



# **Report on the Tobacco Epidemic in Indiana and Marion County and Effective Solutions: 2018 Update**

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**John A. Tauras, PhD**  
*University of Illinois at Chicago and NBER*

**Frank J. Chaloupka, PhD**  
*University of Illinois at Chicago and NBER*

**Paul K. Halverson, DrPH**  
*Indiana University Richard M. Fairbanks School of Public Health in Indianapolis*

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## Executive Summary

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Tobacco use remains a concerning and costly challenge to the health, quality of life, and economic development of communities across the country. The challenge is particularly important in Indiana, where the current smoking rate is among the top ten highest smoking rates in the country, with 21.1% of adults being current smokers in 2016. Smoking rates in Marion County are also much higher than the national average. Of the counties that contain the largest 30 U.S. cities, Marion County is tied for last, with a smoking rate of 21% in 2016.

High rates of tobacco use translate to poor health and premature death. In Indiana, approximately 11,100 citizens die prematurely each year from cigarette smoking, and 3,700 children under 18 become new daily smokers each year. Approximately 13.5% of women in Indiana smoked while pregnant in 2016, ranking Indiana the 11<sup>th</sup> worst state in the U.S. in this category. Among the Medicaid population, 30% of pregnant women smoke, which is more than twice the rate of non-Medicaid mothers. In Marion County, the maternal smoking rate is 9.9%, which is 37.5% higher than the national rate of 7.2%. High rates of maternal smoking are likely one driver of Indiana's disproportionately higher rates of infant mortality and underweight births when compared to the nation as a whole. Secondhand smoke represents a significant danger as well. More than 1,400 Hoosiers die prematurely from secondhand smoke exposure each year. Secondhand smoke is also responsible for more than 900 low-weight births in Indiana annually.

In addition to its health impacts, tobacco places a major financial burden on the state. The direct health care cost attributable to smoking in Indiana has been estimated to be \$3.3 billion in 2017 dollars, with the state Medicaid program bearing nearly \$540 million of that cost. These costs amount to an unnecessary combined annual state and federal tax burden of \$1,125 for each Indiana household. This figure does not even include the health care and loss of life costs associated with secondhand smoke in Indiana, which are estimated to be \$2.2 billion. Smoking also poses myriad problems for businesses in our state, including increased absenteeism, greater disability claims, reduced work performance while on the job, higher insurance premiums, lost work time spent on smoking breaks, and other factors. Smoking breaks alone are estimated to cost employers \$2.1 billion dollars per year in Indiana in lost productive time. Indiana's high smoking rates also have an impact on the state's appeal as a location to start and operate a business. Today, health care costs are second only to payroll expenditures for most businesses. As a result, more companies are looking at health rankings when deciding where to locate. In most of those rankings—from smoking rates to infant mortality—Indiana places near the bottom, making it a less attractive location for companies than in the past.

Fortunately, these problems are preventable. A number of effective solutions exist for lowering tobacco rates, improving health, and lowering costs in Indiana and Marion County. Policy makers, health care systems, employers, schools, and non-profit and community-based organizations all play a critical role.

Evidence-based policy strategies that can greatly reduce tobacco use and exposure to secondhand smoke include raising the price of tobacco, raising the minimum age of legal access for tobacco, funding tobacco control efforts at recommended levels, adopting comprehensive smoke-free air laws, running hard hitting anti-tobacco media campaigns,

adopting policies addressing retail sales of tobacco products, and adopting policies that address emerging tobacco products.

The estimated impacts of these policies, including raising the price of tobacco and restoring tobacco control, are substantial. A \$2.00 increase in the cigarette tax would prevent an estimated 58,100 youth from becoming adult smokers, encourage 70,100 adults to quit smoking, and prevent 36,300 future smoking-caused deaths in the current Indiana population. Moreover, a \$2.00 increase in the cigarette tax would generate at least \$78.9 million in health care cost savings in the first five years, due to fewer smoking-caused cases of lung cancer, heart attacks, strokes, and pregnancy and birth complications. The state Medicaid program would save more than \$11.3 million in health care costs in the first five years. Given the long-term consequences of smoking, these benefits would grow over time, with an estimated long-term savings of \$2.7 billion in overall health care spending. In addition to health benefits, an increase in the cigarette tax would raise revenue. A \$2.00 per pack increase in the Indiana state cigarette excise tax would generate an increase of over \$358 million in tax revenue in the first year alone. Restoring tobacco control spending in Indiana to CDC recommendations would result in: a 10.9% reduction in adult smoking yielding approximately \$373 million in annual health care cost savings; an 8.6% reduction in youth and young adult smoking resulting in lifetime health care cost savings of \$85.6 million; and 58 fewer low-birth-weight babies being born, resulting in first year hospital cost savings of \$1,911,603.

By implementing and promoting evidence-based programs, health care systems, employers, schools, and non-profit and community organizations can also take action to reduce tobacco consumption in Indiana and Marion County. This includes routinely screening patients for tobacco use and referring them to treatment, including cessation pharmacotherapies and counseling; ensuring employee benefits packages include coverage for cessation treatment and providing effective cessation interventions; implementing proven school-based programs to reduce tobacco consumption and adopting nicotine-free school policies; and disseminating information on the harms of smoking and ways to access effective cessation treatment.

This report updates and expands upon a report published by the Richard M. Fairbanks Foundation on September 16, 2016, entitled *Report on the Tobacco Epidemic in Marion County and Indiana*. Over the past two years, few major actions have been taken in Indiana to increase efforts to address tobacco. Not surprisingly, adult smoking rates have remained steady over the past few years. In addition, while youth cigarette smoking rates have declined over the past two years, the use of electronic vapor products by youth has increased significantly. This report includes policy solutions and recommendations for health care systems, employers, schools and non-profit and community organizations designed to address tobacco use and use of emerging nicotine products like e-cigarettes as well.

*Note: Data on smoking rates and other key indicators represent the most current data available as of the writing of this report. For the most up-to-date data, please visit the Richard M. Fairbanks Foundation data page at <http://www.rmff.org/insights/data>.*

## **THE TOBACCO USE PROBLEM**

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### ***TOBACCO'S TOLL IN THE U.S. AND WORLDWIDE***

Tobacco use is the leading preventable cause of death in high-income countries, and an increasing cause of death in low- and middle-income countries. [1] The harms of tobacco are typically expressed in terms of the public's health. If tobacco use is thought of as a chronic disease, it is measurably one of the largest epidemics the world has ever faced. Tobacco kills roughly seven million people around the world every year. More than six million of those deaths are the direct result of tobacco use and almost 900,000 deaths occur among non-smoking individuals who die prematurely each year from exposure to secondhand smoke; children account for 28% of those deaths. [1]

Since the publication of the first U.S. Surgeon General's report in 1964, which causally linked cigarette smoking as the primary cause of lung cancer in men [2], smoking rates among U.S. adults have decreased from 42.4% in 1965 to 13.9% in 2017 [3,4], a testament to the slow but steady progress of our nation's public health efforts. Despite this progress, the consequences of smoking continue to exact a heavy toll on the nation's health and economy. In the more than 50 years that have elapsed since that landmark report, nearly 21 million Americans have died prematurely from smoking and exposure to secondhand smoke. [5] More than 480,000 American adults die each year from 21 diseases caused by the 7,000 chemicals in tobacco smoke. [6] This represents approximately one in every five deaths in the U.S.

The toll that tobacco exacts on the nation's economy is significant. Between 6% and 15% of U.S. health care expenditures are directly attributable to smoking-caused diseases [1,7,8,9], with a cost to the nation estimated to be between \$289 billion and \$332.5 billion per year. [5]

### ***Tobacco's Toll in Indiana***

Tobacco use is by far Indiana's greatest public health challenge. More than 11,000 Indiana citizens die prematurely each year from cigarette smoking [10], and more than 1,400 non-smokers die from exposure to secondhand smoke. [11] It is also estimated that 3,700 children under 18 begin smoking every year. [12] Approximately 13.5% of Hoosier women smoked while pregnant (2016), ranking Indiana the 11th worst state in the U.S. in this category. [13] In the Medicaid population, 30% of pregnant women smoke, [14] which may be one reason why Indiana continues to have disproportionately higher rates of infant mortality and underweight births compared to the nation as a whole.

In Indiana, the direct cost of health care attributable to smoking was estimated to be \$3.3 billion in 2017 dollars [15], with the state Medicaid program bearing approximately \$540 million of that cost [16]. To cover these expenditures, residents of Indiana pay an additional \$1,125 per household in state and federal taxes. [15] These figures exclude the cost of secondhand smoke and lost productivity. Indiana health care and premature death costs attributable to secondhand smoke are estimated to be \$2.2 billion. [15] The yearly cost burden to employers in Indiana in terms of lost productivity caused by smoking breaks is estimated at \$2.1 billion. [15]

## Smoking Rates in Indiana

Although Indiana’s adult smoking rate remains high, the trend has been downward from 32.8% in 1990. Over the past three years, the rate has hovered around 21% (Table 1).\* [17] The Hoosier state lags far behind most states in reducing the number of adults who smoke.

- Indiana currently ranks 41st among states, with a smoking rate of 21.1%, with no significant change in prevalence since 2012. [17]
- The state with the lowest adult smoking rate is Utah with 8.8% of adults smoking, followed by California with 11.0%, and Hawaii with 13.1%. [17]
- The top ten lowest smoking states all have smoking rates of 14.3% or less. [17]
- The Healthy People 2020 goal established by the U.S. Centers for Disease Control and Prevention is 12%. [18]

**Table 1 Indiana’s Smoking Rate 2010-2016 [17]**

| Year                   | 2010  | 2011  | 2012 | 2013  | 2014  | 2015  | 2016  | HP 2020 |
|------------------------|-------|-------|------|-------|-------|-------|-------|---------|
| Indiana’s Smoking Rate | 21.2% | 25.6% | 24%  | 21.9% | 22.9% | 20.6% | 21.1% | 12%     |

Source: Behavioral Risk Factor Surveillance System (BRFSS) data. Note: In 2011, the Centers for Disease Control and Prevention changed the weighting methodology (raking) used in the BRFSS and added cellular phone only respondents. The changes made by the CDC affected smoking prevalence estimates such that data prior to 2011 are not directly comparable to those for 2011 and beyond. Specifically, addition of cellular-phone-only households to the sampling frame in 2011 likely resulted in higher estimates of smoking prevalence compared to estimates from a sampling frame excluding these households. This would result in a shift up in the trend in prevalence beginning in 2011.

## Smoking Rates by Adult Population Group

While 21.1% of adults smoke in Indiana, the smoking rate is not uniform among different subgroups of the population. Certain groups have higher rates of smoking than others and therefore suffer disproportionately from tobacco-related disease and death. The disparities in smoking vary by gender, race/ethnicity, educational attainment, sexual orientation, and mental health status. In Indiana, males, African Americans, individuals with low educational attainment, lesbian, gay, bisexual, and transgender individuals, and individuals with mental illness have significantly higher rates of smoking than the average state smoking rate.

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\* Note: Data on smoking rates and other key indicators represent the most current data available as of the writing of this report. For the most up-to-date data, please visit the Richard M. Fairbanks Foundation data page at <http://www.rmff.org/insights/data>.

### **Gender (Indiana and the U.S.) [17]**

- In 2016, the smoking rate in Indiana was higher for males (23.6%) than females (18.8%).
- The smoking rates for both males and females in Indiana were considerably higher than the national smoking rate for males (17.5%) and females (13.5%) in 2016.

### **Race (Indiana and the U.S.) [17]**

#### *Hispanics*

- In 2016, the smoking rate for adult Hispanics in Indiana was 17.8%. This is 43.5% higher than the average prevalence of smoking among Hispanics in the U.S. of 12.4% in 2016.
- Between 2011 and 2016, smoking rates among Hispanic adults in Indiana declined 20.5%.
- In 2016, smoking rates among Hispanic adults in Indiana were significantly lower than smoking rates among whites (21.2%) and African Americans (23.0%).

#### *African Americans (Indiana and the U.S.) [17]*

- The smoking rate for Indiana African Americans in 2016 was 23.0%, significantly higher than the national rate among African Americans of 18.4% in 2016.
- The prevalence of smoking among African Americans in Indiana is higher than the smoking prevalence among whites and Hispanics and higher than the overall Indiana adult smoking rate of 21.1% (2016).
- Between 2011 and 2016, there has been a statistically significant decline in the prevalence of African American smoking in Indiana of 26.8%.

#### *Whites (Indiana and the U.S.) [17]*

- The smoking rate for whites in Indiana in 2016 was 21.2%, significantly higher than the national rate among whites of 16.6%.
- Between 2011 and 2016, there has been a statistically significant decline in the prevalence of smoking among whites in Indiana of 15.2%.

### **Educational Attainment (Indiana and the U.S.) [17]**

- In 2016, the smoking rate in Indiana was lowest for individuals who completed a college degree (7.3%) and highest for individuals with less than a high school degree (38.2%). Individuals whose highest educational attainment was a high school diploma smoked at a rate of 26.2%.
- The rates of smoking by educational attainment are higher in Indiana than nationally.

### **Lesbian, Gay, Bisexual, and Transgender (LGBT) Adults (Indiana) [19]**

- In 2016, 31.6% of LGBT adults in Indiana were current smokers.
- For both sexes combined, smoking prevalence was approximately 53% higher among Indiana LGBT adults (31.6%) than straight adults (20.6%).
- 30.7% of gay, bisexual, and transgender men reported smoking, compared with 22.8% of heterosexual men.

- A significantly higher percentage of lesbian, bisexual, and transgender women (32.4%) reported smoking than heterosexual women (18.6%) in 2016.

**Adults with Mental Illness (Indiana and the U.S.) [20,21]**

- Approximately 1 in 5 adults in the U.S. (18%) and in Indiana (20.6%) have a mental illness.
- In both Indiana and the U. S., adults with mental illness smoke at much higher rates than adults without mental illness.
- Individuals with mental illness or substance use disorder smoke nearly 40% of all cigarettes smoked in the U.S.
- Indiana adults who report frequent poor mental health days (>14 in the past month) are more than twice as likely to smoke as adults who do not report frequent poor mental health days.

**Pregnant Women (Indiana and the U.S.) [22]**

- In 2016, the smoking rate for pregnant women in Indiana was 13.5%. This is 87.5% higher than the national average prevalence of smoking among pregnant women of 7.2%.

**Use of Smokeless Tobacco Among Adults**

- Indiana’s adult smokeless tobacco rate of 4.0% in 2016 was just slightly higher than the national average rate of 3.9%. [17]
- The prevalence of adult smokeless tobacco consumption in Indiana declined by 18.4% from 2013 to 2016 (Table 2). [17]

**Table 2 Indiana’s Adult Smokeless Tobacco Rate 2013-2016 [17]**

| Year                                   | 2013 | 2014 | 2015 | 2016 | HP 2020 |
|--|------|------|------|------|---------|
| Indiana’s Adult Smokeless Tobacco Rate | 4.9% | 4.3% | 4.4% | 4.0% | 0.2%    |

Source: BRFSS data.

**Youth Tobacco Use [23,24]**

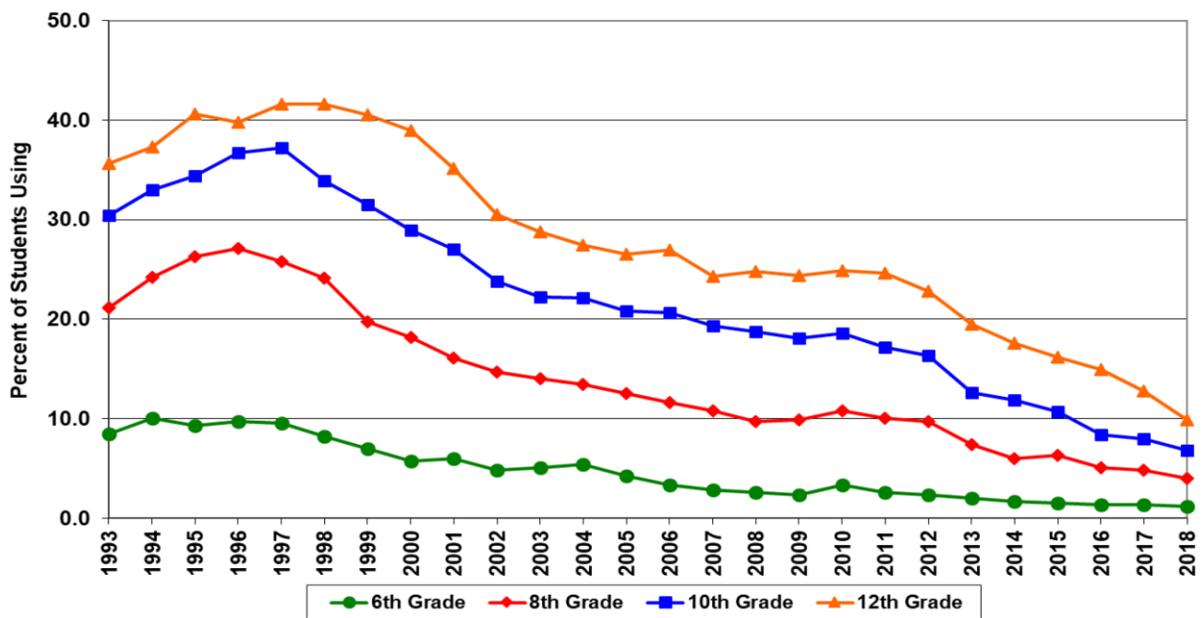
While the prevalence of youth smoking in Indiana has declined considerably since the mid/late 1990’s according to the Indiana Prevention Resource Center, Indiana’s rates of youth tobacco use, including both cigarettes and smokeless tobacco, are consistently above the national average.

- In 2018, the prevalence of youth smoking in Indiana was at an all-time low with 4.0%, 6.8%, and 9.9% of 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> graders smoking, respectively (Figure 1).

- Despite being at all-time lows, smoking prevalence rates in Indiana have consistently been higher than national prevalence rates for 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> graders, respectively (Table 3).
- The prevalence of smokeless tobacco consumption among 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> graders in 2018 in Indiana was 1.8%, 3.5%, and 5.6%, respectively.
- Youth smokeless tobacco prevalence rates have typically been higher than national smokeless tobacco prevalence rates (Table 3).
- Smoking prevalence rates among 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> graders in Indiana have declined by 36.5%, 36.4%, and 38.9% between the years 2015 and 2018, respectively.
- Smokeless tobacco prevalence rates among 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> graders in Indiana have declined by 25.0%, 34.0%, and 32.5% between the years 2015 and 2018, respectively.

**Figure 1 Indiana Youth Smoking Trends [23]**

### Trends of Monthly Cigarettes Use Among Indiana Students: 1993 - 2018



Source: Indiana Youth Survey, 2018

**Table 3 30-Day Youth Prevalence of Select Tobacco Products, 2015-2018 [23,24]**

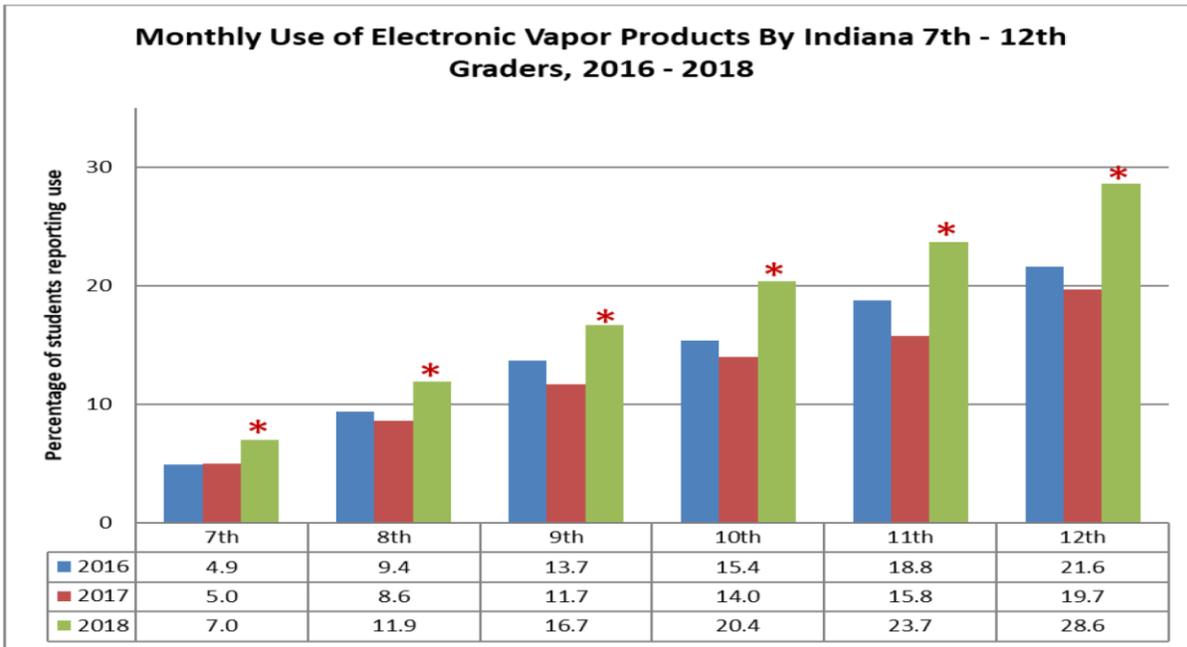
| Year                                      | 2015  | 2016  | 2017  | 2018 | % change 2015-2018 |
|---|-------|-------|-------|------|--------------------|
| Indiana Smoking 8 <sup>th</sup> Grade     | 6.3%  | 5.1%  | 4.8%  | 4.0% | -36.5%             |
| Indiana Smoking 10 <sup>th</sup> Grade    | 10.7% | 8.4%  | 8.0%  | 6.8% | -36.4%             |
| Indiana Smoking 12 <sup>th</sup> Grade    | 16.2% | 14.9% | 12.8% | 9.9% | -38.9%             |
| National Smoking 8 <sup>th</sup> Grade    | 3.6%  | 2.6%  | 1.9%  | -    | -                  |
| National Smoking 10 <sup>th</sup> Grade   | 6.3%  | 4.9%  | 5.0%  | -    | -                  |
| National Smoking 12 <sup>th</sup> Grade   | 11.4% | 10.5% | 9.7%  | -    | -                  |
| Indiana Smokeless 8 <sup>th</sup> Grade   | 2.4%  | 2.4%  | 2.2%  | 1.8% | -25.0%             |
| Indiana Smokeless 10 <sup>th</sup> Grade  | 5.3%  | 4.6%  | 3.8%  | 3.5% | -34.0%             |
| Indiana Smokeless 12 <sup>th</sup> Grade  | 8.3%  | 7.4%  | 6.1%  | 5.6% | -32.5%             |
| National Smokeless 8 <sup>th</sup> Grade  | 3.2%  | 2.5%  | 1.7%  | -    | -                  |
| National Smokeless 10 <sup>th</sup> Grade | 4.9%  | 3.5%  | 3.8%  | -    | -                  |
| National Smokeless 12 <sup>th</sup> Grade | 6.1%  | 6.6%  | 4.9%  | -    | -                  |

Source: Indiana youth smoking prevalence rates are from the Indiana Youth Survey. National youth smoking prevalence rates are from the Monitoring the Future Survey.

### ***Youth Use of Electronic Vapor Products [23,24]***

As can be seen in Figure 2, the rates of electronic vapor product use among 7<sup>th</sup> to 12<sup>th</sup> graders in Indiana has increased significantly between 2017 and 2018. In 2018, 11.9%, 20.4%, and 28.6% of 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> grade students, respectively, in Indiana used electronic vapor products.

