

The Value of Smoking Prevention

An Estimate of the Dollar Value of Preventing One Otherwise-Smoker from Starting

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Executive Summary

Programs to prevent youth smoking are considered beneficial. However, little has been documented on the extent of these benefits, who benefits, and what these programs are worth. This report takes advantage of an excellent and detailed national accounting of the cost of smoking to develop a set of estimates of the net benefits of preventing one Arizona adolescent from smoking. These figures can then be used to help justify and better target youth smoking prevention programs.

The baseline national estimates of the cost of smoking are modified to be appropriate for use valuing prevention efforts targeting youth of about 10 years of age. They are also modified by adjusting the estimate to reflect 2009 dollars, to include existing federal and state tobacco excise taxes, and to include better and more recent data on the effect of smoking on worker productivity and on the health and mortality effects of secondhand smoke exposure.

Because what is considered a cost differs depending on who is asking the question, when talking about value, costs, and cost savings, the perspective (or point of view) required for each situation must be acknowledged. Below are the estimates appropriate for use from several possible perspectives:

- *The perspective of society as a whole.* Preventing one 10-year-old who would have otherwise become a typical smoker from becoming that smoker is worth about \$149,000 to Arizonans as a whole, ignoring for now who is benefiting.
- *The perspective of the portion of society other than the smoker and his or her family.* The vast majority of the costs to society as a whole accrue to the smoker his- or herself (about \$128,000), and the next largest portion of costs accrue to the smoker's immediate family (\$23,000), mostly due to secondhand smoke exposure. Since it is more difficult to justify dollars to prevent someone from harming him- or herself, the smoker's costs may not be appropriate to include as a value to prevention. Whether smokers' families should be included within the realm of personal choice or be considered victims is up for debate. Depending on whether costs to smokers' families are included or not, preventing one 10-year-old who would have otherwise become a typical smoker from becoming that smoker is a cost of over \$2,000 to all Arizonans except the smoker and his or her family, or a gain of about \$21,200 to all Arizonans except the prevented smoker him-or herself.
- *The perspective of Arizona's state budget.* This perspective only includes dollars that would flow into and out of state coffers. From this perspective, preventing one 10-year-old who would have otherwise become a typical smoker from becoming that smoker costs the Arizona state budget about \$6,000 over that smoker's lifetime. Note that this amount, like all other estimates presented in this report, is in addition to the cost of the prevention program itself.

When using these estimates it is important to remember that they are just that: estimates. They are the best available estimates of the value of smoking prevention, but they are not without limitations. These limitations should be noted whenever these estimates are used.

These estimates have policy implications for how tobacco tax revenues are used. To avoid disincentivising tobacco interventions, and in the interest of equity, there is a strong rationale for using these dollars towards tobacco control, which, if done effectively, may phase out the income stream over time, but also, unlike other uses, reduces the need for the income stream.

Introduction

Most people would agree that programs to prevent youth smoking are beneficial. However, it is much more difficult to say the extent of the benefits, who benefits, and what these programs are worth. This report presents the development of a set of estimates of the net benefits of preventing one Arizona adolescent from smoking. These figures can then be used to help justify and better target youth smoking prevention programs.

This report is organized as follows. The next section presents a set of estimates of the cost of smoking that will be used as the baseline from which we will then generate estimates more appropriate to use in valuing smoking prevention in Arizona youth. The third section presents the modifications to the baseline estimates needed to generate the best available estimate of the value of smoking prevention programs in Arizona today. These modifications are limited to those possible using existing data. The fourth section presents information on how the final estimates could be used, and their limitations.

Baseline Estimate of the Cost of Smoking

This analysis takes advantage of an excellent and detailed accounting of the cost of smoking by Frank Sloan and colleagues in their 2004 book entitled *The Price of Smoking*.¹ We will use these estimates of the cost of a 24-year-old smoker as a baseline for the estimate of the value of smoking prevention in Arizona youth.

