

**Centers for Disease Control and Prevention, Office on Smoking and Health**  
**Summary of Scientific Evidence:**  
**Comprehensive Tobacco Control Programs**  
**June 2021**

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**The Public Health Burden of Commercial Tobacco Use**

- The burden of disease and death from commercial tobacco\* use in the United States is overwhelmingly caused by cigarettes and other combustible tobacco products.<sup>1</sup>
  - According to 2014 data, every year in the United States, approximately 480,000 deaths and over \$300 billion in healthcare spending and productivity losses are attributable to cigarette smoking.<sup>1-3</sup>
  - For every person who dies from smoking in the United States, at least 30 people live with a serious smoking-related illness.<sup>4-6</sup>
  - Worldwide, commercial tobacco use and secondhand smoke exposure cause over 8 million deaths per year.<sup>7</sup>
  - Cigarette smoking causes diseases of almost every organ of the human body, including heart disease, stroke, type 2 diabetes, and chronic obstructive pulmonary disease (COPD).<sup>8</sup>
  - Smoking also causes cancer of the lung, esophagus, larynx, mouth, kidney, bladder, liver, pancreas, stomach, cervix, colon and rectum as well as acute myeloid leukemia.<sup>8-10</sup>
  - Even occasional or intermittent cigarette smoking causes considerable harm.<sup>11</sup>
  - Occasional or intermittent smoking is associated with increased risk for cardiovascular disease, lung and other cancers, and lower respiratory tract infections.<sup>11, 12</sup>
- No tobacco product is harmless.
  - Smokeless tobacco use causes cancer of the mouth, esophagus, and pancreas, is associated with diseases of the mouth, and may increase the risk of death from heart disease and stroke.<sup>13-15</sup>
  - Additional research is needed regarding the health effects of e-cigarettes and other emerging tobacco products, such as heated tobacco products. However, the current evidence shows that the e-cigarette aerosol that users breathe from the device and exhale can contain harmful and potentially harmful substances, including heavy metals like lead, volatile organic compounds, and cancer-causing agents.<sup>16</sup>
  - Moreover, studies of emissions from heated tobacco products suggest that the products expose both users and bystanders to some of the same chemicals found in cigarette smoke, although at lower levels than cigarette smoke.<sup>17</sup>
- Nicotine is a highly addictive drug found in tobacco products.<sup>16</sup>
  - As with drugs such as cocaine and heroin, nicotine activates the brain's reward circuits which reinforces repeated nicotine exposure.<sup>16</sup>
  - Nicotine also increases the risk of cardiovascular, respiratory, and gastrointestinal disorders, decreases immune response, negatively impacts reproductive health, and has acute toxicity at high enough doses.<sup>14, 18</sup> Nicotine also activates multiple biological

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\* References to tobacco refer to commercial tobacco and not the sacred and traditional use of tobacco by some American Indian communities.



- pathways through which smoking increases risk for disease development.<sup>14</sup>
- Nicotine is a health danger for pregnant women and their developing babies.<sup>19</sup>
- Youth and young adults are especially impacted by the harmful effects of nicotine.<sup>1, 16</sup>
  - Nicotine exposure can harm the developing adolescent brain, which continues to develop into the mid-20s. Specifically, using nicotine in adolescence can harm the prefrontal cortex, or the part of the brain that controls attention, learning, mood, and impulse control.<sup>16</sup>
  - Each time a new memory is created or a new skill is learned, stronger connections – or synapses – are built between brain cells. Young people’s brains build synapses faster than adult brains. Nicotine changes the way these synapses are formed.<sup>16</sup>
  - Using nicotine in adolescence may also increase risk for future addiction to other drugs.<sup>16</sup>

