

Six Lessons from the U.S. Experience with Tobacco Taxes

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Thank you for inviting me to speak here today. When people think about what this Administration has done to improve public health, they often think immediately of the Affordable Care Act (ACA), and appropriately so. The ACA is undoubtedly the single most important health-related legislation of not just this Administration, but of recent decades. But this Administration has also taken many other steps that are improving Americans’ health, and I want to focus today on what may be the most important public health legislation of this Administration you have not heard of: legislation the President signed in his first month in office that raised the Federal cigarette tax from \$0.39 per pack to approximately \$1.01 per pack.

Plausible estimates suggest that this increase in cigarette taxes will reduce the number of premature deaths due to smoking by between 15,000 and 70,000 for each cohort. The health benefits will be progressively distributed, representing a far larger fraction of income for lower-income families, and even more so when counting the benefits of the expansion of children’s health insurance coverage that the increase funded. Going forward, President Obama is proposing a further increase in tobacco taxes and, importantly, a measure to harmonize the tax rate on different tobacco products so that they are taxed at similar rates. This proposal would reduce the number of premature deaths per cohort by an additional 10,000 to 50,000, again provide the largest benefits to the lowest-income households, and fund an expansion of high-quality early education that would be particularly valuable to working families. In my remarks today, I will discuss six lessons from the U.S. experience with tobacco taxes, focusing especially on our Administration’s history and thinking on this issue.

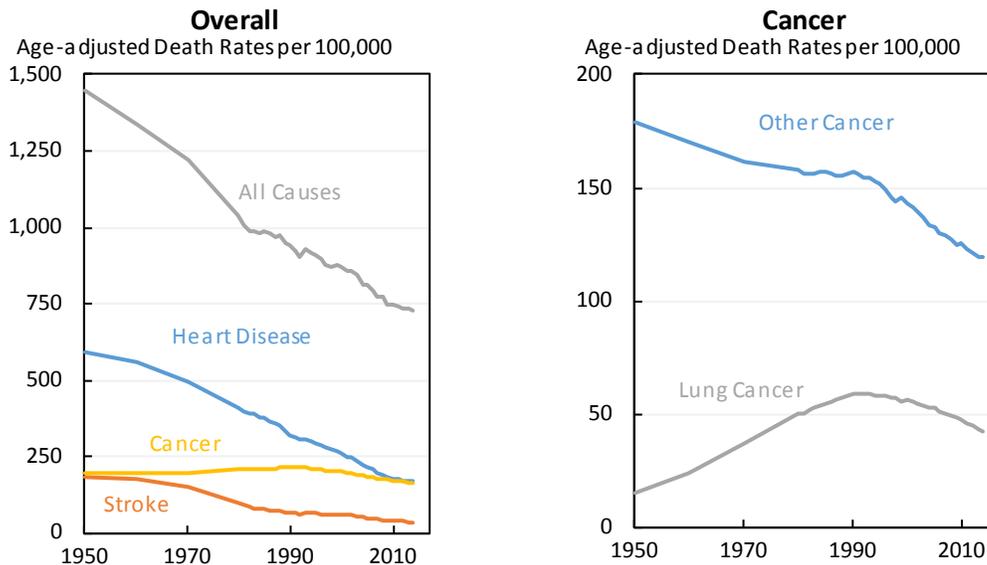
Before jumping into the topic of taxes, which is the focus of your conference, it is important to understand that these tax measures complement a range of other steps to reduce the threat to public health posed by tobacco products. In 2009, President Obama signed into law legislation providing the Food and Drug Administration (FDA) with authority to regulate tobacco products, and requiring FDA approval of certain new tobacco products, building on a series of steps that began with the U.S. Surgeon General’s 1964 report on the harms of tobacco. The ACA requires health insurance to cover tobacco counseling and interventions without cost sharing and requires that Medicaid programs cover cessation services for pregnant women. With funding from the ACA’s Prevention Fund, the Centers for Disease Control and Prevention (CDC) launched an aggressive, graphic media campaign highlighting the health and physical impacts of smoking called *Tips from Former Smokers*. And, just earlier this month, the FDA finalized a rule extending its regulatory authority to all tobacco products, including e-cigarettes, cigars, hookah tobacco, and pipe tobacco. The rule imposes restrictions on youth access to these products and requires approval by the FDA of new products.