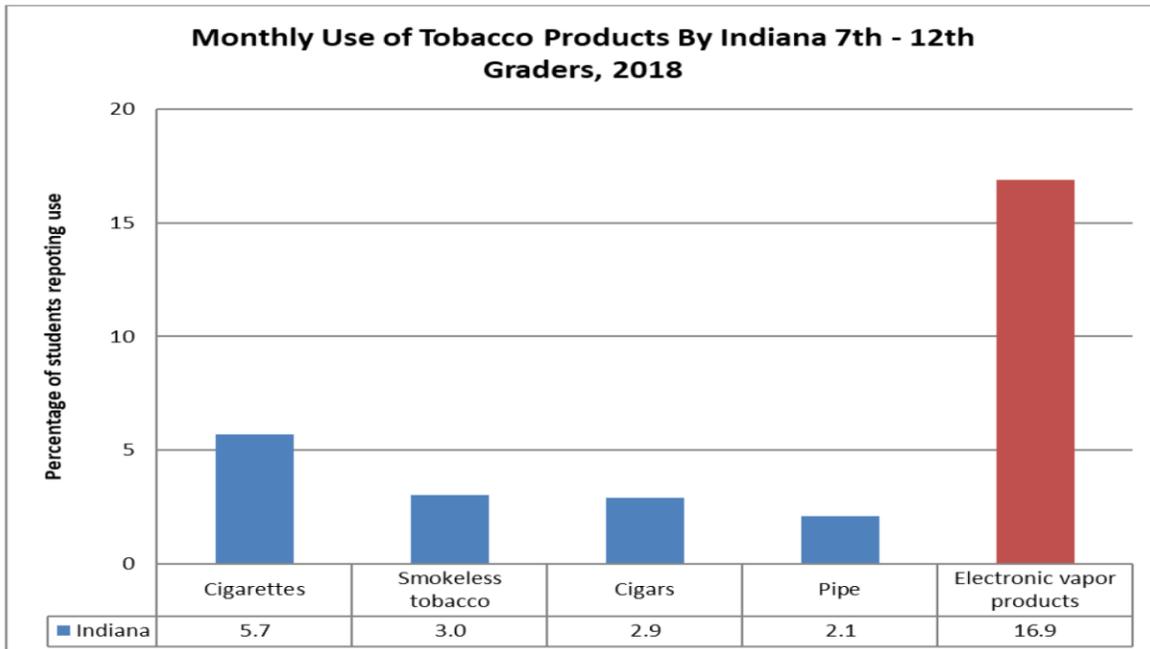
**Figure 2 Indiana Youth Electronic Vapor Product Trends [23]**



Source: Indiana Youth Survey.

The recent explosion in electronic vapor product use in Indiana is alarming, as nearly three times more youth in grades 7-12 reported monthly use of such products (16.9% of youth) compared to cigarettes (5.7% of youth), the next most-frequently-used nicotine delivery product (See Figure 3).

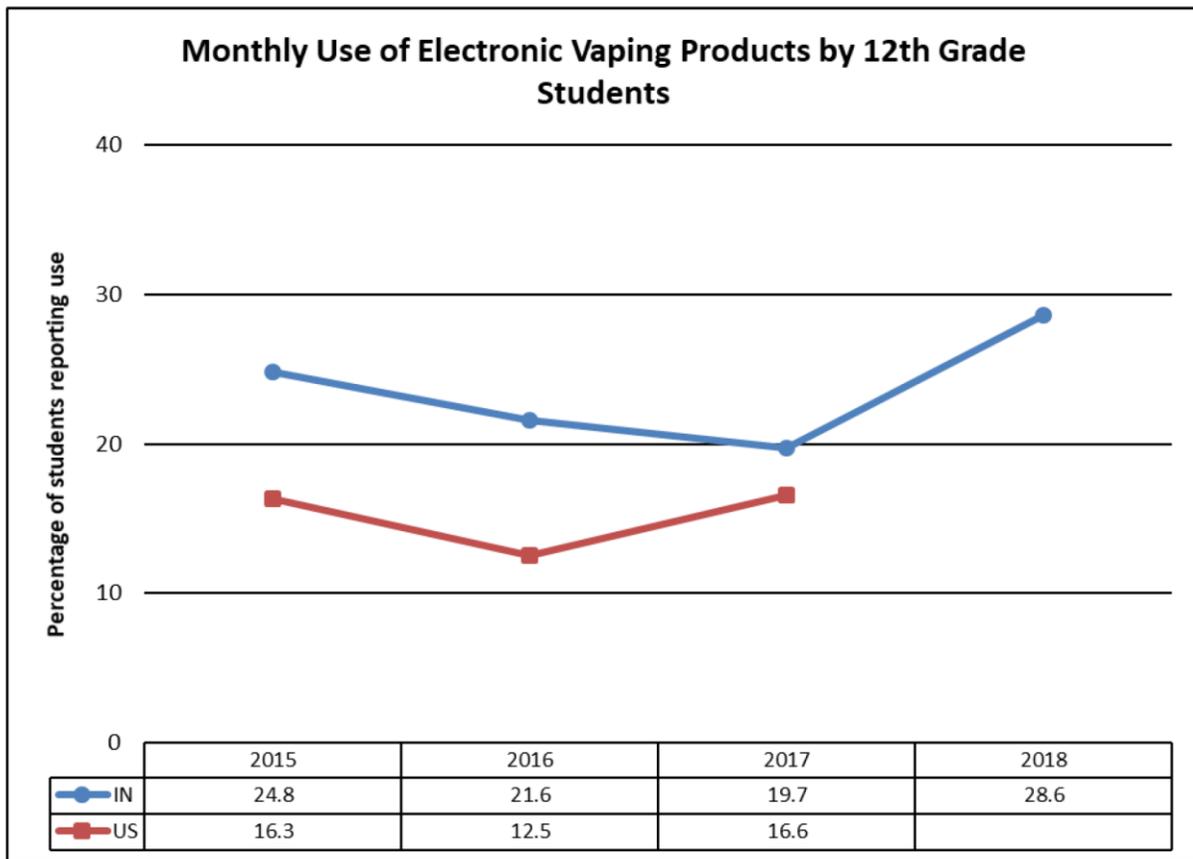
**Figure 3 Indiana Youth Use of Tobacco Products 2018 [23]**



Source: Indiana Youth Survey.

Moreover, Indiana’s rates of electronic vapor product use by 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> grade students have been consistently above the national averages since 2015, the year the Indiana Youth Survey first asked about the use of electronic vapor products [23]. Figure 4 illustrates the difference in prevalence rates of electronic vapor products between Indiana and the U.S. among high school seniors since 2015.

**Figure 4 12<sup>th</sup> Grade Use of Electronic Vapor Products: Indiana and U.S. [23]**



Source: Indiana youth electronic vapor product prevalence rates are from the Indiana Youth Survey. National youth electronic vapor product prevalence rates are from the Monitoring the Future Survey.

**Smoking in Marion County [25,26]**

Marion County’s overall smoking rate<sup>+</sup> is slightly higher than Indiana’s rate but significantly higher than the average smoking rate for the nation, as shown in the most recent Behavioral Risk Factor Surveillance System (BRFSS) data (Table 4):

- Among Marion County residents, males smoked at significantly higher rates than females, and among race/ethnicity groups, smoking prevalence was highest among African Americans and lowest among Hispanics in 2016.
- Among Marion County residents, when compared to the smoking rate among Hispanics, smoking prevalence was nearly two times higher among African Americans and whites in 2016.

These disparities in the smoking rates in Marion County compared to the U.S. illustrate how far behind Indianapolis is in reducing tobacco use among its citizens.

**Table 4 2016 Smoking Prevalence in Marion County, Indiana, and the U.S. [25,26]**

| Category         | Marion County Prevalence 2016 (95% CI) | Indiana Prevalence 2016 (95% CI) | U.S. Prevalence 2016 (95% CI) |
|------------------|--|----------------------------------|-------------------------------|
| Gender:          |  |                                  |                               |
| Male             | 24.6% (19.6, 29.5)                     | 23.6% (21.8, 25.4)               | 17.5%                         |
| Female           | 18.1% (14.4, 21.8)                     | 18.8% (17.3, 20.3)               | 13.5%                         |
| Race/Ethnicity:  |  |                                  |                               |
| White            | 21.3% (17.4, 25.3)                     | 21.2% (19.9, 22.5)               | 16.6%                         |
| African American | 22.6% (16.2, 30.0)                     | 23.0% (18.3, 27.7)               | 16.5%                         |
| Hispanic         | 12.3% (3.6, 21.0)                      | 17.8% (12.7, 23.0)               | 10.7%                         |
| Total            | 21.2% (18.1, 24.2)                     | 21.1% (20.0, 22.3)               | 15.5%                         |

Sources: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health. BRFSS Prevalence & Trends Data. U.S. Prevalence: National Health Interview Survey, U.S. “CI” denotes “confidence interval.”

Compared to counties where other large cities are located, Marion County lags behind in smoking rates. Of the counties that contain the 30 largest U.S. cities, Marion County has the highest smoking rate of 21%, tied with Shelby and Davidson Counties, Tennessee. Of the counties that contain the largest 30 cities, Santa Clara County, California, has the lowest smoking rate of 8% (Table 5). [27]

<sup>+</sup> Note: Data on smoking rates and other key indicators represent the most current data available as of the writing of this report. For the most up-to-date data, please visit the Richard M. Fairbanks Foundation data page at <http://www.rmff.org/insights/data>.

**Table 5 Smoking Rates in the Counties that Contain the 30 Largest Cities in the U.S. [27]**

| City                | Population     | Pop. Rank | County           | County Smoking Rate 2016 | Smoking Rank |
|---------------------|----------------|-----------|------------------|--------------------------|--------------|
| San Jose            | 1,035,317      | 10        | Santa Clara      | 8%                       | 1            |
| Seattle             | 724,745        | 18        | King             | 9%                       | 2            |
| San Francisco       | 884,363        | 13        | San Francisco Co | 10%                      | 3            |
| Los Angeles         | 3,999,759      | 2         | Los Angeles Co   | 11%                      | 4            |
| San Diego           | 1,419,516      | 8         | San Diego Co     | 11%                      | 4            |
| Austin              | 950,715        | 11        | Travis           | 13%                      | 6            |
| Houston             | 2,312,717      | 4         | Harris           | 13%                      | 6            |
| New York City       | 8,622,698      | 1         | 5 Counties       | 13%                      | 6            |
| Baltimore           | 611,648        | 30        | Baltimore Co     | 14%                      | 9            |
| Boston              | 685,094        | 21        | Suffolk          | 14%                      | 9            |
| Chicago             | 2,716,450      | 3         | Cook             | 14%                      | 9            |
| Phoenix             | 1,626,078      | 5         | Maricopa         | 14%                      | 9            |
| San Antonio         | 1,511,946      | 7         | Bexar            | 14%                      | 9            |
| Charlotte           | 859,035        | 17        | Mecklenburg      | 15%                      | 14           |
| Dallas              | 1,341,075      | 9         | Dallas Co        | 15%                      | 14           |
| El Paso             | 683,577        | 22        | El Paso          | 15%                      | 14           |
| Fort Worth          | 874,168        | 15        | Tarrant          | 15%                      | 14           |
| Portland            | 647,805        | 26        | Multnomah        | 15%                      | 14           |
| Denver              | 704,621        | 19        | Denver Co        | 16%                      | 19           |
| Las Vegas           | 641,676        | 28        | Clark            | 16%                      | 19           |
| Oklahoma City       | 643,648        | 27        | Oklahoma Co      | 16%                      | 19           |
| Washington, DC      | 693,972        | 20        | N/A              | 17%                      | 22           |
| Jacksonville        | 892,062        | 12        | Duval            | 18%                      | 23           |
| Columbus            | 879,170        | 14        | Franklin         | 19%                      | 24           |
| Louisville          | 621,349        | 29        | Jefferson        | 19%                      | 24           |
| Detroit             | 673,104        | 23        | Wayne            | 20%                      | 26           |
| Philadelphia        | 1,580,863      | 6         | Philadelphia Co  | 20%                      | 26           |
| <b>Indianapolis</b> | <b>863,002</b> | <b>16</b> | <b>Marion</b>    | <b>21%</b>               | <b>28</b>    |
| Memphis             | 652,236        | 25        | Shelby           | 21%                      | 28           |
| Nashville           | 667,560        | 24        | Davidson         | 21%                      | 28           |

Sources: U.S. Census Bureau, July 1, 2017 estimates; and 2016 smoking rates from County Health Rankings and Roadmaps Located at: <http://www.countyhealthrankings.org/>.

Even among the counties that contain the twelve largest Midwestern cities, Marion County tied for last place (with Cleveland, Ohio) with a smoking rate of 21% (Table 6).

**Table 6 Smoking Rates in Counties that Contain the Largest Midwestern Cities [27]**

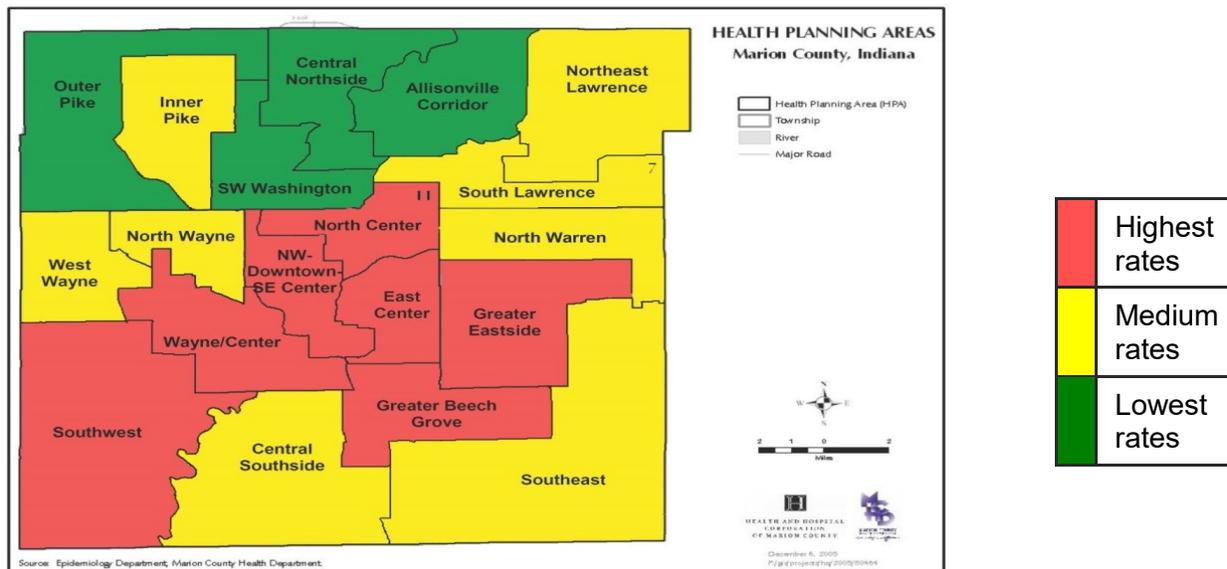
| City                | Population     | Pop. Rank | County        | Smoking Rate 2016 | Smoking Rank |
|---------------------|----------------|-----------|---------------|-------------------|--------------|
| Minneapolis         | 422,331        | 9         | Hennepin      | 13%               | 1            |
| Chicago             | 2,716,450      | 1         | Cook          | 14%               | 2            |
| Omaha               | 466,893        | 8         | Douglas       | 17%               | 3            |
| Milwaukee           | 595,351        | 6         | Milwaukee Co  | 18%               | 4            |
| Columbus            | 879,170        | 2         | Franklin      | 19%               | 5            |
| Lexington           | 321,959        | 12        | Fayette       | 19%               | 5            |
| Louisville          | 621,349        | 5         | Jefferson     | 19%               | 5            |
| Wichita             | 390,591        | 10        | Sedgwick      | 19%               | 5            |
| Detroit             | 673,104        | 4         | Wayne         | 20%               | 9            |
| Kansas City         | 488,943        | 7         | Jackson       | 20%               | 9            |
| Cleveland           | 385,525        | 11        | Cuyahoga      | 21%               | 11           |
| <b>Indianapolis</b> | <b>863,002</b> | <b>3</b>  | <b>Marion</b> | <b>21%</b>        | <b>11</b>    |

Source: U.S. Census Bureau, July 1, 2017 estimates; and 2016 smoking rates from County Health Rankings and Roadmaps Located at: <http://www.countyhealthrankings.org/>.

**Geographical Disparities in Smoking in Marion County**

Smoking varies geographically in Marion County (Figure 5) and is most prevalent in the Central and Southwest parts of the county (red areas). Lowest rates are in the Northwest and North Central parts of the county (green areas). Medium rates are found in the Eastern and Southern borders, and in pockets of the West (yellow areas).

**Figure 5 Highest Smoking Rates in Marion County**



Source: Marion County Public Health Department, Epidemiology Division, 2015. Graphic by Tarik Rabie, MPH County Health Planning District. [28]

### ***Smoking by Pregnant Women in Marion County [18,22,29]***

- 9.9% of mothers in Marion County smoked during pregnancy in 2016.
- Marion County's maternal smoking rate exceeded the Healthy People 2020 objective (1.4%) by more than seven times.
- Marion County's maternal smoking rate is lower than the state average, but is nearly 37.5% higher than the national rate (9.9% vs. 7.2%).

### ***Summary of Tobacco Use in Indiana and Marion County***

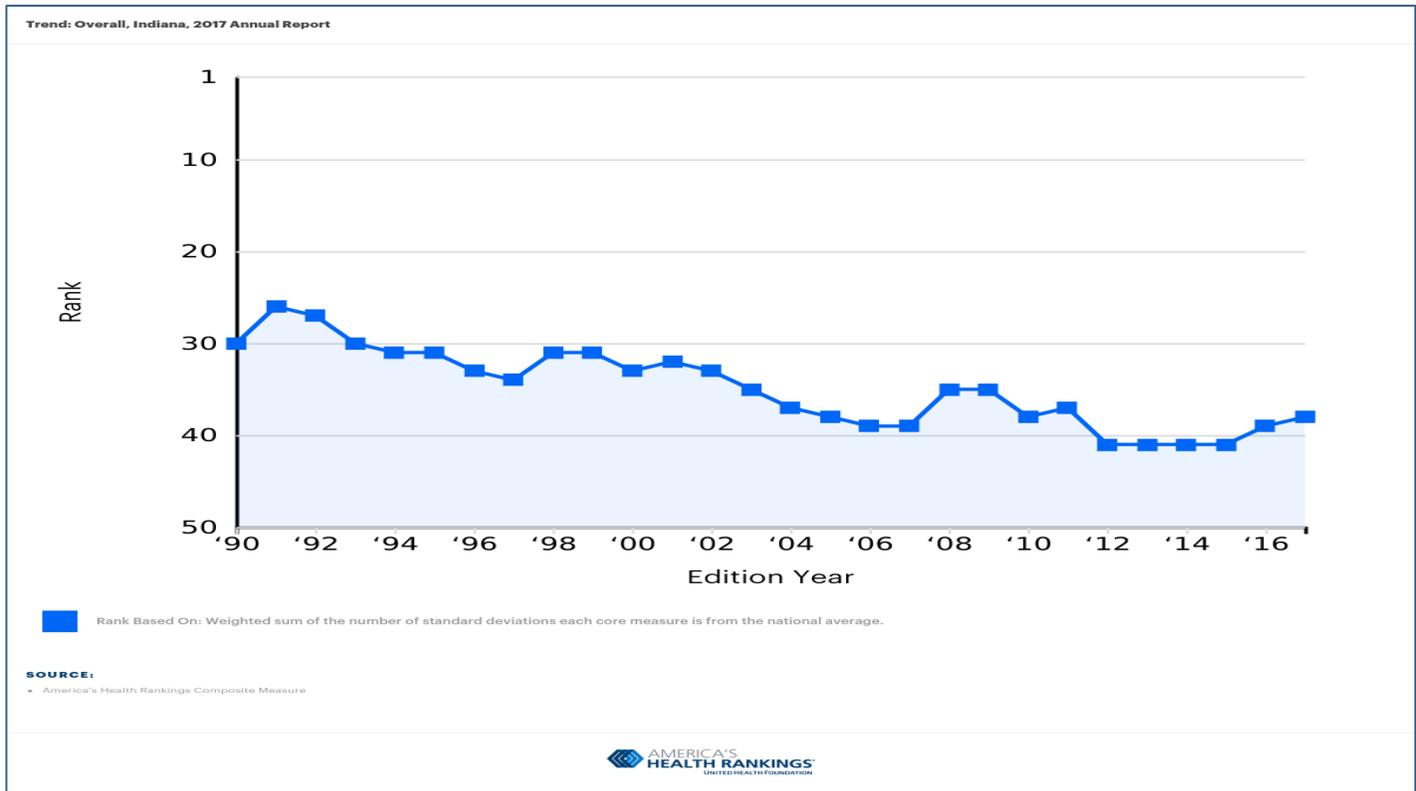
Tobacco use in Indiana and Marion County has not decreased as rapidly as many other states and large cities over the past five years. Indiana ranks 41<sup>st</sup> of 50 states in adult smoking rates. Likewise, Marion County has lagged behind most big cities in reducing smoking. Among counties that contain the largest 30 big cities in the U.S., Marion County has the highest smoking rate at 21%. Even among the counties with the largest cities in the Midwest, Marion County has the highest smoking rate. Failure to reduce smoking rates in the state and Marion County have resulted in excess illness and death, higher health care costs, and reduced productivity among their residents. The following section describes the health implications of tobacco consumption for Indiana and Marion County.

## ***HEALTH IMPLICATIONS***

### ***Health Implications for Indiana***

Each year for the past 28 years the United Health Foundation has released a report entitled *America's Health Rankings* that analyzes a comprehensive set of behaviors, community and environmental conditions, policies, clinical care, and outcomes data to assess the nation's health on a state-by-state basis. In 2017, Indiana ranked 38<sup>th</sup> in the country, placing Indiana among the bottom 13 states for overall health (Figure 6). [30] As recently as 1991, Indiana ranked squarely in the middle of states at 26<sup>th</sup>. Indiana's failure to prevent disease by lowering tobacco rates and adequately protecting citizens from secondhand smoke has been one critical factor in the descent of its overall state health ranking.

**Figure 6 Indiana’s Health Ranking, 1990-2017 [30]**



Source: America’s Health Rankings. United Health Foundation.

Tobacco use negatively affects nearly every organ in the body [5] and plays an important role in several chronic and potentially fatal conditions. More than 11,000 Indiana residents die prematurely each year from cigarette smoking [10]. Moreover, secondhand smoke contains more than 7,000 chemicals, including more than 70 carcinogens and other irritants and toxins. [11] Studies have shown secondhand smoke can cause heart disease, cancer, respiratory problems, and irritation of the eyes and nasal passages. According to the Indiana State Department of Health, more than 1,400 people die prematurely from secondhand smoke exposure each year, including 17 infants and children. [11] Secondhand smoke is also responsible for more than 900 low-birth-weight babies born annually in Indiana. [31] Table 7 provides health indicators for selected smoking-related diseases in Indiana and the U.S.

**Table 7 Selected Health Indicators: Indiana and U.S.**

| <b>Health Indicators</b>  | <b>Indiana</b> | <b>U.S.</b>  |
|---|----------------|--------------|
| <b>Lung Cancer Incidence Rate (2011-2015)</b>                                   |                |              |
| Lung cancer, new cases per 100,000 population (age-adjusted)                    | <b>72.8</b>    | <b>60.2</b>  |
| <b>Source: National Cancer Institute State Cancer Profiles</b>                  |                |              |
| <b>Lung Cancer Mortality Rate (IN 2012-2016; U.S. 2015)</b>                     |                |              |
| Lung cancer deaths per 100,000 population (age-adjusted)                        | <b>49.2</b>    | <b>40.6</b>  |
| <b>Source: Indiana Indicators [32]; National Cancer Institute SEER [33]</b>     |                |              |
| <b>Cancer Mortality Rate (2016)</b>   |                |              |
| Cancer deaths per 100,000 population (age-adjusted)                             | <b>172.5</b>   | <b>155.8</b> |
| <b>Source: CDC Stats of the State of Indiana [34]</b>                           |                |              |
| <b>Prevalence of Cardiovascular Disease 2016</b>                                |                |              |
| Percent of adults Aged 18+ with Cardiovascular Disease                          | <b>7.5%</b>    | <b>6.6%</b>  |
| <b>Source: Kaiser Family Foundation estimates using BRFSS [35]</b>              |                |              |
| <b>Heart Disease Mortality (2016)</b>   |                |              |
| Heart disease deaths per 100,000 population (age-adjusted)                      | <b>180.6</b>   | <b>165.5</b> |
| <b>Source: CDC Stats of the State of Indiana [34]</b>                           |                |              |
| <b>Prevalence of Stroke (2015)</b>  |                |              |
| Percent of adults Aged 18+ that have had a stroke                               | <b>3.5%</b>    | <b>3.0%</b>  |
| <b>Source: CDC National Cardiovascular Disease Surveillance System [36]</b>     |                |              |
| <b>Stroke Mortality (2016)</b>  |                |              |
| Stroke deaths per 100,000 population (age-adjusted)                             | <b>39.5</b>    | <b>37.3</b>  |
| <b>Source: CDC Stats of the State of Indiana [34]</b>                           |                |              |
| <b>Chronic Lower Respiratory Disease Mortality (2016)</b>                       |                |              |
| Chronic lower respiratory disease deaths per 100,000 population (age-adjusted)  | <b>54.6</b>    | <b>40.6</b>  |
| <b>Source: CDC Stats of the State of Indiana [34]</b>                           |                |              |
| <b>Prevalence of Asthma Among Adults (2015)</b>                                 |                |              |
| Percent of adults Aged 18+ with Asthma  | <b>10.2%</b>   | <b>7.8%</b>  |
| <b>Source: Indiana State Department of Health, Epidemiology Resource Center</b> |                |              |
| <b>Child Asthma Hospitalization (2014)</b>                                      |                |              |
| Asthma emergency room visits among children 5 to 17 per 10,000 population       | <b>8.5</b>     |              |
| <b>Source: Indiana State Department of Health, Epidemiology Resource Center</b> |                |              |
| <b>Birth and Infant Data (2016)</b>   |                |              |
| Percent of babies born preterm  | <b>10.0%</b>   | <b>9.9%</b>  |
| Percent of babies born with low birth weight                                    | <b>8.2%</b>    | <b>8.2%</b>  |
| Infant mortality rate (deaths per 1,000 live births)                            | <b>7.5</b>     | <b>5.9</b>   |
| <b>Source: CDC Stats of the State of Indiana [34]</b>                           |                |              |

As can be seen in Table 7, Indiana does not fare well relative to the U.S. as a whole on smoking-related health indicators. In fact, in every health indicator except one (low birth weight percentage, where Indiana is tied with the U.S.) Indiana has worse health outcomes than the U.S. Indiana's high smoking rate relative to the U.S. on average is clearly a critical factor in explaining the health disparities above.