## **Who Uses Tobacco Products**

- Commercial tobacco use remains a considerable problem among adults and youth.
  - Globally, 1.1 billion adults smoke cigarettes.<sup>20</sup>
  - In 2019, 14.0% (34.1 million) of U.S. adults currently smoked cigarettes.<sup>21</sup>
  - Since 2011, the U.S. has seen declines in youth use of combustible tobacco products.<sup>22</sup> However, in 2020, 4.6% of high school and 1.6% of middle school students currently smoked cigarettes.<sup>23</sup>
  - Nearly 9 out of 10 adults who had ever smoked cigarettes daily first tried smoking by age 18,<sup>24</sup> and each day in the U.S., 1,600 youth under age 18 try their first cigarette.<sup>25</sup>
- Although considerable progress has been made in reducing cigarette smoking among U.S. adults and youth,<sup>1</sup> the tobacco product landscape continues to evolve to include a variety of tobacco products, including smoked, smokeless, and electronic products, such as e-cigarettes.<sup>19</sup>
  - In 2020, 19.6% of U.S. high school students and 4.7% of U.S. middle school students – a total of 3.6 million youth – reported current use (use in the past 30 days) of e-cigarettes.<sup>26</sup>
  - E-cigarettes have been the most commonly used tobacco product among U.S. youth since 2014; thus, in recent years, patterns of e-cigarette use have driven patterns of overall tobacco product use among U.S. youth.<sup>22</sup>
- Tobacco-related disparities are often the result of tobacco industry target marketing, advertising, and promotions, as well as inequitable distribution of resources and opportunities within and across populations.
  - For example, adults with lower socioeconomic status, such as lower levels of education or income, have a higher prevalence of cigarette smoking compared to those with higher levels of education and income.<sup>27</sup>
  - Having a lower socioeconomic status is also associated with a higher prevalence of commercial tobacco use among youth.<sup>28</sup>
  - Research findings reveal that there is no difference in quit attempts by socioeconomic status, however people with lower socioeconomic status are less likely to successfully quit smoking cigarettes.<sup>24</sup>
  - The neighborhoods in which people live can be a contributing factor. A 2019 study across 30 U.S. cities found that the lowest-income neighborhoods had nearly five times more tobacco retailers than the highest-income neighborhoods.<sup>29</sup> The U.S. Surgeon General and others have found that high tobacco retailer density is associated with higher youth initiation of tobacco use, increased tobacco consumption, and lower

- likelihood of successful quitting.<sup>30-33</sup>
- Furthermore, unfair and unjust practices contribute to tobacco-related disparities in cigarette smoking among different racial and ethnic groups.
    - For example, American Indians/Alaska Natives have the highest prevalence of cigarette smoking compared to all other racial/ethnic groups in the United States.<sup>21, 34</sup> Higher prevalence of commercial cigarette use has also contributed to American Indians/Alaska Natives having a higher risk of experiencing tobacco-related disease and death.<sup>35, 36</sup>
    - The higher prevalence of cigarette smoking among American Indians/Alaska Natives is due, in part, to tobacco companies targeting American Indian/Alaska Native communities through extensive promotions, sponsorships, and advertising campaigns.<sup>37</sup>
    - In addition, the percentage of African American adults who smoke cigarettes is similar to the percentage of white adults who smoke cigarettes, but African Americans are less likely to be successful at quitting due to their lack of referrals to and/or access to adequate cessation treatments and predatory marketing by the tobacco industry.<sup>38-40</sup>

### **Best Practices for Comprehensive Tobacco Control Programs**

- There is a considerable body of scientific evidence documenting the effectiveness of commercial tobacco prevention and control strategies. Chapter 14 of the 2014 Surgeon General’s Report, *The Health Consequences of Smoking – 50 Years of Progress*, noted several of these strategies, including:
  - Raising the average price of tobacco products, a policy intervention proven to prevent youth from starting to smoke and to encourage those who smoke to quit.
  - Implementing comprehensive smoke-free policies that prohibit smoking in all indoor worksites and public places, including worksites, restaurants, and bars. This strategy is proven to protect people from secondhand smoke, help people quit smoking, and prevent youth smoking initiation.
  - High impact mass media campaigns that shape social norms around preventing initiation, encouraging cessation, and encouraging support for smoke-free environments.
  - Provision of comprehensive, barrier-free access to evidence-based cessation resources.<sup>41, 42</sup>
- The 2014 Surgeon General’s report also recommended funding statewide comprehensive tobacco control programs at CDC-recommended levels because evidence-based state tobacco control programs that are comprehensive, sustained, and accountable have been shown to reduce smoking rates and tobacco-related disease and death.<sup>42</sup>
  - CDC first presented its recommendations regarding the components of evidence-based, effective, and comprehensive state tobacco control programs—along with recommendations for the funding required to implement these programs—in the 1999 guideline, *Best Practices for Comprehensive Tobacco Control Programs*. CDC updated these guidelines in 2007.
  - In 2014, CDC refined this guidance based on the best available science, evidence from state experiences, and the changing tobacco control landscape to help states assess their options and evaluate funding priorities.
  - The 2014 edition of *Best Practices*, which is the most recent, describes an integrated programmatic structure for implementing interventions proven to be effective and

