investing in school nutrition has an impact on short- and long-term health, as well as academic outcomes.<sup>88</sup> For children, there is an association between diet, physical activity, and academic performance. Poorly nourished, overweight, sedentary, and/or hungry children tend to have weaker academic performance and to score lower on standardized achievement tests than their counterparts.<sup>89, 90</sup>

To maximize the potential to achieve good nutrition in school settings for all children, researchers, policymakers, school nutritionists, school food directors, and advocates have worked for decades on a range of strategies to improve the school food environment. Every 5 years, Congress must vote to reauthorize the federal child nutrition programs,

which include the school nutrition programs. In 2010, as part of the reauthorization process, significant changes were made to the school nutrition programs through the Healthy Hunger-Free Kids Act (HHFKA).<sup>91</sup> Participating schools were required to make a variety of changes to better align food offerings with the recommendations in the 2010 Dietary Guidelines for Americans, especially by increasing the number of servings of fruits and vegetables in school meals.<sup>92</sup> As discussed in greater detail below, the HHFKA includes 3 evidence-based strategies that support children's increased intake of fruits and vegetables: 1) establishing nutrition standards for all food sold and served on school grounds to ensure that students receive healthy meals and snacks throughout the school day; 2) requiring that students take a fruit and vegetable in order for a meal to qualify for reimbursement; and 3) providing increased funding for nutrition programs to provide access to nutritious food for all students regardless of household income. Several studies have evaluated students' food selection and intake since the updated nutrition standards were introduced and found that students are selecting and consuming more fruits and vegetables.<sup>93, 94</sup>

### Federal Funding Supporting the Provision of Fruits and Vegetables in Schools

The USDA Food and Nutrition Service (FNS) administers the NSLP and NSBP by reimbursing states for participating in the programs. States, in turn, allocate reimbursement to participating schools based on the numbers of paid, reduced, and free meals served that comply with program requirements. The HHFKA authorized increased reimbursement rates to allow for the new provisions requiring more servings of fruits and vegetables.<sup>95</sup> To assist schools in implementing the program, USDA provides technical assistance to states through the Team Nutrition Grants. These grants can be used for nutrition education, training, and technical assistance activities to support implementation of the USDA nutrition standards for meals and snacks offered through the child nutrition programs (e.g., NSLP, NSBP, and CACFP).<sup>96</sup> In addition to reimbursing schools for meals served, USDA also provides commodities credits to schools based on the number of lunches served. The commodities program,<sup>97</sup> now called USDA Foods, offers over 180 foods, including a wide variety of fruits and vegetables, to financially assist

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<sup>91</sup>The HHFKA, in addition to providing access to healthy food and setting nutrition standards, requires each school district to adopt a local wellness policy that addresses nutrition education and promotion.

schools in meeting the new, more rigorous meal standards established by USDA. One rapidly growing component of the USDA Foods program, called DOD Fresh,<sup>98</sup> takes advantage of the Department of Defense's infrastructure, including their procurement and distribution expertise and negotiating power, to provide fresh fruit and vegetables to schools at an affordable price for use in breakfast and lunch programs. DOD Fresh is increasingly supplying locally or regionally grown fruits and vegetables, thus encouraging the regional production of these foods. The program started as a pilot in 1996 and by 2010 had expanded to 45 states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam, with spending of \$66 million.

In addition to reimbursement for school meals, Congress provides additional support for the provision of fruits and vegetables in schools through discretionary programs. USDA's Fresh Fruit and Vegetable Program (FFVP) is one example. Authorized by Congress in 2002 as a pilot program to help schools in areas that have the most difficulty accessing fruits and vegetables due to geography and/or affordability, the program is now available to students throughout the U.S., although it is only open to a limited number of school districts each year due to funding caps.<sup>99</sup> Spending for the program in school year 2016–2017 was \$185 million.<sup>100</sup> The FFVP provides free fresh fruits and vegetables to students in participating elementary schools (those with the highest free and reduced-price lunch enrollment) during the school day outside of the school meal programs. A recent study found that the FFVP contributed to increases in student fruit and vegetable intake during the school day and also influenced intake outside of school.<sup>101</sup> Similarly, California's Fresh Start Program, enacted in 2005, provided a serving of fresh fruit or vegetables with the school breakfast.<sup>102</sup> Although the program did not measure fruit and vegetable consumption, evaluation data showed a 46% increase in the average number of fruits offered to students per day compared with the year before, and students eating school breakfast took more than twice as many servings of fresh fruits during the program than before it began. Outcomes from California's Fresh Start Program can inform national efforts to increase fruits and vegetables in the NSBP.<sup>103</sup>

Federal funding is also available to NSLP schools to purchase equipment to prepare nutritious food.<sup>104,105</sup> To be eligible for funding, schools must demonstrate that they do not have adequate equipment such as refrigeration units and salad bars to prepare nutritious healthy food on site. In many schools, new equipment such as refrigeration units

and salad bars enables them to handle and serve more fresh fruit and vegetables. In addition, more braising pans, ranges, and cooktops enable the cooking of fresh ingredients rather than the offering of pre-processed heat-and-serve food. A recent study examining school equipment needs found many schools are still challenged in preparing fresh ingredients. About one-quarter to one-third (27 to 34%) of schools surveyed said the existing equipment in their school kitchens was inadequate for receiving and storing fruits and vegetables.<sup>106</sup>

Federal funding has also supported important research on the school food environment.<sup>107, 108</sup> For example, USDA conducts periodic School Nutrition Dietary Assessment studies and School Food Purchase studies, which provide detailed nationally representative data on foods available at schools, in addition to foods eaten at school and on school days. Research has also demonstrated the importance of environmental, policy, and system changes in enhancing school food.<sup>109, 110</sup> CDC's School Health Profiles and School Health Policies and Practices Study are additional tools to support school food monitoring systems.<sup>111</sup>

### School Meal Nutrition Standards

Before the HHFKA was passed in 2010, meals served under the NSLP and NSBP provided fewer servings of fruits and vegetables than the Dietary Guidelines recommended.<sup>112</sup> The HHFKA granted USDA the authority to align the serving sizes for fruit and vegetables in school meals with the most recent Dietary Guidelines for Americans.<sup>113, 114</sup>

A 2008 study using a nationally representative sample found only half of schools participating in the NSLP offered fresh fruits and vegetables on a daily basis, although there never has been (and continues to be) no requirement that fruits and vegetables be fresh.<sup>115</sup> Several studies have evaluated students' food selection and intake since the updated nutrition standards were introduced and found that students are selecting and consuming more fruits and vegetables.<sup>116, 117</sup>

The HHFKA amended the National School Lunch Act and Child Nutrition Act, establishing a baseline for nutrition standards nationwide. And while the role of federal law is significant, states and localities still have the flexibility and authority to implement stronger nutrition standards. Before the HHFKA was passed, a number of states passed laws setting school nutrition standards that were stronger than the federal standards. Researchers studying these state laws found that stricter standards were associated with lower obesity rates.<sup>118</sup> In California, an evaluation

of child BMI trends showed a reduction in rates of increasing BMI change after competitive food standards were implemented.<sup>119</sup> State laws that required fruits and vegetables in school meals were positively associated with actual fruit and vegetable intake, particularly among students with limited access to fruits and vegetables at home.<sup>120</sup> State experimentation can lead to policy improvements. Indeed, these studies provide evidence that suggests whether at the federal, state, tribal, or local level, government action to set strong and specific nutrition standards for school food can increase student fruit and vegetable intake.