Lesson #1: Smoking Plays a Major Role Not Just in Mortality but in Inequality of Mortality

There is substantial concern in the United States and around the world about growing inequality. Recently a number of scholars have advanced the stark and troubling thesis that the United States is witnessing a dramatic increase not just in income inequality but also inequality in how long people live (Chetty et al. 2016, National Academies 2015). The truth is a little more complicated than that, however, and smoking plays an important role in the story.

First, the broader public health story. Age-adjusted death rates in the United States have fallen sharply since the 1950s with particularly notable declines in death rates from heart disease and stroke, among others, as shown in Figure 1 (CDC 2016). Decreasing death rates have led to a substantial increase in period life expectancies at birth, from 68.2 years in 1950 to 78.8 years in 2013. But even as all-cause death rates were falling rapidly, death rates for lung cancer were rising rapidly, tripling from 1950 to 1990. Since 1990, however, death rates for lung cancer have dropped by nearly one-third. This reduction in deaths from lung cancer partly reflects the success of the sustained campaign to combat smoking waged in the United States over the last half century, a phenomenal public health achievement.

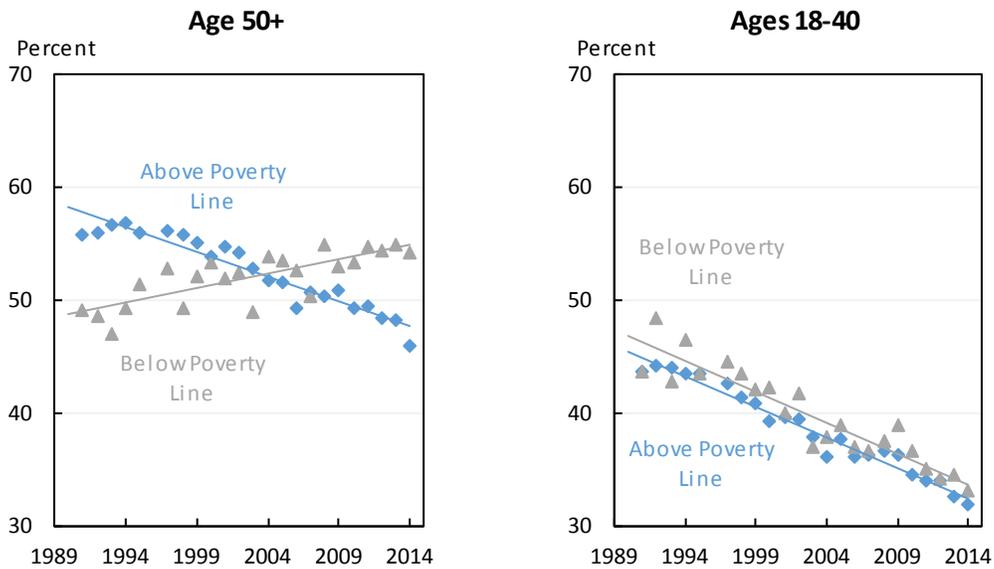
Figure 1
Age-adjusted Death Rates, 1950-2014



That is the broader success story. The data on mortality inequality tells a more nuanced tale. Troublingly, for those who have reached middle-age, the gap in life expectancy between higher income individuals and lower income individuals has grown substantially. At the same time, mortality rates *early in life* are actually falling more quickly in low-income areas than high-income areas (Currie and Schwandt 2016).

Differing trends in smoking rates by income are likely one important factor driving differences in the evolution of mortality rates for the young and old by income. The share of the population 50 and older *below* the poverty line that has ever smoked has grown over the last twenty-five years while the share of the population 50 and older *above* the poverty line that has ever smoked has decreased (Figure 2). In contrast, smoking rates for the population ages 18-40 have declined substantially regardless of poverty status, and smoking rates for people in poverty are only slightly higher than for those not in poverty.