This work was chosen as the source for the cost estimates used in this report for several reasons. First, dozens of estimates of the cost of smoking have been published. Although we believe that the Sloan et al. estimates are some of the most rigorous, any estimate of these costs is just that, an estimate. Given the imprecise nature of the estimation process, advantages of using the Sloan et al. estimates include that they are based on nationally representative samples and that their derivation is well-documented in a 300+ page book. Second, Sloan and colleagues compare smokers' costs to that of "non-smoking smokers" rather than to never or former smokers. This allows a focus on the costs of smoking itself, and separates out any costs associated with lifestyle risk factors which are often correlated with smoking. Third, Sloan and colleagues capture more categories of costs than other estimates. That is, they go beyond an estimate of healthcare costs to include the cost of tobacco use to worker productivity, the smoker's family's health (via secondhand smoke), life insurance premiums, pensions, and tax revenues. Fourth, Sloan and colleague's estimate of healthcare costs include these costs for all causes and not just for those diseases specifically deemed "tobacco-related"—e.g., lung cancer. Fifth, Sloan and colleagues use a lifecycle approach in estimating their costs, capturing the impacts of smokers' increased resource utilization during their lives and of their decreased survival. Lifecycle estimates are more difficult to derive, but they have the advantage of creating a direct conceptual link between smoking initiation and its long term costs (see for example, Miller et al., 1997²). This link is especially important when looking at the benefits of programs focused on reducing initiation.

Table 1 presents the Sloan et al. estimates for the lifetime cost of smoking for a 24-year-old smoker adjusted from year-2000 dollars (as published in their book) to year-2009 dollars using the consumer price index (CPI).¹ The CPI for medical care was used for all healthcare costs, and the CPI for all items less medical care was used for all other cost categories (implicitly assuming wage increases kept up with inflation during those years). The medical care multiplier to take year-2000 dollars to year-2009 dollars is 1.440 and the multiplier for all items other than medical care is 1.235. Negative numbers are cost savings (benefits) from smoking and positive numbers are increased costs. Equivalently, positive numbers are the benefits from preventing one potential smoker from smoking (or continuing to smoke) and negative numbers are the increased cost outcome of this prevention.

As can be seen, smoking has a number of impacts other than increasing healthcare costs, and the costs of smoking differ dramatically depending on the perspective or point of view of the analysis. The fourth column is the sum of the first three and contains the costs of smoking from the perspective of society as a whole—i.e., the cost of smoking when all costs are considered no matter who incurs the cost. Based on the Sloan et al. estimates, the lifetime cost of smoking to society for a typical 24-year-old smoker is \$211,622 in year-2009 dollars. That is, if this typical

¹ The numbers in Table 1 correspond to Tables 11.1, 11.2, and 11.3 on pages 252, 254, and 255, respectively, in Sloan FA, Ostermann J, Taylor DH. *The Price of Smoking*. Cambridge, MA: The MIT Press. 2004.

smoker had not taken up smoking (or had quit smoking before his or her 24th birthday) society as a whole would have incurred \$211,622 less in costs over his or her lifetime.

Table 1. Lifetime cost of smoking for a 24-year-old smoker (male and female weighted average)

Cost component	Smoker	Smoker's family	Rest of society	Society as a whole
Cost of cigarettes themselves	\$12,466	\$0	\$0	\$12,466
Federal excise taxes on tobacco	\$1,880	\$0	(\$1,880)	\$0
State excise taxes on tobacco	\$2,121	\$0	(\$2,121)	\$0
Smoker's mortality	\$107,880	\$0	\$0	\$107,880
Smoker's disability	\$18,052	\$0	\$0	\$18,052
Smoker's medical care	\$1,499	\$0	\$2,973	\$4,472
Loss in smoker's earnings	\$27,411	\$0	\$0	\$27,411
Lost income taxes on earnings	\$0	\$0	\$5,482	\$5,482
Work loss (sick leave/absenteeism)	\$0	\$0	\$4,046	\$4,046
Other productivity losses	\$0	\$0	\$1,243	\$1,243
SSI outlays and benefits	\$5,406	(\$907)	(\$4,499)	\$0
Private pension outlays and benefits	\$7,312	(\$640)	(\$6,672)	\$0
Life insurance outlays and benefits	(\$9,509)	\$0	\$9,509	\$0
Spouse mortality (SHS)	\$0	\$27,655	\$0	\$27,655
Spouse disability (SHS)	\$0	\$1,290	\$0	\$1,290
Infant deaths (SHS)	\$0	\$754	\$0	\$754
Medical care (SHS)	\$0	\$870	\$0	\$870
Totals	\$174,519	\$29,022	\$8,080	\$211,622