In addition to impacting meals, the HHFKA required USDA to update nutrition standards for snack foods and beverages (“competitive foods”) sold at schools. The standards addressing these foods, known as Smart Snacks in School,<sup>121</sup> encourage provision of healthier snack foods, including fruits and vegetables. As with school meals, stronger nutrition standards for competitive foods result in better nutritional choices by students.<sup>122</sup> Table 2 provides a summary of school food standards pertaining to fruits and vegetables before and after the adoption of the HHFKA.

Implementation of the HHFKA has included challenges, as detailed in a 2014 report by the U.S. Government Accountability Office (GAO).<sup>126</sup> The report found that student participation in the school lunch program declined between 2010 and 2013. State and local officials believed that changes to lunch content, the nutrition requirements, and federally required increases to lunch prices resulted in the reduced program participation. Other challenges to the law have included the claim that nutrition standards generate excessive food waste because children will not eat healthy food.<sup>127</sup> However, both a 2014 study and a 2015 study by different authors found that participating students ate more fruit and threw away less of the entrees and vegetables after USDA’s healthier school meal standards went into effect than they did before implementation of the new standards.<sup>128</sup> Additionally, a 2015 report published by CDC examined school-level practices to increase the availability of fruits and vegetables and found that from 2000 through 2014, the percentage of schools offering both 2 or more fruits and 2 or more vegetables every day at lunch increased significantly.<sup>129</sup>

**Table 2. Kindergarten to Grade 12 Fruit and Vegetable Federal Nutrition Standards**

School Breakfast <sup>123</sup>		School Lunch <sup>124</sup>		Competitive Food <sup>122</sup>		2015–2020 Dietary Guidelines for Americans <sup>125</sup>
Before HHFKA	After HHFKA	Before HHFKA	After HHFKA	Before HHFKA	After HHFKA	
½ cup of fruit per day (vegetable substitution allowed)	1 cup of fruit per day (vegetable substitution allowed)	½–¾ cup of fruit and vegetables combined per day	½ cup of fruit (1 cup for grades 9–12) per day plus ¾ cup of vegetables (1 cup for grades 9–12) per day <sup>a, b</sup>	None, state policy	Acceptable sold foods include items that contain at least ¼ cup of fruit and/or vegetables or have as the first ingredient a fruit or vegetables <sup>c</sup>	Consume about 2.5 cups of vegetables daily and approximately 2 cups of fruit and juices daily, and eat a variety of vegetables, especially dark green, red, and orange

<sup>a</sup>Students are allowed to select ½ cup of fruit or vegetables under Offer versus Serve (OVS). OVS allows students to decline some of the food included in a reimbursable lunch or breakfast to reduce waste and to decline foods they do not plan to eat. A major change in the new standards is that children (even under OVS) must take at least ½ cup of fruit or vegetables. Previously, students only had to take 3 components and could potentially have a meal with no fruits or vegetables.

<sup>b</sup>Additional requirements for the type of vegetables offered are in place by grade level. For dark greens, beans/peas (legumes), and starches, schools must offer all students ½ cup per week. For red and orange vegetables, schools must offer ¾ cup per week for grades K–8 and 1¼ cup per week for grades 9–12. For other types of vegetables, schools must offer ½ cup per week for grades K–8 and ¾ cup per week for grades 9–12.

<sup>c</sup>Other acceptable items are “whole grain–rich” grain products and products that have a dairy product or protein food as the first ingredient.

## Nutrition Education and Promotion in School Settings

Nutrition education can be an effective way to increase fruit and vegetable intake among students. A review of 15 nutrition education interventions designed to increase fruit and vegetable intake in children and adolescents ages 5–18 years reported significant increases in intake among intervention versus control students with results spanning time periods greater than 3 months.<sup>130</sup> Citing evidence of the effectiveness of school nutrition education and food literacy programs, an Institute of Medicine (IOM) committee recommended implementation of sequential food literacy and nutrition science education programs in all grades (K–12).<sup>131</sup> The committee recommended that schools provide 20 to 50 hours of this type of education per year, which is much higher than current estimates of 4 to 6 hours per year. Implementation of this recommendation would require leadership from state and federal agencies, as well as local education authorities.

Along with increasing access to healthy food and setting nutrition standards, the HHS requires each school district to adopt a wellness policy that addresses nutrition education and promotion. The final rule for these wellness policies was published in the Federal Register in July 2016.<sup>132</sup> It includes nutrition guidelines for all foods and beverages sold or offered on campus during the school day, policies for food and beverage marketing, and a description of public involvement, an evaluation plan, and a goal for nutrition promotion and education.<sup>133</sup> A specific curriculum for nutrition education is not specified. However, many states have policies addressing nutrition education in schools, with some states including curriculum requirements. Both USDA's Cooperative Extension Expanded Food and Nutrition Education Program and SNAP-Education provide many schools with the choice of various high quality, evidence-based curricula.

According to CDC's 2014 School Health Policies and Practices Study, 74% of all schools have requirements related to nutrition education and dietary behavior,<sup>134</sup> despite the low mean hours of nutrition education delivered, as described above. Emerging evidence supports these kinds of policy efforts. A recent study addressed an intervention in which students were shown educational videos with vegetable characters. A banner featuring the characters was placed near the salad bar, and the number of students taking vegetables from the salad bar increased by nearly 25%.<sup>135</sup> This study shows potential opportunities for policies

encouraging the use of media, brands, and characters to encourage healthier choices for children. However, long-term effects of marketing interventions such as these are unknown.

Recently, 3 states enacted legislation in recognition of the importance of nutrition education and the influence of health education activities in the school environment.<sup>136</sup> For example, in 2013, Massachusetts passed a law that requires schools to incorporate obesity prevention programs, including nutrition and wellness programs, into the school curriculum to help children acquire nutrition and lifestyle habits required for healthy development.<sup>137</sup> The FFVP also strongly encourages schools to offer nutrition education and engage in other health promotion activities. A 2013 evaluation of the FFVP found that in addition to increasing students' fruit and vegetable intake, FFVP schools are more likely to provide nutrition education, which led to an increase in students' positive attitudes toward fruits and vegetables.<sup>138</sup>

### Government Settings and Worksites

Similar to schools, laws and policies that promote healthy eating patterns that include adequate fruit and vegetable availability in government settings and worksites can improve intake. Types of laws and policies include procurement policies, healthy meeting policies, wellness programs that incentivize healthy eating, and the on-site promotion and sale of fruits and vegetables. This section examines these types of laws and policies and the current law and policy landscape in government settings and public and private worksites.