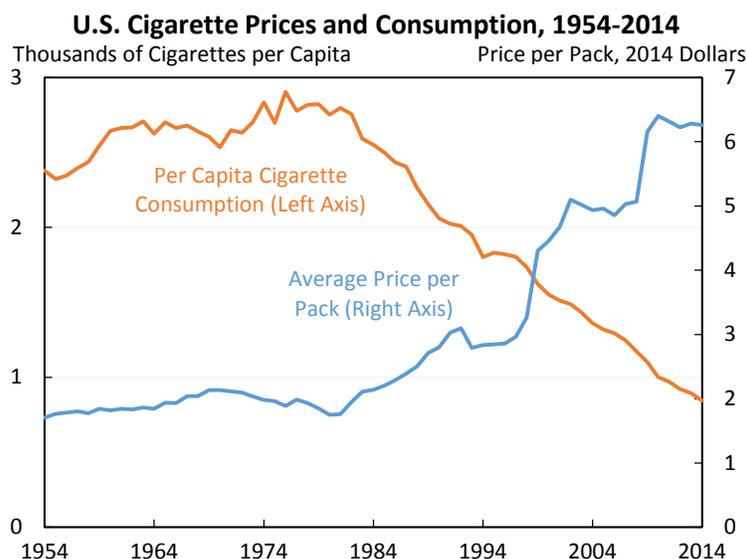
Figure 2
Percent that Ever Smoked by Poverty Status, 1991-2014



Lesson #2: Price Plays an Important Role in Smoking

From 1954 to 1983 inflation-adjusted cigarette prices were essentially flat, coinciding with an increase in per capita cigarette consumption. Since 1983, cigarette prices have increased rapidly and, in parallel, consumption has plummeted (Figure 3). Of course, these changes were driven by a variety of factors in addition to price, including public education campaigns, access to approved cessation tools and other factors, many of which have been the subject of extensive research.

Figure 3

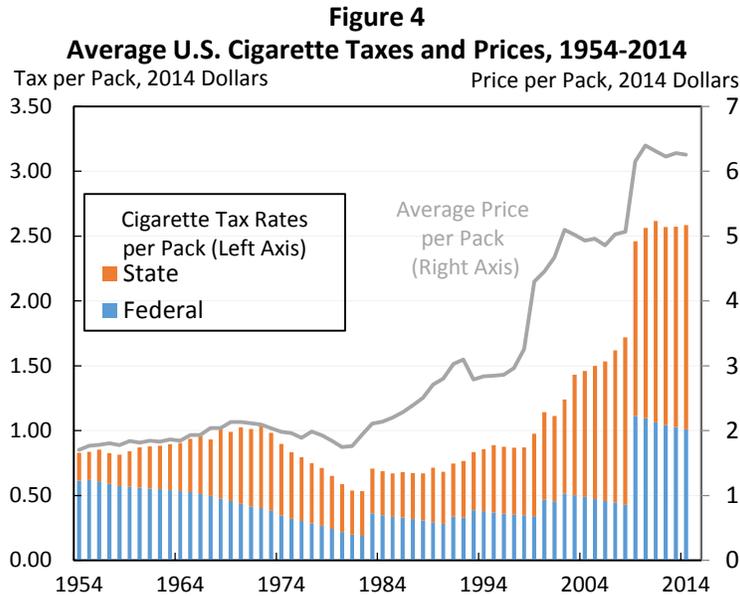


Research into the relationship between cigarette prices and smoking typically estimates elasticities of demand: the percentage decrease in cigarette demand that would result from a one percent increase in price. However, due to the addictive nature of tobacco products, we are concerned with more than the simple quantity of cigarettes consumed. For example, some research examines the impact of prices on smoking initiation and other studies look at the impact of price on quit attempts or the fraction of the population that smokes.

Meta-analyses of the relationship between tobacco prices and use suggest that the overall elasticity of demand for adults lies between 0.3 and 0.7 (CBO 2012, IARC 2011, Gallet and List 2003, Chaloupka and Warner 2000), that is to say that a 10 percent increase in cigarette prices will lead to a 3 to 7 percent decline in consumption. These meta-analyses find that about half of this reduction comes from existing users smoking less (the intensive margin) and about half comes from a decline in the number of smokers (the extensive margin). Though subject to some debate, a number of studies suggest the relevant elasticities for youths and young adults are higher than those for adults, which is to say that youths and young adults respond more to prices.