SHS = these costs are due to secondhand smoke exposure

Three points must be made about this number to aid in clarity for the rest of this report. First, this \$211,622 represents what is actually a larger total dollar amount of costs and benefits over this smoker's lifetime. In fact, just over half of this total dollar amount represents the substantial cost to the smoker of future years of lost life due to smoking. The stream of the costs and benefits of smoking has been "present-valued" to the smoker's 24th birthday. Because *future* costs and benefits are not worth the same as costs and benefits that exist in the present, they are discounted (using an appropriate discount rate, in this case 3%) to represent their value when he or she is 24 years of age. A second, related point is that these future costs and benefits are discounted to their value on the smoker's 24th birthday. Therefore they are appropriate for use regarding the value of changing whether this individual smokes or not *at that point in time*. These costs will require adjustment to be used to value smoking prevention in an individual younger than 24 years of age, or to estimate the value of smoking cessation in an older smoker. The value to society of preventing a younger individual (who would have otherwise taken up smoking) from smoking will be lower due to additional discounting, and will be higher due to any additional costs incurred by this younger smoker. The value of smoking cessation after 24 years of age will increase due to the smoker being closer in time to large mortality costs, but will also decrease somewhat due to the costs already incurred during a longer smoking life. Finally, this estimate of \$211,622 is based on the costs of a "typical smoker" compared to those of a "non-smoking smoker." The definition of a typical smoker in the Sloan et al. estimates includes a typical smoking cessation pattern. Therefore, \$211,622 can be considered to be an estimate of the

additional present-valued cost to society of a 24-year-old smoker living a typical smoker's life (and quitting at some point on his or her own) versus stopping (or never starting) smoking now.

The first column in Table 1 contains the costs of smoking to the smoker him- or herself. As can be seen, the cost to the smoker makes up the largest component of the total cost of smoking to society (\$174,519 of the \$211,622 cost to society). The biggest cost to the smoker is the loss of years of life (mortality costs) which in this analysis was estimated as \$107,880. The only cost savings (benefits) to the smoker (other than any pleasure derived from smoking, which is difficult to monetize and not included in the Sloan et al. analyses) are life insurance benefits (both in terms of less paid in and more paid out). Note that this benefit has been subsidized by everyone else paying into the life insurance policy. As noted by Sloan et al, these benefits should decrease as more life insurance policies add surcharges for smokers.

The second column of Table 1 contains the costs of smoking to the smoker's family. The biggest costs here are the spouse's increased mortality and disability costs because of long-term exposure to secondhand smoke (SHS). The cost savings here are the increased survivor benefits from private pensions and social security.

The third column presents the costs of smoking to everyone else—i.e., the “external” costs of smoking. As can be seen, there are both substantial external costs and cost savings (benefits) from a typical 24-year-old smoker, and that in this analysis these costs exceed the cost savings by \$8,080 over the lifetime of this smoker. The costs include medical costs not paid by the smoker (and covered by everyone else), reductions in state and federal income tax revenues because of the smoker's lower earnings, losses to employers from smokers' increased sick leave and other productivity losses (e.g., smoking breaks), and the subsidization of smokers' life insurance by other policy holders who live longer. Cost savings or benefits include the federal and state excise taxes collected on each pack of cigarettes sold in the US, and the monies that social security and private pension plans save in reduced payments to smokers because of their shorter lives.