### Food Procurement and Nutrition Standards in Government Settings

Like public schools, government settings offer a significant opportunity to reach large numbers of adults and children to promote fruit and vegetable intake. An estimated 22 million people in the U.S. work for the federal, state, or local government.<sup>139</sup> Another approximately 2.2 million people are incarcerated in U.S. jails and prisons,<sup>140</sup> and millions pass through government-owned properties, such as parks, forests, and recreational areas, each year.<sup>141</sup> Food standards and procurement policies in government settings, whether government worksites, government institutions, or government-owned property open to the public, can impact the food choices of hundreds of millions of individuals in the U.S.

Procurement policies adopted by federal, state, tribal, or local governments for worksites and public facilities govern whether the food for sale or provided in government settings conforms to a set of standards such as the 2015–2020 Dietary Guidelines for Americans.<sup>142</sup> The policies are intended to promote settings that provide food and beverage choices that support recommended healthy eating patterns such as increased intake of fruits and vegetables.

At the federal level, HHS and the General Services Administration (GSA) coordinated the development of the Food Service Guidelines for Federal Facilities, which are standards to improve employee health and reduce health care costs.<sup>143</sup> A federal workgroup of more than 60 representatives from 9 federal departments and agencies brought together members with expertise in various fields covered by the food service guidelines including nutrition, food safety, facility operations and efficiency, implementation of food service guidelines and behavioral design. These guidelines include standards for procurement, such as nutrition standards for prepared foods, packaged snacks, and beverages. They also address food safety standards and marketing strategies to promote healthier food and beverage options in food service facilities.<sup>144</sup> The guidelines are used primarily for developing contracts for the delivery of food service in cafeterias, cafes, grills, snack bars, micro markets, vending machines, and other self-service facilities. Similarly, the U.S. National Park Service’s Healthy and Sustainable Food Program was launched in 2013 and requires parks to include standards that focus on health and sustainability in new vendor contracts.<sup>145</sup> For existing contracts, the healthy food policy emphasizes collaboration by encouraging parks and vendors to voluntarily adopt the guidelines.<sup>146</sup> The standards include rules on ingredients, food preparation, and consumer education. By creating a healthier food environment, the guidelines make healthier options more available and easier for consumers to choose.

An increasing number of cities, states, and public and private worksites are also adopting healthy food service guidelines.<sup>147</sup> As of 2014, 9 states and the District of Columbia have adopted food service guidelines that ensure healthy foods are served in facilities owned or controlled by the government; these policies increase access to healthy foods such as fruits and vegetables.<sup>148</sup> Washington State adopted an executive order (EO) that required state agencies to adopt nutrition standards for worksites before 2017.<sup>149</sup> Within states, many large local governments, like New York City, and some individual counties have adopted policies. Table 3 lists other examples of food procurement policies in government settings across the U.S.

Table 3. Selected State and Local Policies Setting Food Standards

Location	Policy
<p>Massachusetts EO 509<sup>150</sup></p>	<p>The Governor of Massachusetts issued EO 509 in 2009, establishing the Massachusetts State Agency Food Standards for food purchased and served by state agencies. These food standards are part of the Mass in Motion statewide wellness initiative, which aligned with the 2010 Dietary Guidelines for Americans.</p>
<p>Delaware State Parks "Munch Better" Policy<sup>151</sup></p>	<p>In 2010, Delaware State Parks implemented a procurement policy at state parks. Nemours Health &amp; Prevention Services worked with Delaware State Parks to categorize all food items sold from vending machines and concession stands as "Go," "Slow," or "Whoa." "Go" foods (e.g., produce and whole grains) are the healthiest options as related to caloric content.</p>
<p>Washington Executive Order<sup>149</sup></p>	<p>The Governor of Washington issued a statewide EO (EO 13-06) in 2013, Improving the Health and Productivity of State Employees and Access to Healthy Foods in State Facilities. EO 13-06 mandates all state agencies in the executive branch to implement food and beverage policies consistent with the state's Healthy Nutrition Guidelines, based on the 2010 Dietary Guidelines for Americans.</p>
<p>Los Angeles Healthy Food Promotion<sup>152</sup></p>	<p>The LA County Board of Supervisors passed the motion "Healthy Food Promotion in Los Angeles County Food Service Contracts" in 2011. The motion created a process for the public health department to emphasize healthier options in new and existing requests for proposals and contracts. The policy covers a wide variety of departments and institutions in LA County.</p>
<p>New York City Food Standards<sup>153</sup></p>	<p>In 2008, the Mayor of New York City issued EO 122 to establish the New York City Food Standards for food procured by city agencies or agency contractors. These standards cover purchased food; meals and snacks; agency- and population-specific standards; and sustainability recommendations.</p>

## Public and Private Worksites

More than 62% of U.S. adults ages 16 years and older participate in the workforce.<sup>154</sup> In addition to government worksites, private worksites represent an opportunity to reach a large percentage of the general population with interventions to increase fruit and vegetable intake and to change social and environmental norms.<sup>155</sup> Similar to government settings, private employers may adopt food procurement policies. Public worksites may also be governed by the standards and policies described previously, though private workplaces can set their own internal standards or policies. Similarly, both public and private worksites may adopt healthy meeting policies that ensure that food and beverages provided at the worksite and during meetings are nutritious.<sup>156,157</sup>

Employee wellness programs are another strategy that employers can use to influence fruit and vegetable intake. Legal requirements for employee wellness programs were established in the Health Insurance Portability and Accountability Act of 1996 and the Patient Protection and Affordable Care Act of 2010 (ACA).<sup>158</sup> The ACA increased the maximum rewards employers can offer employees who participate in wellness programs and demonstrate improved health status.<sup>159</sup> According to a RAND study, approximately half of U.S. employers offer wellness promotion initiatives, such as screenings or health-contingent wellness programs for participants with specific health conditions.<sup>160</sup> In addition, nearly 72% of employers providing a wellness program offer a combination of screening and intervention activities. Nutrition is the focus of the most common interventions.

The literature suggests that worksite health programs, depending on their components (e.g., health screenings, educational materials, exercise memberships, smoking cessation and weight loss and nutrition programs), have positive effects on health-related behavior and risk factors, including smoking cessation, physical activity, biometric measures (e.g., weight, cholesterol, and blood pressure), and fruit and vegetable intake.<sup>161, 162</sup> For example, the Treatwell study tested multiple nutrition education strategies to increase fruit and vegetable intake through the worksite, including interventions focused on the family. The study found statistically significant increases in intake among the intervention groups.<sup>163</sup>

In addition to adopting food procurement policies with nutrition standards and wellness programs with nutrition education components,

large employers can facilitate access to fruits and vegetables by providing access to community gardens and farmers' markets at the workplace. Kaiser Permanente opened more than 60 farmers' markets outside clinics and hospitals in 9 states.<sup>164</sup> A 2010 survey of participants in the markets found that 74% of respondents reported eating more fruits and vegetables as a result. In addition, 40% reported eating "a lot" more, and 71% reported eating a greater variety of fruits and vegetables.<sup>165</sup>

While the overall evidence for the role of workplaces in increasing fruit and vegetable intake is limited, a systematic review of worksite health literature published in 2013 suggests that multiple levels of interventions may be needed to influence dietary patterns as opposed to just a single intervention.<sup>166</sup> The study findings indicate that a variety of factors, including work schedules, work-related stress, and overtime patterns, impact dietary behavior and should be considered together.