Lesson #3: Cigarette Taxes Play an Important Role in Cigarette Prices

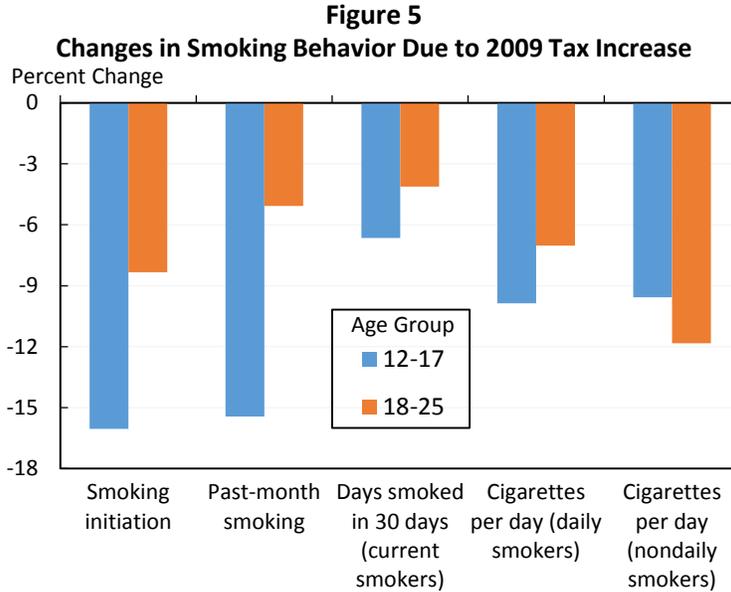
U.S. cigarette taxes fell sharply in inflation-adjusted terms through the 1970s and early 1980s as inflation eroded their value (Figure 4). Federal cigarette taxes were increased in 1983, but remained well below their inflation-adjusted value from decades before. However, around 2000, cigarette taxes took on an increased role as part of tobacco and health policy, and tax rates increased sharply in the first decade of this century, driving the substantial increase in cigarette prices since then. In addition, the Master Settlement Agreement reached in 1998 between the Attorneys General of forty-six States and the District of Columbia and the four largest tobacco companies included substantial annual payments that function like a further tax on tobacco.



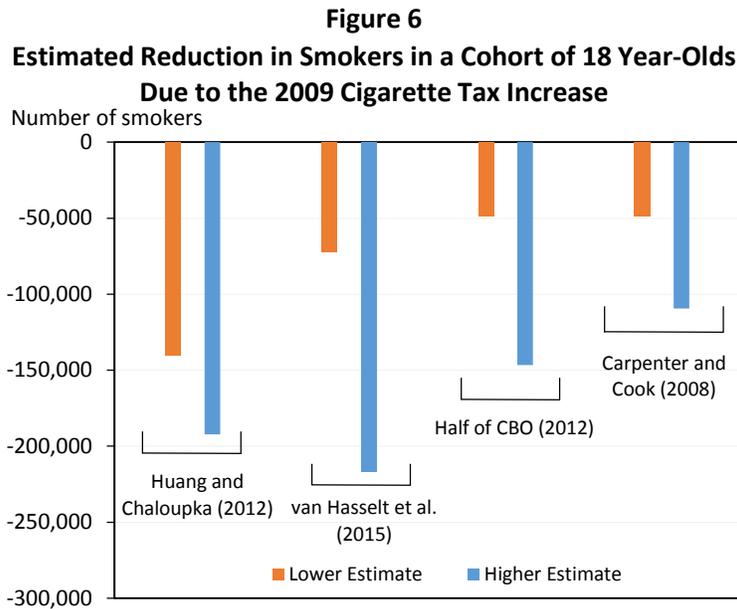
Lesson #4: Cigarette Taxes Have Large Aggregate Benefits for Public Health

By increasing cigarette prices, cigarette taxes substantially reduce smoking rates and generate large improvements in public health. This finding is borne out both by the body of existing research on the topic and the experience of the 2009 tobacco tax increase, which I will discuss in some detail here.

I am aware of two studies that examine the impact of the most recent increase in Federal tobacco taxes in 2009. Both of the studies examining that tax increase find resulting reductions in smoking among youths. The more recent study concluded that smoking initiation for youths age 12-17 fell more than 15 percent and initiation for young adults 18-25 fell 8 percent (Figure 5, van Hasselt et al. 2015). Past-month use likewise fell by about 15 percent for youths 12-17 and fell about 5 percent for young adults 18-25. While all of these results are economically significant, the estimated effect on smoking initiation for young adults 18-25 is not statistically significant. The other study found similar decreases, concluding that the percentage of 8th, 10th, and 12th grade students who smoked in the past month fell by between 10 and 13 percent (Huang and Chaloupka 2012).