Modifications to the Baseline Estimate for Arizona Youth

Several adjustments must be made to the estimates shown in Table 1 in order to generate the best available estimates of the value of smoking prevention for Arizona youth. The modifications presented in this section are limited to those possible with existing data. The next section presents the results of these modifications and a list of future improvements to consider. The modifications we will make in this report to the estimates shown in Table 1 are the following and each is discussed in detail below:

- Adjust the state and federal excise taxes up to present levels
- Adjust national wage estimates to reflect Arizona's slightly lower average wage rate
- Adjust worker productivity estimate to reflect values seen in more recent studies
- Adjust the life insurance impacts for the fact that current non-employer-based life insurance policies in Arizona all charge higher premiums to smokers
- Add medical costs for the spouse and a reduction in the spouse's wages both due to disability from secondhand smoke exposure
- Reevaluate estimates used for the mortality and medical costs for infants and children due to secondhand smoke exposure
- Discount costs back to the average age at which the smoking prevention intervention is targeted and add cigarette consumption from start of smoking to 24 years of age
- Add a column to show the cost of smoking to Arizona's state budget

State and federal excise taxes

As can be seen in Table 1, state and federal tobacco excise taxes are a cost to smokers and a benefit to the rest of society. In these estimates the total cost of these taxes to the smoker over his or her lifetime is \$4,001 (\$1,880 plus \$2,121), and those dollars flow into state and federal coffers to provide benefit the rest of society.ⁱⁱ Note that this \$4,001 partially offsets the total costs imposed by a smoker on others. Without the benefit of these tax dollars the total external costs of smoking would be \$12,082 (\$8,080 plus \$4,001). The estimates in Table 1 use a federal tobacco tax rate of \$0.44 per pack and a state tax rate of \$0.50 per pack (in 2009 dollar terms). If this combined rate of \$0.94 is increased, the external cost of smoking is reduced.

Before April 1, 2009, the federal excise tax on cigarettes was 39 cents per pack.³ After that date the federal excise tax increased to \$1.0066 per pack. On December 7, 2006, Arizona's state excise tax on cigarettes rose from \$1.18 to \$2.00 per pack.

[www.taxadmin.org/fta/rate/cig_inc02.html] These excise taxes transfer dollars from smokers to various state and federal funds which, hopefully, benefit the citizens of Arizona and the nation as a whole.

ⁱⁱ Technically, some small portion of these dollars may also flow back to the smoker and his or her family if they are a beneficiary of any state or federal program that is funded by these taxes. However, for the purposes of this analysis any benefits returning to one smoker's family are considered insignificant when compared to the number of people who make up the rest of society. Note that each smoker is considered alone. When considering a fellow smoker, the first smoker is considered to be part of the "everyone else" group.

Adjustment to Arizona average wage rates

The estimates made by Sloan et al. used year 2000 median daily earnings of \$98.20 for females and \$129.20 for males for absenteeism and other productivity losses. The CPI adjustment used to create the estimates in Table 1 (multiplying by 1.235) means that year 2009 median daily earnings of \$121.24 for females and \$159.52 for males were used in that table. US median usual weekly earnings for full-time wage and salary workers (the measure used in the Sloan study) in 2008 was \$638 for females \$798 for males, and \$722 for females and males combined.

[<http://www.bls.gov/cps/cpswom2008.pdf>] Translating these figures into median daily earnings (by dividing by 5) results in \$127.60 for females, \$159.60 for males, and \$144.40 for both combined—adjusting these to 2009 using the non-medical CPI gives \$126.85, \$158.66, and \$143.55, respectively. These numbers are not far off from Sloan’s original estimates adjusted to 2009 values. Similar 2009 numbers for Arizona are \$130.63 for females, \$153.89 for males, and \$141.96 for both combined. The Arizona numbers are 98.8% of the national values, therefore, the productivity estimates are adjusted down by a factor of 0.988.

More recent worker productivity estimates

The Sloan et al. estimates for losses in worker productivity (other than absenteeism) are based on a 2000 study that estimated losses due to smoking breaks in workplaces using an estimate of 30 minutes per day.⁴ More recent studies have used worker’s self-report estimates of their productivity at work to estimate productivity loss due to smoking.^{5, 6} Estimates from the more recent of these studies were used to estimate productivity loss due to smoking in Arizona. This study used results from about 35,000 workers to estimate an average loss of 53.6 hours per year due to absenteeism and 76.5 hours due to presenteeism (reduced productivity while at work).⁵ The absenteeism estimate is within the range used by the Sloan et al. estimates, so we kept the Sloan et al. estimate for absenteeism. We used the ratio between the presenteeism and absenteeism losses in this new study to generate a better estimate for presenteeism losses due to smoking.