### Retail Settings

Retail food outlets, which are defined as places where people can purchase groceries and prepared foods, play a critical role in food availability, purchasing patterns, and ultimately intake of fruits and vegetables. Laws and policies related to retail food outlets can be grouped into the following 3 major categories: laws and policies influencing the affordability of fruits and vegetables; laws and policies that influence geographic access to retail outlets selling fresh fruits and vegetables; and laws and policies that influence the marketing of fruits and vegetables within retail food outlets, including restaurants.

### Affordability of Fruits and Vegetables

Two major federal food and nutrition assistance programs operated by USDA, the SNAP and WIC programs, make food more affordable for millions of Americans. These programs provide benefits to eligible low-income individuals to enable them to purchase food in local communities. Despite these programs, access to affordable fresh fruits and vegetables and food security in general continues to be a major policy concern in the U.S. More than 1 in 8 Americans were food insecure in 2016, and the rate is even higher among children and older adults.<sup>167</sup>

The Food Stamp Act of 1964<sup>168</sup> institutionalized a federal food stamp program that had operated since the 1930s. Now known as SNAP, this program serves low-income individuals meeting certain income and

asset eligibility tests, which generally includes those with a gross monthly income below 130% of the federal poverty level.<sup>169</sup> Individuals who receive SNAP payments obtain a card with electronic benefits that offset the purchase of food from participating retailers. SNAP benefits may be used at the participants' discretion for any food or beverage purchase, with the exception of alcohol, hot foods, supplements and medicines, and prepared food eaten in the store.

The WIC program provides a variety of supplemental healthy foods, including fruits and vegetables, health care referrals, and nutrition education to low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, infants, and children up to age 5. WIC applicants must be below 185% of the federal poverty level, meet a state residency requirement, and be individually determined to be at "nutritional risk" by a health professional.<sup>170</sup> The goal of the program is to protect and improve the health and nutritional status of participants and to provide specific foods with necessary nutrients to support healthy pregnancies and early childhood development.<sup>171</sup> The program also provides each participant with individualized nutrition education and counseling, usually administered through local WIC clinics located in a variety of community settings. Participants receive a food package assignment and associated paper food vouchers or an electronic card allowing for electronic payment for the purchase of foods from a participating retailer.

In 2009, the WIC food package and associated regulations governing what items can be included were updated by USDA based on recommendations from IOM.<sup>172</sup> IOM recommended: aligning the WIC food packages with the Dietary Guidelines for Americans and the latest infant feeding practice guidelines of the American Academy of Pediatrics; better promoting and supporting the establishment of successful long-term breastfeeding; providing WIC participants with a wider variety of food; and providing WIC state agencies with greater flexibility in prescribing food packages to accommodate participants with cultural food preferences. The new food package increased options for fruits and vegetables. In 2016, a nationally representative study of households participating in the WIC program found a nearly 3.5 times increase in children's intake of "beans and greens" (a healthy vegetable category used in the Healthy Eating Index) following the changes to the WIC food package.<sup>173</sup> Similarly, an evaluation of 1- to 4-year-old children participating in the New York State WIC program provided evidence of an increase in fruit and vegetable intake following food package changes.<sup>174</sup>

Other studies have examined the influence of the WIC food package changes on the increase in availability and variety of healthy foods in WIC-authorized stores and, to a lesser degree, non-WIC convenience and grocery stores.<sup>175, 176, 177</sup> Requirements for retailers participating in the WIC program are set by states, which are not required to authorize participation of all qualified retailers. State agencies, usually health departments, authorize only those vendors that meet certain requirements, including minimum inventory. All WIC-authorized vendors sign agreements that require them to continue to meet these requirements in order to remain authorized.<sup>178</sup> All WIC vendors must stock the federal minimum requirements, which include fresh fruit and vegetables, as well as any additional requirements developed by states. It is ultimately within the discretion of a state to decide what variety of fruits and vegetables vendors must provide beyond the federal minimum standards. For state and local policymakers, these are important policy decisions. WIC stocking requirements can have a positive impact on the availability of food items in certain communities, but too many requirements could potentially limit retailer participation. This is especially true for those in rural areas or with unpredictable distribution systems. Results from a study of stores in 7 Illinois counties suggest that the WIC policy revision also contributed to modest reductions in fruit and vegetable prices.<sup>179</sup>

While both go through a rigorous authorization process, SNAP retailers, unlike WIC retailers, are not specifically required to sell fresh fruits and vegetables. They are, however, currently required to sell perishable items, which may include fresh fruits and vegetables. Before new retailer standards became effective in January 2017, to participate in the SNAP program, retailers only needed to sell perishable food (including frozen foods) and 3 varieties of foods from 2 of the following categories: meat, poultry, or fish; bread or cereal; vegetables or fruits; and dairy products.<sup>180</sup> Following implementation of the final rule by USDA, SNAP retailers must now offer an increased variety of foods, specifically at least 3 different staple food varieties from the 4 staple food categories, with perishable foods being offered in at least 2 staple food categories, thereby increasing the availability of fresh foods.<sup>181</sup>

There is evidence that offering incentives to SNAP and WIC participants, such as coupons that double the dollars available to an individual to spend on fruits and vegetables, can increase fruit and vegetable intake.<sup>182</sup> These incentives have been implemented in a variety of settings, such as grocery stores and farmers' markets. Many of these

efforts at farmers' markets are grant funded, like Michigan's Double Up Food Bucks Program, either by private grants and fundraising, or through government programs such as USDA's Food Insecurity Nutrition Incentive (FINI) Grant Program.<sup>183, 184</sup> Congress authorized the FINI program in the 2014 Farm Bill. It provides \$100 million in matching funds to pay costs associated with providing incentives to increase the purchase of fruits and vegetables by SNAP households at the point of purchase. Previously, the 2008 Farm Bill authorized \$20 million in federal funds for projects through the Healthy Incentives Pilot (HIP). This provided incentives or subsidies to SNAP recipients at the point of sale to increase the purchase of fruits, vegetables, and other healthy foods.<sup>185</sup> An evaluation of a HIP program in Massachusetts found that participants receiving subsidies consumed 26% more of the targeted fruits and vegetables than those not receiving the subsidy.<sup>184</sup> In 2015, USDA awarded \$31.5 million dollars to over 30 programs that assist SNAP participants in purchasing fruits and vegetables in multiple different retail venues; this will generate valuable information about the impact of different types of incentives and inform future policy interventions.<sup>186</sup>

## Geographic Access to Retail Outlets Selling Fruits and Vegetables

Geographic distribution of retail outlets selling fresh fruits and vegetables also influences intake. Studies examining the relationship between grocery store access and dietary intake, including fruit and vegetable intake, have found that individuals who have better access to supermarkets are more likely to have healthier diets.<sup>187</sup> Community-level characteristics, such as the income level of residents and population density, have been found to be associated with access to retail outlets selling healthy foods.<sup>188, 189</sup> Smaller retail food outlets, such as corner stores, convenience stores, and gas stations, typically have more limited food offerings than full-service grocery stores. Interventions to increase the number of grocery stores in underserved neighborhoods have been implemented, including zoning and tax policies to encourage grocery stores to locate in particular neighborhoods.<sup>190</sup> However, there is limited data on the impact of new grocery stores on fruit and vegetable intake. Some evidence suggests that access to a grocery store may not alone increase fruit and vegetable intake.<sup>191</sup> This suggests the need for comprehensive strategies that also address other critical influences on purchasing patterns, such as marketing and pricing of healthy food, to promote purchase and consumption.

