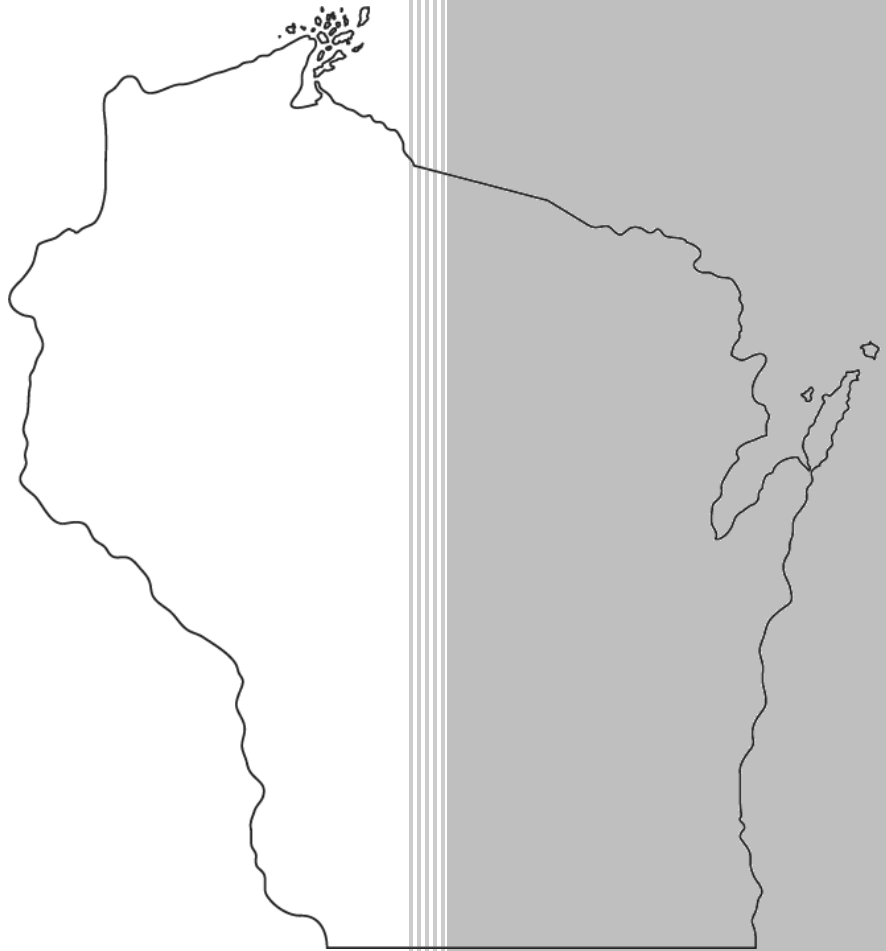


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# Tobacco Taxes: Still an Effective Strategy?



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## INTRODUCTION

Tobacco use poses a significant health and economic burden to Wisconsinites. From 2008 through 2012, approximately 15% of all deaths in Wisconsin among individuals aged 35 years or greater were directly attributable to cigarette smoking.<sup>1</sup> This resulted in an annual average of 4.6 billion dollars in smoking-related health care costs and lost productivity.<sup>1</sup>

In an effort to mitigate the human and financial costs of tobacco use, Wisconsin has implemented a range of tobacco prevention and control strategies. One such strategy is to increase excise taxes, which the Surgeon General called “the most important policy-related determinant of tobacco prices”.<sup>2(p788)</sup> Wisconsin has been taxing cigarettes since 1939, with the largest absolute tax increases occurring between 2007 and 2009. During that time frame, the cigarette excise tax rate in Wisconsin increased from \$0.77 to \$2.52, where it remains today.

Considerable research has been conducted on the relationship between tobacco prices and consumption, leading the Surgeon General to conclude that raising tobacco prices, via excise taxes, will reduce overall tobacco use.<sup>2-4</sup> This includes reducing the prevalence of use among adults and youth by reducing daily consumption among current smokers, increasing the number of current smokers that quit, and decreasing the initiation of tobacco use among youth.<sup>5</sup> However, in a climate of limited resources and a repertoire of competing tobacco prevention and control strategies, it is important to evaluate whether increasing tobacco prices via taxation continues to be a viable strategy for current tobacco prevention and control efforts in Wisconsin.