Adjustment to life insurance cross subsidization estimates

In the book the *Price of Smoking*, the authors note that if smokers were universally charged “the actuarial value of the loss in death-contingent payments that smoking causes” there would no longer be any cross subsidization between nonsmokers and smokers in terms of life insurance.¹ (pg193) Informal calls to insurance brokers in Arizona indicate that all life insurance policies sold to individuals have higher premiums for smokers. However, life insurance policies sold to businesses to cover their employees do not distinguish between smokers and nonsmokers, or even between the mix of smokers and nonsmokers in a particular employee mix. Therefore, it is still likely that cross subsidization is happening. However, it is not likely to be as much as was seen in the older data used in the Sloan et al. estimates, which were based on the 1992 through 2000 panels of the Health and Retirement Study. We adjusted the life insurance cross subsidization estimates down by 25 percent to account for the likelihood that less cross subsidization is occurring now and likely less will happen in the future due to more awareness of the mortality costs of smoking.

Spouse reduction in wages and medical costs due to disability from secondhand smoke exposure

The Sloan et al. estimates include estimates for loss of life and quality of life reductions for disability for both the smoker and his or her spouse. However, no loss of earnings and no medical costs for the spouse's disability are included. We used the ratio between smokers' disability costs and their lost earnings and medical costs to calculate and estimate of lost earnings and medical costs for smokers' spouses based on the estimate for spousal disability. The medical costs for smokers' spouses will now be included in the medical costs due to secondhand smoke (SHS) exposure, which in the Sloan et al. estimates only contain medical costs for smokers' children and infants.

A relook at the literature regarding mortality and medical costs for children due to secondhand smoke exposure

The Sloan et al. estimates use an estimate for infant mortality based on infant exposure to SHS and to prenatal maternal smoking that assumes 599 male and 409 female deaths due to smoking and that these deaths are valued at \$100,000 per year of lost life (the same mortality cost as used for smokers' deaths). These estimates of male and female infant deaths are similar to those calculated by the CDC's Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC) system for the 2000-2004 period of 445 male and 331 female deaths.⁷ We allocated these mortality costs across all smokers and adjusted them for the usual age at which men and women have children.

For the direct medical costs for infants and children due to illness from SHS exposure the Sloan et al. estimates used an estimate that was an average across a number of studies. However, these studies used a variety of methodologies and targeted different childhood diseases. Therefore, we took the most detailed and comprehensive of these studies and used these estimates. This study measured the medical costs from excess cases due to SHS exposure and maternal smoking of low birth weight infants, respiratory syncytial virus bronchiolitis, acute otitis media and otitis media with effusion, asthma and burns.⁸

Discount the costs to average age for prevention services and add consumption costs from start of smoking to 24 years of age

The Sloan et al. estimates show the cost of smoking for a 24-year-old smoker. In order to use these cost of smoking estimates as estimates of the value of smoking prevention we have to discount these costs back to the age targeted for smoking prevention services. Smoking prevention services in Arizona tend to target children and adolescents in grades 4 through 8 with most of the services going to those in grades 4 and 5.⁹ Using an average age of 10 years for children in those grades, we must discount the 24-year-old estimates back another 14 years (to 10 years of age) using a discount rate of 3% (the value used in Sloan et al). This means that the 24-year-old estimates will be multiplied by a factor of 0.661 ($1/(1.03)^{14}$).

In addition to discounting, we also must be sure to capture any additional costs that would occur during the period between 10 and 24 years of age for a typical smoker. For most of the cost categories shown in Table 1 it is reasonable to assume zero costs for the 10 to 24 year old period. The health impacts of smoking are not yet manifest in this younger population, so mortality,

disability, medical care, and productivity costs are zero or negligible. Also, for at least most of these years these smokers during these ages are not living with spouses or their own children—or at least not enough to generate large SHS health impacts. However, these smokers do purchase and consume cigarettes. We used data from the 2009 Youth Risk Behavioral Survey (14 to 18 year olds) and the 2005 Arizona Tobacco Survey (18 to 24 year olds) to estimate the number of packs per year smoked by these younger smokers, and we used data from the 2005 Arizona Tobacco Survey to estimate the likely start age for a typical 24-year-old smoker. The additional consumption each year is then estimated as the proportion of future 24-year old smokers that would have been smoking by that age times the average pack-per-day consumption for that age. These packs consumed are then valued in terms of the cost of the cigarettes themselves and in terms of the excise taxes paid.