- provides the recommended level of state investment necessary to reach these goals and to reduce commercial tobacco use in each state. This document provides an overview of the recommendations in the 2014 *Best Practices* guidelines, as well as other resources regarding comprehensive statewide tobacco control programs.<sup>43</sup>
- A comprehensive state tobacco control program is a coordinated effort to prevent initiation of commercial tobacco use among youth and young adults, to promote quitting among adults and youth, to eliminate exposure to secondhand smoke, and to identify and eliminate tobacco-related disparities among population groups.<sup>43</sup>
    - This comprehensive approach optimizes synergy from applying a mix of educational, clinical, regulatory, economic, and social strategies.<sup>43</sup>
    - States that have made larger investments in comprehensive tobacco control programs have seen larger declines in cigarette sales than the United States as a whole, and the prevalence of smoking among adults and youth has declined faster as spending for tobacco control programs has increased.<sup>44, 45</sup>
  - *Best Practices for Comprehensive Tobacco Control Programs–2014* provides the specific annual investment recommended to implement a comprehensive, effective tobacco control program in each state.
    - In 2014, research showed that while all states combined received about \$80 per person in revenue from tobacco settlement payments and sales each year, states’ actual spending on tobacco control was less than \$1.50 per person per year. This was only 15% of CDC’s national recommended annual investment from *Best Practices-2014*, which is \$10.53 per person.<sup>43</sup>
    - While states are projected to spend \$656 million on tobacco control in fiscal year 2021, that amount is less than 20% of the total investment recommended by CDC and just 2.4% of the \$26.9 billion the states will collect from tobacco settlement funds and tobacco tax revenue in 2021.<sup>46</sup>
    - In fiscal year 2021, no state funds its tobacco prevention and cessation programs at CDC-recommended levels; just three states fund their programs at 75% or more of what CDC recommends, while thirty-four states and the District of Columbia fund their programs at less than 25% of what CDC recommends. This is less than 20% of the \$3.3 billion CDC recommends for all states combined; 34 states and the District of Columbia spend less than 25% of what the CDC recommends.<sup>46</sup>
  - These funding recommendations are small when compared to tobacco industry advertising and promotion.
    - In 2019, cigarette and smokeless tobacco companies spent more than \$8.2 billion on advertising and promotional expenses in the United States, nearly \$1 million every hour.<sup>47</sup>
    - In addition, e-cigarette companies spent \$110 million on advertising in 2018.<sup>48</sup>
    - Nearly 75 percent (\$5.7 billion) of all cigarette company marketing expenditures were for price discounts paid to retailers or wholesalers to reduce the price of cigarettes to consumers.<sup>47</sup> This is about 1.7 times more than what CDC’s recommends (\$3.3 billion) all states spend combined on comprehensive tobacco control programs per year.
  - These recommended program funding levels also are small when compared to the massive health and economic burdens that commercial tobacco use places on states.
    - As discussed above, each year in the U.S., approximately 480,000 deaths and over \$300 billion in healthcare spending and productivity losses are attributable to cigarette smoking.<sup>1-3</sup>

- According to *Best Practices-2014*, state-level smoking-attributable healthcare spending ranged from \$258 million to \$13.29 billion per year.<sup>49, 50</sup>

