

Cigarette Purchase Patterns Among Older Smokers: Findings from the COMMIT Cohort

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Abstract: Almost 13 million people aging 50 and above in the US, including 4 million persons aging 65 and above, currently smoke. This paper considers smoking patterns among older smokers in relation to price by identifying the use of discounted purchasing options. Multivariate logistic regression models were estimated using survey data from the years 2001 to 2005 to consider differences in age regarding the use of lower price alternatives (the internet, neighboring states with lower taxes, and Indian reservations) to the high taxed cigarettes, the effects of cigarette taxes and the use of untaxed sources on quit attempts, and how the price and the availability of low priced alternatives may affect the use of cessation medications. We found that older smokers, in particular, turn to low/untaxed sources of cigarettes, such as the internet, neighboring states with lower taxes, and Indian reservations. They also turned to discounted cigarettes. The sensitivity of older Americans to price was also confirmed by findings that quit attempts by seniors relative to younger smokers are most responsive to the state tax rate, but are at least partially negated by the use of low tax cigarettes.

INTRODUCTION

Today, almost 73 million people in the US, are aging 50 and above, about 26.9% of the total population (34 million are 65 and over, 12.7% of the population). Health care costs are mostly incurred by this age group and are likely to grow at rapid rates as this age cohort ages. Almost 13 million people aged 50 and older, including almost 4 million aged 65 and older, currently smoke [1]. Of almost 430,000 smoking deaths annually, 70% involve those aged 65 and older, and more than 94% involve those aged 50 and older [2]. The billions of dollars in health care costs incurred in the U.S. by those with tobacco-caused diseases are incurred largely by older smokers and former smokers [2]. Savings may be available to society as research has demonstrated that quitting smoking immediately improves health which continues as time pass [3].

Between 1997 and 2005, prevalence rates for the US rapidly declined [1, 4]. However, smoking rates of those aged 45-64 only declined 10% in absolute terms and 2.5% in relative terms (from 24.4 (± 1.0) to 21.9 (± 0.9)) while those ages 65 and above declined by 28% in relative terms and 3.8% in absolute terms from 12.0 (± 0.9) to 8.2 (± 0.8), with much of the decline for each of these groups between 1997 and 2002. Part of the explanation for the rapid decline in smoking rates between 1997 and 2005 resides in the increase in cigarette prices following the tobacco settlement in 1998 and the increase in taxes by many states since 2001 [5]. A growing body of research demonstrates that increases in the price

of cigarettes will decrease the prevalence of smoking as well as the number of cigarettes smoked by both youth and adults [6-9]. Much of the research has focused on the effects of price on youth smoking prevalence and a body of research now concludes that increasing cigarette taxes are a proven measure to reduce youth smoking initiation and consumption. These findings provide a strong impetus to convince public policymakers of the health-related value of increasing tobacco taxes.

While the importance of reducing youth smoking cannot be minimized, the impact of reducing youth smoking initiation and consumption on overall smoking rates is small and their effect on chronic illness and mortality rates and on health care costs will not be felt for decades [10]. In contrast, the impact of price increases on cigarette consumption and cessation by older smokers would show much more immediate health and health care cost benefits [11].

Three recent studies consider the effects of price on smoking prevalence rates by age. Using a sample of 1990-2002 state-level data, Sloan [12] obtained prevalence elasticities of -0.1 for ages 21-64 and -0.25 for ages 65 and above. Ahmad [13], using the same data, obtained elasticities of -0.2 for ages 30-64 and -0.3 for ages 65 and above. Levy *et al.* [14] employed a large sample at the individual level for the years 1993, 1996, 1999, and 2002, and decomposed the effects of price into the effects on smoking prevalence (i.e., participation) rates, the effects on smoking some days rather than every day, and the quantity of cigarettes consumed. They found that the smoking prevalence of those above age 65 was sensitive to price, with elasticities of -0.3 for males and for females. The prevalence of those ages 50-64 were not found to be sensitive to price, but the likelihood of becoming a someday, or occasional, smoker (elasticities of 0.4

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for males and 0.5 for females) and the quantity (elasticities of -0.1 for males and females) were sensitive to price. They suggest that those aged 50-64 appear more likely to reduce quantity consumed in response to high prices, leading to more quits when smokers reach age 65. However, they also found that the effect of price on smoking prevalence was decreasing over time especially among the 50-64 year olds and the above 65 age groups.

