THE LONG-TERM DECLINE IN SMOKING IN THE U.S.

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ABSTRACT

Earlier research [1] investigated the impact of state excise tax increases on the incidence of smoking. The research is extended proposing a more robust modeling approach.

INTRODUCTION

In the U.S. smoking has been well established as a major health risk since the early 1960's. In the nearly 50-years since this risk was recognized, numerous studies have confirmed this health risk by identifying primary risks such as lung cancer and heart disease and by establishing that smoking contributes to the development of a variety of other serious diseases. Americans have responded to these warnings about smoking by reducing smoking significantly since the 1960s. However, the human costs of smoking remains high. Recently it was estimated that tobacco use, primarily smoking, remains "one of the biggest causes of preventable and premature deaths in the U.S., claiming the lives of more than 440,000 people each year" [3]. Given the cost in human life associated with smoking, we should ask when will smoking be eliminated or virtually eliminated.

In the 40-year period 1965-2005 the percentage of U.S. adults, 18 and older, who smoked declined dramatically—from about 42.0 percent in 1965 to about 20.8 percent in 2005. This decline began just after the 1964 Surgeon General's report on the health risks of tobacco. This report created a strong public awareness of the risk of smoking and triggered the beginning of the decrease in smoking rates. Figure 1 shows the decline during the 1965-2005 period. As shown the rate of decline during the period was relatively constant. In addition to the public awareness of the health risks of smoking, other factors contributed to the decline including the increased excise tax on cigarettes causing smoking to be expensive, a variety of smoke-free laws and regulations for both public places and work places, and the increased availability of smoking cessation medications and programs [3]. This cluster of factors—health concerns, taxes, the smoke-free movement, and cessation methods—worked together to reduce the proportion of the population smoking.



Figure 1. Smoking Rates in the United States, 1965 – 2005.

There are substantial differences in the proportion of the population that smoke from state to state and from region to region. For example, in 2005 Kentucky, Tennessee, and West Virginia had the highest rates of smoking with 28.7, 26.8, and 26.6 percent, respectively, of their adult populations. At the other end of the range, Connecticut, California, and Utah had 2005 rates of 16.5, 15.2, and 11.5 percent, respectively. In terms of the four Census Bureau regions, the West Region had the lowest percent of smokers in 2005 with 19.2, but the Northeast Region was only slightly higher with 19.8 percent, and the Midwest Region only a bit higher with 20.4 percent. The South Region had the highest proportion smoking in 2005 with 23.1 percent [2]. There are anomalies within region such as the three west coast states of California, Oregon, and Washington having smoking rates of 15.2, 18.5, and 17.6 percent, respectively, compared to the region's rate of 19.2 percent. Also in the South Region, Kentucky, Tennessee, and West Virginia have rates of 28.7, 26.8, and 26.6 percent, respectively, compared to the South Region rate of 23.1 percent.

States vary considerably in their decline in smoking over the 1965-2005 period. The level of a state's excise tax on cigarettes is clearly a factor in explaining a state's decline. However, other variables such as economic factors, demographic factors, and variations in tobacco industry marketing and promotion within a state are possible explanatory variables for the rate of decline in smoking [2].

PROPOSED APPROACH TO MODELING SMOKING DECLINE

A modeling approach is developed here that will be applied in future research. It is proposed that the following steps be taken to increase understanding of the factors related to the decline in smoking among states. The approach taken will apply regression modeling techniques using the full 50 states and in some cases smaller groups of states.

First, a regression analysis will be applied to estimate the explanatory power of the level of state excise tax on the decline in smoking during the 1998-2007 period. In this analysis the 50 states will be used and the dependent variable will be the average annual percentage decline in smoking during the 10-year period. The explanatory variable will be the average per pack state excise tax during the period. In this step a secondary analysis will be done to determine the set of states for which the excise tax level is a strong versus weak predictor of the decline in smoking.

Second, economic explanatory variables will be added to the regression model or models from the first step. Possible state economic variables will include average per capita income, unemployment rate, and proportion of jobs in the agriculture sector over the 1998-2008 period. Analyzing the explanatory power of these variables likely will lead to other possible explanatory variables.

Third, the model resulting from the previous steps will be further developed by introducing some state demographic variables. Variables examined will include educational attainment (possibly the percent of adults that have not completed high school or the percent of adults that have completed a bachelor's degree), proportion of population that is non-white, and proportion of families in poverty.

Fourth, to the extent reliable data can be obtained, programs that encourage or discourage smoking can possibly be incorporated into the model. For example, some states use a proportion of the revenue from tobacco sales to make smoking cessation programs available to the public. Tobacco companies conduct marketing campaigns aimed at encouraging the use of tobacco products. At this point it is not known if reliable data at the state level are available in this area, but it is worth investigating.

Fifth and last, the best models developed in this process will be interpreted in terms of what they reveal about the factors associated with states reducing the level of smoking. In addition it may prove interesting to forecast the time frame over which the U.S. will be able to reduce smoking to one half its 2005 level of 20.8 percent or to about 10.0 percent. That is, repeat the reduction in the percentage of people smoking to one half its level as was accomplished in the 1965-2005 period. This is a secondary purpose but it is of general interest and puts the problem of smoking and its associated health costs in perspective.

REFERENCES

[1] Barrett, R. T., R. E. Pugh, and N. E. Riley, "South Carolina's Cigarette Tax Increase Decision," *Southeast Decision Sciences Institute Proceedings*, February 2008 [CD].

[2] "State-Specific Prevalence and Trends in Adult Cigarette Smoking—United States, 1998-2007," *Morbidity and Mortality Weekly Report*, March 13, 2009.

[3] <u>www.injuryboard.com</u>, "Smoking rates in the U.S. Decline below 20 Percent," November 14, 2009.