### **Best Practices: Program Components**

- CDC’s *Best Practices for Comprehensive Tobacco Control Programs–2014* includes descriptions of the integrated, programmatic structure for comprehensive tobacco control programs that maximizes program effectiveness.<sup>43</sup>
  - This approach is key to the success of state tobacco control programs because the effectiveness of these programs is based on the synergy between their components.
  - An entire, comprehensive approach is most effective, and individual interventions have less impact when they are implemented in isolation.<sup>43</sup>
- Based on the evidence of effectiveness documented in the scientific literature, as well as state experiences, CDC recommends that state tobacco control programs include all of the following components:
  - State and Community Interventions, including local and statewide policies and programs designed to influence societal organizations, systems, and networks that encourage tobacco-free social norms.<sup>43</sup>
  - Mass-Reach Health Communication Interventions, including high-impact messages through paid and earned media to encourage people who smoke to quit, prevent youth and young adult commercial tobacco use initiation, and to educate about the harms of secondhand smoke exposure.<sup>43</sup>
  - Cessation Interventions, including promoting health systems change, expanding insurance coverage of proven cessation treatments, and supporting state quitline capacity.<sup>43</sup>
  - Surveillance and Evaluation, including ongoing monitoring and evaluation of commercial tobacco use, as well as tobacco-related attitudes, behaviors, and health outcomes, to better understand the problem as well as monitor progress toward reducing commercial tobacco use.<sup>43</sup>
  - Infrastructure, Administration, and Management to assure adequate internal capacity within states, including a sufficient number of skilled staff to provide program oversight, technical assistance, and training.<sup>43</sup> In 2010, the National Association of County and City Health Officials noted local governments need to “develop a strong infrastructure to support a broad range of tobacco-control activities at the community level.”<sup>51</sup> Its report noted that by doing so, localities could “significantly improve community health and save money for all levels of government by reducing the incidence of tobacco-related chronic disease.”<sup>51</sup>
- In addition to these specific components, comprehensive tobacco control programs should integrate efforts in all their activities to advance health equity and eliminate tobacco-related disparities.
  - *Best Practices–2014* outlines examples of ways programs can do this, including health education campaigns which feature testimonials from a variety of people with different backgrounds and monitoring commercial tobacco use across multiple subpopulations, particularly those with the greatest burden of use.<sup>51</sup>
  - In addition, the 2015 *Best Practices User Guide—Health Equity in Tobacco Prevention* focuses on how comprehensive tobacco control programs can work to achieve health equity in commercial tobacco prevention and control. It offers tobacco control program staff and partners information on how to work toward achieving health equity when

planning, implementing, and enforcing commercial tobacco control policies.<sup>52</sup>

### **Impact of Comprehensive State Tobacco Control Programs**

- Evaluations of comprehensive state tobacco control programs indicate that there is a dose-response relationship between investment in these programs and reductions in commercial tobacco use.
  - That is, the more states spend on these programs, the greater the reductions in smoking—and the longer states invest, the greater and faster the impact.<sup>43, 53</sup>
  - If each state implemented and sustained the recommended level of funding outlined in *Best Practices–2014*, millions fewer people would smoke and hundreds of thousands of premature tobacco-related deaths would be prevented in the United States.<sup>43</sup>
  - Longer-term investments would yield even greater effects.<sup>43</sup> The resulting reductions in disease and death would translate into major savings in health care and productivity costs.
- Data from California—home to the first and longest-running state tobacco control program in the United States—provide an example of the impact that such a program can have if sustained over time.
  - In January 1989, the California cigarette excise tax increased from \$0.10 to \$0.35 per pack, with about 20% of the resulting revenue being used to fund commercial tobacco control efforts. Following the implementation of a comprehensive, evidence-based program, cigarette smoking prevalence among California adults fell from just under 23% in 1988 to just over 13% in 2006.<sup>54</sup>
  - As a result, compared with the rest of the country, heart disease deaths and lung cancer incidence in California have fallen at an accelerated rate. In fact, since 1998, lung cancer incidence has been falling four times faster in California than in the rest of the country.<sup>55</sup>
  - Over the years, California has continued its efforts. In November 2016, California Proposition 56 increased tobacco taxes, including raising the cigarette tax to \$2.87 per pack and allocating a portion of tobacco tax revenue to tobacco control and prevention.<sup>56</sup>
  - California’s commercial tobacco control and prevention efforts are estimated to have saved more than one million lives and reduced health care expenditures by an estimated \$134 billion.”<sup>43</sup>
- Minnesota provides another example of the impact of state tobacco control programs.
  - The Minnesota Department of Health reported that 20 years of tobacco control programming, from 1998 to 2017, led to significant impacts including declines in smoking and increased health. Minnesota adult cigarette smoking prevalence fell from 21.8% in 1997 to 15.2% in 2016.<sup>57</sup>
  - Specifically, through its comprehensive program, it is estimated that Minnesota might have prevented over 4,500 cancer cases and approximately 4,100 smoking-attributable deaths.<sup>58</sup>
  - The state’s long-term investment has also paid off economically. Minnesota reports that its tobacco control efforts have avoided \$2.4 billion in productivity losses and \$2.7 billion less spent in medical care, for a total of \$5.1 billion saved.<sup>58</sup>
  - The state expects benefits of its program to increase as it is implemented over time.<sup>58</sup>
- In Florida, between 1998 and 2003, a comprehensive tobacco control program that included an aggressive youth-oriented media campaign reduced cigarette smoking prevalence by 50% among middle school students and by 35% among high school students.<sup>59</sup>
  - By 2018, Florida reduced its high school smoking prevalence to 3.6% in 2018, one of the lowest ever reported by any state.<sup>60</sup>