To enable and support the development of retail food outlets in underserved communities, governments have used policy tools that promote financing, including grants, loans, and tax incentives. In 2010, the federal government established the HFFI, which brings grocery stores and other healthy food retailers to underserved urban and rural communities.<sup>192</sup> Through the collaborative efforts of USDA, the Department of the Treasury, and HHS, the HFFI expanded access to nutritious food in these communities. The Agriculture Act of 2014, or the Farm Bill,<sup>193</sup> authorized \$125 million to the HFFI program to make nutritious food more readily accessible. The Treasury also established a fund to provide technical assistance to community development financial institutions (CDFIs), mission-driven financial institutions that take a market-based approach to supporting economically disadvantaged communities, for investment in these types of projects.<sup>194</sup> By allocating federal resources, the HFFI makes grants, loans, and a New Markets Tax Credit available, among a number of other financial tools, to support grocery store development.

Policies to increase the availability of fresh fruits and vegetables at corner stores have been implemented through planning and zoning. Examples include a shelf space requirement (a certain amount of shelf space must be devoted to fresh produce) in a conditional use permit or through a licensing ordinance requiring the stocking of staple foods. The Safe Access to Alcohol and Food Establishments (SAAFE) ordinance took effect on October 19, 2017 in Los Angeles County, requiring conditional use permits for businesses seeking to sell alcohol, with conditions of operation that include offering multiple types of fresh produce for sale in high-visibility areas within stores.<sup>195</sup> Since 2012, Portland, Oregon, has taken a coordinated planning approach to development that supports neighborhoods where individuals can walk or bicycle to meet all daily needs, including grocery shopping, within 20 minutes.<sup>196</sup> This 20-minute walkable neighborhood concept has been adopted or considered by other cities, including Detroit and Baltimore.<sup>197</sup>

In 2011, Philadelphia updated its entire zoning code, incorporating health and sustainability provisions. This included density bonuses, allowing developers to build taller buildings or buildings with additional floor area than otherwise would be allowed, for including fresh food markets in mixed-use developments.<sup>198</sup> The Minneapolis Staple Foods Ordinance is another example of an intervention in smaller retail settings. It requires stores to stock a minimum number of perishable and non-perishable “staple foods” from the following categories: vegetables and

fruits; meat, poultry, fish, and/or vegetable proteins; bread and/or cereal; and dairy products and/or substitutes.<sup>199</sup> Preliminary evaluation showed an increase in produce sales at stores covered by the ordinance. It is important to note that the ordinance, which is administered and enforced by the local health department, was implemented in conjunction with the Minneapolis Healthy Corner Store Program. This program includes marketing and point-of-purchase technical assistance for store owners.<sup>200</sup>

Interventions targeting farmers' markets and mobile vending have also been implemented by some jurisdictions to increase access to fresh fruits and vegetables. Farmers' markets have spread throughout both urban and rural communities at an unprecedented rate.<sup>201</sup> With the exception of studies evaluating the impact of monetary incentives at farmers' markets serving SNAP and WIC participants, as well as the Senior Farmers' Market Nutrition Program (a USDA program to provide low-income seniors with coupons that can be exchanged for eligible foods at farmers' markets),<sup>202</sup> few studies have measured the impact on population produce intake. One recent study conducted in low-income counties in North Carolina and Kentucky found that fruit and vegetable intake was positively associated with farmers' market shopping among telephone respondents who said they shopped at farmers' markets (16 to 18% of those interviewed) compared with those who did not.<sup>203</sup> Many policies have focused on encouraging the location of farmers' markets in underserved neighborhoods.<sup>204</sup> For example, LA County updated its zoning code to allow farmers' markets to locate in all zones within the county, including residential areas. The code also specifically requires that farmers' markets accept SNAP as a form of payment.<sup>205</sup>

For mobile vending, promising policy approaches have focused on mobile carts selling fresh fruits and vegetables, or "green carts." An evaluation of the New York City Green Carts program, which provides specific mobile vending permits for carts to sell only whole fresh fruits and vegetables in underserved neighborhoods, found a small but statistically significant increase in fruit and vegetable intake associated with the Green Carts initiative.<sup>206</sup>

## Marketing of Fruits and Vegetables

Laws and policies shape where and how foods and beverages are marketed. The marketing of foods and beverages strongly influences consumer purchasing patterns in retail settings, and the highly effective marketing of processed foods and beverages is considered a key determinant of food intake.<sup>207</sup> When considering interventions that restrict advertising of unhealthy foods, complex legal issues may arise, many of which are related to the First Amendment of the U.S. Constitution, which protects the freedom of speech. The First Amendment protects the right of free speech by limiting the extent to which governments, at all jurisdictional levels, can abridge those rights. The Supreme Court has applied these protections to advertising, dubbed “commercial speech.”<sup>208, 209</sup> Given this, many interventions related to marketing focus on highlighting healthier options and on marketing practices unrelated to speech, such as product placement or price.<sup>210</sup>

Interventions focused on marketing in or for retail settings can seek to increase the marketing of fruits and vegetables or decrease the marketing of less healthy foods, often in an effort to bring greater attention to healthier options. For example, in 2015, with support from foundations, athletes, and celebrities, the Partnership for a Healthier America started a large-scale fruit and vegetable marketing campaign, FNV,<sup>211</sup> in Fresno, California, and Hampton Roads, Virginia. The evaluation of this effort is underway, but the intention is to expand the campaign to communities across the country. Due to the costs of large-scale marketing campaigns, few marketing campaigns in the past have featured fruits and vegetables, with the exception of fruit juice, dried fruit, and baby carrots.