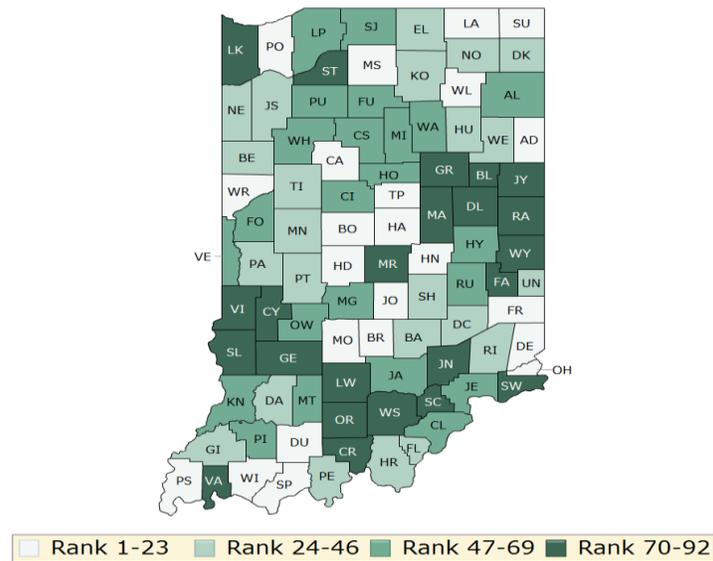
Racial health disparities also exist in Indiana. In 2016, the number of deaths per 100,000 individuals in Indiana was 828.4 for whites and 980.2 for African Americans. [37] The higher rate of African American smoking in Indiana relative to other races and ethnicities helps explain some of the elevated death rate among African Americans. Studies have found African Americans suffer disproportionately from many smoking-related diseases including cancer, diabetes, and heart disease. In Indiana, during 2010-2014, African Americans had a 3.2% greater incidence of cancer than whites, and more than a 20% higher mortality rate. [38] Moreover, in Indiana, African Americans are almost twice as likely to get type 2 diabetes as non-Hispanic whites. [39] Finally, African-Americans are twice as likely to die from stroke as whites and their rate of first strokes is almost double that of whites. [40]

### ***Regional Disparities in Health Across Indiana***

Regional disparities also play an important role in Indiana's overall health status. The opportunity to be healthy varies considerably between counties in Indiana. These disparities are costly, in terms of health care and lost productivity, and are preventable.

In 2018, the County Health Rankings and Roadmaps group analyzed the disparities between counties in every state based on residents' health outcomes. The health outcomes used measure how long people live and how healthy people feel. Length of life is measured by premature death (i.e. years of potential life lost before age 75) and quality of life is measured by self-reported health status (i.e. % of people reporting poor or fair health and the number of physically and mentally unhealthy days within the last 30 days) and the percent of low birth weight newborns. Figure 7 shows the county distribution of health outcomes in Indiana. The map is divided into four quartiles with less color intensity indicating better performance in health outcomes. The healthiest county in Indiana based on the aforementioned outcomes is Hamilton County, and the least healthy is Fayette County. Marion County ranked 75<sup>th</sup> out of 92 counties, placing it in the lowest quartile of health outcomes in the state. [37]

**Figure 7 Distribution of Indiana’s Health Outcomes [37]**



**Health Implications for Marion County**

As described above, Marion County’s smoking rate is considerably higher than the national average rate and just slightly higher (one tenth of one percent) than the state average smoking rate. However, Marion County is covered by a comprehensive smoke-free air law as opposed to the state’s weaker smoke-free law. Despite the stronger smoking restriction in Marion County, the Marion County Community Health Assessment found that one in five youths aged 12 to 17 (20%) was still exposed to tobacco smoke in his or her own home. [42] Table 8 provides health indicators for selected smoking-related diseases in Marion County and Indiana. [32]

**Table 8 Selected Health Indicators: Marion County and Indiana**

| Health Indicators  |             |
|--|-------------|
| <b>Lung Cancer Incidence Rate (2011-2015)</b>                |             |
| Lung cancer, new cases per 100,000 population (age-adjusted) |             |
| Marion County  | <b>78.7</b> |
| Indiana  | <b>72.8</b> |
| <b>Source: Indiana State Cancer Registry</b>                 |             |
| <b>Lung Cancer Mortality Rate (2016)</b>                     |             |
| Lung cancer deaths per 100,000 population (age-adjusted)     |             |
| Marion County  | <b>53.8</b> |
| Indiana  | <b>49.2</b> |
| <b>Source: Indiana State Cancer Registry</b>                 |             |

|   |              |
|---|--------------|
| <b>Heart Disease Hospitalization (2014)</b>                                     |              |
| Hospital admissions per 10,000 population (age-adjusted)                        |              |
| Marion County   | <b>84.0</b>  |
| Indiana   | <b>81.5</b>  |
| <b>Source: Indiana State Department of Health, Epidemiology Resource Center</b> |              |
| <b>Heart Disease Mortality (2016)</b>   |              |
| Heart disease deaths per 100,000 population (age-adjusted)                      |              |
| Marion County   | <b>177.7</b> |
| Indiana   | <b>180.6</b> |
| <b>Source: Indiana State Department of Health</b>                               |              |
| <b>Stroke Hospitalization (2014)</b>  |              |
| Stroke hospital admissions per 10,000 population (age-adjusted)                 |              |
| Marion County   | <b>24.7</b>  |
| Indiana   | <b>20.9</b>  |
| <b>Source: Indiana State Department of Health, Epidemiology Resource Center</b> |              |
| <b>Stroke Mortality (2016)</b>  |              |
| Stroke deaths per 100,000 population (age-adjusted)                             |              |
| Marion County   | <b>39.4</b>  |
| Indiana   | <b>39.5</b>  |
| <b>Source: Indiana State Department of Health</b>                               |              |
| <b>Chronic Lower Respiratory Disease Mortality (2016)</b>                       |              |
| Chronic lower respiratory disease deaths per 100,000 population (age-adjusted)  |              |
| Marion County   | <b>61.7</b>  |
| Indiana   | <b>54.6</b>  |
| <b>Source: Indiana State Department of Health</b>                               |              |
| <b>Asthma Hospitalization (2014)</b>  |              |
| Asthma hospital admissions per 10,000 population (age-adjusted)                 |              |
| Marion County   | <b>18.5</b>  |
| Indiana   | <b>10.5</b>  |
| <b>Source: Indiana State Department of Health, Epidemiology Resource Center</b> |              |
| <b>Child Asthma Hospitalization (2014)</b>                                      |              |
| Asthma emergency room visits among children 5 to 17 per 10,000 population       |              |
| Marion County   | <b>25.9</b>  |
| Indiana   | <b>8.5</b>   |
| <b>Source: Indiana State Department of Health, Epidemiology Resource Center</b> |              |

In nearly all the categories above, Marion County exceeds the state's overall rates. These include 1) lung cancer incidence and mortality, 2) heart disease hospital admissions, 3) stroke hospitalization, 4) chronic lower respiratory disease mortality, and 5) asthma hospitalizations, particularly child asthma hospitalizations. Marion County even has a higher rate of low-birth-weight babies and preterm babies than the rest of Indiana (Table 9) despite the fact that smoking by pregnant women is lower in Marion County than the rest of Indiana.

**Table 9 Selected Birth Indicators: Marion County and Indiana**

| Birth Indicator                              | Marion County | Indiana |
|--|---------------|---------|
| Percent of Births Born Preterm               | 11.1%         | 9.6%    |
| Percent of Births born with Low Birth Weight | 9.2%          | 8.0%    |

The Marion County 2014 Community Health Assessment [43] found that:

- Maternal smoking was associated with 24.6% of all low birth weight births and 35.3% of low birth weight births among white mothers.
- Maternal smoking was associated with 19.6% of all preterm births and 28% of preterm births among white mothers.

Although the rates are high, the prevalence of smoking during pregnancy appears to be trending downward (Table 10). However, the related negative birth outcomes have remained relatively constant. Still, white women who were pregnant were much more likely to smoke than African American or Hispanic women, a trend that has persisted since at least 2009. [44]

**Table 10 Adverse Health Outcomes/Smoking Rates for Pregnant Women, Aged 18-34**

| Pregnant Women Aged 18-34      | 2009  | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  | 2016  | 2017  | HP 2020 |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Low birth weight (LBW)         | 10.3% | 9.8%  | 9.5%  | 9.1%  | 9.6%  | 9.1%  | 9.7%  | 10.0% | 10.6% | 7.8%    |
| Very low birth weight (VLBW)   | 2.3%  | 2.1%  | 2.1%  | 1.9%  | 1.9%  | 1.8%  | 2.0%  | 2.1%  | 2.1%  | 1.4%    |
| Prematurity                    | 11.7% | 10.2% | 10.2% | 10.2% | 10.8% | 10.9% | 10.8% | 11.7% | 11.6% | 11.4%   |
| Smoking during pregnancy       | 16.3% | 16.6% | 15.7% | 15.3% | 13.6% | 12.8% | 11.7% | 10.7% | 11.1% | ◊ 1.4%  |
| White, non-Hispanic            | 24.4% | 24.8% | 23.0% | 23.3% | 21.0% | 19.6% | 18.2% | 17.3% | 18.8% | ◊ 1.4%  |
| African American, non-Hispanic | 12.4% | 13.5% | 12.5% | 12.6% | 10.3% | 9.9%  | 9.5%  | 8.3%  | 8.0%  | ◊ 1.4%  |
| Hispanic                       | 3.3%  | 2.7%  | 3.7%  | 2.7%  | 2.7%  | 1.7%  | 1.9%  | 2.0%  | 1.7%  | ◊ 1.4%  |

◊HP Goal: 98.6% of women will abstain from smoking in pregnancy [18].

Source: Marion County Birth Certificates.

## ***COSTS TO GOVERNMENT AND TAXPAYERS***

The health effects of smoking and secondhand smoke impose substantial economic costs upon individuals, the government, and, in turn, taxpayers. In 2017, the direct cost of health care attributable to smoking in Indiana was estimated to be \$3.3 billion with the state Medicaid program paying a significant fraction of this expenditure. [15] A report published by the Richard M. Fairbanks Foundation found that the Indiana Medicaid program spent approximately \$540 million treating smoking-related diseases in fiscal year 2016. [16] To cover these expenditures, residents of Indiana pay an additional \$1,125 per household in state and federal taxes. [15] These health care cost estimates exclude the cost of secondhand smoke. The health care and premature death costs attributable to secondhand smoke in Indiana are estimated to be \$2.2 billion. [15] The Indiana Tobacco Prevention and Cessation Commission estimates the economic burden of secondhand smoke in Marion County to be \$301.8 million in 2017. [29]

There are immediate and long-term benefits of quitting cigarette smoking. It is commonly believed that it takes many years to see a return on investment in smoking cessation interventions. With the exception of cancer (which can develop over years), the risks for smoking-related diseases actually begin to decrease quickly after quitting. The risks of heart attack and stroke drop by about half after a year without smoking [45, 46] and a pregnant woman's risk of having a low-birth-weight infant due to smoking nearly evaporates if she quits in the first trimester [47].

Individual health status isn't the only factor that shows immediate improvement when a smoker quits; health care costs rapidly follow suit. A study evaluating the Massachusetts Medicaid population found net savings from reduced hospitalizations for cardiovascular conditions within two years of starting a statewide smoking cessation program, producing a return on investment of \$3.12 for every \$1.00 spent. [48] A 2016 study from the University of California, San Francisco's (UCSF) Center for Tobacco Control Research and Education found that a 10% decrease in smoking nationally would be followed by a \$63 billion decrease in total health care costs in the next year, and that savings would continue in the short term. [49]

UCSF researchers also estimated each state's health care costs (or savings) related to their smoking rate being above (or below) the national average. The excess cost to Indiana, with a rate of 22.9%, was \$1.702 billion annually. [50] No state had more excess smoking expenditures than Indiana except Kentucky, with \$1.723 billion. By contrast, the state of Utah, which consistently has the lowest smoking rate in the country, had an annual health care cost savings of \$1.295 billion. [50]

## ***COSTS TO EMPLOYERS***

The health effects of smoking and secondhand smoke are not only associated with large costs to individuals and the government, but they also impose substantial economic costs upon employers. These costs include lost productivity, as well as higher health care costs and higher insurance premiums.

## ***Lost Productivity***

A significant driver of tobacco's costs to employers is lost productivity, including higher absenteeism and lower performance while on the job.

### ***Smoking and Workplace Productivity***

Smokers exhibit reduced health relative to non-smokers. The resulting health shortfalls affect smokers' participation in the labor force. Numerous studies have found that employees who smoke are absent from work more frequently than nonsmoking employees. One study found that smokers have three times more sick days than people who have never smoked. [51] Former smokers are found to have rates of absenteeism that are lower than current smokers but higher than never-smokers. [51] There is also evidence that absenteeism rates vary by time since quitting, with recent quitters having higher absenteeism rates than long-term quitters. [51] A meta-analysis of 29 studies that examined the relationship between smoking and absence from work found that current smokers were 33% more likely to have an absence from work than non-smoking workers. [52]. In addition, the meta-analysis found current smokers to be absent from work for an average of 2.74 more days per year than non-smokers. [52] Absenteeism costs companies a significant amount of money each year in lost productivity, sick leave, and poorer quality of goods/services produced. Furthermore, the employees who do show up to work are often burdened with extra duties and responsibilities to fill in for absent employees, which can lead to tension and a decline in employee morale. Using an estimate of excess absences due to smoking, a recent study calculated the excess per-smoker absenteeism cost to employers to be approximately \$517 per year. [53]

Productivity loss due to smoke breaks is very costly to employers. A review of the literature concluded that smoking employees take an additional 4-30 minutes in break time each day for on-the-job smoking. [54] Using these estimates, research in the U.S. found that the annual per smoker cost of lost productivity due to unsanctioned smoking breaks is between \$1,642 and \$4,103, with a preferred estimate of \$3,077. [53]

Studies have also found smokers to have reduced work performance while on the job. [55] The lower on the job productivity that results from nicotine addiction is separate from lost work time due to smoking breaks and absenteeism. Research has found symptoms of physical and psychological withdrawal to set in within 30 minutes of finishing the last inhalation of smoke from cigarettes. [56] The prolonged withdrawal that smoking employees suffer diminishes their productivity at work. Estimates for smoker-related lost productivity due to withdrawal range from 1.9% - 4.0% of hours worked per year. Using a very conservative estimate of lost productivity of 1% of hours worked per year, the excess per-smoker cost to employers is \$462 per year. A productivity loss of 4% of hours worked per year results in an excess annual per-smoker cost of \$1,848. [53]

### ***Estimates of Productivity Losses in Indiana and Marion County Attributed to Smoking Employees***

Recent estimates find that the excess cost of lost productivity due to unsanctioned smoking breaks to employers in Indiana is \$2.1 billion per year. [15] To this we add the excess cost of

lost productivity due to absenteeism and reduced work performance to generate an estimate of the total yearly smoking-caused productivity loss to employers in Indiana. According to the Bureau of Labor Statistics, there were 3,119,000 non-farm employees working in Indiana in January 2018. Applying the adult smoking rate in Indiana of 21.1%, it is estimated that there were 658,109 employees who smoked in Indiana in January 2018. Adjusting the 2010 excess per-smoker absenteeism cost to employers of \$517 per year to January 2018 dollars and multiplying by the number of smoking employees, we estimate that the excess absenteeism cost to employers in Indiana is \$386.8 million in 2018. Finally, adjusting the 2010 excess per smoker reduced work performance while on the job cost to employers of \$462 per year to January 2018 dollars and multiplying by the number of smoking employees, we estimate that the excess reduced work performance while on the job cost to employers in Indiana is \$345.6 million in 2018. Our estimate of total smoking-caused productivity loss to employers in Indiana is \$2.8 billion per year.

We calculate productivity losses attributed to smoking in Marion County in a similar fashion. In particular, according to the Bureau of Labor Statistics, there were 601,889 employees working in Marion County, Indiana, in December 2017. Applying the adult smoking rate in Marion County of Indiana of 21.2%, it is estimated that there were 127,600 employees who smoked in Marion County Indiana in December 2017. Adjusting the 2010 excess per-smoker cost of lost productivity due to unsanctioned smoking breaks of \$3,077 per year to January 2018 dollars and multiplying by the number of smoking employees, we estimate that the excess cost of lost productivity due to unsanctioned smoking breaks to employers in Marion County, Indiana, is \$446.3 million in 2018. Further, adjusting the 2010 excess per smoker absenteeism cost to employers of \$517 per year to January 2018 dollars and multiplying by the number of smoking employees, we estimate that the excess absenteeism cost to employers in Marion County, Indiana, is \$74.99 million in 2018. Finally, adjusting the 2010 excess per-smoker reduced work performance while on the job cost to employers of \$462 per year to January 2018 dollars and multiplying by the number of smoking employees, we estimate that the excess reduced work performance while on the job cost to employers in Marion County, Indiana, is \$67.0 million in 2018. Our estimate of total smoking-caused productivity loss to employers in Marion County, Indiana, is \$588.3 million per year.

### ***Additional Costs***

The above estimates do not include the costs tobacco imposes on employers through higher health care costs and insurance premiums.

### ***Health Care Costs***

Indiana's high smoking rates have an impact on the state's appeal as a location to start and operate a business. Today, health care costs are second only to payroll expenditures for most businesses. As a result, more companies are looking at health rankings when deciding where to locate. In most of those rankings—from smoking rates to infant mortality—Indiana places near the bottom, making it a less attractive location for companies than in the past.

### *Insurance Premiums*

Several studies have estimated the higher costs of insurance coverage for smoking employees and workplaces that allow smoking. One study used data on health care claims in the U.S. for a large group indemnity plan and found the average health care insurance premiums for smoking employees to be approximately 50% higher than for non-smoking employees. A review of the literature found fire insurance costs to increase between \$15-\$21 per smoking employee in the U.S. and the cost to a business of providing \$75,000 of life insurance coverage to a smoker was an additional \$90 per year relative to a non-smoker. [54] Some companies may decide to self-insure and pay costs directly. A study in the U.S. estimated that the excess annual health care cost per smoking employee ranged from \$899-\$3,598 with a preferred estimate of \$2,056. [53]

Moreover, companies may face legal challenges if they allow smoking in the workplace. The Occupational Safety and Health Act of 1970 requires employers to provide their employees with working conditions that are free of known dangers. As there is irrefutable evidence on the health effects of secondhand smoke, employers who allow smoking put themselves at risk for litigation from non-smoking employees and customers. Examples of legal challenges include claims for workers compensation and disability benefits resulting from exposure to smoke in the workplace and lawsuits from customers who argue they are being discriminated against because they are being denied a smoke-free environment to conduct business. Since 1976, the year of the first reported secondhand smoke lawsuit, this type of litigation has increased both in number and in scope with increasing success. The increasing positive results of these lawsuits have persuaded many private business owners to go smoke-free. [57]

### ***Concerns About the Impact of Tobacco Control on the Economy***

A common argument against tobacco control policies is that they eliminate jobs and harm the state's economy. However, tobacco growing has declined sharply since 1997, a trend that is unlikely to reverse itself for at least two reasons: 1) the demand for tobacco products has decreased and is unlikely to return to previous levels; and 2) manufacturers of tobacco products are increasingly purchasing tobacco grown in foreign countries. [58] In 2012, there were 58,695 farms in Indiana, of which only 158 produced tobacco (or 0.27% of farms).

As the market for tobacco decreases, some farmers are replacing their tobacco crop with stevia plants, a source of sugar substitute. [59] Stevia grows in similar soil and climates as tobacco and can be produced using the same equipment and similar processes. The Food and Drug Administration has recognized that extracts from the stevia herb are generally safe for human consumption.

Given that tobacco is an increasingly smaller slice of Indiana's agricultural market, that the number of people employed is shrinking due to fewer tobacco farms, and that a substitute crop has become available, the argument for not enacting tobacco control policies because of harm to jobs and the economy is steadily losing ground.

## EFFECTIVE SOLUTIONS TO THE TOBACCO USE PROBLEM

Policy makers, health care systems, employers, schools, and non-profit and community-based organizations all play a critical role in reducing tobacco consumption in Indiana and Marion County. This section discusses evidence-based policy strategies that can greatly reduce tobacco use and exposure to secondhand smoke. These strategies include raising the price of tobacco, raising the minimum age of legal access for tobacco, funding tobacco control efforts at recommended levels, adopting comprehensive smoke-free air laws, running hard-hitting anti-tobacco media campaigns, adopting policies addressing retail sales of tobacco products, and adopting policies that address emerging nicotine products. This section also discusses the roles health care systems, employers, schools, and other non-profit and community partners can play in reducing tobacco consumption in Indiana and Marion County.

### **POLICY SOLUTIONS**

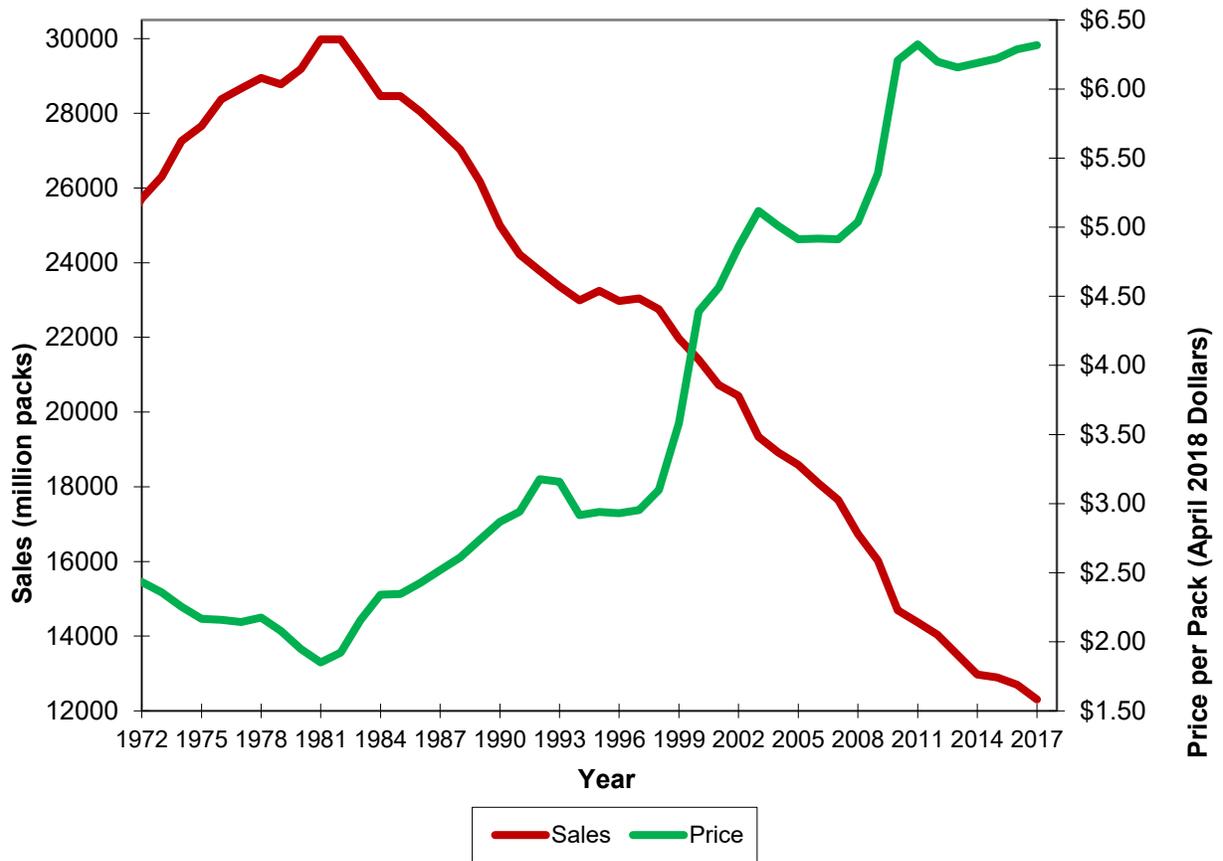
#### ***Raising the Price of Tobacco***

Cigarette and other tobacco product tax increases that increase price are highly effective in reducing tobacco use, while at the same time generating significant new tax revenues. The improvements in health that follow the reductions in tobacco use result in less spending on health care to treat the consequences of tobacco use, as well as increased productivity. While opponents argue that tax increases have a variety of unintended economic consequences, experiences from Indiana and many other states clearly show that these arguments are either false or greatly exaggerated.