Figure 1 shows the trajectories of the probability of a typical 24-year-old smoker smoking at each earlier age and the average packs per year smoked for each of those ages. As can be seen almost 95 percent of typical 24-year-old smokers were also smoking at 19 years of age, and by 20 years of age these smokers are already smoking as much on average as was found in the Sloan et al. estimates (about 216 packs per year). Therefore, the cost and excise taxes collected on a total of almost 1,200 additional packs smoked before 24 years of age were added to the Table 1 estimates.

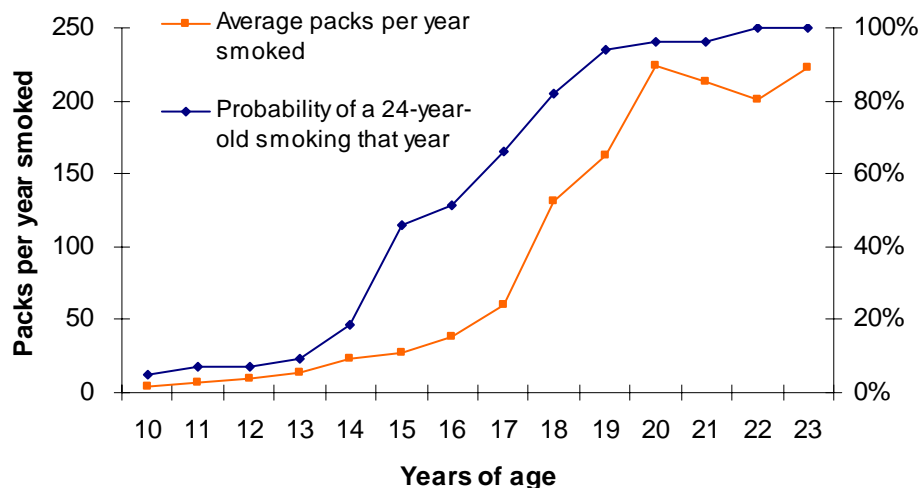


Figure 1. Estimates of the probability of a 24-year-old smoker smoking in younger years and average amounts smoked

Portion of these costs that directly impact the state budget

The last adjustment to these dollars is to include a column acknowledging the impact of the cost of smoking on Arizona’s state budget. This perspective is important since this is the source for much of the funding for tobacco control programs, including smoking prevention. As might be expected, the Arizona state budget perspective includes a subset of the costs included for the rest of society.

The most obvious dollar amount included in for the state budget is the estimate of state tobacco excise tax revenue. Other direct dollar impacts on the state budget due to smoking come from

Medicaid expendituresⁱⁱⁱ and lost state income tax revenue due to the lower earnings of smokers. In the Sloan et al. estimates approximately 43 percent of the increase in medical costs due to smoking are costs paid by Medicaid. The estimate of the impact on Arizona income tax revenues used a tax rate of 2.2 percent of taxable earnings

Best available estimate of the cost of smoking (and value of prevention) for Arizona youth

Table 2 shows the baseline cost of smoking estimates from Table 1 after all the adjustments discussed above have been made. As can be seen the main differences between the results shown in Table 2 and what was seen in Table 1 are:

- That state and federal excise tax revenues collected on cigarettes have gone up substantially.
- The smoker's mortality, disability, medical, and lost earnings costs have gone down due to the fact that these costs are now farther in the future.
- Smokers' sick leave has gone down because these costs are also farther in the future, but other productivity losses have tripled with using newer, better estimates.
- Transfers of dollars between smokers, their families, and the rest of society for Social Security Insurance and private pensions have been reduced due to discounting, but the life insurance transfer has been reduced both because of being farther in the future and because higher premiums for smokers becoming more common.
- Finally, costs to the smoker's family because of their secondhand smoke exposure have gone down in total due to discounting, despite the addition of lost earnings and medical care costs for the spouse, and better (and higher) estimates for infant mortality and children's medical costs.