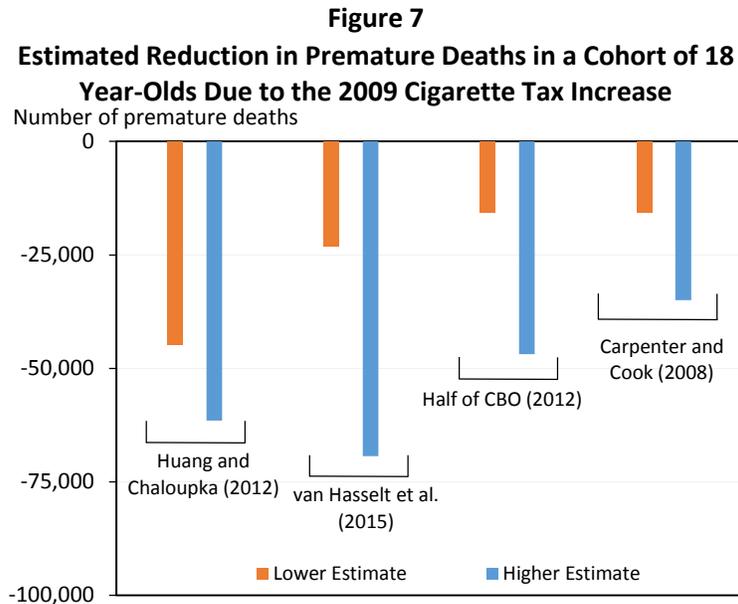


The findings from these recent studies are broadly consistent with the results from the earlier literature. Adapting the estimates from these two studies, an analysis of cigarette taxes and smoking by the U.S. Congressional Budget Office (CBO 2012), and estimates from a study of youth smoking by Carpenter and Cook (2008), the evidence suggests that the 2009 Federal cigarette tax increase could have plausibly reduced the number of smokers in a cohort of 18 year-olds by between 45,000 and 220,000 people, roughly 3 to 15 percent (Figure 6).



We can also apply estimates of the health impacts of smoking, the frequency and success of quit attempts, and so forth to the estimates presented above for the impact of the cigarette tax increase on smoking rates to obtain an estimate of a portion of the health benefits of the tax increase. For these calculations, I adopt an assumption that roughly one-third of youth smokers die

prematurely due to smoking (U.S. Surgeon General 2014). Based on these assumptions, the 2009 cigarette tax increase plausibly reduced the number of premature deaths due to smoking in each cohort by between 15,000 and 70,000 (Figure 7).



We are unlikely to have reached the optimal level of tobacco taxation, especially when the average combined Federal and State tax is about \$2.50 per pack and estimates of the harm associated with smoking a pack of cigarettes range from about \$25 to \$50 or more per pack (although consumers take some of the costs of this harm into account in making their decisions). To this end, President Obama is proposing to further raise the Federal cigarette tax from \$1.01 per pack and to index it to inflation going forward (along with proposing to harmonize tax rates on different tobacco products, a topic I return to in Lesson 6). This increase in tobacco taxes is part of an effort to fund high-quality early education for all Americans, a policy that itself would have enormous economic benefits (CEA 2016). The proposal would reduce the number of premature deaths due to smoking in a cohort by between about 10,000 and 50,000 based on similar assumptions used to analyze the 2009 increase.

Lesson #5: Tobacco Taxes Disproportionately Benefit Lower-Income Households

Tobacco taxes are sometimes criticized for being regressive, but this criticism is backward. The health benefits of tobacco taxes far exceed the increase in tax liability, and these health benefits accrue disproportionately to lower-income households. Moreover, it is important to also evaluate what the revenue raised by the tobacco tax is used for. The most recent increases, enacted in 1997 and 2009, were used to create and expand a very progressive children’s health insurance program. The Administration’s proposal to further increase tobacco taxes would finance a highly progressive high-quality early education proposal.

Externalities, Internalities and Addictive Goods

Before diving into the estimates it is useful to briefly discuss the underlying theory and motivation, because it affects not only the assessment of past policies but also the analysis and motivation for future ones. Tobacco imposes a number of costs on society that can be understood through the traditional economic concept of “externalities,” including the negative health and amenity effects of secondhand smoke, the large costs to children and society more broadly of low birthweight babies that happen when a mother smokes during pregnancy, and the additional health costs borne by all of us to help care for smokers.