#### ***The Impact of Price Increases on Tobacco Use***

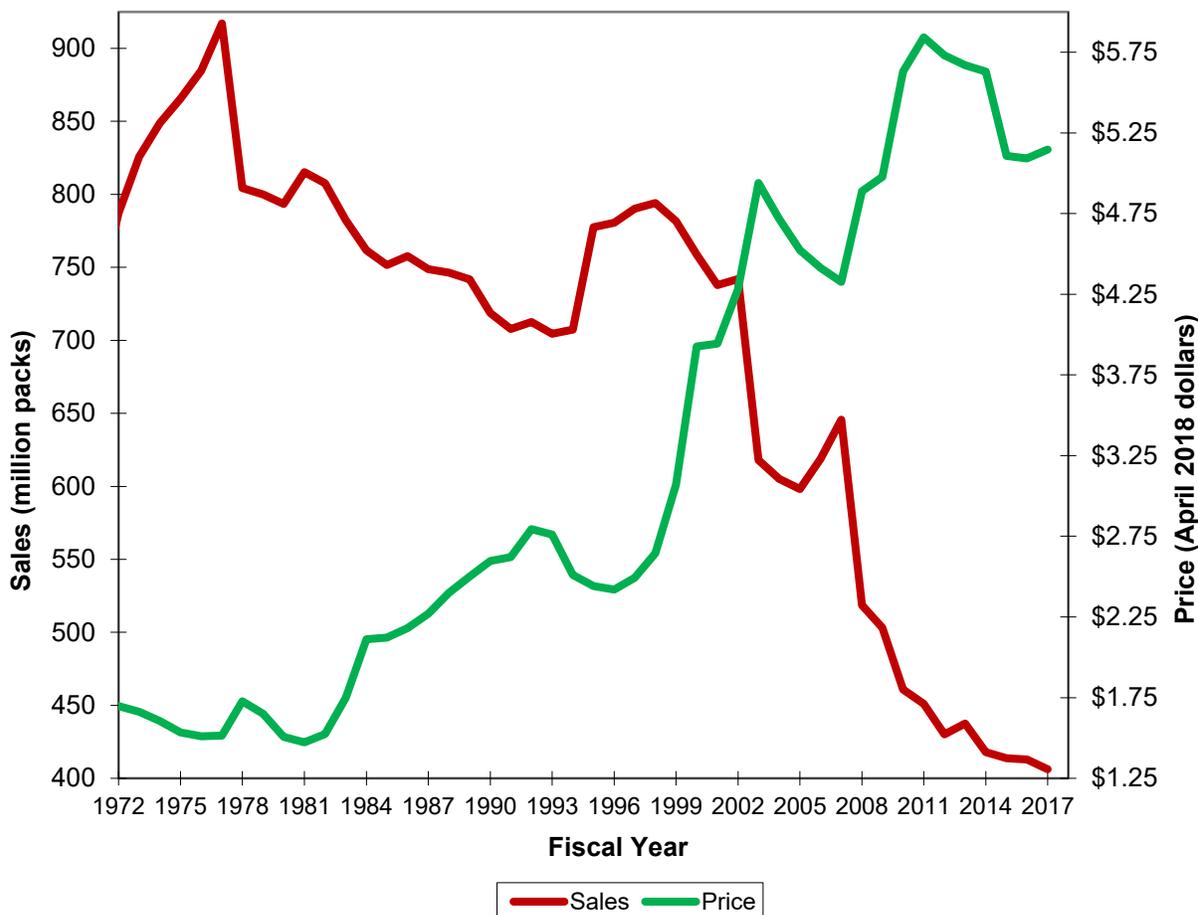
Significantly increasing cigarette and other tobacco product taxes is the single most effective and cost-effective option for reducing tobacco use. [60] Extensive economic research clearly shows that the demand for tobacco products follows the most fundamental law of economics – that of the downward sloping demand curve. That is, as prices go up, the quantity consumed goes down, and vice-versa. Estimates indicate that a 10% increase in cigarette prices reduces overall cigarette consumption by about 4%. [60,61] This inverse relationship is illustrated in Figures 8 and 9 showing trends over time in inflation-adjusted cigarette prices and cigarette sales for the U.S. and Indiana, respectively. As clearly illustrated by these figures, when cigarette prices are rising, cigarette sales are generally falling, and when cigarette prices are falling, in inflation-adjusted terms, cigarette sales are generally rising.

**Figure 8 Cigarette Prices and Tax-Paid Cigarette Sales Inflation Adjusted, U.S., 1972-2017**



Source: Orzechowski and Walker, 2018; Bureau of Labor Statistics, and authors' calculations. [62,63]

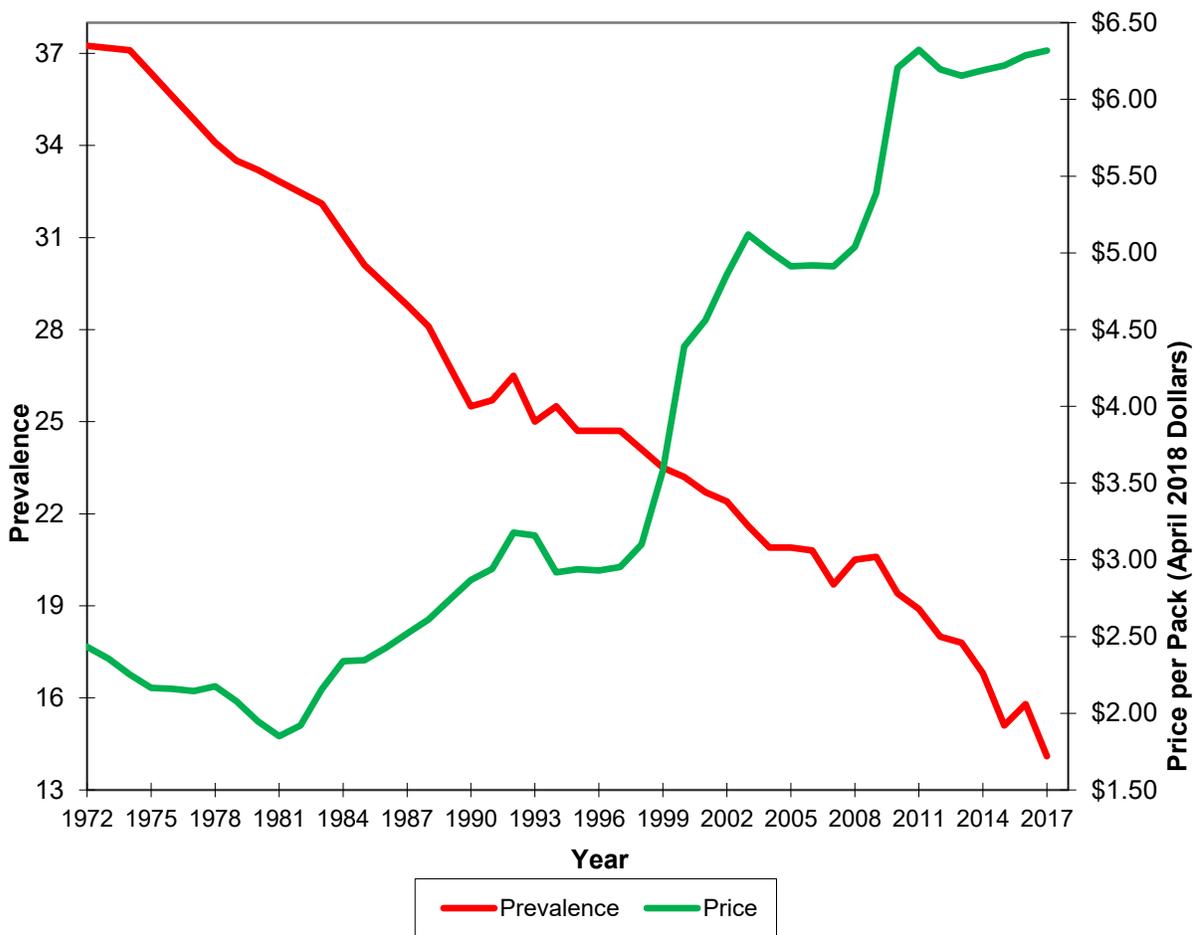
**Figure 9 Cigarette Prices and Tax-Paid Cigarette Sales, Inflation-Adjusted, Indiana, 1972-2017**



Source: Orzechowski and Walker, 2018, Bureau of Labor Statistics, and authors' calculations. [62,63]

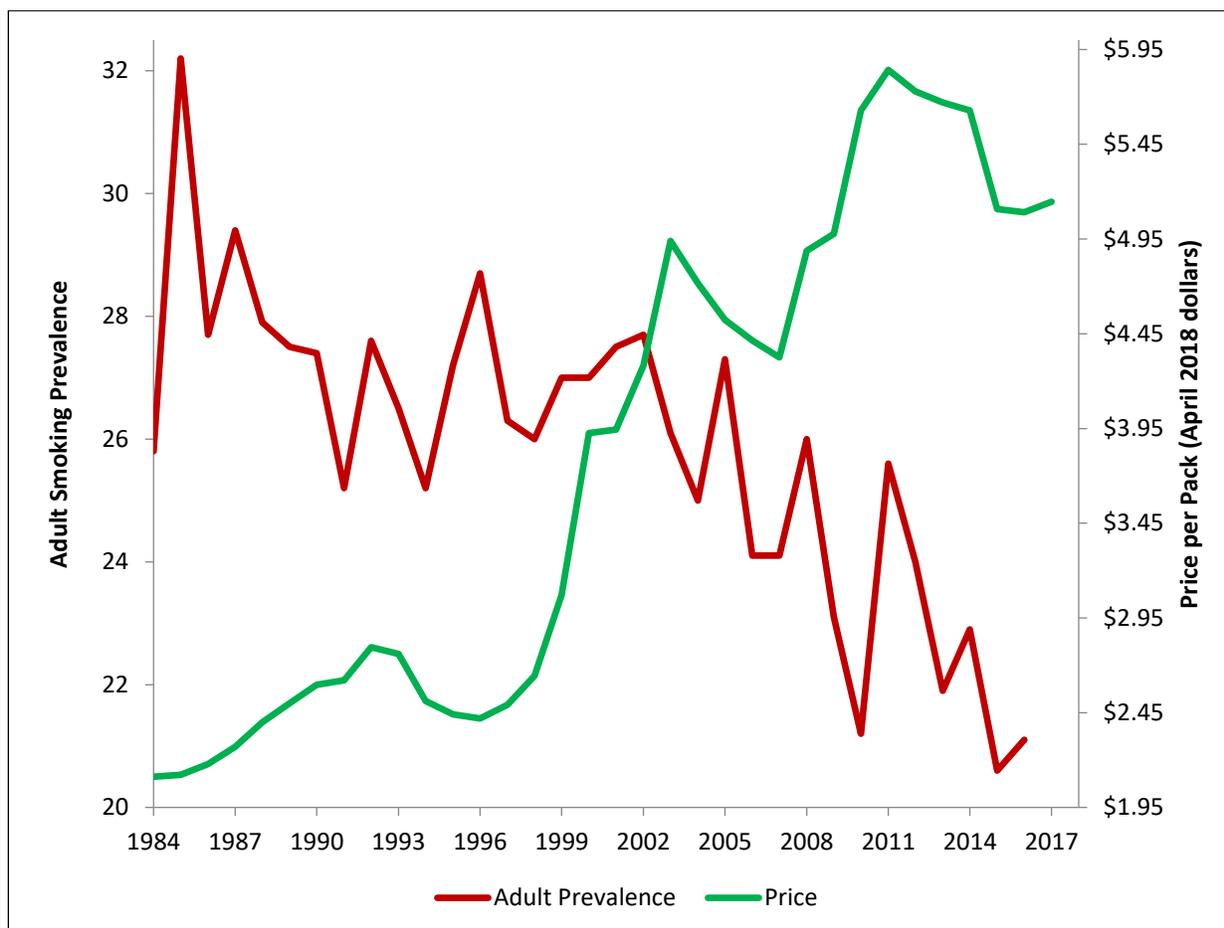
The declines in smoking include reductions in the number of people who smoke, due to increases in smoking cessation among current smokers, prevention of relapse among former smokers, and deterred initiation among young people. [60,61] Estimates indicate that about half of the impact of price increases on smoking is from reductions in the number of people who smoke, with a 10% price increase reducing smoking prevalence by about 2%. [60,61] The inverse relationship between cigarette prices and smoking prevalence is illustrated in Figures 10 and 11 for the U.S. and Indiana, respectively. As with cigarette sales, when inflation adjusted cigarette prices are rising, smoking prevalence is falling, and vice-versa. Most of this results from current smokers trying to quit smoking. It is estimated that about 10% of smokers will try to quit smoking in response to a 10% price increase, with about one in five who try to quit succeeding. [60,61]

**Figure 10** Cigarette Prices and Adult Smoking Prevalence, Inflation-Adjusted, U.S., 1972-2017



Sources: National Health Interview Survey, Orzechowski and Walker (2018), Bureau of Labor Statistics, and authors' calculations. [62,63,4]

**Figure 11 Cigarette Prices and Adult Smoking Prevalence Inflation Adjusted, Indiana, 1984-2017**

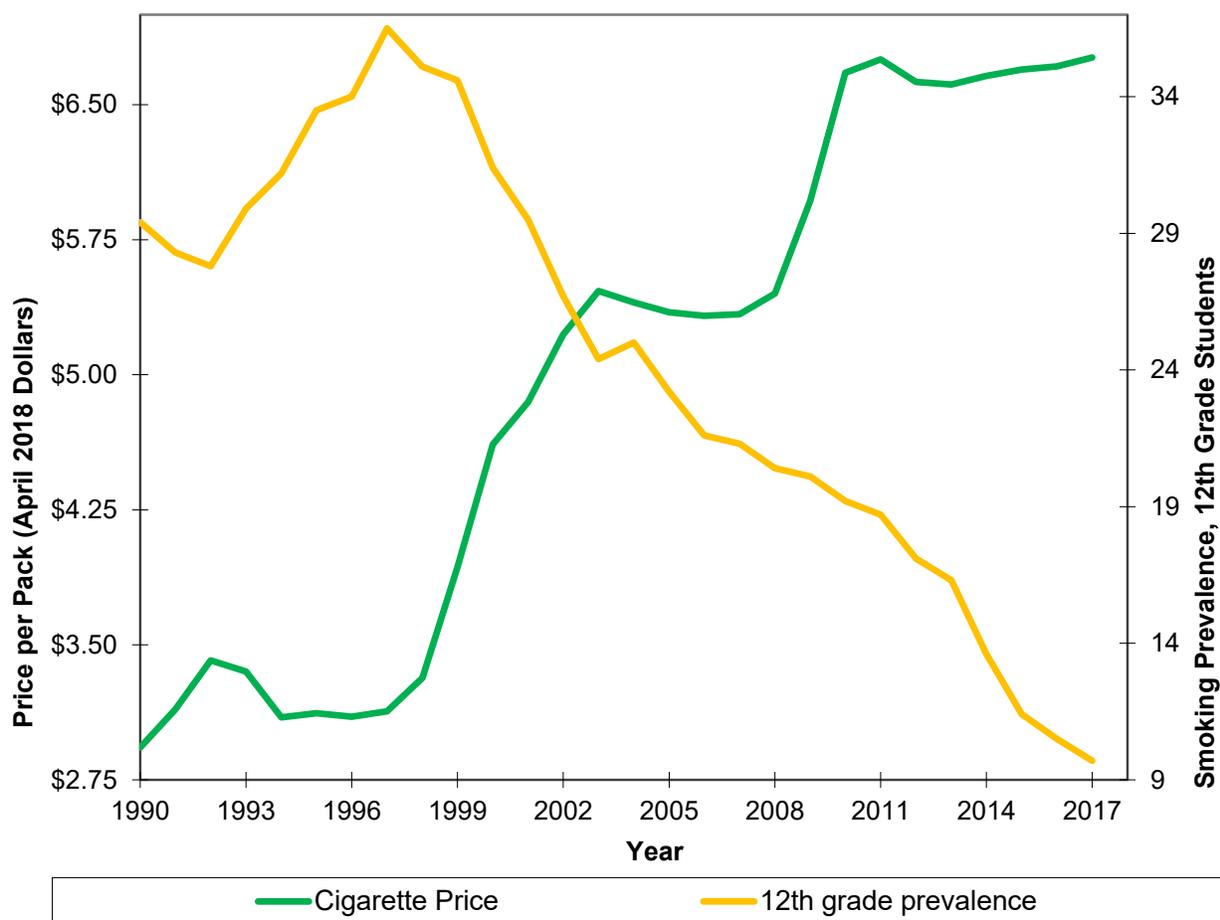


Source: Behavioral Risk Factor Surveillance System (BRFSS), Orzechowski and Walker (2018), Bureau of Labor Statistics, and authors' calculations.

Note: BRFSS sampling methodology changed in 2011, so prevalence estimates beginning in 2011 are not directly comparable to prevalence estimates before 2011.

Moreover, price increases have their greatest impact on high-risk populations, including young people, pregnant women, and those with low income. [60,61] Estimates suggest that smoking among young people is two to three times more sensitive to price increases than is smoking among older populations. Price increases are highly effective in deterring young people from smoking, particularly in preventing the transition from experimentation with cigarettes into more regular smoking. [60,61] Figure 12 illustrates the impact of prices on youth smoking prevalence among U.S. high school seniors since 1990; again, as cigarette prices rise, youth smoking prevalence declines. Similarly, estimates indicate that a 10% price increase will reduce smoking prevalence among pregnant women by as much as 7%, leading to improved birth outcomes such as reductions in low birthweight births. [64-65] Finally, price increases can help reduce socioeconomic disparities in the health consequences of smoking, given that low-income smokers will respond more to price increases than will their higher-income counterparts. [60-61]

**Figure 12 Cigarette Prices and Youth Smoking Prevalence High School Seniors, Inflation-Adjusted, U.S., 1990-2017**



Sources: Monitoring the Future, Orzechowski and Walker (2018), Bureau of Labor Statistics, and authors' calculations.

### Tax Increases and Tax Revenues

Increasing excise tax rates on tobacco products is the most direct way to increase prices. Despite the reductions in tobacco use that result, tax increases that raise prices also generate considerable new tax revenues. Two factors explain this. First, excise taxes account for a relatively small share of tobacco product prices in most states. This implies that a large tax increase will result in a less than proportional rise in price. Second, the reduction in sales is less than proportionate to the increase in price. For example, if the cigarette tax accounts for 25% of average prices, a doubling of the tax – a 100% tax increase – will raise prices by 25%, if fully passed on to smokers. This 25% price increase reduces consumption by about 10%, on average. The remaining 90% of the original consumption is now taxed at twice the original rate, resulting in an 80% rise in revenues. Even if there is some tax avoidance and evasion in response to the tax increase, revenues will still rise. Using the example above, if for every one-pack decline in actual cigarette consumption, there is another one-pack decline in sales due to

smokers avoiding the tax (e.g. by buying cigarettes in a neighboring state where taxes are lower) or from purchases of cigarettes smuggled in from a lower-tax state, the overall decline in sales would be about 20%. In this case, the remaining 80% of sales being taxed at double the rate would result in a 60% rise in revenues.

The positive impact of cigarette tax increases on tax revenues is clear from the experiences with state tax increases. Table 11 highlights this relationship, showing the changes in state tax-paid cigarette sales and tax revenues for all state tax increases of at least 50 cents per pack since 2003 and through 2016. In every state, cigarette sales declined sharply following the tax increase, while cigarette tax revenues went up at the same time. For example, in August 2016, Pennsylvania raised its cigarette tax by \$1.00 per pack, to \$2.60, leading to an 18.1% drop in sales, while raising \$314.3 million in new tax revenues, a 31.3% increase. Similarly, in July 2016, West Virginia more than doubled its tax, raising it by 65 cents, to \$1.20 per pack, leading to a 15.8% decline in sales while generating \$82.0 million in new tax revenues, an 83.7% increase.

**Table 11 State Experiences with Large Cigarette Tax Increases 2003-2016—Reduced Pack Sales and Increased Revenues**

| State          | Effective Date | Tax Increase Amount (per pack) | New State Tax Rate (per pack) | State Pack Sales Decline | Revenue Increase | Gross New Revenues (millions) |
|----------------|----------------|--------------------------------|-------------------------------|--------------------------|------------------|-------------------------------|
| Alaska         | 1/1/05         | 60¢                            | \$1.60                        | - 23.2%                  | + 22.8%          | + \$9.3                       |
| Arizona        | 12/8/06        | 82¢                            | \$2.00                        | - 32.5%                  | + 13.6%          | + \$44.5                      |
| Arkansas       | 3/1/09         | 56¢                            | \$1.15                        | - 27.8%                  | + 33.5%          | + \$46.5                      |
| Colorado       | 1/1/05         | 64¢                            | 84¢                           | - 24.3%                  | + 220.2%         | + \$131.0                     |
| Delaware       | 7/31/07        | 60¢                            | \$1.15                        | - 35.1%                  | + 35.1%          | + \$31.8                      |
| Washington, DC | 10/1/08        | \$1.00                         | \$2.00                        | - 25.9%                  | + 57.3%          | + \$13.2                      |
| Florida        | 7/1/09         | \$1.00                         | \$1.339                       | - 27.4 %                 | + 193.2%         | + \$828.8                     |
| Hawaii         | 7/1/09         | 60¢                            | \$2.60                        | - 11.3%                  | + 14.5%          | + \$15.1                      |
| Illinois       | 6/24/12        | \$1.00                         | \$1.98                        | - 31.2%                  | + 39.0%          | + \$229.2                     |
| Iowa           | 3/15/07        | \$1.00                         | \$1.36                        | - 30.6%                  | + 140.2%         | + \$128.0                     |
| Kansas         | 7/1/15         | 50¢                            | \$1.29                        | -6.4%                    | +56.3%           | +\$50.4                       |
| Louisiana      | 7/1/15         | 50¢                            | 86¢                           | -23.9%                   | +81.0%           | +\$100.0                      |
| Maine          | 9/19/05        | \$1.00                         | \$2.00                        | - 12.3%                  | + 76.5%          | + \$71.5                      |
| Maryland       | 1/1/08         | \$1.00                         | \$2.00                        | - 27.1%                  | + 45.8%          | + \$126.9                     |
| Massachusetts  | 7/1/08         | \$1.00                         | \$2.51                        | - 20.3%                  | + 32.2%          | + \$137.2                     |
| Massachusetts  | 7/1/13         | \$1.00                         | \$3.51                        | - 15.0%                  | + 15.3%          | + \$81.9                      |
| Michigan       | 7/1/04         | 75¢                            | \$2.00                        | - 15.2%                  | + 28.1%          | + \$238.9                     |

|                |         |         |         |                     |          |             |
|----------------|---------|---------|---------|---------------------|----------|-------------|
| Minnesota      | 8/1/05  | 75¢     | \$1.23  | - 16.1%             | + 160.7% | + \$258.4   |
| Minnesota      | 7/1/13  | \$1.60  | \$2.83  | - 24.0%             | + 56.0%  | + \$204.1   |
| Mississippi    | 5/15/09 | 50¢     | \$0.68  | - 22.8%             | + 188.3% | + \$88.9    |
| Montana        | 5/1/03  | 52¢     | \$0.70  | - 7.3%              | + 259.8% | + \$30.5    |
| Montana        | 1/1/05  | \$1.00  | \$1.70  | - 42.0%             | + 36.5%  | + \$18.8    |
| Nevada         | 7/1/15  | \$1.00  | \$1.80  | -33.1%              | +51.6%   | +\$54.6     |
| New Jersey     | 7/1/03  | 55¢     | \$2.05  | - 9.0%              | + 26.6%  | + \$157.4   |
| New Mexico     | 7/1/03  | 70¢     | \$0.91  | - 32.3%             | + 191.8% | + \$39.2    |
| New Mexico     | 7/1/10  | \$0.75  | \$1.66  | - 7.8%              | + 67.5%  | + \$37.5    |
| New York       | 6/3/08  | \$1.25  | \$2.75  | - 15.2%             | + 40.3%  | + \$377.4   |
| New York       | 7/1/10  | \$1.60  | \$4.35  | - 24.8%             | + 18.8%  | + \$244.6   |
| Ohio           | 7/1/05  | 70¢     | \$1.25  | - 20.6%             | + 78.9%  | + \$437.6   |
| Oklahoma       | 1/1/05  | 80¢     | \$1.03  | - 34.7%             | + 98.2%  | + \$81.6    |
| Pennsylvania   | 8/1/16  | \$1.00  | \$2.60  | -18.1%              | +31.3%   | +\$314.3    |
| Rhode Island   | 7/1/04  | 75¢     | \$2.46  | - 18.7%             | + 16.9%  | + \$18.7    |
| Rhode Island   | 4/10/09 | \$1.00  | \$3.46  | - 14.7%             | + 15.1%  | + \$17.8    |
| South Carolina | 7/1/10  | 50¢     | \$0.57  | + 7.8% <sup>1</sup> | + 434.2% | + \$116.8   |
| South Dakota   | 1/1/07  | \$1.00  | \$1.53  | - 25.8%             | + 115.4% | + \$31.8    |
| Texas          | 1/1/07  | \$1.00  | \$1.41  | - 21.0%             | + 191.7% | + \$1,003.7 |
| Utah           | 7/1/10  | \$1.005 | \$1.70  | - 24.5%             | + 85.0%  | + \$47.0    |
| Vermont        | 7/1/06  | 60¢     | \$1.79  | - 15.2%             | + 27.9%  | + \$13.2    |
| Washington     | 7/1/05  | 60¢     | \$2.025 | - 8.4%              | + 29.1%  | + \$95.5    |
| Washington     | 5/1/10  | \$1.00  | \$3.025 | - 20.5%             | + 17.0%  | + \$62.0    |
| West Virginia  | 7/1/16  | 65¢     | \$1.20  | -15.8%              | +83.7%   | +\$82.0     |
| Wisconsin      | 1/1/08  | \$1.00  | \$1.77  | - 15.0%             | + 93.9%  | + \$286.0   |