This research is an extension of work previously conducted by Ceraso, Ahrens, and Remington (2005)<sup>6</sup> and Brown, Palmersheim, and Wegner (2007).<sup>7</sup> It provides an important assessment of the most recent tobacco excise tax increase in Wisconsin with regards to cigarette consumption.

## METHODS

Data on cigarette prices from 1970 through 2014 were from *The Tax Burden on Tobacco*,<sup>8</sup> an annually published compilation of historical tobacco revenue data and statistics. The data on cigarette prices in *The Tax Burden on Tobacco* were from an annual survey of tobacco retailers. Cigarette prices have been adjusted for inflation to 2015 dollars.

Per capita sales data from 1970 through 2014 were from *The Tax Burden on Tobacco* and the 2015 datum was calculated using the Wisconsin Department of Revenue’s *Cigarette and Tobacco Products Revenue Summary Report*.<sup>9</sup>

The adult smoking prevalence data were calculated using data from the Behavioral Risk Factor Surveillance System (BRFSS).<sup>10</sup> For adults, current smokers are defined as individuals 18 years old and older who smoked a minimum of 100 cigarettes in their lifetime and reported either smoking cigarettes now (1990-1995), or smoking on some days or every day (1996-2015). Data were weighted to be representative of the populations from which the samples were drawn.

Adult average daily cigarette consumption data were also obtained from the BRFSS. Current daily smokers reported the average number of cigarettes smoked per day. Current occasional smokers reported the average number of cigarettes smoked per day on the days they smoked. The BRFSS did not ask respondents about average daily consumption in 2001, 2003, 2011, 2012, or 2014; for the purpose

of this brief, these data points were interpolated using the preceding and succeeding data points, as indicated with asterisks (\*) in Figure 3. Data were weighted to be representative of the populations from which the samples were drawn.

The youth smoking prevalence data for high school students were obtained from the Youth Risk Behavior Survey (YRBS)<sup>11</sup> and the Youth Tobacco Survey (YTS).<sup>12</sup> For both surveys, high school students responded to the question, “During the past 30 days, on how many days did you smoke cigarettes?” The YRBS has been conducted biennially in Wisconsin since 1991, and the YTS has been conducted biennially since 2000. Data were weighted to be representative of the populations from which the samples were drawn.

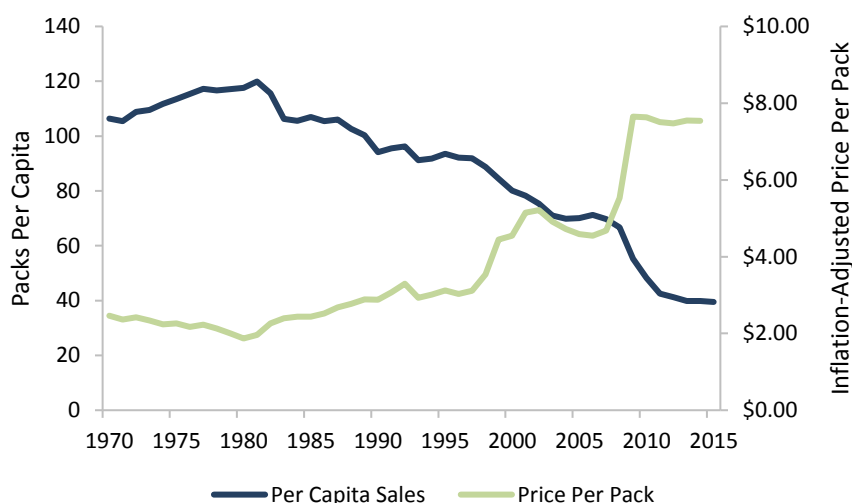
For further methodological details, please see the Technical Notes.

## RESULTS

The four figures presented in this brief compare cigarette price with per capita sales, daily cigarette consumption, adult prevalence, and high school youth prevalence.