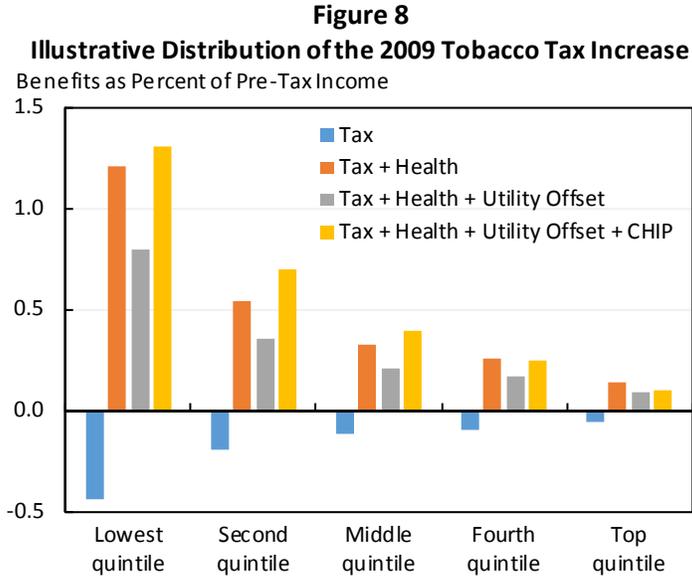
But smoking has its largest effects on smokers themselves, imposing a cost of about \$25 to \$50 or more on someone in terms of shorter life expectancy and other negative health effects. A rational person should have an additional pack of cigarettes if the benefit to him or her exceeds at least \$25 plus the relatively modest cost of producing the pack of cigarettes itself.

In most cases we would assume that government policy should address externalities, but that rational consumers would fully take into account all of the internal costs and come to the optimal decision with no further need for public policy intervention. However, in the case of tobacco use, there are a number of reasons to believe this simplistic analysis is incorrect. First, and perhaps most importantly, is what economists call the present-bias problem. Across a wide range of domains, we have evidence that people overweight the present at the expense of the future. In the case of tobacco use, which has large costs that appear many years in the future, this leads to smoking at rates above the socially optimal. The highly addictive nature of tobacco greatly exacerbates this problem since, once people have started smoking, it is difficult to stop even if they decide they want to. Evidence suggests that overly optimistic assessments of one’s ability to quit also play a role in smoking initiation. In surveys, far more teenagers who smoke report that they will quit than ultimately do. Teenagers may excessively discount the future health costs assuming that they will be able to quit smoking when, in reality, quitting is much more difficult than they think. When individuals do not take into account costs they impose on themselves for whatever reason, economists refer to it as an “internality.” Finally, although we have made major strides in increasing public awareness of the health risks of smoking, traditional informational shortcomings may also play a role in smoking initiation.

Welfare and Distributional Impact of the 2009 Tobacco Tax Increase

Figure 8 provides an illustrative estimate of the distributional impacts of the 2009 tobacco tax increase based on a plausible set of assumptions. However, I would not place too much weight on any one number; my point here is to illustrate why applying standard distributional analysis to tobacco tax changes go so badly awry.¹

¹ The illustrative distribution is computed by allocating the burden of tobacco taxes according to the distribution of tobacco taxes reported in Rosenberg (2015), allocating \$37.5 billion in health benefits proportional to the tax burden, allocating a \$9.4 billion utility offset proportional to the health benefits (and thus also proportional to the tax burden), and allocating CHIP benefits equal in value to the tax increase proportional to the distribution of children with CHIP coverage in the March CPS.



In particular, the blue bars in Figure 8 portray the traditional finding that tobacco tax increases, by themselves, are regressive—leading to the largest percentage reductions in pre-tax incomes for the lowest-income households.

But the picture changes markedly when we count the benefits of reduced mortality and morbidity as shown in the second set of estimates in orange. These benefits are strongly progressive, for two reasons. First, smoking is more prevalent at lower incomes, so the reductions in smoking are larger for those groups (not accounting the fact that they may also be more sensitive to price increases, a factor that is not included here). Second, these estimates assume the dollar value of the health benefit does not vary with income and thus is proportionately more important to lower-income households, although other assumptions on this question are also possible.