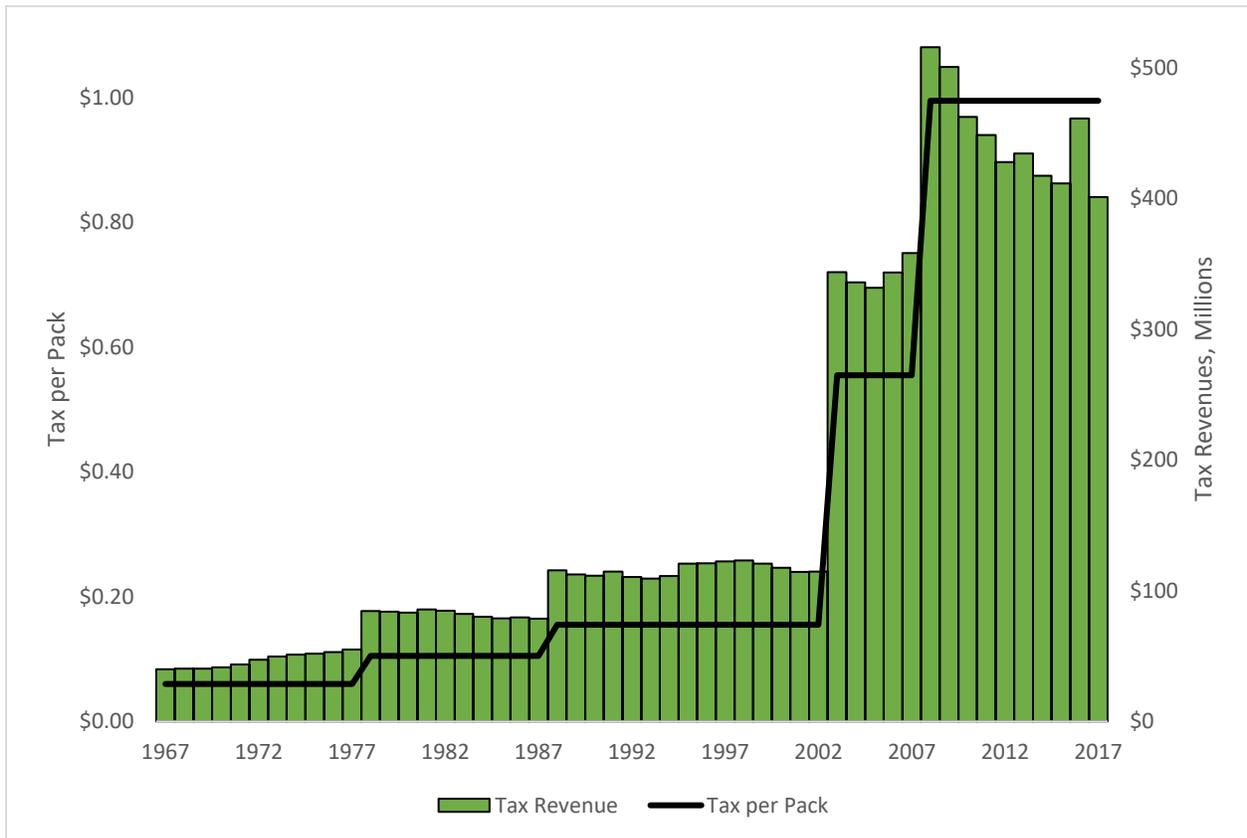
Sources: Orzechowski & Walker, *Tax Burden on Tobacco* monthly data, and authors' calculations.

The same is true for Indiana, as illustrated in Figure 13 showing the evolution of the cigarette excise tax rate and cigarette tax revenues in the state over the last 50 years. Every time Indiana has raised its cigarette tax rate, cigarette tax revenues increased significantly. For

<sup>1</sup> The increased pack sales are largely due to a surge in pack sales in July 2010 because SC's new tax rate was not implemented until August 2010.

example, when the tax was increased from 55.5 cents per pack to 99.5 cents per pack on July 1, 2007, gross state cigarette tax revenues rose from \$358.4 million in fiscal year 2007 to \$515.8 million in fiscal year 2008. Likewise, revenues rose from \$114.8 million in fiscal year 2002 to \$343.7 million in fiscal year 2003, when the tax was increase from 15.5 cents per pack to 55.5 cents per pack on July 1, 2002.

**Figure 13. Cigarette Tax Per Pack and Cigarette Tax Revenues Indiana, 1967-2017**



Source: Orzechowski and Walker (2018) and authors' calculations.

Year to year, state cigarette and other tobacco tax revenues are more predictable and less volatile than most other state revenue sources, such as state personal income taxes or corporate income taxes, which can vary considerably from year to year because of nationwide or regional recessions or state economic slowdowns. [66] In contrast, sharp drops in cigarette or other tobacco tax revenues from one year to the next are rare, given the addictive nature of cigarette smoking and other tobacco use. Long-term trends in tobacco use show modest declines from year to year, both nationally and at the state level. These declines can be accelerated by comprehensive tobacco prevention efforts, but will generally be no more than a few percentage points each year. The exception to this will be the large declines that result from significant increases in cigarette prices, such as the large cigarette company price increases prompted by the 1998 Master Settlement Agreement and the April 1, 2009, increase in federal excise taxes on cigarettes and other tobacco products. The only other large year-to-

year changes to state cigarette tax revenues are the large revenue increases when a state significantly increases its own cigarette tax rates.

### *Maximizing Tobacco Tax Revenues*

If gradually declining state tobacco tax revenues are a concern for Indiana, the state can periodically increase its tobacco tax rates to offset any declines in revenue. Alternatively, Indiana could implement legislation that allows for administrative increases in state tobacco tax rates following any significant decline in annual state tobacco tax revenues (or in total state tobacco revenues, including tobacco settlement payments).

Another important strategy is to make sure that taxes on other tobacco products, particularly combustible tobacco products such as roll-your-own (RYO) cigarettes and little cigars, are set at rates that parallel the state's cigarette tax rate. Indiana currently taxes snuff at 40 cents per ounce, and other tobacco products at 24% of wholesale prices. Creating tax equity across these products will make revenue flows even more reliable, as Indiana will not lose revenues from cigarette smokers switching to products taxed at lower rates. Tax parity also maximizes the public health impact of tobacco tax increases by minimizing substitution to other products in response to the higher taxes. Specifically, if the tax on cigarettes is increased but taxes on other tobacco products are unchanged, some smokers will quit smoking, others will cut back on how many cigarettes they smoke, and some will substitute from cigarettes to other tobacco products. This substitution reduces the public health and revenue impact of higher cigarette taxes. Taxing all tobacco products at the same rate minimizes this substitution and maximizes the revenue and public health effects of higher tobacco taxes. That said, and as discussed further below, tax parity may not be appropriate when considering taxes on emerging and likely less harmful products containing nicotine, such as electronic cigarettes.

A similar cigarette-pack amount of tax could be placed on standard packs of cigarillos, blunts and other small cigars. But the biggest tax policy concern for cigars usually comes from cigarettes being packaged and sold as "little cigars" to escape the state's higher tax on cigarettes. That problem can be eliminated by amending the state's legal definition of "cigarette" so that it covers any and all cigarette-equivalent products, no matter how they are labeled and packaged (without reaching any bona fide cigars).

Additional cost-effective strategies to protect tobacco tax revenues from tax evasion include: adopting new, high-tech tax stamps; increasing penalties and fines; educating smokers about applicable state laws (such as limits on the number of packs that may be brought into the state from other states); and increasing enforcement efforts – perhaps allowing the enforcing agencies to keep half of all fines and penalties they collect to fund expanded new enforcement efforts (with general revenues receiving the other half, along with all of the recouped tax revenues). These strategies are discussed in more detail below. Other states have reduced tax avoidance and increased collections by targeting tax collection efforts at smokers who purchase cigarettes on the Internet without paying the state tax. Finally, including an inventory, or floor stock, tax will protect tobacco tax revenues from short-term tax avoidance from stockpiling of tax-paid cigarettes and other tobacco products in anticipation of a tax increase.

### *Arguments Against Tobacco Tax Increases*

Unlike most other taxes, U.S. voters are generally supportive of tobacco tax increases, particularly when some of the revenues from an increase are used to fund tobacco prevention and cessation programs. [67]

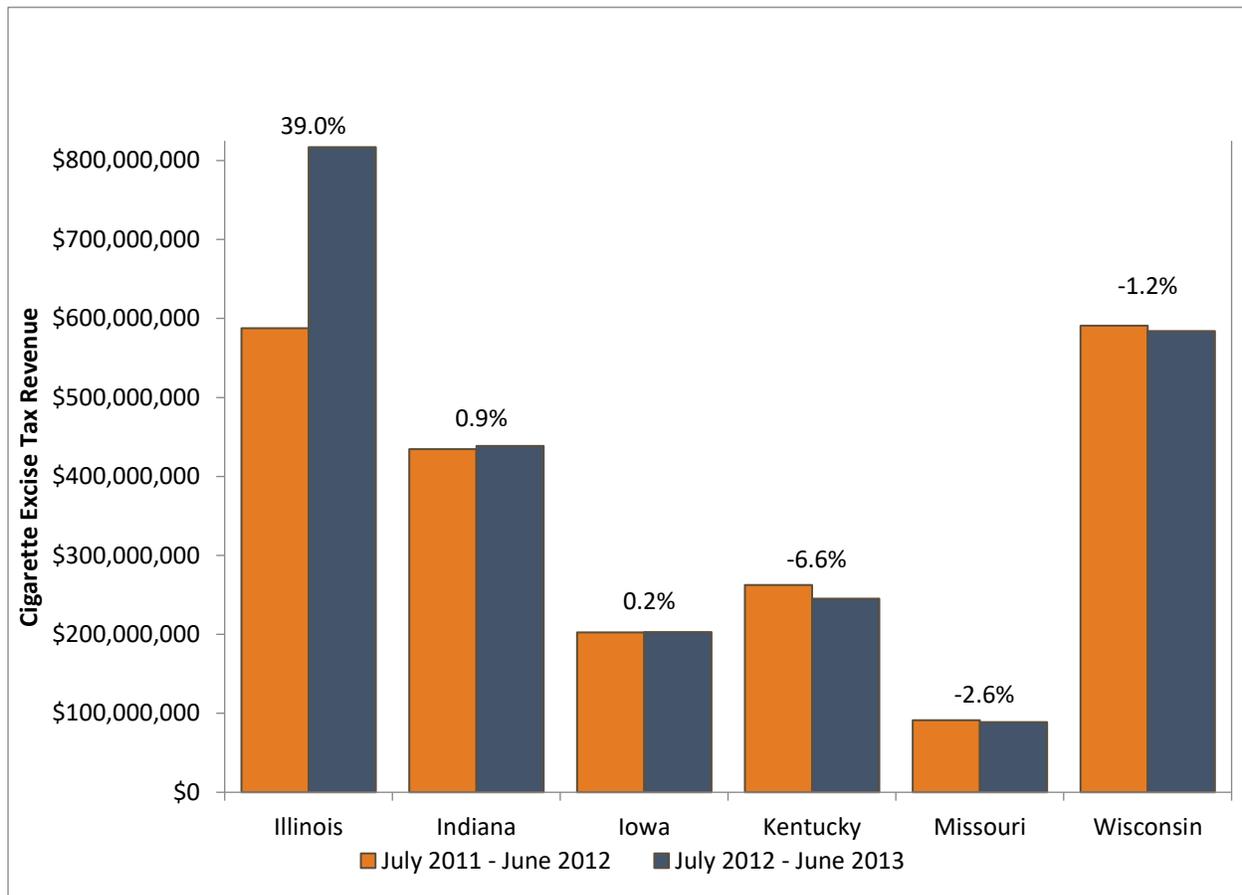
Opponents of tobacco tax increases make a few common claims to argue against tax increases. [60,61] They contend that tax increases will lead to widespread tax avoidance and evasion, undermining their health impact and leading to lower revenues. They argue that tax increases will have negative economic effects, leading to job losses and hurting small businesses that sell tobacco products. They maintain that tax increases are regressive and hurt the poor. These claims are either completely false or greatly exaggerated, as discussed below.

#### Tax Avoidance and Evasion

Significant increases in cigarette and other tobacco taxes reduce tobacco use and lead to significant increases in tax revenues. While these tax increases do create incentives for tobacco users to avoid the tax increase by crossing state borders to buy tobacco products in nearby lower-tax states or by engaging in other forms of tax avoidance such as purchasing on Native American reservations or buying on the Internet, relatively few tobacco users engage in these behaviors. [68] Similarly, while tobacco tax increases do increase the profitability of smuggling, states that raise their tobacco taxes significantly see large increases in revenues despite any increase in smuggling of cigarettes from low-tax jurisdictions. [69]

This was observed, for example, after Illinois raised its cigarette excise tax by \$1.00 per pack, from \$0.98 to \$1.98, in late June 2012. At that time, cigarette taxes in most of Illinois' neighboring states were considerably lower: Indiana (\$0.995), Iowa (\$1.36), Kentucky (\$0.60), and Missouri (\$0.17). Only Wisconsin (\$2.52) had a higher state tax than Illinois. In addition, there were significant local taxes in Cook County (\$2.00) and Chicago (\$0.68). As shown in Figure 14, cigarette tax revenues in Illinois rose by 39% in the 12 months following the state tax increase, while combined tax revenues in neighboring states fell by 1.4%. Indiana (0.9%) and Iowa (0.2%) saw minimal increases in tax revenues, while revenues fell modestly in Kentucky (6.6%), Missouri (2.6%), and Wisconsin (1.2%).

**Figure 14 Cigarette Tax Revenues, July 2011 – June 2013: Illinois and Neighboring States**



Source: Orzechowski and Walker, and authors' calculations.

The experience in Illinois is consistent with the experiences in other states, with cigarette tax increases generating substantial new revenue, while revenues in neighboring states are relatively unaffected, suggesting that any increase in tax avoidance or evasion following a state cigarette tax increase is minimal. [69] Longer-distance smuggling of cigarettes from very-low-tax states in response to higher state cigarette taxes also appears to be limited. Between calendar years 2005 and 2015, tax-paid cigarette sales and tax revenues fell by almost 15% in Missouri, the nation's lowest-tax state, with a tax of 17 cents per pack. Similarly, tax paid sales and cigarette tax revenues fell by 8.5% between calendar years 2006 and 2015 in Virginia, the second-lowest-tax state in the country after increasing its tax to 30 cents per pack in 2005. These declines occurred despite dozens of state cigarette tax increases across the country, including many in states bordering or near either Missouri or Virginia, suggesting that there was little large-scale bootlegging from either state.

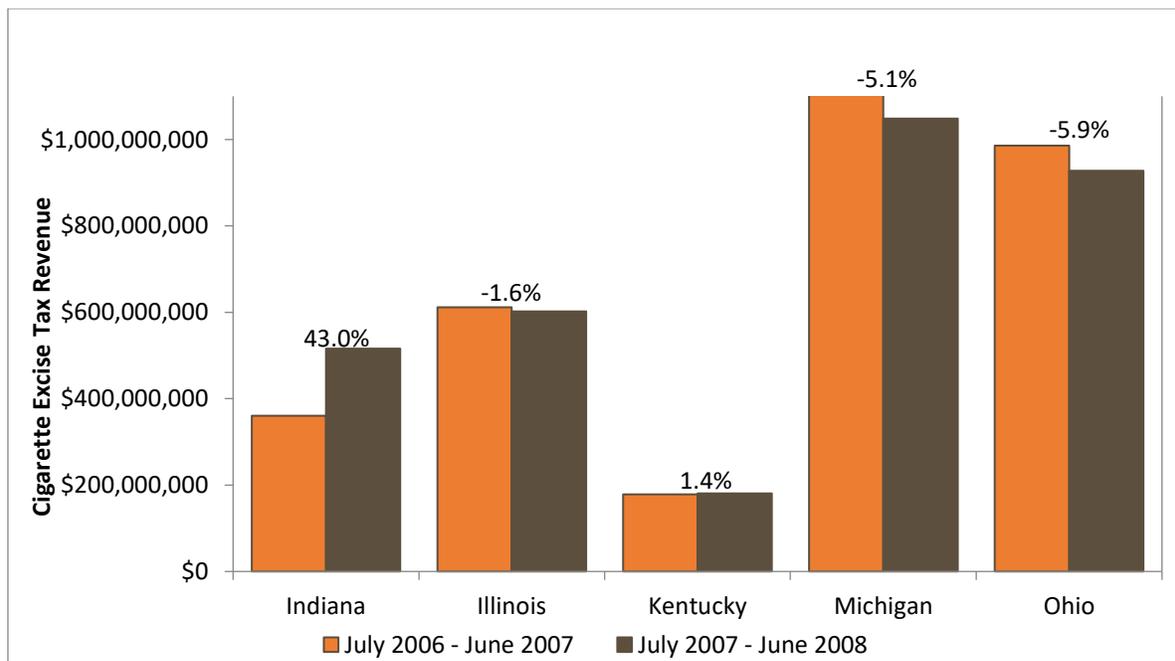
The same is true for Indiana. Since 2000, Indiana has implemented two sizable cigarette excise tax increases. In July 2002, the state more than tripled its tax, from 15.5 cents to 55.5 cents per pack, the first increase since 1987. Around the same time, most of Indiana's neighbors also raised their taxes: Illinois went from 58 cents to 98 cents per pack; Ohio increased from 24

cents to 55 cents per pack; and Michigan went from 75 cents to \$1.25 per pack. Kentucky's tax remained unchanged at 3 cents per pack. In the year following the tax increase, Indiana's cigarette tax revenues rose by almost \$229 million, from \$114.8 million to \$343.7 million. Similar large revenue increases occurred in neighboring states where taxes were also increased, with revenues rising by over \$182 million in Illinois, over \$244 million in Michigan, and over \$284 million in Ohio. In contrast, revenues rose by just over \$4 million in Kentucky, where the tax was not increased.

The Indiana cigarette excise tax was further increased in July 2007, almost doubling to its current rate of 99.5 cents per pack. In contrast to the 2002 increase, none of Indiana's neighbors raised its tax that year. Following the increase, Indiana's tax differential with Kentucky (a tax of 30 cents per pack) increased sharply, from 25.5 cents to 69.5 cents. The tax increase eliminated the gap between Indiana and Illinois, with the new tax only slightly higher than the tax in Illinois (98 cents), but still well below the combined state and local tax of \$3.66 in Chicago. The tax differential between Indiana and Ohio narrowed from 69.5 cents to 25.5 cents per pack tax given Ohio's tax of \$1.25 tax. Finally, the tax differential between Indiana and Michigan narrowed from \$1.445 to \$1.005 per pack, given Michigan's tax of \$2.00 per pack. As shown in Figure 15, the tax increase led to a significant 43% rise in tax revenues in Indiana. In contrast, cigarette tax revenues fell in Illinois (-1.6%), Michigan (-5.1%) and Ohio (-5.9%), and rose modestly in Kentucky (1.4%).

As Indiana's past experiences with tobacco tax increases, as well as experiences in other states, clearly demonstrate, increasing tobacco taxes in Indiana will raise revenue despite any increases in tax avoidance and tax evasion.

**Figure 15 Cigarette Tax Revenues, July 2006 – June 2008: Indiana and Neighboring States**



Source: Orzechowski and Walker, and authors' calculations.

If Indiana is concerned about a possible rise in smuggling in response to an increase in its cigarette tax, the state can implement measures that directly address this concern. Doing so will enhance the revenue and public health benefits of the higher tax. These measures are described briefly below; for more details, see the 2015 report *Preventing and Reducing Illicit Tobacco Trade* from the Centers for Disease Control and Prevention [70].

Effective efforts to curb illicit tobacco trade begin with a “three-legged stool” strategy that includes: licensing of all entities involved in tobacco product manufacturing, importing, distribution, and retailing; use of the latest generation of “high-tech” tax stamps that include overt and covert features which are nearly impossible to counterfeit and which allow tobacco products to be tracked and traced from the point at which the stamps are applied until final retail sale to consumers; and enhanced enforcement efforts coupled with stronger penalties.

To date, only three states have implemented this strategy. California was the first to do so, beginning in 2005 with a tax stamp that featured encrypted information on the name and address of the licensed distributor that applied the stamp, the date the stamp was applied, several overt features (including the California state bear and the value of the stamp), and various covert features (such as invisible ink and a unique serial number). Additional features were added in 2011. In the decade following the implementation of the original stamp and its eventual upgrade, coupled with its licensing and enforcement efforts, California received \$450 million more in revenues than it would have received had it continued to use its old stamp, despite not raising its cigarette tax during this period.

More recent experiences in Massachusetts and Michigan are consistent with the California experience. Massachusetts was the second state to implement a “high-tech” stamp, in 2010, using a stamp similar to that used by California. In the first three years following full implementation, Massachusetts cigarette excise tax revenues averaged \$551 million per year, virtually identical to revenues in the last year before implementation, despite a sharp decline in smoking prevalence during this period.

Most recently, Michigan implemented a different version of the “high-tech” tax stamp, with a variety of overt and covert security features, as well as a unique quick response (QR) code that consumers can read with a smart-phone app that provides information on the state's cessation programs, a link to a tip line to report noncompliant packs and sales to minors, and information on the harms caused by illicit tobacco sales and purchases. Implementation began in 2014 and appears to have been highly successful. After declining by over 3% per year in the years prior to implementation, tobacco tax revenues have increased in recent years, despite a steady decline in smoking prevalence. Tax revenues in fiscal year 2015 and fiscal year 2016 were more than \$60 million higher than they would have been in the absence of the new stamp and related efforts.

While the “high-tech” stamps are more expensive than traditional tax stamps, they appear highly cost-effective given that the increase in revenues following their use appears to far exceed the additional costs.[71] In California, for example, the costs of the first generation of “high-tech” stamps, implemented in 2005, was \$4.77 per 1,000 stamps compared to \$0.42 per 1,000 stamps for their traditional stamp, with costs rising to \$8.20 per 1,000 stamps for the second generation of “high-tech” stamps. In both cases, the additional tax revenues following the use of the upgraded tax stamps more than covered the higher costs of the upgraded tax stamps. [71]

Another important strategy to curb legal tax avoidance is to ensure that taxes on other tobacco products, particularly combustible tobacco products such as roll-your-own (RYO) cigarettes and little cigars, are set at rates that parallel the state's cigarette tax rate. Creating tax equity across these products will reduce the likelihood that tobacco users avoid a tax increase by switching to tobacco products that are taxed at a lower rate.