**Figure 1. Per Capita Cigarette Sales and Cigarette Price, Wisconsin, 1970-2015**

Figure 1 displays real cigarette price relative to per capita sales from 1970 to 2015, revealing an inverse relationship. The real price of cigarettes decreased by \$0.50 across the first decade, from 1970 to 1981, which corresponded with a per capita cigarette sales increase of 13.5 packs.



Consistent with the observed inverse relationship, when the real price of cigarettes began to increase in the early 1980s, there was a relative percent decrease in per capita sales (-8.0% between 1982 and 1983).<sup>†</sup> Real price continued to increase from 1982 through 2002, as per capita cigarette sales decreased at a relatively steady rate. Real price then proceeded to drop modestly from 2003 through 2006 and per capita sales leveled off.

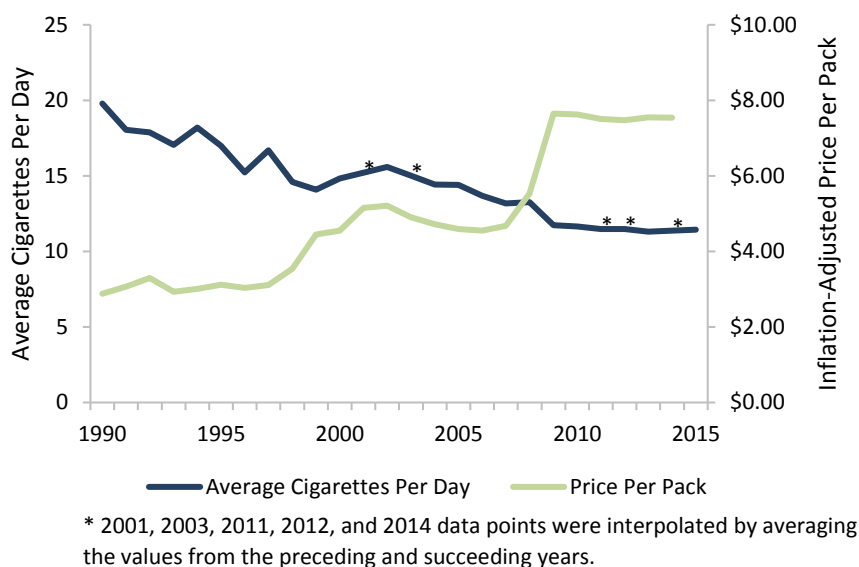
The real price of cigarettes jumped from \$4.68 in 2007 to \$7.65 in 2009, an increase of 63.5%. The steepest decreases in per capita sales overlapped with these price hikes. In 2009, 2010, and 2011, the annual relative percent decreases in per capita cigarette sales were 17.1%, 12.8%, and 11.8%, respectively. As of 2011, both real cigarette price and per capita sales have leveled off. In 2014, the last

<sup>†</sup> All percent changes are relative percent changes.

year for which price per pack is available, the real price was \$7.54, and in 2015, sales were at 39.5 packs per capita.

**Figure 2. Average Daily Cigarette Consumption Among Adult Smokers and Cigarette Price, Wisconsin, 1990-2015**

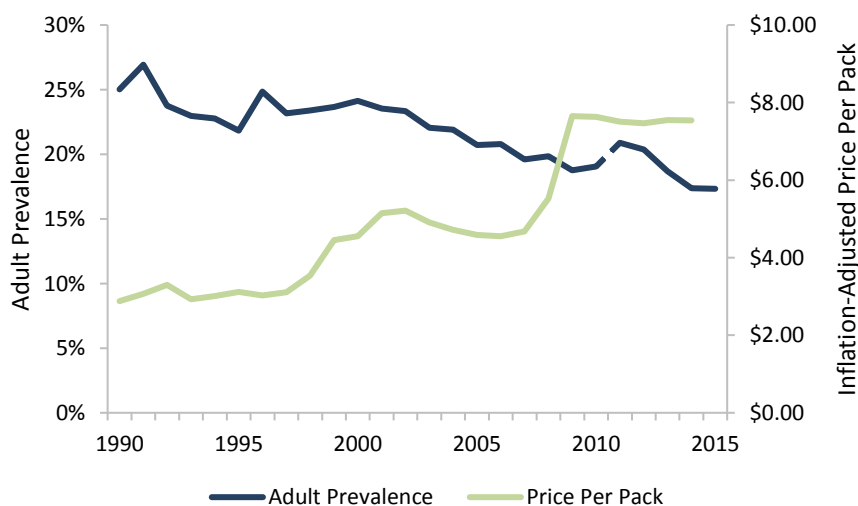
Figure 2 shows cigarette price and daily cigarette consumption among adult smokers in Wisconsin between 1990 and 2015. At the start of the analysis period, adult smokers were consuming, on average, one pack of cigarettes per day (19.8 cigarettes). Overall, daily consumption fell throughout the 1990s, with slight fluctuations from year to year.