Some activities that have a marketing component may be categorized as business practices rather than as speech, and therefore may not be subject to the same legal protections as commercial speech.<sup>212</sup> For example, in 2010, local governments in California, Santa Clara County and San Francisco County, passed ordinances setting nutrition standards for children’s meals in restaurants.<sup>213, 214</sup> The ordinances required that in order for a restaurant to offer a children’s meal accompanied by an incentive such as a toy, the meal had to meet specific nutrition standards that included fruit and vegetable requirements. Both ordinances, which frame the inclusion of a toy with a children’s meal as a business practice that does not infringe upon legally protected speech, remain in effect and have not been challenged in

court. However, it is important to note that these ordinances both have unique circumstances that may have rendered lawsuits an unattractive prospect; in San Francisco County, the drafting of the law allowed for restaurants to sell the toy for a nominal fee of 10 cents, while in Santa Clara County very few restaurants were impacted by the law. Data regarding the impact of these laws on purchasing and intake is limited. However, an initial evaluation of Santa Clara County's ordinance revealed improvements in the promotion of healthy meals, beverages, and side items in restaurants covered by the ordinance.<sup>215</sup>

Thus, it may be feasible to regulate marketing practices that do not involve speech. In addition, there are opportunities to address unhealthy marketing using non-regulatory approaches, such as instituting healthy corner store programs and healthy restaurant programs that include provisions focused on in-store signage.<sup>216</sup>

Restaurants have also been the subject of another type of marketing intervention: incentive programs. Restaurants are a critical part of the retail food landscape, as food dollars spent on foods consumed outside the home have eclipsed spending in grocery stores.<sup>217</sup> Restaurant meals have been documented to be less likely to contain fresh fruits and vegetables than meals prepared at home.<sup>218</sup> There are many promising city and state restaurant incentive programs with the potential to directly or indirectly increase fruit and vegetable intake. State programs include the Utah Farm-Chef-Fork Program, which seeks to build sustainable connections between local farms and restaurants,<sup>219</sup> and the Certified Healthy Oklahoma program, which provides recognition to restaurants that offer healthier environments and meal options, such as including fruits and vegetables with meals.<sup>220</sup> The Certified Healthy Oklahoma program allows restaurants to market themselves to consumers seeking healthier options. These programs act as excellent examples of communities literally putting health on the menu.<sup>221</sup> However, to sustain and institutionalize these types of initiatives, localities need to translate the programs into long-term policy strategies for their communities.

## Community Interventions to Increase Fruit and Vegetable Intake

In addition to the settings listed above, laws and policies influence the availability of fruits and vegetables in community settings and food production, particularly among populations with low socio-economic status. This section of the report addresses the laws and policies that broadly influence fruit and vegetable access, availability, and consumption at the community level, including the SNAP-Education program; urban agriculture approaches; the availability of community gardens; and fruits and vegetables in community food banks.

### SNAP-Education Program

In addition to providing individuals with SNAP benefits for food purchases, USDA provides SNAP-Education, known as SNAP-Ed, funding to states to use a wide range of evidence-based interventions to promote healthful eating behaviors for individuals under 185% of the Federal Poverty Level or \$11,880 per year for individuals in the states and Washington, D.C.<sup>222</sup> The goal of SNAP-Ed is “to improve the likelihood that persons eligible for SNAP will make healthy food choices within a limited budget and choose physically active lifestyles consistent with the current Dietary Guidelines for Americans and MyPlate.”<sup>223</sup> Historically much of the SNAP-Ed work has focused on improving diet through the promotion of increasing fruit and vegetable intake.

SNAP-Ed is the largest single source of federal nutrition education funding in the Nation<sup>224</sup> with \$414 million in state funding in FY2017.<sup>225</sup> SNAP-Ed nutrition education classes have been demonstrated to change participants’ knowledge, attitudes, and reported consumption of fruits and vegetables. While the per capita SNAP-Ed investment is quite small, it is critically important for helping to counteract the trend toward increasing dietary disparities. SNAP-Ed funding to states is used for nutrition education and complementary institutional practices and policy, systems, and environmental (PSE) interventions to promote healthful eating behaviors. The PSE approach focuses on institutional changes in ways that support nutritional goals. Taken together, education, marketing, and PSE changes are more effective than any of these approaches alone for improving diet and promoting health.<sup>226</sup> Programs in a wide variety of venues such as schools, child care facilities, and other community institutions provide additional opportunities to reach low-income, SNAP-Ed eligible individuals and support the healthy

behaviors promoted through educational strategies. By providing both nutrition education and community interventions, programs, and policies at the local level to support healthy eating for low-income Americans, the government can provide needed targeting of resources to improve diet and disparities in the intake of fruits and vegetables.

SNAP-Ed programs partner with a wide variety of community partners, particularly the Expanded Food and Nutrition Education Program (EFNEP). The EFNEP is a federally funded program that currently operates through the land-grant universities in every state, Washington, D.C., and 6 territories. Another potentially effective intervention strategy is pairing SNAP-Ed and EFNEP face-to-face nutrition education interventions with other SNAP-Ed interventions focused on systems and environmental approaches designed to influence the environments where SNAP-eligible individuals and families shop for food and eat.

### Urban Agriculture and Community Gardens

Urban agriculture is a term that encompasses backyard gardens for personal consumption to commercial farms with on- or offsite sales.<sup>227</sup> Regulation of land use, including agriculture, is typically the responsibility of local government; community gardens and urban agriculture are shaped primarily by local zoning and land use laws. Zoning is a regulatory mechanism used by local government to divide a community, such as a city or county, into distinct districts. Most cities have use-based zoning laws, which divide the jurisdiction into districts such as residential, commercial, multi- or mixed use, and industrial. These laws regulate the use and development of the land within the districts based on the designation.<sup>228</sup>

Local governments can use their zoning ordinances either to permit urban agriculture “as-of-right” or use a discretionary process known as conditional use to impose certain standards and requirements. Other review processes that are less rigorous than conditional use may also be available to local governments, allowing for some governmental and community review of uses, but with a potentially lower cost or less complex process. Where the use is permitted as a right of ownership, the community may place restrictions or regulations on that use. However, if residents comply with those regulations, no land use approval is required. Conditional uses require the landowner to seek approval before using property in that particular manner. In communities where urban agriculture, on-site sales, or raising animals prompt practical or

political concerns, conditional use gives planners and decision-makers a tool to ensure that residents' issues are addressed appropriately when an urban agriculture development is proposed. However, conditional use review can be a time-consuming and expensive process, and the costs associated are generally borne by the use permit applicant.<sup>229</sup>

If a specific use of land, such as a productive home garden or a community garden, is not included within a community's zoning code, the land owner or tenant may find the use "illegal" or displaced by development that is expressly permitted in the zoning district. Research indicates that higher-income communities are nearly 3 times more likely than communities with lower average incomes to have a zoning code that permits urban agriculture.<sup>230</sup> This suggests that residents of low-income communities may more regularly face legal sanctions when they engage in urban agriculture practices that put them at risk of fines and displacement. Amending and updating local land use codes to support urban agriculture may present an opportunity to increase access to fruits and vegetables in some low-income communities. Not surprisingly, studies have found that home gardeners, on average, consume more fruits and especially vegetables than non-gardeners.<sup>231</sup> Home gardeners are able to grow culturally appropriate fruits and vegetables that might otherwise be difficult to source.<sup>232</sup> Legal restrictions or requirements established by homeowners' associations or local ordinances are relatively common and can influence residents' ability to engage in urban agriculture. In Sacramento, California, local residents successfully overturned a local law that limited the percentage of space they could use for cultivating fruits and vegetables in their front yards.<sup>233</sup>

Community gardens, which are privately or publicly owned land used for the cultivation of fruits, vegetables, plants, flowers, or herbs by multiple users, are another way in which low-income families with limited access to supermarkets or home gardens can obtain low-cost fruits and vegetables. SNAP allows for the purchase of food-producing plants and seeds, making community gardening accessible for recipients.<sup>234</sup> USDA's Cooperative Extension Master Gardener program educates the public through its comprehensive gardening activities.