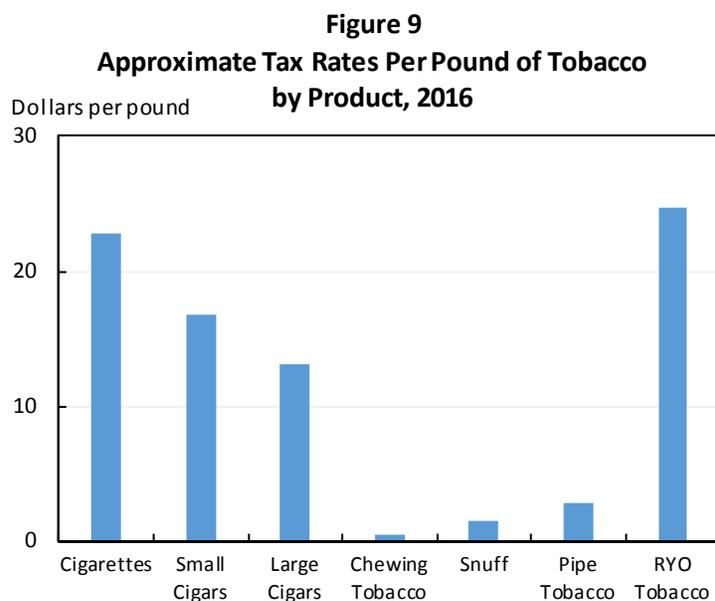
The third set of estimates in grey takes into account a “utility offset” reflecting the fact that people who stop smoking may lose some of the utility they would otherwise have derived from smoking. If people were fully rational, this utility offset would roughly match the internal health costs, but, as discussed above, this is not the case with tobacco, so these estimates assume an illustrative 25 percent offset. The 25 percent offset, reflecting the high end of estimates in a recent analysis conducted for the U.S. Department of Health and Human Services (HHS 2015), is merely illustrative and arguably very high for a good with addictive properties. Moreover, there are good arguments that in the case of people dissuaded from taking up smoking in the first place, this offset could be much smaller and possibly zero. The point is to show that even with this large offset the tobacco tax increase is still highly progressive, albeit slightly less so.

Finally, the last set of estimates incorporates not just the direct effects of the tax, but also the use of the revenue it generates—in this case expanding health insurance coverage for low- and moderate-income children. Accounting for this coverage expansion adds to the progressivity of the overall legislative package.

The bottom line is that these estimates are positive for all groups and large on average for low-income households.

Lesson #6: It is Really Important to Tax Similar Tobacco Products at Similar Rates

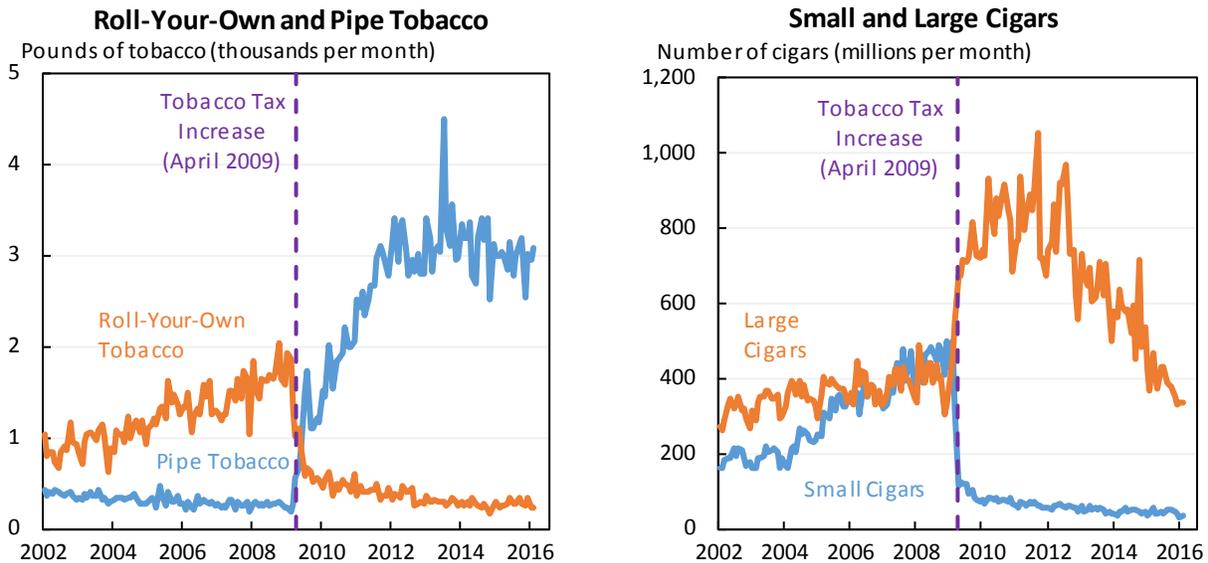
One often overlooked aspect of tobacco taxation is the importance of harmonizing the tax rate on different tobacco products. Currently, there is a wide disparity in tax rates in the United States between tobacco products (Figure 9). For example, pipe tobacco is taxed at a rate of less than \$3 per pound while roll-your-own tobacco is taxed at a rate of nearly \$25 per pound. These disparities can lead to substitution between tobacco products and can mitigate the positive health effects of tobacco tax increases.