The effects of pricing on smoking behaviors may be decreasing over time because now smokers may have more low-price substitutes. Specifically, they may be purchasing cigarettes through lower or un-taxed sources, such as over the internet, crossing state or national boundaries, at Indian reservations, or purchasing discount cigarettes such as generics. These sources may be increasingly important in recent years with the large increase in cigarette taxes in some states. At present, state and local taxes in five states (Alaska, Arizona, Maine, New Jersey, Rhode Island and Washington) and two cities (New York and Chicago) are above \$2.00, with ten states (Alabama, Florida, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, and Virginia) below \$0.50 (www.tobaccofreekids.org/research/factsheets/pdf/0097.pdf). In addition, the increased taxes in recent years create larger price differentials with respect to Indian reservations, where cigarettes are often sold without state taxes to non-Indians [15-19]. Internet purchases can also be made from lower taxed states or nations [8, 15-19]. In addition, discount/generic cigarettes have also proliferated since the late 1980s in response to increased price competition [15, 16, 18].

Studies have examined smokers' behavior with respect to lower price substitutes. Many cross sectional demand studies which controlled for interstate purchases have found that these purchases are important in determining actual cigarette demand [20]. Some recent studies have found that purchases on Indian reservations and from the internet can be an important part of cigarette sales [18, 19, 21], especially in high taxed states such as California [22, 23] and New York, where geographic access to lower taxed cigarettes from Indian Reservations and other states is ubiquitous throughout the state [17]. Some studies have focused specifically on internet purchases by youth [24-26]. However, except for some evidence from a study by Hrwyna, Delnovo *et al.* [21], none of the studies have examined older smokers. These smokers generally have less income and more time to seek and purchase lower priced substitutes, because they are often on a fixed income and not working.

This paper considers smoking patterns by older smokers in obtaining lower price alternatives to the high taxed cigarettes. We use the individual level data from the COMMIT data, which contains detailed information on smoking patterns by those ages 40-50, 50-64 and 65 and above, to investigate their responsiveness to price and their efforts to avoid higher taxed cigarettes and use lower price brands. In particular, with increased availability over the internet and a stronger incentive to use that and other lower price sources, as prices increase in part because of higher taxes it will be important to know older smokers' purchasing patterns. We also consider the effects of cigarette taxes and the use of untaxed sources on quit attempts and quit success. In addition, we consider how price and the availability of low

priced alternatives may affect the use of smoking cessation medications, which, in turn, also may be expected to improve quit success.

METHODS

Funded by the National Cancer Institute (NCI), the Community Intervention Trial for Smoking Cessation (COMMIT) was a community-based randomized cessation study conducted between 1988 and 1993. Details of the study can be found elsewhere [27]. Briefly, the COMMIT project was created to test a comprehensive smoking control intervention through communities. It was conducted in 11 matched pairs of communities in the United States (10 pairs) and Canada (1 pair). Each pair consists of one community randomized to intervention conditions and one community randomized to control conditions.

The COMMIT cohort was identified by a telephone survey in 1988. Only current smokers aged 64 years old were eligible. The baseline cohort consisted of about 1000 smokers in each community and over-sampled heavy smokers who reported smoking greater than 25 cigarettes per day (CPD). The cohort was then followed through 1993 to evaluate the effects of COMMIT intervention. Between 1988 and 1993, 34% of the cohort members were lost to follow-up.