ⁱⁱⁱ Note that technically a substantial portion of Medicaid costs are paid by the Federal government.

Table 2. Lifetime cost of smoking for a 10-year-old future smoker (male and female weighted average)

Cost component	Smoker	Smoker's family	Rest of society	Society as a whole	Arizona state budget
Cost of cigarettes themselves	\$10,699	\$0	\$0	\$10,699	
Federal excise taxes on tobacco	\$4,054	\$0	(\$4,054)	\$0	
State excise taxes on tobacco	\$7,338	\$0	(\$7,338)	\$0	(\$7,338)
Smoker's mortality	\$71,322	\$0	\$0	\$71,322	
Smoker's disability	\$11,934	\$0	\$0	\$11,934	
Smoker's medical care	\$991	\$0	\$1,965	\$2,956	\$853
Loss in smoker's earnings	\$17,905	\$0	\$0	\$17,905	
Lost income taxes on earnings	\$0	\$0	\$3,581	\$3,581	\$399
Work loss (sick leave)	\$0	\$0	\$2,643	\$2,643	
Other productivity losses	\$0	\$0	\$3,762	\$3,762	
SSI outlays and benefits	\$3,531	(\$593)	(\$2,939)	\$0	
Private pension outlays and benefits	\$4,776	(\$418)	(\$4,358)	\$0	
Life insurance outlays and benefits	(\$4,715)	\$0	\$4,715	\$0	
Spouse mortality (SHS)	\$0	\$18,283	\$0	\$18,283	
Spouse disability (SHS)	\$0	\$853	\$0	\$853	
Spouse lost earnings (SHS)	\$0	\$1,280	\$0	\$1,280	
Infant deaths (SHS)	\$0	\$1,744	\$0	\$1,744	
Medical care (SHS)	\$0	\$2,073	\$0	\$2,073	
Totals	\$127,835	\$23,222	(\$2,023)	\$149,034	(\$6,087)

How These Estimates Can Be Used and Their Limitations

This report documents the estimation of the value of smoking prevention efforts in Arizona. This section presents the appropriate use of these estimates, and their limitations.

The perspective of the analysis determines which estimates to use

Because what is considered a cost differs depending on who is asking the question, when talking about value, costs, and cost savings, we must acknowledge the perspective (or point of view) of the analysis. This is why Table 2 contains five columns of estimates. As can be seen, the numbers in each column are related, but the “bottom line” estimate for each column varies dramatically. Below are listed various possible perspectives and the estimate to be used for each.

- *The perspective of society as a whole.* This perspective is appropriate to use when discussing the benefits of smoking prevention across all individuals in the state,^{iv} no matter who receives the benefits or pays the costs. From this perspective, preventing one 10-year-old who would have otherwise become a typical smoker from becoming that smoker is worth \$149,034 to Arizonans as a whole.
- *The perspective of the portion of society other than the smoker and his or her family.* As can be seen in Table 2, the vast majority of the costs to society as a whole accrue to the smoker his- or herself (\$127,835), and the next largest portion of costs accrue to the smoker’s immediate family (\$23,222) mostly in terms of the health and mortality costs of secondhand smoke exposure. To many, smoking is considered a voluntary, personal decision, and free will and personal autonomy must be respected. Therefore, it can be easier to justify dollars for tobacco control programs that prevent costs to everyone else (i.e., reduce the external costs of smoking) than it is to justify dollars for programs that prevent the costs of smoking from affecting smokers themselves. Whether smokers’ families should be included within the realm of personal choice or be considered victims is up for debate. Therefore, depending on whether costs to smokers’ families are included, preventing one 10-year-old who would have otherwise become a typical smoker from becoming that smoker is a cost of \$2,023 to all Arizonans except the smoker and his or her family, or a gain of \$21,198 to all Arizonans except the prevented smoker him-or herself (\$23,222 gain to the family minus a \$2,023 cost to the rest of the state).
- *The perspective of Arizona’s state budget.* This perspective is appropriate to use when discussing budget issues with the Arizona legislature because it only includes dollars that would flow into and out of state coffers. From this perspective preventing one 10-year-old who would have otherwise become a typical smoker from becoming that smoker costs the Arizona state budget \$6,087 over that smoker’s lifetime. Note that this, like all other estimates presented in this report, is in addition to the cost of the prevention program itself.