Another cost-effective strategy for protecting tobacco tax revenues from tax evasion is the implementation of a public education program that: highlights the consequences of illegal tobacco sales on law-abiding businesses, youth smoking, and state tax revenues; educates smokers about applicable state laws (such as limits on the number of packs that may be brought into the state from other states); and encourages consumers to report retailers selling cigarettes with inappropriate tax stamps. One example is Chicago's "Check the Stamps" program, which provides rewards for tips that lead to enforcement actions against retailers selling illicit cigarettes. Other states have reduced tax avoidance and increased collections by targeting tax collection efforts at smokers who purchase cigarettes on the Internet without paying the state tax.

### Economic Impact

Another argument often used in opposition to tobacco tax increases specifically, and to tobacco control efforts generally, is that they will hurt the local economy, leading to job losses. [60,61] Opponents of tobacco control maintain that the production, distribution, and sale of tobacco products create many jobs and that the incomes earned in these jobs are spent on a wide variety of goods and services, creating additional jobs throughout the economy, and that tax increases, by reducing tobacco use, would lead to job losses. However, this argument tells only part of the story, ignoring the fact that those who quit using tobacco in response to tax increases and other tobacco control efforts will spend the money that they used to spend on tobacco on other goods and services, creating jobs in other sectors. Similarly, governments will spend the new tax revenues from a tobacco tax increase, typically on highly labor-intensive activities, creating additional jobs. In a state like Indiana, where there is very little tobacco growing and manufacturing, the net impact on employment will almost certainly be positive. Indeed, one study specifically examined the impact of eliminating tobacco use in Indiana, concluding that there would be net job gains due to the resulting changes in consumer spending, and that these job gains would grow over time given the reductions in health care spending and increased productivity that follow the improvements in health when tobacco use is eliminated. [72]

Similarly, some argue that tax increases and other tobacco control measures are particularly harmful to small businesses that sell tobacco products, contending that the sale of these products accounts for a sizable share of store revenues. However, one study that examined the impact of state cigarette taxes and smoke-free air policies found the opposite, concluding that higher cigarette taxes and prices were associated with increased convenience store business, while smoke-free air policies had no impact on convenience store business. [73] The positive impact of taxes on convenience stores is likely due to consumers buying other products in these stores instead of cigarettes in response to the higher taxes, and to prices rising by more than the amount of the tax increase, so that there was little impact on revenues from cigarette sales.

### Impact on the Poor

A third commonly used argument against tobacco tax increases is that they hurt the poor. This is based on the idea that tobacco taxes, and consumption taxes in general, are regressive in that they account for a greater share of income for lower-income consumers than for higher-income consumers. While it is the case that tobacco taxes are regressive, tax increases can be progressive given the greater reductions in tobacco use among lower-income consumers when taxes and prices rise. That is, higher taxes lead to larger reductions in tobacco use among lower-income consumers, so that higher-income consumers pay for a greater share of the higher taxes. Moreover, the health impact of the tax increase is progressive given the bigger declines in tobacco use among lower-income smokers. Recent studies from the World Bank show that when the reduced spending on health care and higher incomes resulting from improved health are taken into account, tobacco tax increases are highly progressive. The same is almost certain to apply in the U.S. given the evidence that lower-income smokers respond more to tax and price increases. [74]

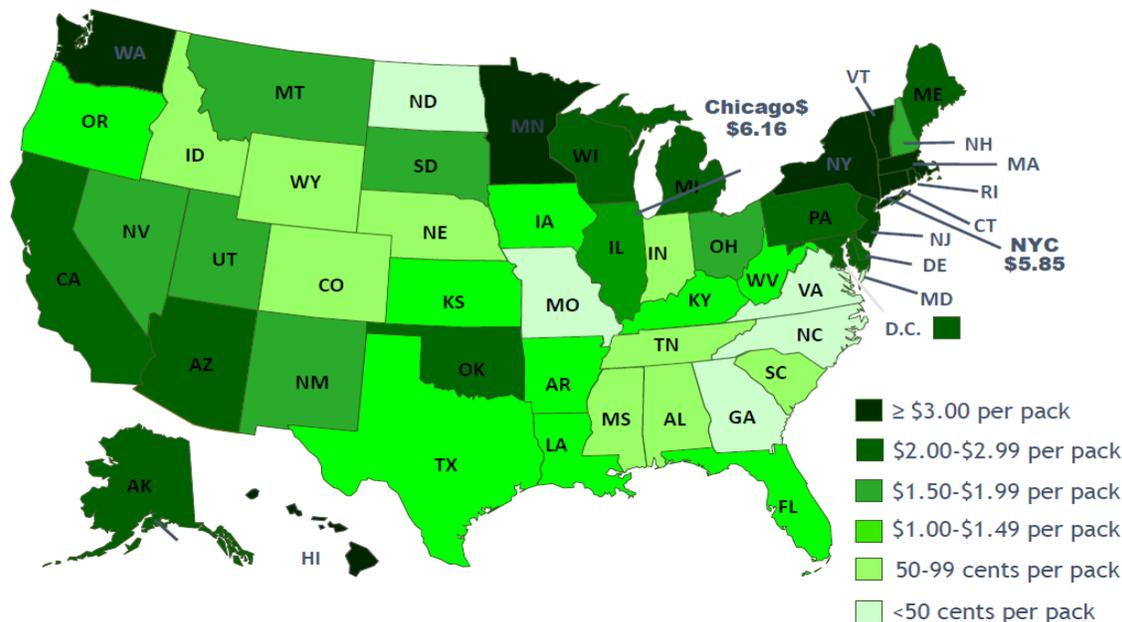
To the extent that there are concerns about the financial impact of tobacco tax increases on the poor, governments can allocate some of the new revenues generated by the tax increase to efforts to help poor smokers quit smoking and to other programs targeting the poor. For example, the new revenues from the 2009 Federal tobacco tax increases were used to fund an expansion of the state children's health insurance program, expanding coverage among children in low-income families.

### *Potential Impact of Tax Increases in Indiana*

Tobacco taxes in Indiana are low compared to taxes in other states, as shown in Figure 16. The state's 99.5 cent per pack cigarette tax is the 38<sup>th</sup> highest state tax (including DC) in the country and is less than 57% of the average state tax of \$1.75 per pack. It is the lowest among its neighboring states of Illinois (\$1.98), Kentucky (\$1.10), Michigan (\$2.00), and Ohio (\$1.60), and far below the tax of \$6.16 in Chicago, where city and county taxes add \$4.18 to the state tax.

**Figure 16 State Cigarette Excise Tax Rates, July 1, 2018**

## State Cigarette Excise Tax Rates July 1, 2018



As Indiana's past experiences with tobacco tax increases, as well as experiences in other states, clearly demonstrate, increasing tobacco taxes in Indiana will raise revenue despite any increases in tax avoidance and tax evasion. Based on a model that accounts for the impact of higher taxes and prices on tax paid sales, including changes in cross-border shopping, bootlegging, and other forms of tax avoidance and evasion, it is estimated that a \$2.00 per pack increase in the Indiana state cigarette excise tax will generate an increase of over \$358 million in the first year alone. Moreover, the increase in revenues would be sustained over time, with revenues declining slowly and predictably as tobacco use continues to fall in the state.

In addition to the revenue benefits, an increase in Indiana's tobacco tax rates would lead to significant improvements in public health. A \$2.00 increase in the cigarette tax would prevent an estimated 58,100 youth from becoming adult smokers, encourage 70,100 adults to quit smoking, and prevent 36,300 future smoking-caused deaths in the current Indiana population. Increases in taxes on other tobacco products would add to the public health impact by reducing the use of these products and minimizing incentives for smokers to switch from cigarettes to other forms of tobacco.

The improvements in health following the tax-induced reductions in tobacco use would lower health care spending in the state. It is estimated that a \$2.00 increase in the cigarette tax would generate at least \$78.9 million in health care cost savings in the first five years, due to fewer smoking-caused cases of lung cancer, heart attacks, strokes, and pregnancy and birth

complications. The state Medicaid program would save more than \$11.3 million in health care costs in the first five years. Given the long-term consequences of smoking, these benefits would grow over time, with an estimated long-term savings of \$2.7 billion in overall health care spending.

Large tax increases are needed to generate significant new revenues and meaningful reductions in tobacco use. [75] Small tax increases will have relatively little impact given that smokers can avoid these by switching to cheaper brands and given that tobacco companies can offset these through targeted price promotions.

### ***Raising the Minimum Age of Legal Access for Tobacco***

Most states in the U.S. have laws that stipulate the minimum legal age (MLA) for purchasing tobacco as 18 years of age; in three states (Alaska, Alabama, and Utah), the age is 19. [76] The first state laws establishing MLA appeared in the 1880s; by 1920, half of states had set MLAs of at least 21 years. After 1920, lobbying by the tobacco industry resulted in their erosion to 16-18 years. By the 1980s, two decades after the Surgeon General declared that smoking is a cause of lung cancer, the industry came to view higher MLAs as a critical threat to its business and that recruiting new young smokers was necessary for its survival. [76]

Raising the legal age for purchase of tobacco products to 21, or Tobacco 21, has steadily gained popularity in recent years. [77] From 2013 through 2018, six states (Maine, New Jersey, Oregon, Hawaii, California, and Massachusetts<sup>2</sup>), and 340 cities and counties have raised their tobacco sales age to 21. [78] These cities include major cities in the U.S. such as New York, Chicago, San Antonio, Kansas City, St Louis, Columbus, Cleveland, San Francisco, and others. The population covered by Tobacco 21 laws is nearly 100 million people, accounting for more than 25% of the U.S. population. The current MLA to purchase tobacco products in Indiana is 18, and no cities or counties in Indiana have higher MLA policies. As discussed below, this MLA to purchase tobacco products in Indiana also pertains to electronic cigarettes. Due to preemption language in the state law, local governments are prohibited from setting their own sales age for tobacco (including electronic cigarettes) in Indiana. In order for a municipality to raise the MLA to purchase tobacco, Indiana would need to alter or remove this preemptive language from the law.

There are strong reasons to believe raising the MLA to 21 will decrease tobacco consumption. A preponderance of smokers begin smoking during adolescence, a time when the brain is vulnerable to nicotine addiction. While many underage youth report buying cigarettes themselves, a significant majority of underage youth obtain cigarettes through social sources. According to a Population Assessment of Tobacco and Health (PATH) study, 32% of 15-17-year-olds obtained cigarettes by giving someone else money to buy cigarettes, and 43% of 15-17-year-olds obtained cigarettes by asking someone else for cigarettes or being offered cigarettes from someone. [79] A study examining the extent to which cigarettes are provided to minors by facilitators of legal age found a majority (56.1%) of individuals who purchase

---

<sup>2</sup> Massachusetts' minimum legal sales age of tobacco products of 21 becomes effective December 30, 2018.

cigarettes for minors were 18- to 20-year-olds. [80] Raising the MLA to 21 will have a major impact on decreasing the availability of cigarettes to youth and young adults through social sources.

Evidence from the U.S. on the effect of raising the legal age of cigarette consumption to 21 is building. A multivariate study published in 2015 examined the effect of Needham, Massachusetts, raising the MLA to purchase tobacco to 21. [81] Using pooled cross-sectional data from Needham and surrounding communities, the study found a 47% decline in the smoking prevalence rate of high school students in Needham. This decrease was significantly greater than the declines in smoking among high schoolers in 16 comparison communities that did not raise the MLA to 21. Moreover, in 2015, the Institute of Medicine published a report that examined the public health implications of raising the minimum age to purchase tobacco products. [82] The report used mathematical modeling to predict the likely public health outcomes of raising the minimum legal age to purchase tobacco products to 21 years. The report concluded that if the minimum age to purchase tobacco was raised to 21 nationwide, there would be a 12% drop in overall smoking rates by the year 2100 relative to the status quo. In addition, the report concluded that if the minimum legal age to buy tobacco were raised to age 21 nationwide, for the cohort of people born between 2000 and 2019 there would be approximately 10% fewer lifetime premature deaths, lung cancer deaths, and years of life lost (YLL) from cigarette smoking. This translates to approximately 249,000 fewer premature deaths, 45,000 fewer deaths from lung cancer, and 4.2 million fewer YLL.

### ***Funding Tobacco Control Efforts at Recommended Levels***

State tobacco control programs provide funding for a variety of activities to prevent smoking and promote cessation, including expanded coverage for evidence-based cessation interventions and mass media communications campaigns. Specifically, based on the evidence from early studies, CDC developed a set of “best practices” for comprehensive state tobacco control programs that included key program activities and recommended funding levels. [83] Over time, these “best practices” and funding recommendations were revised based on the continued accumulation of evidence on what program components were most effective and cost-effective. In the most recent revision (2014), CDC emphasizes five key activities [84]:

1. *State and community interventions*, which include efforts to promote tobacco use cessation, prevent initiation, eliminate exposure to secondhand smoke, and reduce tobacco-related disparities through programs and policies that target social organizations, systems and networks.
2. *Mass-reach health communication interventions*, which include counter-marketing campaigns using earned and paid media, social media, and innovative strategies that use new technologies to educate the public about the harms of tobacco use.
3. *Cessation interventions*, including quit lines providing telephone counseling to smokers interested in stopping smoking, expanded insurance coverage for cessation treatments, and health system changes that incorporate cessation interventions into routine care.
4. *Surveillance and evaluation*, including regular monitoring of tobacco use knowledge, attitudes, and behavior and evaluation of state programmatic activities and state and local tobacco control policies.

5. *Infrastructure, administration, and management* that provides the necessary capacity to implement the other four components.

Evaluations of major individual state tobacco control programs provide compelling evidence that these programs reduce tobacco use. [85,86,87] For example, following the creation of the California Tobacco Control Program in 1988, per-capita cigarette sales were cut almost in half from 1988 to 1999, whereas the decline was only about 20% in the rest of the U.S. Adult smoking prevalence in California declined by 47.5% from 1988 to 2010, whereas adult smoking prevalence for the U.S. as a whole declined by 31.3% over the same period. After adopting large-scale comprehensive state tobacco control programs, Arizona, Florida, Massachusetts, and Oregon also observed significant reductions in smoking. [88-95]

Several national-level analyses have examined the impact of state tobacco control programs on cigarette smoking. An early study compared per capita cigarette sales in states that received funding as part of the American Stop Smoking Intervention Study (ASSIST) to sales in non-ASSIST states and found that sales declined 28% faster in the ASSIST states in the first several years after the program began, whereas in the years before the program, trends in sales between the two groups were similar. [96] Another study looked at the effect of state-level per-capita tobacco control expenditures on state-level per-capita cigarette sales for the period from 1981 through 2000. [97] The study concluded that if states had funded tobacco control efforts at the minimum CDC-recommended levels, the rate of decline in cigarette consumption would have doubled from 1994 through 2000. A subsequent study found a strong negative relationship between state-level tobacco control funding and youth smoking using survey data from 1991-2000. [98] The study concluded that, had states spent the minimum amount of money recommended by the CDC, the prevalence of smoking among youths would have been between 3.3% and 13.5% lower than the rate that was observed over this period. A study that used survey data on adults from 1985 to 2003 found that if states had spent the minimum CDC-recommended level of expenditures on tobacco control efforts, there would have been 2.2 million fewer adult smokers than observed between 1985 and 2003. [99] Finally, the most recent study examined actual tobacco control spending in each state in each of the five Best Practice categories for the years 2008-2012 and found increased spending in the areas of cessation interventions, health communication interventions, state and community interventions, and even surveillance and evaluation and administration to decrease cigarette sales. [100] The paper concluded that current program spending could be significantly increased and cigarette sales would continue to decline.

In spite of the strong evidence demonstrating the effectiveness of comprehensive tobacco control programs in reducing tobacco use and the deaths, diseases, and economic costs that result, few states have provided adequate funding for these programs. In fiscal year 2017, states were projected to receive \$26.6 billion in tobacco revenues (taxes and settlement payments), but had allocated less than \$500 million on their comprehensive tobacco control programs—less than 15% of what CDC recommended and a fraction of what tobacco companies spend marketing their products. [101]

For several years in the early 2000s, Indiana was among the leaders in funding for its comprehensive tobacco control program, allocating \$35 million to the program in fiscal year 2001, consistent with CDC recommendations, and \$32.5 million in fiscal year 2002 and fiscal year 2003, about 93% of CDC recommendations. [102] However, Indiana now trails most other states. Despite an increase of \$2.5 million in the 2017 biennial budget, fiscal year 2018 funding is \$7.5 million, putting it in the bottom-half of all states at only 10.2% of CDC's recommended funding level. The CDC currently recommends Indiana spend \$73.5 million on tobacco control efforts per year. The fiscal year 2018 funding level is a slight increase over fiscal year 2017 spending, but it is down sharply from past years; as recently as fiscal year 2008, for example, Indiana allocated \$16.2 million to its program—an amount that is more than twice the fiscal year 2018 level. [102]

A 2018 report published by the Richard M. Fairbanks Foundation entitled *Tobacco Control Program Funding in Indiana: A Critical Assessment*, describes in detail the tobacco control activities undertaken in the state of Indiana in fiscal year 2016 and fiscal year 2017, discusses the accomplishments of the programs, outlines areas of needed improvement for tobacco control efforts in Indiana, and provides estimates on the effects of restoring tobacco control funding in Indiana to CDC-recommended levels. [102] The report strongly recommended that the state of Indiana restore tobacco control spending to CDC recommended levels, as the restoration of funding would yield large reductions in smoking among adults, adolescents, and pregnant women and would yield significant health care cost savings. The report concludes that restoring tobacco control spending in Indiana to CDC-recommendations would result in a 10.89% reduction in adult smoking, from 21.1% to 18.8% and decrease the number of adult smokers aged 18+ by 117,148. The reduction in smokers would yield approximately \$373 million in annual health care cost savings. Moreover, the report concludes that restoring tobacco control spending in Indiana to CDC recommendations would result in an 8.6% reduction in youth and young adult smoking, yielding a decrease of 2,718 students who smoke in high school and 427 students who smoke in middle school. The reduction in youth and young adult smokers would result in lifetime health care cost savings of \$74 million for high school students and \$11.6 million for middle school students. Finally, the report concluded that restoring tobacco control spending in Indiana to CDC recommendations would result in 58 fewer low-birth-weight babies being born, yielding first-year hospital cost savings of \$1,911,603.

### ***Adopting Comprehensive Smoke-Free Air Laws***

The detrimental health effects of exposure to secondhand smoke are well established. [103] The 1986 Surgeon General's report reached firm causal conclusions on the risks of secondhand smoke to the health of non-smokers. Smoke-free air laws are designed to protect non-smokers from the harms of smoking. There has been tremendous growth in laws regulating smoking in public locations such as workplaces, restaurants, bars, schools, health care facilities, public transportation, government buildings, elevators, and other locations. The progress in implementing comprehensive smoke-free laws has been one of the major public health achievements over the past 50 years. However, wide geographic disparities in smoke-free air law adoption still remain in the U.S.

As of July 1, 2018, 25 states and the District of Columbia, as well as 976 municipalities have laws in effect that require non-hospitality workplaces, restaurants, and bars to be 100% smoke-free. [104] These state laws, along with local laws in other states, protect 58.9% of the U.S. population. [104]

Since July 1, 2012, Indiana has had a state smoke-free air law. However, the smoke-free air law is not comprehensive. Many public places in the state, including restaurants and most workplaces, are smoke-free, but there are a number of businesses that are exempt from the statewide law including bars, taverns, night clubs, casinos, private clubs such as fraternal and veterans' organizations, and retail tobacco shops. Local communities in Indiana do have the ability to adopt stronger smoke-free laws than the state law. For example, in Marion County, the city of Indianapolis amended its smoke-free ordinance on June 1, 2012. The amended ordinance in Indianapolis is stronger than the state ordinance and prohibits smoking in all businesses including bars and taverns and only exempts a few businesses such as tobacco-specialty businesses and off-track betting facilities. The Indianapolis ordinance also banned the use of electronic cigarettes in all locations where smoking was prohibited. Within Marion County, the city of Lawrence enacted a smoke-free air law similar to the Indianapolis ordinance on October 1, 2012.

As of July 1, 2018, 21 local areas in Indiana have adopted comprehensive smoke-free air ordinances, defined as communities or counties that had stronger smoke-free air policies than the state, and banned smoking in private worksites, restaurants, and bars. [105] Table 12 provides a list of the local areas that have adopted a comprehensive smoke-free air law. The proportion of citizens in Indiana being covered by comprehensive smoke-free policies is 31%. [105]

**Table 12 Local Areas in Indiana That Have Adopted Comprehensive Smoke-Free Air Ordinances**

| Towns and Counties in Indiana That Have Adopted Comprehensive Smoke-Free Air Ordinances |
|---|
| Bloomington   |
| Columbus  |
| Cumberland  |
| Delaware County   |
| Elkhart   |
| Fort Wayne  |
| Franklin  |
| Greencastle   |
| Indianapolis  |
| Hancock County  |
| Howard County   |
| Kokomo  |
| Lawrence  |
| Monroe County   |

| Towns and Counties in Indiana That Have Adopted Comprehensive Smoke-Free Air Ordinances |
|---|
| Plainfield  |
| South Bend  |
| Terre Haute   |
| Vanderburgh Co  |
| Vigo Co   |
| West Lafayette  |
| Zionsville  |

Recent progress has been made in increasing the number of school districts that have adopted a tobacco-free school policy. [105] A tobacco-free school policy is defined as prohibiting all tobacco use by students, all school staff, parents, and visitors on school property, in school vehicles, and at school-sponsored functions away from school property 24 hours a day. At the beginning of fiscal year 2016, 265 public school districts in Indiana had adopted tobacco-free school policies. These 265 school districts represented 90% of public school students being protected by a comprehensive tobacco-free school policy at that time. By August 15, 2018, 284 out of 289 public school districts in Indiana had adopted tobacco-free school policies. Table 13 lists the public school districts in Indiana that did not have a tobacco-free policy as of August 15, 2018. 212 out of 284 school districts that have a tobacco-free policy include electronic nicotine delivery systems (ENDS) in the policy. Finally, all 11 school districts in Marion County are tobacco-free. With the exception of two school districts in Marion County (Indianapolis Public Schools and MSD Pike Township), all include ENDS use in their policies.

**Table 13 Indiana School Districts That Do Not Have Tobacco-Free School Policies**

| School Districts That Do Not Have Tobacco-Free School Policies |                                 |
|--|---------------------------------|
| County   | School Corporation              |
| Grant  | Marion Community Schools        |
|  | Mississinewa Comm School Corp   |
| Jackson  | Crothersville Community Schools |
| Randolph   | Union School Corporation        |
| Tippecanoe   | Lafayette School Corporation    |

Source: Indiana State Department of Health, Indiana Tobacco Free School Policy List. Available at: [https://www.in.gov/isdh/tpc/files/SCHOOLS\\_TOTAL%20LIST\\_8%2015%2018.pdf](https://www.in.gov/isdh/tpc/files/SCHOOLS_TOTAL%20LIST_8%2015%2018.pdf).

There has been limited recent progress increasing the number of hospitals and health systems in Indiana that are tobacco-free. [105] The percent of non-Veterans Administration hospitals in Indiana that were smoke-free increased from 91.3% to 93.6% from the beginning of fiscal year 2016 to July 1, 2018. All hospitals and health systems in Marion County have tobacco-free policies with the exception of the Richard L. Roudebush Veterans Administration Medical Center. Table 14 lists the hospitals in Indiana that do not have a tobacco-free policy. The last

hospital to go smoke-free in Marion County was the Indiana Orthopedic Hospital on August 1, 2012. Substantially more progress was made in increasing the number of behavioral health centers in Indiana that became smoke-free in fiscal year 2016 and fiscal year 2017. At the beginning of fiscal year 2016, 55.6% of behavioral health centers were smoke-free, whereas at the end of fiscal year 2017, 61.4% of behavioral health centers were smoke-free. Table 15 lists the behavioral health centers in Indiana that were not tobacco-free by the end of fiscal year 2017.

**Table 14 Indiana Hospitals and Health Systems That Do Not Have a Tobacco-Free Policy**

| Hospitals and Health Systems That Do Not Have a Tobacco-Free Policy |  |
|---|--|
| County  | Hospital   |
| Allen   | VA Northern IN Health Care System                |
| Clark   | Wellstone Regional Hospital                      |
| Grant   | VA Northern IN Health Care System, Marion Campus |
| Johnson   | BHC Valle Vista Hospital                         |
| Lake  | Illiana Surgery and Medical Center               |
|   | Select Specialty Hospital-Northwest Indiana      |
|   | Regency Hospital of Northwest IN                 |
|   | Hind General Hospital                            |
|   | Physicians Regional Hospital                     |
| Marshall  | Doctor's Hospital                                |
| Marion  | Richard L. Roudebush VA Medical Center           |
| Monroe  | Select Specialty Hospital-Bloomington            |
| Vanderburgh   | Select Specialty Hospital-Evansville             |

Source: Indiana State Department of Health. Tobacco Free Hospitals. Located at: [https://www.in.gov/isdh/tpc/files/hospitals\\_7%203%2018.pdf](https://www.in.gov/isdh/tpc/files/hospitals_7%203%2018.pdf).