In 2001, with additional funding from NCI, a follow-up survey was conducted among 13,544 U.S. cohort members who completed the 1988 and 1993 surveys and who agreed to be contacted again in 2001. Of these participants, 7,329 subjects completed the 2001 follow-up survey, generating a response rate of 54%. In 2005, another follow-up survey was conducted among the U.S. cohort participants who completed all of the previous surveys and agreed to be contacted again. Of these participants, 4,963 subjects completed the 2005 survey. The response rate between 2001 and 2005 was 68%. The results of the 2005 survey showed that 2,269 (45.7%) of the respondents reported that they were current smokers in 2005. Among current smokers in 2001 ($n=3,947$), those who were male, lower income, African Americans were more likely to be lost to follow up. Daily cigarette consumption, use of discount/generic cigarettes and low/untaxed cigarettes in 2001 were not associated with attrition in 2005.

The COMMIT cohort is not representative of the smokers in the study states. The study participants were between 25 and 64 years of age in 1988 and were followed-up for 17 years. Thus, this cohort tends to be older than the general population in these states. The average age of the subjects who completed the 2005 follow-up survey is 57.9 years, about 8 years older than the 2004 Behavioral Risk Factor Surveillance System (BRFSS) survey participants who live in the nine study states. Smokers in this cohort tend to be heavier smokers than those in 2005. On average, current smokers in this cohort in 2005 smoked 18 CPD, slightly higher than the U.S. average level in 2004 (16.8 CPD) (CDC 2005).

We consider three types of outcome measures: cigarette purchase patterns as they relate to purchasing lower price cigarettes, quitting behaviors and pharmacotherapy use.

In the 2005 COMMIT survey, current smokers answered a battery of questions concerning their cigarette purchasing patterns in the 12 months before the survey, including

whether or not they have "regularly purchased cigarettes" from each of the following venues in the past 12 months "because they were cheaper":

- (1) on an Indian reservation,
- (2) in another state, and
- (3) in another country.

Respondents were also queried if the respondent made any cigarette purchase on the internet during the 12 months before the interview "because they were cheaper." Four variables were created to indicate whether a smoker bought cigarettes in the last year from each of the four sources (coded: 0 if no, 1 if yes). These four measures were also combined into a summary measure, equal to 1 if the respondent responded affirmatively to any of these four items and equal to zero otherwise. These measures were unavailable in previous surveys of the COMMIT cohort.

Smokers were also asked whether they smoked a generic brand and, if so, the name of the brand that they smoked. Current smokers were considered to be smoking a discount/generic cigarette brand if they self reported their brand as a "generic" brand or if, based on brand characteristics data and UPC code, they could be identified as a discounted brand based on data from the Maxwell Consumer Report (The Maxwell Report February 2002). A small percentage of brands were classified as a discount/generic brand through subsequent web searches of internet based cigarette vendors. A cheaper purchase variable was created for those who use discounted cigarettes or any of the low/untaxed sources of cigarettes.

To examine quitting behaviors, we examine the two common measures of quit attempts and quit success. In the COMMIT follow-up surveys, those who were current smokers in 2001 were asked if they made a serious quit attempt (i.e., lasting at least one day) between 2001 and 2005. If so, they were asked if they currently smoked. A successful quitter was defined as a respondent who responded no to the following two questions: 1) "Do you smoke cigarettes now?" 2) "Have you smoked any cigarettes in the last six months?"

We also consider the use of pharmacotherapies, including over-the-counter medications, such as the gum or patches, or prescribed medications, such as zyban. Those who were current smokers in 2001 were asked in 2005 if they used stop smoking medication between 2001 and 2005 (yes or no).

The current state cigarette excise tax at the time of the survey was obtained from the STATE system created by the Office on Smoking and Health at the Centers for Disease Control and Prevention to perform surveillance of tobacco related policies and behaviors. Since we examined behavior between 2001 and 2005, we included variables to reflect the cigarette tax in the year 2001 as well as changes in taxes between 2001 and 2005. The former variable was included to capture long-term reactions to taxes, and the later to capture more short-term reactions.