Policies can ensure that community gardens are a legitimate land use to ensure that gardeners will not be required to stop these activities. For example, the zoning code in Kansas City, Missouri, allows community gardens in residential and other zones as an approved use.<sup>235</sup> Studies in both rural and urban settings have demonstrated significantly higher

intakes of fruits and vegetables for those who work in local community gardens.<sup>236, 237, 238, 239</sup> In addition, community gardens can serve as learning laboratories for after-school gardening and cooking programs, as well as parent/child gardening programs.<sup>240, 241, 242</sup> While it is well established that community gardens can have positive effects on community bonding, civic engagement, and individual food security,<sup>243</sup> the reach of these interventions is currently quite limited and the effort required to maintain gardens is high.

Land designated as an urban farm is used for more extensive cultivation of fruits, vegetables, plants, and livestock with the primary purpose of growing food for sale. From a land use perspective, a profitmaking enterprise is distinguished from the primarily non-commercial activities of home and community gardens by the scale of use.<sup>244</sup> Requiring a farm management plan for larger farms or more intensive cultivation practices can assist in preventing adverse effects on the environment and neighbors. Seattle, Washington, applied the land use concept of farm management plans to urban farms, in which urban farms in residential zones must apply for a conditional use permit and provide a proposed farm management plan.<sup>245</sup> Studies have found that urban farmers have increased fruit and vegetable intake, and that they consume more vegetables than the general population.<sup>246, 247</sup> The extent of urban farming's impact on non-farmer fruit and vegetable intake is less clear, and is considered partially dependent on prices relative to other produce sources in the neighborhood.<sup>248</sup>

Educational resources about potential risks and hazards are a critical companion piece to policies supporting urban agriculture. Urban soils can be contaminated with heavy metals and chemicals that may pose health risks to gardeners, either through direct soil contact or through uptake by plants that are subsequently consumed. Common contaminants include arsenic and lead, especially on properties with a history of industrial use. Prior to initiating use of a property, gardeners can conduct historical research on previous uses and send in soil samples for testing. Soil testing can be accessed at low or no cost through the Cooperative Extension Service; it provides valuable information on what types of mitigation efforts, if any, should be implemented at a particular site.<sup>249</sup> Mitigation can include using raised beds, excavating contaminated soil, or putting a clay barrier between contaminated soil and new soil brought to the site. Some communities have codified environmental testing and remediation as requirements for urban gardening, while others have provided extensive educational

materials on known contamination issues to encourage safe gardening. For example, Seattle offers information about lead and arsenic contamination related to the Tacoma Smelter Plume and provides resources for soil testing.<sup>250</sup> Baltimore's new zoning code, which was effective June 2017, requires soil testing for urban agriculture, and, if necessary, remediation in accordance with guidelines provided by the city.<sup>251</sup>

Supporting urban agriculture by removing regulatory barriers and enhancing access to land is one approach to bolstering the physical and economic health of communities. This is particularly true in low-income neighborhoods, where traditional food retail options may be scarce. Regulatory reform and land access strategies have the potential to be most successful when community organizations, residents, and other public partners (e.g., schools) have demonstrated interest, ability, and support for urban agriculture.

### Charitable Food Systems and Food in Congregate Settings

Charitable food systems, including emergency food systems and food provided in congregate settings and home delivery systems for older and homebound adults, play an important role in improving access to fruits and vegetables.

The Older Americans Act of 1965 (OAA) authorizes nutrition funding under Title III-C (state and community programs on aging) and Title VI (American Indian, Alaskan Natives and Native Hawaiians) for the Congregate Nutrition Services Program, which provides meals for a voluntary donation in settings such as community centers, and the Home-Delivered Nutrition Services Program, which delivers food to homebound adults.<sup>252, 253</sup> Together these programs serve more than 900,000 individuals annually through more than 5,000 providers, some of which supplement their funding with state, local, and private funds. While the purpose of these programs is to reduce hunger and food insecurity, promote socialization, and delay the onset of adverse health conditions, research has demonstrated that these programs can also increase fruit and vegetable consumption for older adults.<sup>254, 255</sup>

The voluntary emergency food system, which includes regional food banks and food pantries as the main distributors, serves nearly 50 million low-income individuals per year.<sup>256</sup> With the confluence of hunger and

obesity-related diseases, a new movement to promote nutrition-focused food banking is underway.<sup>257, 258</sup> Feeding America, a national non-profit organization, recently developed nutrition guidance for food banks.<sup>259</sup> Studies have shown that food bank clients prefer to receive fruits and vegetables over less healthful foods like snack foods.<sup>260</sup>

At the federal level, 2 USDA programs, the Emergency Food Assistance Program (TEFAP)<sup>261</sup> and the Commodity Supplemental Food Program (CSFP),<sup>262</sup> supplement food purchases made by emergency food providers and donations from individuals and corporations. TEFAP makes nutritious, high-quality USDA food available to State Distributing Agencies, which in turn can distribute it to emergency feeding organizations such as food banks and other providers.<sup>263</sup> The CSFP is similar to TEFAP, but provides supplemental food packages to low-income older adults (over age 60). Unlike other USDA FNS programs, such as the school meal programs, these 2 programs are not required to adhere to specific nutrition standards. Nevertheless, a recent USDA study showed that the majority of foods available through TEFAP are more healthful than those typically found in the American diet.<sup>264</sup> There are also state-financed programs that support food banks' procurement of locally grown fruits and vegetables. The Massachusetts Grown Initiative received 6% of food purchase funding in the state Massachusetts Emergency Food Assistance Program in 2015, with an emphasis on providing access to fresh produce while supporting local farmers.<sup>265, 266</sup>

Recognizing the potential to improve health in the populations they serve, food banks and pantries are taking steps to provide food with better nutritional value by establishing related institutional policies. A 2012 study of 137 food banks across the Nation showed that over half of all food banks had standards for food and beverages.<sup>267</sup> These standards focus on eliminating certain unhealthy products from inventories by stating what products the bank will or will not accept and/or distribute. Often, these policies are the product of internal conversations, as well as feedback from partners and clients on respective priorities and needs.<sup>268</sup> Many food banks use the Choose Healthy Options Program's scale from the Greater Pittsburgh Community Food Bank to help facilitate compliance with these policies (not federal policies). The scale rates food items based on nutrition quality (red, yellow, or green) and allows food banks to set goals for the proportion of items with certain ratings.<sup>269</sup> In a number of cases, food banks

have partnered with local public health departments to develop and implement standards.<sup>270</sup>

In order to increase access to fruits and vegetables within the emergency food system, advocates are considering the impact and feasibility of revising tax benefits for corporate donations to the emergency food system. These tax benefits would be awarded for donations of healthy food, with no benefit for unhealthy food.<sup>270</sup> Additionally, legislated nutrition standards that align the foods and beverages available through the federal food distribution programs (including bonus items) with the Dietary Guidelines could result in nutritional improvements seen in other federal programs.