The problem is that if you raise the tax on one product without raising it on another, consumers can substitute to the cheaper product, potentially undoing some of the public health benefit the tax was intended to encourage. This is not just a theoretical possibility but visible in the data. For example, consider the patterns in the sale of roll-your-own and pipe tobacco and in small and large cigars following the enactment of the 2009 tobacco tax increase (Figure 10). Prior to the law's enactment, the tax rates on roll-your-own tobacco and pipe tobacco were the same. After the law's enactment, the tax rate on roll-your-own tobacco was over \$20 per pound higher than the tax on pipe tobacco. And, as you can see in the figure below, sales of roll-your-own tobacco plummeted after the law and sales of pipe tobacco increased by a factor of ten. Similarly, as the law disadvantaged modestly priced small cigars relative to modestly priced large cigars, sales of small cigars plummeted and sales of large cigars rose. In fact, many manufacturers of small cigars slightly increased the weight of their product to classify it as a large cigar (GAO 2012).

Figure 10

Sales of Selected Tobacco Products, 2002-2016



In the extreme case where different tobacco products are perfect substitutes, a tax increase on one product alone would have no impact on overall consumption and resultant health harms. In reality, of course, substitution is imperfect but still larger than one might expect. When we were developing President Obama’s proposal to increase and harmonize taxes on tobacco, economists in the Treasury Department estimated that *the reduction in tobacco consumption under a harmonization proposal would be nearly two and a half times the size it would be under an increase in the cigarette tax alone that raises comparable revenue*. This implies additional health benefits of more than \$100 billion over ten years. This is not just a technical detail.

Application to Developing Countries

While my remarks today have focused on the experience of the United States, the lessons are applicable to a broad range of countries in both the developed and developing world. Indeed, for a number of years now the World Bank, the World Health Organization (WHO) and others have promoted the use of tobacco taxes as the most effective means of reducing smoking presence on a global level (WHO 2015). If anything, the use of taxation as a means of reducing the prevalence of smoking may be even *more* effective in developing countries going forward. While estimates of price elasticities of demand for cigarettes across countries vary somewhat widely from study to study, studies of low- and middle-income countries have generally (though not always) found that demand for tobacco is even more price-responsive than in high-income countries (Chaloupka et al. 2000; WHO 2010). Meanwhile, a broad range of studies of population subgroups *within* low- and middle-income countries (e.g. Sayginsoy, Yurelki, and de Beyer 2002; van Walbeek 2002) have generally found that price-responsiveness is negatively correlated with income, as in developed countries.

And, just as in the United States, non-harmonization of taxes across different tobacco products has been shown to lead to substitution of lower-taxed products for higher-taxed products in developing countries (see, for example, Laxminarayan and Deolalikar 2004 for evidence from Vietnam), blunting the effectiveness of taxation as a means to reduce the overall prevalence of tobacco use.

Of course, developing countries may face unique challenges in governance and the efficacy of taxation that may complicate the use of tobacco taxes as a public health measure. But to the extent that these research findings hold true broadly, the lessons I have laid out today regarding the United States are a reason why it is so important to overcome those challenges rather than use them as an excuse for inaction.

Notes to Figures

Figure 1

Source: CDC (2016).

Figure 2

Source: NHIS and CEA calculations following Currie and Schwandt (2016).

Figures 3 and 4

Source: Orzechowski and Walker (2015); Bureau of Labor Statistics; CEA calculations.

Figure 5

Source: van Hasselt et al. (2015).

Figures 6 and 7

Note: Lower estimate for van Hasselt et al. (2015) is based on results for 18-25 year-olds; higher estimate is based on results for 12-17 year-olds.

Source: Huang and Chaloupka (2012); van Hasselt et al. (2015); CBO (2012); Carpenter and Cook (2008); CEA calculations.

Figure 8

Note: See footnote 1 for methodological details.

Source: CEA calculations.

Figures 9 and 10

Source: Department of the Treasury, Alcohol and Tobacco Tax and Trade Bureau.

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