The following additional variables, from the COMMIT survey, were considered when examining the correlates of purchasing cigarettes from less expensive sources:

- Gender (male or female);

- Age in 2005 (<50 years, 50-64 years, 65+ years);
- Race/ethnicity (white, non-Hispanic; black, non-Hispanic; Hispanic; other);
- Gross household income in 2005 (<\$15,000/yr, \$15,000 to \$37,500/yr, \$37,501 to \$60,000/yr, >\$60,000/yr);
- Cigarettes smoked per day in 2005 (<5, 5-14, 15-24, 25+);
- Time of first cigarette in the morning in 2005 (<10 minutes, 10-30 minutes, 31-60 minutes, >60 minutes);
- Age started smoking (≤15 years, 16-19 years, 20+ years)
- Desire to stop smoking in 2005 (none, a little, somewhat, a lot);
- History of past serious quit attempts in 2005 (0 attempts, 1 attempts, >2+ attempts); and
- Current use of other tobacco products (e.g., chewing tobacco or cigars) in 2005 (yes or no)

We also included a medication use variable in all equations except for the medication use equation, as well as use of low tax source variables in the quit and medication use equations.

Analyses were conducted using the Stata package.

Descriptive statistics were used to assess the characteristics of the sample and the prevalence of different alternative venues for cigarette purchasing, use of discount/generic cigarettes, quit attempts, quit success, and medication use. Multivariate logistic regression models were estimated to assess the characteristics of persons who engaged in each of these discounted purchasing activities, focusing on the role of age. We also considered the sensitivity of these behaviors to factors that encouraged these behaviours, focusing particularly on the tax differential and the distance to an Indian Reservation or other state with lower taxes. After tax prices were calculated as a tax differential variable equal to the amount of a tax per pack of cigarettes in the smokers home state less the lowest tax per pack of a nearby (within 40 miles of roadway) state, Indian reservation

We also estimated separate equations for quit attempts and quit success for those who made a quit attempt, where we considered the specific effect of the size of tax as well as change in tax over the period 2001-2005 and the effects of tax avoidance and purchase of discounted cigarettes. Results were estimated separately by age group and also stratified by age groups in 2001: < 50 (N=1,118), 50-64 (N=1,148), and 65 and above (N=336). Those who were less than fifty were at least age 42, because the sample began in 1989 with those at least age 25. While these age groups studied do not include all smokers, the underlying comparison between older and other smokers remains of interest to the field and represents the best that can be done with the COMMIT data which has other compensating advantages.

RESULTS

The analysis found evidence of a relationship between age and tax avoidance. Separate equations were estimated for

each type of purchasing behavior from low/untaxed venues and for discount/generic cigarettes. Table 1 shows the association between age in each of these types of equations.

Table 1. Less Expensive Cigarette Purchasing Behavior by Age, COMMIT Data, 2005

Cigarette Purchase Option	Overall			
	N	%	OR	p-Value
Other State				
<50 years	645	23.0%	Ref. Category	
50-64 years	1,179	17.0%	<u>0.57</u>	<0.01
65+ years	438	16.0%	0.78	0.32
Internet				
<50 years	646	5.1%	Ref. Category	
50-64 years	1,179	6.7%	1.45	0.16
65+ years	436	6.0%	<u>2.26</u>	0.02
Indian Reservation				
<50 years	645	16.1%	Ref. Category	
50-64 years	1,175	20.8%	<u>1.47</u>	0.02
65+ years	437	18.3%	<u>1.77</u>	0.02
Discount/Generics				
<50 years	642	23.2%	Ref. Category	
50-64 years	1,169	34.9%	<u>1.72</u>	0.00
65+ years	424	43.6%	<u>1.45</u>	0.04
Any Cheaper Purchase				
<50 years	646	51%	Ref. Category	
50-64 years	1,185	56%	1.22	0.09
65+ years	438	62%	<u>1.47</u>	0.02

NOTE: OR indicates odds ratios. Underlined entries are significant at the 5% level. NOTE: OR's are controlled for gender, race/ethnicity, education, income, CPD, time to first cigarette, age started smoking, previous quit attempts, desire to stop smoking, use of stop smoking medications, use of other tobacco products, distance to lower taxed venue, and tax differential to lower taxed venue.