### Building the Evidence Base: Areas for Additional Research

This report highlights many evidence-based approaches to promote increased fruit and vegetable intake to foster improved population health. Other innovative approaches requiring additional research and evaluation include:

- Investigating policy mechanisms to reduce food waste and better utilize all fruits and vegetables grown. For example, surplus and/or cosmetically unappealing produce can provide a cost-effective option for increasing access and intake.
- Conducting creative experiments that make fruits and vegetables available at competitive prices and quality points in settings with small sales volumes (corner stores, inexpensive and convenient restaurants, etc.) and determining scalability.
- Conducting additional research on the cultural drivers of dietary change in fruit and vegetable intake (e.g., social marketing, food production policy, school educational programs).
- Encouraging more research on ways to fill gaps in knowledge about specific needs for and health benefits of fruits and vegetables for specific populations, particularly prenatal women, early infants, young adults, and older Americans.
- Conducting research about the optimal ways to link nutrition education with related policy approaches to achieve the desired outcome—increased fruit and vegetable intake.

- Learning from the small percentage of the population that meets the recommended fruit and vegetable consumption targets to discover what strategies or practices are used by these segments of the population, compared to those who have similar environmental and policy exposures, in order to achieve the recommendations.
- Improving understanding of the connections between agricultural policy supports, food production outputs, and dietary intake, including what is needed to make fruits and vegetables more available and affordable without a detrimental environmental impact.
- Experimenting with policies to incentivize the price of fruits and vegetables, as price supports are a well-established means to increase fruit and vegetable intake in low-income Americans.
- Using “big data,” such as information on procurement and sales data for fruit and vegetables, to better understand population trends, given the limitations and costs of assessing dietary intake of individuals.
- Examining the system of agricultural support and subsidy for traditional crops and “specialty crops” (e.g., many fruits and vegetables) and its alignment with the current Dietary Guidelines.

## Opportunities to Further Increase Fruit and Vegetable Intake

The Healthy People 2020 objectives related to increasing fruit and vegetable intake set ambitious targets for the decade given current national intake patterns. Laws and policies at the federal, state, tribal, and local levels can play a critical role in influencing where fruits and vegetables are grown, distributed, sold, marketed, and served. Information found in this report illustrates the important ways in which policies can help the Nation meet health objectives. Although this report focuses on policy strategies, programmatic interventions are also important to build the evidence base for broader policy strategies and provide an initial “proof of concept.” The progress of fruit and vegetable policies to date is promising, but is not sufficiently widespread or adequate to bring current intake of fruits and vegetables closer to the

Healthy People 2020 targets. Areas of consideration for accelerating progress in reaching these targets include:

### **Continue to implement laws and policies related to nutrition standards.**

Over the past decade, federal agencies and some states have developed and/or refined and at times strengthened nutrition standards in many programs and public environments as part of a growing awareness about the connections between good nutrition and health status. As described in this report, USDA improved nutrition standards for the NSLP, SBP, WIC, and CACFP. HHS and GSA coordinated the development of the Food Service Guidelines for Federal Facilities. Nutrition standards can influence food choices and also show benefit to the nutritional health of the program participants. Given the positive health impacts demonstrated by the stronger nutrition standards in the school nutrition programs and the WIC program, improved standards in other programs such as TEFAP and the CSFP could yield similar benefits.

### **Continue to advance alignment efforts among all federal food programs and policies.**

While considerable attention has been devoted to understanding the linkages between food, agriculture, and nutrition policies and programs, more work is needed to align these areas and ensure an adequate and healthy food supply. The U.S. does not currently produce an adequate supply of fruits and vegetables for all Americans to meet the recommended daily servings as outlined in the Dietary Guidelines.<sup>271</sup> Farm and food policies can work in tandem to help ensure the Nation produces foods in proportions that are consistent with national dietary recommendations. Evidence-based policies improving access to domestic fruit and vegetable production, distribution, and waste reduction strategies consistent with federal recommendations could contribute to a vibrant, sustainable, healthy food system.

### **Encourage opportunities for policy innovations at the state and local levels.**

Many of the most innovative policies discussed in this report have originated at the state, tribal, or local level, rather than at the federal level. It is important that these governments have the flexibility and the authority to implement the policy strategies that work best for their communities.

### **Consider geography, environment, and community needs in policy development.**

There is significant variation within and between states related to geography, environment, and local community needs. Within states and tribal lands, there are rural or frontier areas where environment and geography may prohibit effective implementation of widely accepted evidence-based policies for promoting fruit and vegetable intake. Tribal communities need additional considerations given their often limited access to grocery stores.<sup>272</sup> These areas require special consideration related to access and economic issues. Promoting economic stability by improving food security and strengthening communities by increasing access to healthy foods can help to improve fruit and vegetable intake in the U.S.

### **Expand the focus on reaching young children.**

Lifelong eating and physical activity habits are established at a very young age. To provide recommendations for feeding children ages 0–2 years, which are not included in the current Dietary Guidelines for Americans, the Robert Wood Johnson Foundation’s Healthy Eating Research Program convened an expert panel and created feeding guidelines for infants and young toddlers.<sup>273</sup> These guidelines can be used by health professionals working with parents and child care providers of young children. Child care providers play a critical role in helping families reinforce healthy habits, such as daily fruit and vegetable intake. Despite recent data showing that obesity rates among 2- to 5-year-old children have declined since 2003, rates remain higher than in the late 1980s and early 1990s.<sup>274</sup> Given that child care is regulated primarily at the state level, the public health community can continue to support efforts to strengthen the nutrition standards in state licensing regulations and QRIS requirements.

### **Conduct rigorous evaluations of existing programs and policies.**

While some data does exist, as reflected in this report, rigorous evaluations can help assess whether existing programs and policies have made a difference not only in fruit and vegetable intake, but also in total dietary intake as well as other outcomes such as chronic disease risk factors. There are limited resources for public health law and policy impact evaluation and a significant need to better understand how policies impact outcomes at the local level, within states, and between states as well as how local and tribal, state, and federal policies have combined effects on outcomes.

### Conclusion

There is much more to do to achieve the Healthy People 2020 goals designed to improve the health of all Americans, including goals and targets focused on increasing fruit and vegetable intake. To ensure that all Americans have the opportunity to make the healthiest choices possible about their diets, policy and programmatic advances are needed to align fruit and vegetable distribution and access with our national consumption goals. To be most effective, laws and policies designed to meet these targets will need to be both innovative and based upon the best scientific research.

As this report has demonstrated, there continue to be many opportunities to ensure Americans live in communities with environments and policies that adequately support healthy eating. Integrating federal program resources, including those from the NSLP, SNAP, SNAP-Ed, WIC, and Cooperative Extension, with other public and privately funded initiatives and supporting states, tribes, and communities in adopting evidence-based policies could help to increase fruit and vegetable consumption and improve the public's health. This paper summarizes effective and creative legal and policy strategies that federal, state, tribal, and local governments have implemented to promote good nutrition generally and fruit and vegetable consumption specifically.

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