From 2002 through 2008, daily consumption was in slow decline. In 2009, however, daily consumption decreased by 11.5%, from 13.3 cigarettes per day to 11.7. This was the same year that the real price of cigarettes increased 38.3%. As with cigarette price, average daily consumption remained fairly level from 2009 through 2015, based on the available data.

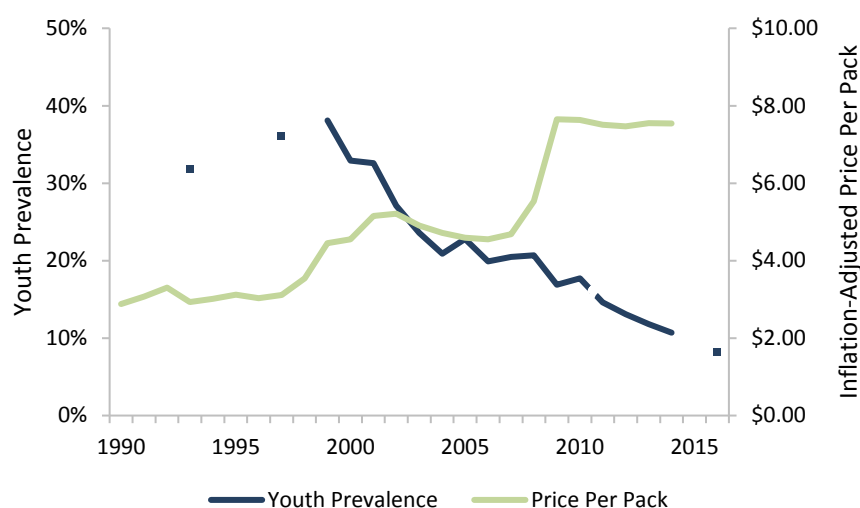
**Figure 3. Adult Smoking Prevalence and Cigarette Price, Wisconsin, 1990-2015**

Figure 3 displays cigarette price and adult prevalence from 1990 to 2015. The general trend for adult prevalence has been one of slow decline, with a couple of intermittent increases. Adult smoking prevalence first dipped below 20% in 2007. From 2010 to 2011, there was a 9.6% relative increase, bringing the prevalence back up to 20.9%, however, this increase is thought to be associated with the inclusion of cell phones in the data collection process which began in 2011 (see Technical Notes). In 2013, the prevalence fell to 18.7% of adults, a relative decrease of 8.3% from the previous year. Adult prevalence has continued to slowly decline, with its lowest point being in 2015, at 17.3%.



**Figure 4. High School Youth Smoking Prevalence and Cigarette Price, Wisconsin, 1993-2016**

Figure 4 displays cigarette price and youth prevalence from 1990 to 2016. The availability of data was sporadic until 1999, but youth prevalence appears to have risen throughout the 1990s. Prevalence peaked in 1999 with 38.1% of high school students reporting being current smokers, followed by a



trend of considerable decline from 2000 through 2016. From 1997 to 1999, cigarette price increased by 43.1%. This was followed by a 35.8% decrease in youth smoking from 2001 to 2004. In 2009, there was another large price increase of 38.3%, which aligned with an 18.1% decrease in youth smoking prevalence in the same year. The smoking prevalence decreased another 17.5% in 2011, bringing the youth prevalence under 15% for Wisconsin high schoolers for the first time in the analysis period. From 2012 through 2016, the youth prevalence continued to decline to 8.1%, despite the leveling off of cigarette price.