Limitations to these estimates

Any estimate of the cost of smoking is just that; an estimate. Therefore, the numbers in Table 2 should be used with caution. First of all there are a number of cost components that were not

^{iv} This statement assumes that federal dollars paid by Arizonans generally return to Arizonans in the form of various federal benefits.

included in these estimates. It is likely that these costs will be small, but they should be noted for completeness. Missing costs include lost worker productivity due to caring for children with SHS caused illnesses, SHS costs to those other than the smokers' family (these will be especially small due to the implementation of the comprehensive statewide smoking ban), lost income taxes on spouse lost earnings, and sales tax revenue on cigarette sales. Sales taxes were not included because these amounts differ greatly by location and because these revenues mostly benefit local communities.

Other cost component estimates would benefit from additional, more recent and Arizona-specific analyses. In particular, it would be beneficial to closely analyze the Arizona Health Care Cost Containment System's (AHCCCS's) costs to determine what portion is due to smoking. The limitations stated by the authors of *The Price of Smoking* should also be closely reviewed.¹ Each chapter presents the limitations of the analyses discussed therein, and a summary is presented in the last chapter of the book, starting on page 267.

Finally, one last limitation for the use of these estimates should be stated. These estimates are appropriate to use to estimate the value of preventing a 10-year-old, who would have otherwise become a typical 24-year-old smoker, from becoming a typical 24-year-old smoker. The number of 10-year-olds prevented from smoking according to this definition is difficult to determine for at least two reasons. First, because it requires knowing whether a 10-year-old will become a 24-year-old typical smoker, and second, because it requires a determination of whether an intervention prevented this or not.

Policy Implications

The finding that the costs to society as a whole of a 10-year-old taking up smoking is about \$150,000 supports the general notion that preventing smoking is an important and useful undertaking. The finding that the vast majority of these costs are costs to the smoker him- or herself and not to the rest of society is important for clarifying the real benefits of tobacco control programs. However, one of the most striking findings is that preventing a child from taking up smoking (who otherwise would have) actually costs the State of Arizona about \$6,000 over the course of that child's lifetime.

This situation arises because of the substantial taxes paid on cigarettes in Arizona, which more than offset the costs of smoking to the rest of society. The State actually makes money from smokers. Therefore, dollars spent on tobacco use prevention have a double cost—the cost of the program itself and the cost of the future lost tobacco tax revenues. These programs are still justifiable as funds spent to help a particular citizen group—otherwise future smokers. However, if tobacco tax dollars are spent on non-tobacco-related services two issues arise. First, smokers pay these additional dollars into the State budget, and they are the biggest losers from smoking. Therefore, in the interest of equity, they should be the beneficiaries of the services funded by their taxes. This is especially true given that tobacco taxes tend to be regressive—i.e., have a larger economic impact on lower socioeconomic groups.¹⁰⁻¹² Second, tobacco control programs and any non-tobacco programs dependent upon tobacco tax dollars are put into direct conflict. The former are actively reducing the future budgets of the latter, which sets up a disincentive to fund tobacco control programs. In contrast, if tobacco tax dollars are used to fund tobacco control programs, the reduction in future funding caused by the success of the programs will align with the reduced need over time for those funds.

Higher tobacco taxes are seen as part of the arsenal of tobacco control. Indeed, increased taxes have been shown to decrease cigarette smoking somewhat¹³⁻¹⁶ particularly among younger people^{15, 17}—although this effect on youth has been challenged.^{18, 19} However, it is important to consider the uses to which this tax revenue is put. To avoid disincentivising tobacco interventions, and in the interest of equity, there is a strong rationale for using these dollars towards tobacco control, which, if done effectively, may phase out the income stream over time, but also, unlike other uses, reduces the need for the income stream.

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