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The effect of cigarette excise taxes on smoking before, during and after pregnancy

Greg Colman^a, Michael Grossman^{c,d}, Ted Joyce^{b,c,d,*}

^a Pace University, New York, NY, USA

^b Baruch College, City University of New York, New York, NY, USA

^c Graduate Center, City University of New York, New York, NY, USA

^d The National Bureau of Economic Research, 365 Fifth Avenue, 5th Floor, New York, NY 10016, USA

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Abstract

Recent analyses suggest that cigarette excise taxes lower prenatal smoking. It is unclear, however, whether the association between taxes and prenatal smoking represents a decline among women of reproductive age or a particular response by pregnant women. We address this question directly with an analysis of quit and relapse behavior during and after pregnancy. We find that the price elasticity of prenatal quitting and postpartum relapse is close to one in absolute value. We conclude that direct financial incentives to stop smoking during and after pregnancy should be considered. © 2003 Elsevier B.V. All rights reserved.

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1. Introduction

Prenatal smoking is the most important modifiable risk factor for poor pregnancy outcomes in the United States (US Department of Health and Human Services, 1990). Approximately 20% of all low birthweight births are attributable to smoking, and the risk of sudden infant death syndrome (SIDS) is three times greater for women who smoke (Institute of Medicine, 1985; DiFranza and Lew, 1995). Nor is the impact of maternal smoking limited to the perinatal period. The American Academy of Pediatrics considers environmental tobacco smoke (ETS) a major risk factor for lower respiratory illness, middle ear effusion and asthma in children (American Academy of Pediatrics, 1997).

* Corresponding author. Tel.: +212-817-7960; fax: +212-817-1597.

E-mail address: ted.joyce@baruch.cuny.edu (T. Joyce).

Maternal smoking has also become an important element of the debate over the optimal level of cigarette excise taxes. Unlike the public health community, economists tend to include only the external costs of smoking—costs imposed on others—in the calculation of optimal tax levels (Manning et al., 1991; Viscusi, 1995). Economists assume that parents account for or internalize the possible damage of cigarettes to the fetus or infant when deciding to smoke.¹ The assumption has strong implications. Evans et al. (1999), for instance, find that if considered external, the costs of maternal smoking adds between 42 and 72 cents per pack to the costs of smoking in 1994 dollars. Since state and federal excise taxes averaged 75 cents in 2000 (Orzechowski and Walker, 2001), the consequences of maternal smoking alone, if treated as external, would justify the present level of taxation.

Recent work by economists suggests that increases in the excise tax for cigarettes may be an effective means of lowering the prevalence of smoking among pregnant women. In two papers (Evans and Ringel, 1999; Ringel and Evans, 2001), authors use national natality files and report participation elasticities of -0.5 and -0.7 , which exceed the consensus estimate of aggregate elasticities of -0.3 to -0.5 (Chaloupka and Warner, 2000). Another study that also uses national natality files reports a participation elasticity of -0.35 (Gruber and Köszegi, 2001). The obvious advantage of national natality data is the size of the sample and its national coverage.

However, these studies are limited to an analysis of smoking at a single, but unspecified, point during pregnancy. Consequently, it is unclear whether the prevalence of smoking during pregnancy associated with state excise taxes reflects the response to taxes by women of reproductive age, or a particular response by pregnant women (Ebrahim et al., 2000). The distinction has important implications for policy. If taxes have no effect on quit rates during pregnancy, but do lower the prevalence of smoking among women of reproductive age, then efforts to reduce smoking during pregnancy might best be directed at smoking initiation among adolescent girls. Pregnancy, on the other hand, may provide important motivation for women to quit permanently. As a result, policies directed specifically at pregnant women may be more welfare enhancing than excise taxes directed at all smokers.

In this paper, we analyze the effect of cigarette excise taxes on smoking before, during and after pregnancy. With information on the prevalence of smoking at multiple points in time, we extend the literature on maternal smoking and taxes with an analysis of prenatal quit and postpartum relapse rates. We present a simple model that links quit rates to changes in smoking participation before and during pregnancy. The model provides guidance as to the presence of potential selection effects in conditional analyses based on samples of pregnant smokers. Moreover, our focus on quit probabilities provides comparisons of the effectiveness of taxes as a smoking cessation intervention to clinical trials of prenatal smoking cessation programs based on education and counseling. If taxes are associated with increased quit rates during pregnancy, then taxes may provide an important complement to other smoking cessation interventions as well as a source of funding.

Data are from the Pregnancy Risk Assessment Monitoring System (PRAMS): a random, stratified monthly survey of recent mothers overseen by the Centers for Disease Control and Prevention (CDC). We combine data from 10 states over 7 years (1993–1999) and construct a sample of 115,000 women. Although the number of states is limited, the detailed

¹ The obvious exception would be the medical and remedial costs of maternal smoking borne by taxpayers.

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