**Table 15 Indiana Behavioral Health Centers That Do Not Have a Tobacco-Free Policy**

| Behavioral Health Centers That Do Not Have a Tobacco-Free Policy |   |
|--|---|
| County   | Behavioral Health Center                    |
| Adams  | Midwest Addictions and Psychiatric Services |
|  | Park Center, Inc.                           |
| Allen  | Caring About People, Inc.                   |
|  | Family & Children Services, Inc.            |
|  | Hope House I & II                           |
|  | Midwest Addictions and Psychiatric Services |
|  | Park Center, Inc.                           |
|  | Peace Counseling, Inc.                      |
|  | Phoenix Chemical Dependency Program         |
| Bartholomew  | Brumbaugh and Associates                    |
|  | Steps of Addiction Recovery (SOAR)          |
| Cass   | Four County Mental Health Center            |
| DeKalb   | Northeastern Center, Inc.                   |
| Dubois   | Southern Hills Counseling Center            |

| Behavioral Health Centers That Do Not Have a Tobacco-Free Policy |  |
|--|--|
| Elkhart  | Center for Problem Resolution  |
|  | Danen Counseling Services  |
| Fulton   | Four County Mental Health Center   |
| Gibson   | Southwestern Behavioral Healthcare, Inc./Southwestern IN MH Center, Inc. |
| Hamilton   | LaVerna Lodge (Fairbanks)  |
| Harrison   | Recovery Care Center, Inc.   |
| Hendricks  | Penrod Counseling  |
| Johnson  | Indy Interventions of Greenwood, IN                                      |
|  | Tara Treatment Center, Inc.  |
|  | Valle Vista Hospital and Health System                                   |
| Kosciusko  | Northeastern Center, Inc.  |
| Lake   | Choices Counseling Services  |
|  | Discovery House: The Center for Recovery and Hope                        |
|  | Holiday Healthcare PC  |
|  | Madison Center and Hospital  |
|  | Metro Treatment of Gary (Methadone Treatment Center)                     |
|  | New Horizons, Inc.   |
|  | Serenity House of Gary, Inc.   |
| LaPorte  | Choices Counseling Services  |
|  | Swanson Center   |
| Madison  | House of Hope  |
|  | Sower of Seeds Counseling, Inc.  |
| Marion   | Broadripple Counseling Center  |
|  | Center for Behavioral Change   |
|  | Fairbanks Addiction Treatment Center                                     |
|  | Fall Creek Counseling Services, Inc.                                     |
|  | Indianapolis Treatment Center, Inc.                                      |
|  | Options Treatment Center   |
|  | Resource Treatment Center  |
| Marshall   | Madison Center and Hospital  |
| Miami  | Four County Mental Health Center   |
| Monroe   | Amethyst House, Inc.   |
|  | Meadows Behavioral Care System   |
| Montgomery   | H.O.P.E. Counseling Services   |
|  | New Directions, Inc.   |
| Noble  | Northeastern Center, Inc.  |
| Porter   | Choices Counseling Services  |
|  | Madison Center and Hospital  |
| Posey  | Southwestern Behavioral Healthcare, Inc./Southwestern IN MH Center, Inc. |
| Pulaski  | Four County Mental Health Center   |
| Steuben  | Northeastern Center, Inc.  |
| Tippecanoe   | Alpine Clinic  |
|  | Mental Health America of Tippecanoe County                               |

| Behavioral Health Centers That Do Not Have a Tobacco-Free Policy |  |
|--|--|
|  | Sycamore Springs   |
| Vanderburgh  | Amethyst House, Inc.   |
|  | The Lampion Center   |
|  | Southwestern Behavioral Healthcare, Inc./Southwestern IN MH Center, Inc. |
| Warrick  | Southwestern Behavioral Healthcare, Inc./Southwestern IN MH Center, Inc. |
| Wells  | Park Center, Inc.  |
|  | Caring About People, Inc.  |

Source: Indiana State Department of Health. Indiana Tobacco Prevention and Cessation Commission Partner Dashboard, Quarter 2, 2017.

If Indiana’s goal of increasing the proportion of the population that is protected from secondhand smoke indoors by a law that covers all workplaces, restaurants, bars, membership clubs, and entertainment venues to 100% by the year 2020 is to be met, more must be done to change social norms and influence business leaders, community leaders, and policymakers.

The primary purpose of laws and policies on secondhand smoke is to protect non-smokers from exposure to secondhand smoke. The evidence on the effects of smoke-free air laws is well documented. [106] The 2014 Surgeon General’s report entitled *The Health Consequences of Smoking – 50 Years of Progress* finds that evidence is sufficient to conclude that smoke-free indoor air policies are effective in reducing exposure to secondhand smoke and lead to less smoking among covered individuals. A growing body of research suggests that smoke-free air policies result in improvements in health. [106] A recent study evaluated changes in acute myocardial infarction (AMI) admission rates in Indianapolis and Marion County before and after the comprehensive smoke-free air law was enacted on June 1, 2012, that covered most of Marion County, Indiana. [107] The study concluded that AMI admissions declined 20% in Marion County and 25% in Indianapolis after the comprehensive smoke-free air laws were implemented. Finally, a growing number of studies have found that smoke-free air policies have an additional benefit of lowering smoking rates among youth and young adults. [106] There are several pathways for this to happen, including decreasing the visibility of role models who smoke, decreasing individuals’ opportunities to smoke, and decreasing the social acceptability of smoking.

Opponents of smoke-free air laws argue that implementation of these policies will have an adverse economic impact on the establishments covered by these policies. These arguments have long been used in opposition to policies that make restaurants and bars smoke-free, with opponents citing “studies” based on incomplete or non-objective data, inappropriate methods, and/or analyses that fail to include appropriate control jurisdictions or other key determinants of economic activity. Consistent and overwhelming evidence from high quality studies that do not suffer from these flaws has demonstrated, however, that smoke-free policies have no negative effect, and often a small positive effect, on business activity, as measured by revenues, employment, business openings/closings, and other objective measures. [106]

Similar arguments are made in opposition to smoke-free casino policies. Opponents of smoking bans in casinos argue that casino patrons have higher smoking rates than the general population and prohibiting smoking in casinos will have a negative impact on business. Only a handful of previous studies have examined the effects of casino smoking bans on casino

revenues or admissions. These studies provide mixed evidence on the economic effects of casino smoking bans. The most recent study used data from Illinois, Indiana, Missouri, and Iowa to examine the impact of the Smoke-free Illinois Act, which banned smoking in Illinois casinos. [108] The study found that the ban had no significant negative economic consequences for casinos in terms of per-capita admissions or revenues.

### ***Funding Anti-Tobacco Mass Media Campaigns***

Mass media interventions include a wide range of efforts such as paid television, radio, billboard, print, and digital advertising at the state and local levels. Media campaigns also include press releases, social media, and a variety of other strategies. Mass Media campaigns have sometimes been accompanied by offering free nicotine replacement therapy such as nicotine patches, gums, or lozenges and working with health care professionals and other partners promoting quit lines and Medicaid cessation benefits. Mass media campaigns have been used in the U.S. for decades as part of prevention efforts in tobacco control. These campaigns have the ability to reach sizeable fractions of the population and have the potential to influence individuals' smoking behaviors and change social norms regarding tobacco use.

Funding hard-hitting youth-oriented mass media campaigns has been shown to have large impacts on youth smoking. For example, a study found that the aggressive youth-oriented health communications campaign in Florida significantly reduced the prevalence of smoking among middle and high school. [109] Moreover, a 2008 National Cancer Institute (NCI) monograph concluded that mass media campaigns designed to discourage tobacco use can change youth attitudes about tobacco use and curb smoking initiation and their effects are greater when mass media campaigns are combined with other prevention efforts, such as school and/or community-based programs. [110] Unfortunately, Indiana did not fund any mass media campaigns during the past two fiscal years oriented toward youth tobacco consumption. The Indiana Tobacco Prevention Cessation Commission (TPCC) funded four mass media campaigns—Winter Cessation Campaign, What's Your Reason Campaign, Quit4Life (employer), and Quit4Life (adult)—that focused exclusively on cessation for adults aged 25-44. TPCC did fund Vincennes University's Teen Institute Voice Program in fiscal year 2016 and fiscal year 2017. The Voice Program created a website ([www.voiceindiana.org](http://www.voiceindiana.org)) which distributes youth focused anti-tobacco messages using social media.

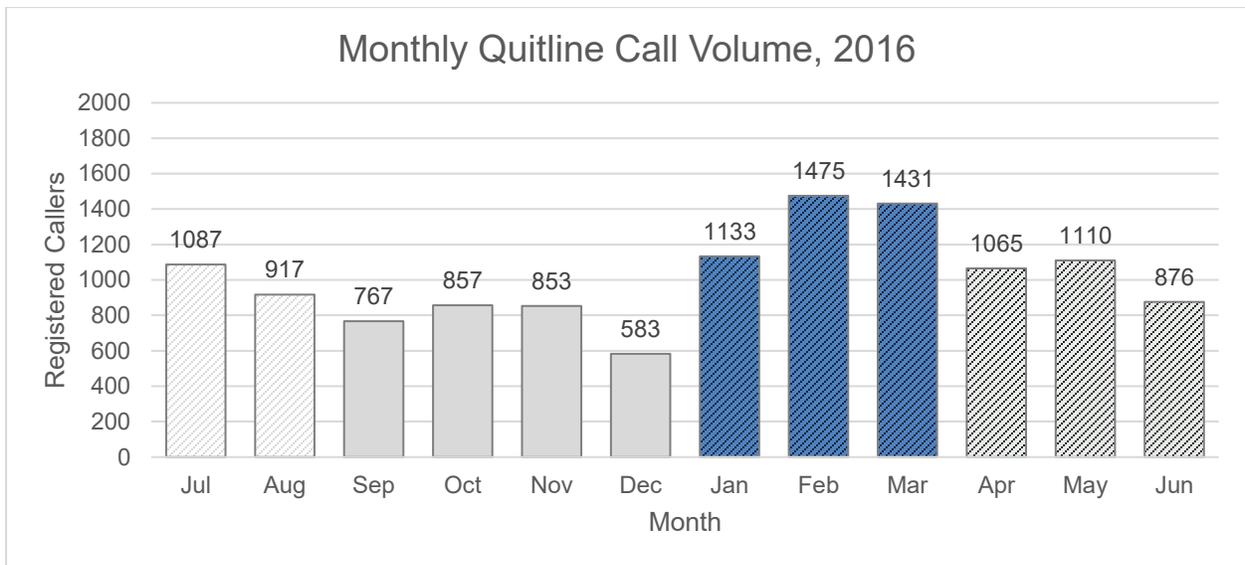
Funding hard-hitting adult-oriented mass media campaigns has also been shown to reduce the prevalence of smoking, increase cessation, increase quit attempts, and increase intentions to quit. [111,112,113,114] A recent study examined the effect of the Centers for Disease Control and Prevention's national tobacco education campaign, Tips from Former Smokers (TIPS), on sustained quits during 2012–2015. [115] The study concluded that the TIPS campaign was successful in achieving substantial long-term cigarette cessation at the population level resulting in approximately 522,000 sustained quits during 2012–2015.

Over the past two fiscal years, Indiana did conduct adult oriented anti-tobacco media campaigns. In fiscal year 2016, \$450,000 (\$150,000 state and \$300,000 federal) was spent on publicizing the Winter Cessation Campaign in Indiana. The campaign ran from January 6, 2016, to March 18, 2016, and was focused on adults aged 25 to 44. The campaign consisted of radio and Internet radio advertisements and digital display in the Indianapolis metropolitan area, South Bend/Elkhart, Fort Wayne, and Lake, Laporte, and Porter Counties and billboard

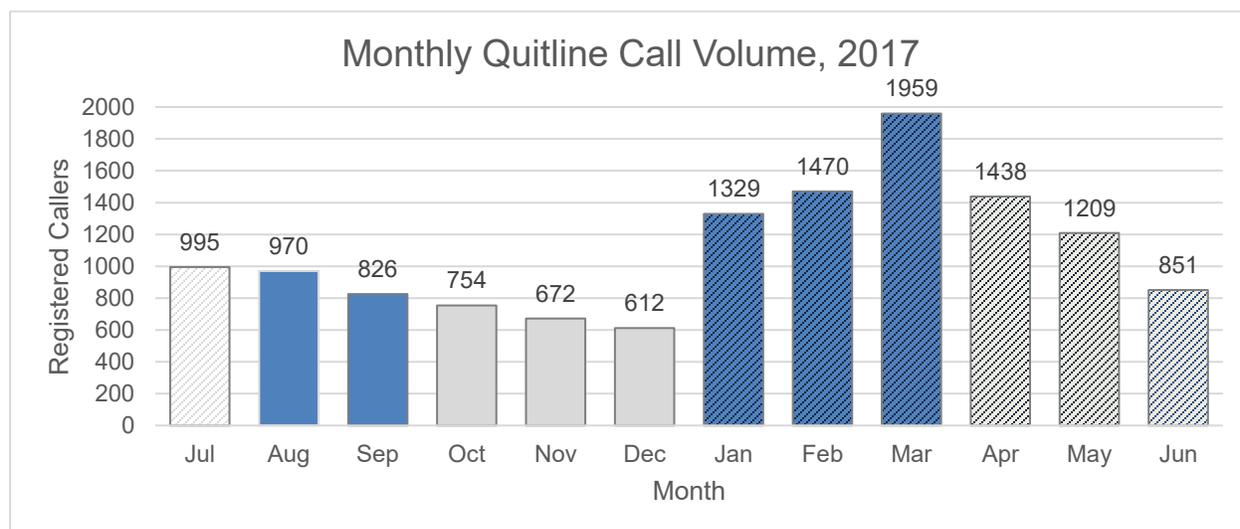
advertising in South Bend/Elkhart and Fort Wayne. In fiscal year 2017, three separate state media campaigns were publicized in Indiana: What's Your Reason, Quit4Life-Employer, and Quit4Life-General. The What's Your Reason campaign was publicized between August 8, 2016 and September 18, 2016. \$210,000 was spent on radio advertisements in the following areas: Indianapolis metropolitan area, South Bend/Elkhart, Fort Wayne, Jeffersonville, Evansville, and Terre Haute. The Quit4Life employer-focused campaign was publicized between December 5, 2016, and January 2, 2017. \$70,000 of federal funds were spent on radio, digital display and print in the Indianapolis metropolitan area. Finally, the Quit4Life general campaign was publicized between January 16, 2017, and March 15, 2017. \$500,000 (\$100,000 federal and \$400,000 state) was spent on radio, Internet radio, and digital display in the Indianapolis metropolitan area, South Bend, Fort Wayne, and Northwest Indiana, and billboards were used in the Indianapolis metropolitan area and Northwest Indiana.

As can be seen in Figures 17 and 18, call volumes to the Indiana Tobacco Quitline increased substantially during the state anti-smoking advertising campaigns, suggesting that the mass media campaigns increased Indiana's smokers desire to quit.

**Figure 17 Monthly Indiana Tobacco Quitline Call Volume, 2016**



**Figure 18 Monthly Indiana Tobacco Quitline Call Volume, 2017**



-  State media campaign
-  No state media campaign
-  Tips from Former Smokers (National Media)

### **Adopting New Policies Addressing Retail Sales of Tobacco Products**

In recent years, a variety of policies targeting the retail sale of tobacco products have emerged, mostly at the local level. These policies address nearly all aspects of retail sales, including where tobacco products can be sold, what products can be sold, how these products are marketed, and at what price they are sold. [116] Emerging research demonstrates the effectiveness of many of these policies in reducing tobacco use, particularly among young people. [117,118]

Most states, including Indiana, and many localities require retailers to have a license to sell tobacco products. In some jurisdictions, licensing laws have been strengthened to limit the number of licenses available, including by either capping the number of licenses available (based on population or geographic area) or by imposing a moratorium on issuance of new licenses. Other jurisdictions, including San Francisco and many localities in Massachusetts, have banned the sale of tobacco products in pharmacies, while CVS voluntarily stopped selling tobacco products in its stores nationwide in September 2014. Still other jurisdictions have prohibited the sale of tobacco products in stores near schools.

In January 2012, Providence, Rhode Island, adopted the first ban on the sale of flavored tobacco products, although the policy was not comprehensive given that it allowed the sale of menthol flavored products, did not address flavored e-liquids, and had other exceptions. Over time, other jurisdictions implemented similar and/or stronger policies. In June 2018, for example, San Francisco voters approved a ballot initiative that will ban the sale of all flavored tobacco products, including menthol cigarettes and flavored e-liquids.

Similarly, a growing number of jurisdictions have implemented policies addressing the marketing of tobacco products, including limits on advertising, requirements for minimum pack sizes, and bans on self-service displays for various products, including e-liquids. [119] The 2009 Family Smoking Prevention & Tobacco Control Act opened the door for these policies by eliminating Federal pre-emption of state and local policies limiting the time, place, and manner of tobacco product advertising.

Finally, state and local governments have implemented a variety of non-tax policies that raise the price of tobacco products. [120] Most state and several local governments have policies that set a minimum price for cigarettes and, in some cases, other tobacco products. [121] These policies are often implemented through required minimum markups on the prices of tobacco products at the wholesale and/or retail level, although some establish floor prices. The strongest of these policies include either significant minimum markups or high floor prices, and do not include loopholes that allow for trade discounts and other exceptions to the minimum prices. Others have restricted tobacco companies' ability to offer price promotions, by banning the redemption of cents-off coupons or prohibiting multi-pack discounts. Others have indirectly affected prices by raising the cost of selling tobacco products, through increases in licensing fees or, in the case of San Francisco, through the imposition of a mitigation fee that aims to recoup the costs the city incurs from discarded cigarette butts.

To date, these policies are largely non-existent in Indiana, but could be implemented at the state level and/or, for at least some policies, at the local level as part of a comprehensive strategy to reduce tobacco use.

### ***Addressing E-Cigarettes and Other Emerging Nicotine Products***

In recent years, a variety of new nicotine delivery products have emerged in the U.S. and globally. The use of electronic cigarettes and other vaping products has grown rapidly in Indiana and across the rest of the country. In 2015, 3.1% of Indiana adults used vaping products, and these products were the most commonly used nicotine delivery product among young people, with 23.9% of high school students reporting use in the last month. [122] While not currently available in the U.S., sales of heated tobacco products have skyrocketed in countries like Japan and South Korea, and it seems likely that the FDA will eventually approve the sale of heated tobacco products in the U.S. The market for vaping products is rapidly changing, with new brands and devices being introduced seemingly continuously. Of particular note are Juul vaping products that look like flash drives and use "pods" with relatively high nicotine concentrations. First introduced in 2015, Juul currently accounts for more than half of overall sales of vaping products in conventional retailers and appear to be particularly popular among young users.

While the long-term health consequences from the use of these products is unclear, it appears almost certain that they are significantly less harmful than conventional cigarettes, given the elimination of combustion and the myriad of harmful constituents produced by burning tobacco. In its 2018 consensus study report on the *Public Health Consequences of E-Cigarettes*, the National Academies of Sciences, Engineering, and Medicine concluded that: under normal use conditions, exposure to toxic substances from e-cigarettes was significantly lower than from conventional cigarettes; completely switching from conventional cigarettes to e-cigarettes significantly reduced a user's exposure to numerous carcinogens and other toxicants found in conventional cigarettes; and completely switching from conventional cigarettes to e-cigarettes would result in short-term improvements in health. [123] However, as described in the 2016 Surgeon General's report *E-Cigarette Use Among Youth and Young Adults*, the use of e-cigarettes and other vaping products is not harmless, concluding that: exposure to nicotine during adolescence is harmful to the developing brain; e-cigarette users are exposed to a variety of chemicals known to be harmful; and the vapor produced by e-cigarettes contains harmful constituents, although generally fewer than contained in the smoke from conventional cigarettes. [124] In contrast to the emerging evidence on the health consequences of e-cigarettes and other vaping products, very little is known about the effects of heated tobacco products, with a recent review from Public Health England concluding that the risks from these products are likely to lie between those from vaping products and conventional cigarettes. [125]

The impact of e-cigarettes on public health has been the subject of vigorous debate. Some evidence suggests that e-cigarettes can be effective in promoting smoking cessation, at least for some smokers. At the same time, the high rates of e-cigarette use among youth raise concerns that e-cigarettes will be a gateway to smoking conventional cigarettes. In its consensus report, the National Academies concluded that under likely scenarios regarding the impact of e-cigarettes on cessation and initiation, e-cigarette use would produce a net public health benefit at the population level, given that the benefits from increased cessation would more than outweigh the consequences of increased initiation. [123]

Governments can implement a variety of policies to try to maximize the net public health benefits from e-cigarettes by minimizing youth use, encouraging adult smokers to switch completely, and protecting non-users from exposure to secondhand vapor. [126] The sale of e-cigarettes to minors is banned nationally, under FDA's regulatory authority over tobacco products, including e-cigarettes, and states and localities that have raised the minimum age to 21 have generally included e-cigarettes in their policies. As of July 1, 2018, comprehensive smoke-free air policies in 11 states and over 750 localities have been extended to prohibit the use of vaping products in public places, including bars, restaurants, and workplaces. [127] While Indiana's smoke-free policy does not address e-cigarettes, several local policies do, including: comprehensive bans on e-cigarette use in restaurants, bars, workplaces, and gambling outlets in Franklin, South Bend, and Howard County; bans on use in restaurants, bars, and workplaces in Bloomington, Zionsville, and Indianapolis/Marion County (except Beech Grove, Lawrence, Southport, and Speedway); a ban on use in restaurants and workplaces in Seymour; and a ban on use in workplaces in Greenwood.<sup>3</sup> After many state and local governments, including Indiana, adopted laws requiring that the packaging for e-liquids be child-proof, the federal

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<sup>3</sup> Note that the workplace bans referred to here are for non-hospitality sector workplaces and do not include restaurants, bars, and gambling facilities.

government passed national legislation requiring child-proof packaging in 2016. A growing number of state and local governments, including Indiana, require e-cigarette retailers to be licensed and prohibit self-service displays of e-liquids and/or vending machine sales in establishments where minors are allowed to enter.

To date, relatively few state or local governments tax e-cigarettes, and the approaches used by those that do differ widely. Minnesota was the first state to implement an e-cigarette tax in 2012 when its Department of Revenue determined that e-cigarettes met the state's definition of tobacco products, given that they delivered nicotine derived from tobacco. As a result, Minnesota began applying its other tobacco products tax, levied at 95% of wholesale price, to e-cigarettes. A few other jurisdictions have followed a similar approach, including California, the District of Columbia, Pennsylvania, and two localities in Alaska (Mat Su Borough and Petersen). Others, beginning with North Carolina, have taken a very different approach, defining e-cigarettes as a new product for taxation purposes and levying taxes based on the volume of the e-liquid. These taxes are typically very low and include a tax of: 5 cents per milliliter in Delaware, Kansas, Louisiana, and North Carolina; 7.5 cents per milliliter in West Virginia; and 20 cents per milliliter in Cook County, Illinois. Chicago has implemented a unique two-part tax, consisting of a tax of 80 cents per unit of e-liquid sold, and an additional tax of 55 cents per milliliter of e-liquid.

Recent research demonstrates that e-cigarette use is relatively more sensitive to price than is conventional cigarette smoking, that use among young people is highly responsive to price, and that changes in the price of e-cigarettes relative to conventional cigarettes affect users' substitution between the two. [128,129,130] Given this, some have proposed taxing e-cigarettes and other emerging products based on their harms relative to conventional cigarettes as a way to maximize the net public health impact of e-cigarettes. [131] Under this approach, governments would adopt a significant tax on e-cigarettes while at the same time raising their tax on cigarettes and other combustible tobacco products. The e-cigarette tax would discourage youth from taking up e-cigarette use, while the increase in taxes on combustible products would further discourage youth use of these products. The increase in the taxes on combustible products would encourage current smokers to quit and, for those who can't quit entirely, a relatively lower tax on e-cigarettes would encourage them to switch from more harmful combustible products to less harmful e-cigarettes. To date, no state or local government has explicitly implemented this type of differential taxation approach, although Connecticut recently adopted legislation that would tax tobacco products that the FDA designates as "modified-risk" products at half the rate the state taxes conventional cigarettes.