Those smokers age 65 and above (16%) and ages 50 through 64 (17%) were less likely to report buying cigarettes from lower taxed states compared to younger smokers (23%), but only the results for those ages 50-64 was statistically significant. The number of observations was much lower for those above age 65. Nevertheless, those ages 65 and above were more likely to purchase cigarettes from the Internet and Indian Reservations as well as discount/generic cigarettes compared to those less than 50 years of age. Those ages 50-64 had a relatively high percentage of those buying from the internet (6.7% vs 6.0 % of those ages 50 and below), though the difference was not statistically significant. Those ages 50-64 (21%) and age 65 and above (18%), however, were also more likely to buy from the Indian Reservations than those below age 50 (16%). In buying generic cigarettes, those ages 65 and above (44%) and those ages 50-64

(35%) were more likely than those less than 50 years of age (23%).

When taken together, older smokers were more likely to report buying cigarettes from any lower priced alternative (51% of those less than age 50, 56% of those ages 50-64 and 62% of those age 65 and above, and the odds ratio was significant for those ages 65 and above (OR=1.47, 95% CI (1.04 to 2.09))

Findings regarding quitting behaviors showed differentials by age. Table 2 examines the relationship of having a serious quit attempt between 2001 and 2005 to medication use, taxes, the purchase of untaxed cigarettes and the purchase of discount cigarettes. Quit attempts are highest among seniors: 64% for those < 50 years, 62% for those age 50-64, and 74% for those aged 65 and above. However, after controlling for other factors, the differences were not significant. In the equation for all ages, the likelihood of having a quit attempt increases with the state tax rate and the use of medications. For other variables, the likelihood of having a quit attempt was less for African Americans and decreases with quantity smoked, starting to smoke at an early age and education. Similar effects are observed by age for medication use, but the effect of taxes on quit attempts is only significant and of greatest magnitude for those above age 65. For those above age 65, quit attempts increase not only with the tax in the year 2001, but also with tax increases and decrease with the purchase of any low/untaxed cigarettes. A less prominent effect, significant at the 10% level, of untaxed purchases was found for those ages 50-64. Interestingly, quit attempts increased with the time in the morning until first cigarette for seniors.

We also examined quit success (not shown), and found increases with age: 16% for those < 50 years, 20% for those ages 50-64, and 26% for those ages 60 and above. After controlling for other factors, the differences were still significant, with those ages 50-64 having 50% greater likelihood and seniors having twice the likelihood of success of those below age 50. However, other factors, including the tax and distance variables, were generally insignificant, probably due to the imprecise nature of the quit measure (quit success as of 2005 that lasted for six months).

As shown in Table 3, medication use between 2001 and 2005 was found to decrease with age (42% for those below age 50, 39% for those ages 50-64, and 32% for those ages 65 and above), with seniors 30% less likely than those below age 50 of using medications after controlling for other factors. In the equation for all ages, medication use was found to be higher among females, those with higher incomes and those smoking more than 5 cigarettes per day, and lower among African Americans and time until first cigarette smoked in the morning. Medication use is also found to increase with the use of discount cigarettes with the effect significant only for those below age 50, and to be less in higher tax states, but the effect is only significant for those between the ages of 50 and 64. For the less than 50 age group, use of low/untaxed sources was of borderline significance. The effects of income on use were only significant in the above 65 year old age group.