- Other states have also seen sharp percent reductions in youth smoking prevalence after implementing sustained comprehensive statewide programs.
  - For example, between 2001 and 2010, New York State’s tobacco control program reported that declines in adult and youth cigarette smoking prevalence outpaced national declines. This resulted in smoking-attributable personal health care expenditures in 2010 that were \$4.1 billion less than they would have been if the smoking prevalence remained at 2001 levels.<sup>61</sup>
  - Washington State’s tobacco control program reported that it saw greater declines than the rest of the nation in adult and youth smoking prevalence from 2001 to 2005, after the state funded its tobacco program near the CDC-recommended levels.<sup>62</sup>

### **Negative Impact of Funding Cuts**

- After the 1999 *Best Practices* report was published, overall funding for state tobacco control programs more than doubled.<sup>63</sup>
- Unfortunately, however, in the face of budget deficits and tough funding choices among competing priorities, states have sharply reduced their investment in commercial tobacco prevention and control in recent years, resulting in the near-elimination of tobacco control programs in some states.<sup>64</sup>
  - Between 2002 and 2012, states cut commercial tobacco prevention funding from 749.7 million to \$456.7 million.<sup>65</sup>
  - Although the total amount budgeted by all the states combined has increased since that time, as noted above, in fiscal year 2021, all the states combined will spend much less than what CDC recommends, and much less than what the states collect in tobacco settlement funds and tobacco tax revenue, on tobacco prevention and control programs.<sup>46</sup>
- The experiences of a number of states show that cutting funding for state tobacco control programs leads to rapid reversals of previous progress in reducing commercial tobacco use.
  - For example, after funding for the Massachusetts’ tobacco control program was cut by 95%, from approximately \$54 million per year to \$2.5 million in fiscal year 2004, cigarette sales to minors increased, declines in youth smoking stalled, and the state’s per capita cigarette consumption rose. Between 2005 and 2006, after this funding cut, Massachusetts’s per capita cigarette consumption increased by 3.2%, while the national per capita consumption declined by 3.5%.<sup>66</sup>
  - Similarly, after funding for Florida’s highly successful youth-oriented “truth” campaign was cut in 2004, youth cigarette smoking rates—which had been falling sharply—stabilized, and then began creeping up again.<sup>67</sup>
  - Oregon experienced a cut in its program funding by about 70% in 2003, from \$10 million to \$3.5 million, and had to stop conducting certain youth prevention activities which it had implemented in different school districts. Youth smoking prevalence previously had slowed in the areas where prevention activities occurred, but when the state’s funding was cut, youth smoking prevalence increases were similar to those school districts where youth prevention activities had never been conducted, illustrating a backsliding on progress made when the funds were cut.<sup>68</sup>

## Conclusion

- Commercial tobacco use continues to impose a significant health and financial burden on individuals, health care systems, and society.
- We know what works to effectively prevent and reduce tobacco use.
- With sustained implementation of comprehensive tobacco control programs, at CDC recommended funding levels, we could prevent and reduce the staggering toll that commercial tobacco use takes on our families and our communities.
  - States that have made larger investments in comprehensive tobacco control programs have seen larger declines in cigarette sales than the United States as a whole, and the prevalence of smoking among adults and youth has declined faster as spending for tobacco control programs has increased.
  - In contrast, cutting funding for state tobacco control programs leads to rapid reversals of previous progress in reducing commercial tobacco use.

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