## DISCUSSION

Findings in this report reveal an overall inverse relationship between tobacco consumption and the price of cigarettes, after controlling for inflation. During the analyzed time frames for each aspect of tobacco consumption assessed, the findings reveal the following. From 1970 through 2015, the real price of cigarettes increased 206.5% and per capita cigarette sales decreased 62.9%. As of the early 1990s, when the real price of cigarettes increased 161.8%, daily cigarette consumption decreased 42.3%, adult prevalence decreased 30.8%, and youth prevalence decreased 74.5%. It is noteworthy that this report does not attempt to statistically corroborate the relationship between tobacco consumption and the price of cigarettes. However, it is visually apparent, and this is consistent with existing research on the subject.

There is a general consensus in the literature that a 10% increase in cigarette price will result in an estimated 3% to 5% decrease in overall cigarette consumption, including a 3.5% increase in the number of young adults who successfully quit smoking.<sup>2,4</sup> Furthermore, research has shown that youth are two to three times more sensitive to price increases than adults.<sup>2,4</sup> To fully appreciate these generalizations as they relate to tobacco taxes, it is important to consider other factors that influence cigarette price, such as the actual application of excise taxes and consumers' buying strategies.

When looking at federal and state cigarette tax rates in conjunction with cigarette prices, the relationship is not perfect. While factors such as inflation and litigation do impact price, the tobacco

industry also decides the extent to which it passes excise taxes on to the consumer. Companies may choose to absorb a tax increase, to partially or fully pass on a tax, or to “overshift” a tax by increasing their price in excess of the tax amount.<sup>13</sup> As such, it is necessary to look at the change in cigarette price and not just the change in the tax rate.

Consumers of tobacco also respond to price increases in ways other than decreasing their consumption or accepting higher costs; many of them implement price-minimizing strategies. In Wisconsin, from 2009 to 2010, 53.9% of current smokers reported using a price-minimizing strategy in the past year, including purchasing generic brands of cigarettes, buying cigarettes by the carton, purchasing cigarettes online (though online purchases are now taxed), buying cigarettes on Indian reservations, and using coupons or promotions.<sup>14</sup> Wisconsin smokers reported saving an average of 24.6% per pack using a combination of these strategies.<sup>14</sup> Price-minimizing strategies do somewhat diminish the impact of price increases on consumption, however, they do not eliminate the affect.<sup>2,5,13</sup>

It also should be noted that several other tobacco prevention and control strategies have contributed to the observed reduction in consumption. These include, but are not limited to, health warnings and campaigns, tobacco advertising restrictions, restrictions on access to tobacco products, smoke-free laws, litigation against the tobacco industry, school-based programs, and cessation interventions.<sup>2,3</sup> Yet, the Surgeon General has concluded that the implementation of a tobacco tax that increases prices is an effective strategy on its own and serves as an important tool for a comprehensive tobacco prevention and control program.<sup>2,3</sup>

In sum, this study suggests that increasing cigarette prices via increases in tobacco excise taxes continues to be an effective strategy to reduce cigarette consumption. The most recent increases in taxes, resulting in cigarette price increases, were accompanied by observable decreases in consumption. Given the growing popularity of other tobacco products such as cigars, electronic cigarettes, and other smokeless tobacco products, it may be worthwhile to consider whether influencing their prices through taxation might reduce consumption of these products, thereby furthering overall tobacco-related harm reduction.

## TECHNICAL NOTES

The population figures used to calculate per capita sales do not exclude youth under the age of 18 in *The Tax Burden on Tobacco* and the Wisconsin Department of Revenue’s *Cigarette and Tobacco Products Revenue Summary Report*.

During the 26 years of BRFSS data collection, there were minor variations in how the tobacco use questions were asked.

In 2011, the sampling and weighting methodologies of the BRFSS were modified. Originally, data collection was accomplished via interviews using landline phones. Starting in 2011, interviews were conducted using cell and landline phones. For the new weighting methodology, additional demographic variables were incorporated to represent the population. These changes are represented in Figures 2 and 3 by a break in the trend lines for adult smoking prevalence and average daily cigarette consumption.

YRBS data for 1991, 1995, and 2015 are not available due to low response rates. There was also a low response rate for the 2014 YTS, so a different weight was used on the data that year.

## ACKNOWLEDGEMENTS

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