Table 2. Serious Quit Attempt Between 2001 and 2005, COMMIT DATA

	<50 Years				50-64 Years				65+ Years				Total All Ages			
	N	Attempt	OR	p-Value	N	Attempt	OR	p-Value	N	Attempt	OR	p-Value	N	Attempt	OR	p-Value
Age in 2001																
<50 years													1088	64%		0.63
50-64 years													1096	61%	0.91	0.34
65+ years													311	61%	0.97	0.85
2001 characteristics																
Cessation meds bet. 2001 and 2005	524	76%	3.22	<u><0.01</u>	517	74%	3.16	<u><0.01</u>	118	77%	3.87	<u><0.01</u>	1159	75%	3.1	<u><0.01</u>
Use of discount cigarettes in 2001																
Premium	797	64%			696	62%			172	59%			1665	62%		
Discount	236	65%	0.98	0.92	325	62%	1.09	0.58	109	60%	1.52	0.24	670	63%	1.06	0.57
Use of low-taxed cigarettes in 2001																
No	717	62%			709	64%			202	62%			1628	62%		
Yes	371	68%	1.16	0.34	387	58%	0.76	0.08	109	57%	0.37	<u>0.01</u>	867	62%	0.90	0.32
State tax in 2001			1.01	<u><0.01</u>			1.00	0.64			1.01	<u>0.01</u>			1.00	<u>0.02</u>
Change in state taxes 2001 to 2005			1.00	0.80			1.00	0.70			1.03	<u><0.01</u>			1.00	0.27
Total	1088	64%			1096	61%			311	61%			2,495	62%		

NOTE: Underlined entries are significant at the 5% level.

NOTE: Odds ratios (OR) are controlled for gender, race/ethnicity, education, income, cigarettes per day, time to first cigarette, age started smoking, previous quit attempts, use of cessation meds between 1993 and 2001, desire to stop smoking, and use of other tobacco products.

DISCUSSION

Our results tend to confirm the results of previous studies which concluded that older Americans, particularly those above age 65, are sensitive to the price. We found that older smokers turn to low/untaxed sources of cigarettes, such as the internet, states with lower taxes, Indian reservations, for

buying cigarettes. These results indicate the need to generally increase taxes and enforce tax laws, especially regarding purchases on the internet and from Indian reservations. Tax differentials between states may be reduced if those states with lower taxes increase their tax rates. We also found that the purchase of discounted cigarettes decreases with the size of the cigarette tax, suggesting that the price of discounted

Table 3. Use of Cessation Treatment Medication between 2001 and 2005, COMMIT DATA

	<50 years				50-64 years				65+ years				Total All Ages			
	N	Attempt	OR	p-Value	N	Attempt	OR	p-Value	N	Attempt	OR	p-Value	N	Attempt	OR	p-Value
Age in 2001																
<50 years													1118	42%		0.05
50-64 years													1148	38%	0.88	0.16
65+ years													336	29%	0.68	<u>0.02</u>
2001 characteristics																
Use of discount cigarettes in 2001																
Premium	820	39%			732	37%			189	28%			1741	37%		
Discount	240	49%	1.38	0.04	334	40%	1.12	0.43	113	30%	1.09	0.79	687	42%	1.20	0.07
Use of low-taxed cigarettes in 2001																
No	744	39%			746	46%			218	27%			1708	38%		
Yes	374	49%	1.30	0.07	402	36%	0.84	0.24	118	33%	1.54		894	41%	1.07	0.47
State tax in 2001			1.00	0.98			0.99	<u>0.01</u>			0.998	0.67			0.99	<u>0.05</u>
Change in state taxes 2001 to 2005			1.00	0.70			1.00	0.14			1.00	<u>0.34</u>			1.00	0.66
Total	1118	42%			1148	39%			336	32%			2602	39%		

NOTE: Underlined entries are significant at the 5% level.

NOTE: Odds ratios (OR) are controlled for gender, race/ethnicity, education, income, cigarettes per day, time to first cigarette, age started smoking, previous quit attempts, desire to stop smoking, use of stop smoking medications between 2001 and 2005, and use of other tobacco products.

cigarettes is likely to rise relative to higher priced cigarettes as the tax increases. This result also indicates the need to generally increase taxes if the goal is to reduce smoking. However, it will be important to control for smuggling as taxes increase.