## **HEALTH CARE SYSTEMS**

Health care providers with direct patient contact have an extraordinary opportunity to assist tobacco users in quitting their habit. Physicians and other health care providers should address smoking cessation with all patients who use tobacco. This can be accomplished through integrating screening for smoking cessation at all patient visits, delivering brief interventions and providing access to evidence-based treatment, which includes nicotine-replacement therapy and counseling. Given the often low utilization of these evidence-based treatment options among smokers, health care systems and their partners may also play a role in raising awareness of coverage, particularly among the Medicaid population.

## ***Integration of Tobacco Screening, Brief Intervention and Evidence-Based Treatment***

Health care systems can help tobacco users quit the habit by institutionalizing systems to identify tobacco users, delivering brief interventions of 3-10 minutes and treating tobacco users through pharmacotherapies, including nicotine-replacement therapy, and individual, group or telephone counseling. [132]

Tobacco use treatments have been found to be highly cost-effective relative to other commonly used disease prevention interventions and medical treatments. Many researchers consider this tobacco use treatment as the “gold standard” of health care cost-effectiveness, and several studies indicate that evidence-based cessation interventions produce a positive return on investment for employers and health plans. [132] For example, as discussed previously, a recent study from Massachusetts found that for every \$1 spent on the state’s Medicaid smoking cessation benefit, \$3.12 was saved, resulting in a net savings of \$2.12 for each \$1 invested. [48]

### ***Screening***

Health care systems should screen for tobacco use on every patient visit. The widespread adoption of electronic health records (EHR) have created further opportunities for health care systems to reduce tobacco use. In particular, EHRs may automatically prompt physicians or their staff to ask patients whether they smoke and their smoking history, provide a brief “script” for advising the patient to quit and also provide the ability to connect them to effective treatment options once they leave the visit.

### ***Brief Intervention***

Research has shown that providers can make a difference with even a minimal (less than 3 minutes) intervention. The Clinical Practice Guidelines suggest that the odds of quitting smoking are 30% higher for smokers who receive brief advice from a physician to quit smoking as compared to smokers who do not receive advice from a physician. [133] Given the large number of smokers who visit a provider each year, the potential public health effect of widespread advice to quit is substantial. The Clinical Practice Guidelines also conclude that the more time providers spend counseling their patients to quit, the better the treatment outcomes. In particular, the odds of quitting smoking are 60% higher for smokers receiving 3-10 minutes of provider counseling to quit smoking as compared to smokers who do not receive advice from a provider. Finally, the odds of quitting smoking are 130% higher for smokers receiving more than 10 minutes of counseling to quit smoking as compared to smokers who do not receive advice to quit from a provider.

### ***Pharmacotherapies and Counseling***

After brief intervention, health care systems should then offer evidence-based treatment, which includes pharmacotherapies and counseling. Both counseling and pharmacotherapies are effective when used on their own, but the combination of both is more effective. [130]

U.S. Food and Drug Administration-approved pharmacotherapies for smoking cessation include nicotine replacement therapy (NRT), bupropion hydrochloride sustained-release (bupropion SR), and varenicline. NRT is designed to make withdrawal from nicotine easier by providing measured doses of nicotine that are absorbed through the skin via a transdermal patch or

membranes of the mouth, throat, and/or nasal passages via gum, lozenge, inhaler, or spray. Bupropion is an anti-depressant that is thought to reduce the displeasure of smoking cessation by inhibiting the recapture of neuromediators and compensating for the dopamine deficit linked to smoking cessation. Varenicline works by bonding to nicotine receptors and acting like nicotine (partial agonist), which helps to relieve withdrawal symptoms and it also acts against nicotine (antagonist) by taking its place, which allows it to decrease the pleasurable effects of smoking. The 2015 U.S. Preventive Services Task Force Guidelines conclude that these pharmacotherapies substantially improve achievement of tobacco cessation in non-pregnant adults who smoke. [134] A review of the literature on the effect of NRT on cessation found that all licensed forms of NRT (gum, transdermal patch, nasal spray, inhaler and sublingual tablets/lozenges) help people who make a quit attempt to increase their chances of quitting smoking. The review concluded that NRTs increase the rate of quitting by 50% to 60% and the relative effectiveness of NRT appears to be largely independent of the intensity of additional support provided to individuals. [135] Another review of the literature compared the effects of different pharmacotherapies on smoking cessation and found NRT and bupropion helped about 80% more people to quit smoking than placebo (meaning that for every 10 people who quit with placebo about 18 could be expected to quit with NRT or bupropion). [136] Moreover, the review found varenicline more than doubled the chances of quitting compared with placebo, so that for every 10 people who quit with placebo about 28 could be expected to quit with varenicline. [136] Head-to-head comparisons between bupropion and NRT showed equal efficacy, whereas varenicline was found to be superior to single forms of NRT and to bupropion, but was found not to be more effective than combination NRT therapy.

The Affordable Care Act (ACA) and other federal laws and rules require almost all health insurance plans in the U.S.—including employer-sponsored insurance, state health insurance marketplace plans, Medicaid, Medicare, and other insurance plans—to cover some tobacco cessation pharmacotherapies.

Providers can also increase their patients' success in quitting through counseling. Counseling includes individual and group counseling. One commonly used approach is telephone counseling through state quitlines. The Indiana Tobacco Quitline (ITQL) provides free support to Indiana residents who want to stop using tobacco. Trained quit counselors provide telephone counseling to all Indiana residents who want to quit using tobacco. Non-pregnant adults (aged 18+) who plan to quit using tobacco in the next 30 days receive four initial intervention calls with quit counselors and can receive additional calls at no cost if subsequent help is needed in quitting. Some of these individuals will be eligible to receive a free two-week nicotine-replacement therapy starter kit. Pregnant women who want to stop using tobacco receive ten initial intervention calls, whereas youth (aged 13-17) who want to stop using tobacco receive five initial intervention calls. The ITQL also provides information to health professionals regarding tobacco dependence, provides information on cessation to family and friends of tobacco users, and provides information on local and national resources for cessation. Finally, the ITQL offers a web-based counseling program (Web Coach) and a texting-based program (Text2Quit) for those individuals who prefer this over phone counseling. A review of 12 studies that examined the effect of mobile phone-based cessation interventions concluded that smokers who participated in mobile phone-based interventions were around 1.7 times more likely to stay quit than smokers who did not participate (9.3% quit with mobile phone interventions compared to 5.6% with no intervention). [137] A review of Internet-based interventions for smoking cessation concluded that interactive and tailored Internet-based interventions with or without additional behavioral support are more effective than non-active

control at six months or longer. However, there is no evidence that Internet interventions are better than other active smoking treatments. [138]

Health care providers in Indiana have the ability to include direct referral to ITQL into their practices as part of the Quit Now Indiana Preferred Provider Program. There is also a statewide effort to integrate the ITQL into health systems' electronic health records.

Several reviews of the literature have established that proactive telephone counseling (i.e., proactive quit lines) is an effective intervention for smoking cessation. A review of 13 studies showed that proactive quit lines yielded a 56% increase in quit rates when compared with self-help. [139] The 2008 Clinical Practice Guideline for treating tobacco use and dependence concluded that smokers who receive proactive telephone counseling are more than one and one-half times more likely to remain abstinent than if they had received minimal or no counseling or self-help. [133] The most recent U.S. Preventive Services Task Force clinical recommendations confirm the earlier reviews and conclude that telephone counseling interventions are effective in helping tobacco users quit. [134]

The ITQL has been successful in assisting tobacco users in quitting tobacco. In 2016, 78% of the ITQL phone program participants had stopped using tobacco for 24 hours or longer because they were trying to quit, whereas 71% of the ITQL web-only program participants had stopped using tobacco for 24 hours or longer because they were trying to quit. In 2016, 30% of the ITQL phone program participants were quit at the 7-month follow-up evaluation survey, a rate that is comparable to the average quitline quit rate for all states in fiscal year 2016 of 30.2% reported by the North American Quitline Consortium. Moreover, 26% of the participants of the ITQL web-only program were quit at the 7-month follow-up evaluation survey. ITQL participants who were not able to quit saw health improvements. For example, in 2016, 3 in 5 continued smokers in both programs (phone and web-only) reduced the number of cigarettes they smoked by half a pack on average. Further, in 2016, there was a 33% decrease for the phone program and 19% decrease for the web-only program in the number of continued smokers who reported smoking their first cigarette within 5 minutes of waking.

### ***Raising Awareness of Smoking Cessation Benefits***

Counseling and pharmacotherapy are effective interventions for increasing smoking cessation and lowering long-term costs due to smoking. While many insurance plans, both public and private, cover these cessation treatments, they are only beneficial if utilized. As a result, increasing awareness of coverage among both health care providers and patients may further improve uptake.

Low utilization of FDA-approved pharmacotherapies for cessation is especially troubling for Indiana's Medicaid population, given the high rate of smoking among this group. Indiana has one of the highest Medicaid smoking rates in the nation. A 2016 report published by the CDC concluded that, as of December 2015, the prevalence of smoking among Indiana Medicaid beneficiaries was 48.3%. [140] While Indiana covers nine smoking cessation treatments for all Medicaid enrollees including coverage of individual counseling, group counseling, and seven FDA-approved cessation medications, a 2018 report published by the Richard M. Fairbanks Foundation entitled *Tobacco Control Program Funding in Indiana: A Critical Assessment*

concluded that the utilization of smoking cessation treatment in Indiana was low, with only 11.65% of adult Medicaid smokers in Indiana in fiscal year 2016 having used a smoking cessation pharmacotherapy for which Medicaid paid either a portion of the claim or the entire claim.

Barriers to utilization of pharmacotherapies by Medicaid enrollees in Indiana have included copayment requirements, counseling requirements to receive pharmacotherapies, limits on duration of pharmacotherapies, limits on yearly quit attempts and lack of staff time. The recent approval of Indiana's HIP waiver renewal addressed some of these barriers—by, for example, increasing coverage for pharmacotherapies and reimbursing staff time spent discussing smoking cessation—which will likely result in an increased utilization of pharmacotherapies by Medicaid enrollees in the future. To further promote utilization, Indiana could initiate an education and outreach program supported by a statewide media campaign to promote smoking cessation among Medicaid enrollees. Managed care entities could also consider providing incentives to Medicaid providers to screen and refer individuals to these evidence-based and cost-effective treatment options.

Health care systems need to increase awareness and utilization of covered cessation treatments among Medicaid enrollees and their health care providers. Efforts to increase this awareness and use of covered cessation treatments have been an intentional focus of several state tobacco control programs. For example, on July 1, 2006, the Massachusetts Medicaid program (MassHealth) expanded tobacco cessation coverage to all MassHealth beneficiaries. The Massachusetts Department of Public Health (MDPH) initiated a broad publicity and outreach campaign to increase the awareness and utilization of the expanded cessation benefits by health care providers and MassHealth beneficiaries. From fiscal year 2007 to 2009, the MDPH spent \$558,500 on promotion and outreach. For health care providers, this outreach included the development and distribution of fact sheets, detailed Frequently Asked Questions with rate and billing codes, a pharmacotherapy pocket guide, and new intake and assessment protocols that were widely disseminated to health care systems and facilities and regular communications were sent to provider groups including medical associations and subspecialty groups. [141] For consumers, this outreach included radio ads, transit ads, and direct mailings. The expansion of benefits in conjunction with the substantial amount of promotion resulted in a substantial decrease in smoking among MassHealth beneficiaries from 38% in 2006 to 28% in 2008, a 26% decline in the first 2.5 years. [141] In addition, researchers compared the probability of hospitalization before and after the cessation benefit expansion and found there was a 46% decrease in hospitalizations for heart attacks and a 49% decrease in hospitalizations for other acute heart disease diagnoses among users of the pharmacotherapy benefit. [142]

## **EMPLOYERS**

Workplaces are important settings in which smoking cessation interventions can be implemented. By adopting workplace smoking cessation interventions, employers can help smokers quit their habit, improve employee health and productivity, and decrease medical costs. Employers can implement company-specific smoke-free air policies when state or local laws do not exist or are non-comprehensive. There is a strong consensus from previous research that workplace smoking restrictions decrease exposure of non-smoking employees to

secondhand smoke at work and lead smoking employees to reduce their daily cigarette consumption. [61] Moreover, several studies have found smoke-free workplace policies to increase smoking cessation and decrease smoking prevalence rates among employees. Further, implementing a non-smoking policy in the workplace not only protects employees from dangerous secondhand smoke, it also supports those employees who want to quit smoking and emphasizes the employers' commitment to employee health.

Section 1001 of the Affordable Care Act required non-grandfathered employer-sponsored health insurance plans to cover, with no cost-sharing, a collection of clinical preventive services including tobacco cessation interventions for those adults who use tobacco products. However, there is no single definition of tobacco cessation, so the scope of coverage varies by state and by the insurance provider. Employer-sponsored insurance policies typically cover one or more of the following: counseling, either in-person (either individual or group), via phone, or via the Internet; prescription pharmacotherapies for cessation such as varenicline (Chantix) and bupropion (Zyban); and over-the-counter nicotine-replacement therapies such as nicotine patches, gum, nasal spray, and inhaler. As discussed previously, there is evidence that the combination of counseling and medication is more effective for smoking cessation than either medication or counseling alone. Therefore, to increase the likelihood of successful cessation among employees, employers should include both counseling and medication coverage in their health benefits package. Employers can also provide additional resources and assistance to employees who are trying to quit smoking such as self-help materials and social support. A 2014 Cochrane review of the scientific literature found strong evidence that some workplace interventions aimed at individual smokers increased the likelihood of smoking cessation. These interventions included individual counseling, group therapy, and pharmacological treatments for nicotine addiction which all increased cessation rates in comparison to no treatment or minimal intervention controls. The review found self-help materials and support from friends, family and workmates to have a smaller impact on worker smoking cessation in comparison to no treatment or minimal intervention controls. [143]

Employers can also encourage their employees to utilize tobacco quit lines to help them kick the habit. In Indiana, employers who enroll as a [Quit Now Preferred Employer](#) can obtain materials to educate their employees on tobacco use and have the ability include direct referral to ITQL into their workplaces.

Finally, employers can offer financial incentives such as offering cash rewards and commitment contracts to help employees quit smoking. General Electric and CVS Caremark are two companies that experimented with financial incentives for smoking cessation. In 2005, General Electric offered incentives up to \$750 to quit smoking among some employees but not others. Those employees that received financial incentives had quit rates that were three times higher than those that did not receive a cash reward: 15% of the group that received a financial incentive quit compared to 5% of the non-incentivized group. [144] More recently, researchers randomly assigned CVS Caremark employees and their relatives and friends to one of four financial incentive programs or to usual care for smoking cessation. [145] Two of the incentive programs targeted individuals and two targeted groups of six participants. One of the individual programs and one of the group programs provided rewards up to \$800 for smoking cessation; the others entailed refundable deposits of \$150 plus up to \$650 in reward payments for participants who quit smoking. Usual care included informational resources and free smoking cessation aids. Individual recruitment occurred from February 2012 through October 2012. The rates of sustained abstinence from smoking through 6 months were higher in each of the four incentive programs (range, 9.4% to 16.0%) than with usual care (6.0%). Reward-based

programs were associated with higher abstinence rates than deposit-based programs (15.7% vs. 10.2%) and the superiority of reward-based programs was sustained through 12 months. Similar six-month abstinence rates were found for the group-oriented (13.7%) and individual-oriented (12.1%) programs. While neither of these studies calculated a return on investment, even an \$800 payment borne entirely by an employer is likely to be cost saving. This is due to the fact that the costs of employing a smoker are estimated to be \$5,816 more each year than employing a non-smoker. [53]

## **SCHOOLS**

### **K-12 Schools**

During the past 40 years, numerous school-based programs to prevent tobacco use have been developed. The goal of school-based tobacco prevention and cessation programs is to keep youth and young adults tobacco-free so that they remain tobacco free through adulthood. The 2000 Surgeon General's Report entitled *Reducing Tobacco Use* concluded that implementing effective educational programs for preventing tobacco use could postpone or prevent smoking onset in 20% to 40% of U.S. adolescents. [146] The 2012 Surgeon General's report entitled *Preventing Tobacco Use Among Youth and Young Adults* reviewed additional and more recent research on school-based programs and concluded that some programs can be effective in preventing and decreasing tobacco use in the short-term, and that certain programs demonstrated long-term prevention effects as well. The 2012 report emphasized that effective programs are usually integrated with community-wide prevention efforts.

Evidence-based prevention programs generally focus on teaching students personal and social skills to help avoid tobacco use such as problem solving, decision making, and coping methods for stress. These programs may also teach techniques to improve self-esteem, self-control, and assertiveness and discuss methods to resist personal or media influences.

Life Skills Training (LST) is an example of a school-based program that teaches social resistance skills along with general personal and social competence skills. In numerous studies, LST has been shown to prevent tobacco use among youth. One of the studies that evaluated the effect of LST was conducted on middle school children in Marion County, Indiana. [147] From 1997 to 2000, students in grades six to eight in 12 of 16 middle schools within Indianapolis Public Schools, the largest public school district in Indiana, received the Life Skills Training curriculum. Survey data compare tobacco use behavior, attitudes, and knowledge of middle schoolers exposed to LST with those not exposed to the program. Middle schoolers who received LST were significantly less likely to smoke than those who did not receive the training. Fewer of those participating in the LST program "hung out" with smokers and more said they could easily refuse a cigarette if offered one. Students completing LST were also found to be more knowledgeable about the health effects of smoking.

Other school-based programs have also shown to be effective in decreasing tobacco use among school children. In 2018, as part of its *Prevention Matters* initiative, the Richard M. Fairbanks Foundation committed more than \$10.2 million to implement evidence-based prevention programs in public (traditional, charter, and innovation network) and accredited private K-12 schools in Marion County, Indiana. *Prevention Matters* is projected to serve 151 Indianapolis schools delivering prevention programs to 71,112 students by the 2020-2021 school year. In addition to LST, the Foundation highlights other school-based programs that have proven to decrease substance use, including tobacco. Examples include Positive Action,

Good Behavior Game, and Project Towards No Drug Abuse, and a full list can be found on the *Prevention Matters* website. [148] Additional information on evidence-based programs can also be found in *Indiana's Evidence Based Practice Guide*, published by the Indiana Family and Social Services Administration. [149] The list includes evidence-based school intervention programs aimed at reducing tobacco consumption and other risky behaviors.

School districts and communities should invest only in research-proven school-based programs and disregard programs with little or no evidence of effectiveness. There is some evidence that school-based tobacco prevention skill-building programs reduce smoking among school children. [150] A recent review of the literature found that school-based programs that combine social competence training such as problem solving and decision-making skills with social influences training such as skills to manage peer pressure have been shown to reduce youth smoking. [150] However, programs that use only a social influences approach without other skills-based components, such as the Drug Abuse Resistance Education (D.A.R.E.) program, do not affect smoking rates among youth. While no comprehensive list of school-based tobacco prevention programs exists in Indiana, anecdotal evidence indicates that the D.A.R.E. program is still being used by some schools in Indiana.

### **Colleges and Universities**

Colleges and universities can also play a role in reducing tobacco consumption. Most colleges and universities in the U.S. are nonprofit entities. Most local and state smoke-free air laws do not include college or university campuses. Some states do include state schools in their smoke-free workplace laws. Therefore, it is important for colleges and universities to adopt smoke-free policies to protect employees and students from exposure to secondhand smoke and reduce smoking initiation and the social acceptability of tobacco. According to the CDC, as of November 2017, at least 2,082 U.S. college and university campuses had smoke-free policies, of which 1,743 (83.7%) were tobacco-free. [151] The number of U.S. college and university campuses with smoke-free and tobacco-free policies has more than doubled over the past half-decade. [151] As part of tobacco-free policies, colleges must also provide students and employees with effective tobacco cessation resources. If colleges want students and employees to stop using tobacco on college campuses, they must offer them help to quit, including counseling and pharmacotherapies.

### **NON-PROFIT AND COMMUNITY-BASED ORGANIZATIONS**

Non-profit and community-based organizations play an important role in tobacco control. These organizations often lead the advocacy efforts to reduce tobacco use and its deadly consequences in the U.S. Nonprofits and community-based organizations can advocate against tobacco in many ways including: disseminating information on television, radio, billboards, mailings, handouts, newspapers, and magazines to educate the lay public to the harms of tobacco and effective solutions to kick the habit; spotlighting public officials that receive money from the tobacco industry; advocating for effective policies that will prevent and reduce tobacco use; or conducting anti-tobacco public relations campaigns.

Research has shown the importance of community involvement and support in adopting new tobacco control policies. Community involvement in policy change will ultimately lead to changes in social norms and subsequently to changes in tobacco consumption, as tobacco use

becomes less desirable and acceptable. Non-profits can also fund tobacco control research and policy studies in an effort to create new knowledge. In addition, nonprofits and community organizations can refer individuals to quit lines and help smokers obtain counseling and pharmacotherapies.

## ***OTHER EVIDENCE-BASED PRACTICES***

Numerous tobacco prevention and cessation programs exist in the U.S. It is important for employers, schools, non-profit organizations, health care systems, and other organizations to select only programs that are evidence-based. That is, organizations should choose to utilize tobacco programs where peer-reviewed scientific research shows these programs cause substantial reductions in the use of tobacco. In April 2018, the Substance Abuse and Mental Health Services Administration (SAMHSA) launched an Evidence-Based Practices Resource Center that aims to provide individuals and organizations with information and tools to incorporate evidence-based practices. The Evidence-Based Practices Resource Center contains a collection of science-based resources including information on finding evidence-based tobacco prevention and cessation programs. [152] On February 23, 2016, the Indiana Family and Social Services Administration's Division of Mental Health and Addiction compiled a list of approved evidence-based programs that include tobacco prevention and cessation and guidance on how to select an appropriate program. [149] These lists should be used by organizations seeking to incorporate a tobacco prevention or cessation program into their organizations.

## ***RECOMMENDATIONS FOR ORGANIZATIONS TO EFFECTIVELY ADDRESS TOBACCO USE***

### ***Health Care Systems***

- Health care providers should routinely screen patients for tobacco use and intervene with every tobacco user at every visit. Research has shown that health care providers can make a difference with even a minimal intervention.
- Health care providers should also offer patients evidence-based treatment, including smoking cessation pharmacotherapies and counseling. Both counseling and medications are effective in helping smokers quit.
- Health care systems should increase awareness and utilization of covered cessation treatments among health care providers and patients, including Medicaid patients.
- Health care systems should adopt electronic health records (EHR) and use the EHR in ways to support smoking cessation.
- EHRs should be used to document and monitor patient smoking status and assist providers in: providing advice and educational material to patients, providing patients with cessation medication, and providing access to pharmacotherapies and counseling.

### ***Employers***

- Employers should adopt workplace smoking cessation interventions to help their employees quit smoking.

- Employers can implement company-specific smoke-free air policies when state or local laws do not exist or are non-comprehensive.
- Employers should include both counseling and smoking cessation pharmacotherapy coverage in their health benefits package.
- Employers should encourage their employees to utilize tobacco quit lines.
- Employers can offer financial incentives to help employees quit smoking.

### **Schools**

- School districts should invest only in research-proven school-based programs that effectively reduce tobacco consumption, and disregard programs with little or no evidence of effectiveness.
- School districts should adopt tobacco-free school policies that include e-cigarettes.
- As part of tobacco-free policies, schools (particularly universities and colleges) must also provide students and employees with effective tobacco cessation resources.

### **Non-Profit and Community-Based Organizations**

- Non-profits and community organizations can disseminate information to educate the lay public on the harms of tobacco and effective solutions to kick the habit.
- Non-profits and community organizations can refer individuals to quit lines and help smokers obtain counseling and pharmacotherapies.
- Non-profits and community organizations can advocate for effective policies that will prevent and reduce tobacco use.
- Non-profits and community organizations can conduct anti-tobacco public relations campaigns.
- Non-profits and community organizations can fund new tobacco prevention and cessation research and generate new knowledge.

## **CONCLUSION**

Tobacco use is indisputably causing harm to the health and economic wellbeing of residents in Marion County and Indiana. The economic cost to all Hoosiers, both smokers and non-smokers alike, is significant. The health and economic costs of tobacco use are *preventable*. Raising the price of tobacco, raising the legal age to purchase tobacco, funding tobacco control programs at CDC-recommended levels, establishing a state wide comprehensive smoke-free air law, funding hard-hitting anti-tobacco mass media campaigns, adopting new retail tobacco sales policies, and enacting laws that address new and emerging tobacco products are all actions that Indiana could take that would lead to far fewer adults and youth who smoke in Indiana, generating significant health care cost savings, employer cost savings, and a reduction in lives lost. Employers, health care systems, schools, and non-profit and community organizations can also have a substantial impact on decreasing tobacco consumption and its associated consequences by implementing the evidence-based programs and practices discussed in this report.

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