The sensitivity of older Americans to price was also confirmed by our findings that quit attempts by seniors are more responsive to the state tax rate than younger smokers, but the effect of higher taxes are at least partially negated by the use of low tax cigarettes. To a lesser extent, the use of low tax cigarettes was also found to reduce quit attempts among those ages 50-64. These effects are consistent with those of Levy *et al.* (2007) who found that the smoking rates of seniors are lower in states with higher prices. We also examined quit success among those who attempted to quit, and did not obtain significant effects of taxes. However, our samples were smaller and we use point estimates (having quit for at least six months in the year 2005) instead of more appropriate interval estimates. Further exploration of quitting behaviors is merited. Nevertheless, in conjunction with other evidence, these results provide additional support for increasing taxes on cigarettes to continue to reduce smoking rates among older Americans.

Another way to reduce smoking rates among older Americans is through the greater use of proven cessation treatments, such as pharmacotherapies. We found less use of these medications by older Americans, which may help explain the lack of greater quit success among those groups. There was some indication that lower taxes were associated with more medication use, a counterintuitive result since smokers might be expected to increase medication use in order to quit in response to the higher prices of cigarettes. However, use of discounted cigarettes was associated with greater medication use, suggesting that those who are more price-sensitive may be more likely users of medications. Further exploration on the role of price in affecting medication use is needed. In particular, it is important to consider variations in pharmacotherapy prices, as well as cigarette prices.

We found that medication use among older smokers was highly dependent on income, with those of lower income being less likely to use medications. Subsidization of the costs of medications may thus be needed to encourage more use among those with lower incomes, the segment of the population increasingly more likely to be smokers. As Medicare coverage is implemented, greater medication use may follow, but it will be important to publicize coverage and for health care providers to encourage the use of proven therapies.

There are other reactions that smokers may take that have not been addressed in this paper. They may cut back on the number of cigarettes smoked per day or the number of days that smoking takes place per week, as found by Levy *et al.* [14] for those ages 45-64. We did not detect significant differences by age regarding smokers cutting back on the number of cigarettes smoked between 2001 and 2005. We also considered whether smokers switched to discount brands. We found a 50% higher likelihood that those ages 50-64 (though not for those ages 65 and above) engaged in this behavior compared to younger smokers, but did not find that this behavior was related to state taxes.

While not reported above, we did find other factors that suggest that seniors are amenable to policy. We found that they are likely to smoke fewer cigarettes and wait a longer time before smoking their first cigarette in the morning, both factors that indicate less addiction and thus more potential to be affected by public policies. In addition, we found that older smokers are less likely to use other tobacco products besides cigarettes, such as chewing tobacco. Thus, their likelihood of substituting to these other products as taxes are raised is probably lower than for other age groups.

The strengths of this analysis include the long-term follow-up, large sample size, and the fact that it is population-based. Its principal limitation is that only a fraction of the cohort completed interviews in all survey years. The rates of buying low/untaxed cigarettes may be biased because some of the characteristics of the cohort have changed over time, although the data were weighted to the baseline demographic distribution of the sample to minimize this potential bias.

In conclusion, our study suggests that older smokers are more likely to be using untaxed/lower priced cigarettes, and those above age 65 that use low-taxed cigarettes are less likely to make quit attempts. Nevertheless, senior smokers are sensitive to the magnitude of the state tax, even after controlling for the purchase of untaxed/lower priced cigarettes, but also are less likely to use pharmacotherapies. The continued increases in cigarette prices through higher taxes and the subsidization of medication are both policies that will encourage the rapid declines in smoking rates among those above age 65. In addition, it will be important for untaxed sources, such as the internet to be limited or halted, and for those states with low tax rates on cigarettes to increase their rates.

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