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ABSTRACT

Smoking during pregnancy has been shown to have significant adverse health effects for new born babies. Smoking is the leading preventable cause of low birth weight of infants who in turn, need more resources at delivery and are more likely to have related health problems in infancy and beyond. Despite these outcomes, many women still smoke during pregnancy. The main question for policy makers is whether tobacco control policies can influence maternal smoking and reduce adverse birth outcomes. We examine this question using data from the Pregnancy Risk Assessment Monitoring System data from 2000 to 2005. This is a time period during which states significantly changed their tobacco control policies by raising excise taxes and imposing strong restrictions on indoor smoking. We estimate reduced form models of birth weight and gestational weeks, focusing on the effects of taxes and workplace restrictions on smoking as the policies of interest. We also estimate demand equations for the probability of smoking during the third trimester. Results show that the smoking policies are effective, but limited to babies born to mothers of certain age groups. For babies born to teenage mothers, higher cigarette taxes are associated with small increases in birth weight and gestational weeks. For babies born to mothers ages 25-34, restrictions on smoking in the workplace are associated with small increases in gestational weeks.

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INTRODUCTION

It has long been known that smoking during pregnancy has significant adverse health effects for both the mother and infant at delivery (USDHHS, 2010). It is the single most important preventable cause of low birth weight of infants who in turn, need more resources at delivery and are more likely to have related health problems in infancy and beyond (USDHHS, 2010). Despite these outcomes, recent data indicates that 25 percent of mothers enter their pregnancy as smokers, 14 percent continue to smoke in their 3rd trimester and almost half (49 percent) of those who quit during pregnancy relapse within four months of delivery (Adams et al. 2008). While the nation's overall prevalence of prenatal smoking has fallen, the U.S. is far from its Healthy People 2010 goal of 1 percent prenatal smoking.

There exists wide variation in the levels of maternal smoking across states. In 2004, prenatal smoking ranged from a low of 5.9 percent in Arizona to 27.1 percent in West Virginia (CDC, SAMMEC software). Given the inherent variation that exists in socio-demographics of states' populations as well as state policy environments, a natural question arises as to what role the state policies play in determining the prevalence levels.

Economists have contributed to the literature on the effects of smoking on birth outcomes by addressing the endogeneity of smoking in determining the health of newborns. Most of this research uses cigarette prices or taxes in an instrumental variable framework or a reduced form model to estimate the direction and magnitude of the effects of maternal smoking (Ringel and Evans 2001; Gruber and Koszegi 2001; and Colman et al. 2003). However, the research to date uses data collected prior to the 1998 Tobacco Master Settlement Agreement (MSA). The MSA marks the beginning of a new era of tobacco regulation in the United States. This was an agreement between eleven major tobacco companies and forty-six states after plaintiffs

successfully sued the tobacco industry to recoup Medicaid costs for the care of persons injured by tobacco use. In addition to the billions of dollars won, the settlement also included new restrictions on marketing and promotion, and established funds to support anti-smoking research and advocacy efforts. Immediately following the November 1998 MSA agreement, major tobacco companies such as Phillip Morris and R.J. Reynolds raised wholesale prices by $0.45 to finance the payments. This increase was in addition to four price increases earlier in 1998 (Capehart, 1999).

In the wake of the MSA, states have been able to take advantage of prevailing anti-tobacco sentiment among residents to dramatically increase excise taxes. Since 1998, 38 states (including Washington D.C.) raised their excise tax rates at least once; never before have so many states raised cigarette taxes in a comparable period of time. The average state excise tax in 2010 was $1.45, more than four times the 1997, pre-settlement, value of $0.35 per pack. Even Tennessee and Georgia, tobacco producing states that traditionally have resisted raising taxes, increased their cigarette taxes in 2002 and 2003, respectively.

In addition to raising taxes, more and more states have imposed stronger restrictions on locations in which people can legally smoke. Known as clean indoor air laws or smoke free air laws, twenty-two states currently ban all indoor smoking in private workplaces, restaurants and bars. Dozens of other cities and counties across the United States have similar bans. This is in stark contrast to the situation prior to 1998 where only a few municipalities and no state had comprehensive bans. Many locations did, however, restrict or limit smoking prior to 1998, but the trend since has been towards stronger restrictions or outright bans.

New research on the demand for cigarettes in the post-MSA era is emerging. Estimates show that youth and adults are still price sensitive (Tauras, Markowitz and Cawley 2005;

Carpenter and Cook 2008; DeCicca and McLeod 2008). However, the effectiveness of smoking bans in reducing consumption is in question (Adda and Cornaglia 2010; Bitler et al. 2009). But the effects of the new, stricter tobacco control environment on the smoking behaviors on pregnant women still needs to be examined. Levy and Meara (2006) present the first evidence that the price increases resulting from the MSA decreased prenatal smoking, but mostly by the youngest and oldest women, and only by small amounts.

In this paper, we use the Pregnancy Risk Assessment Monitoring System (PRAMS) data for 29 states and New York City over the 2000 to 2005 time period along with state level data on tobacco control policies to assess whether the recent changes in tobacco control policies are associated with reduced maternal smoking and improved the health of infants. Results show the policies are effective, but limited to babies born to mothers of certain age groups. For babies born to teenage mothers, higher cigarette taxes are associated with small increases in birth weight and gestational weeks. For babies born to mothers ages 25-34, restrictions on smoking in the workplace are associated with small increases in weeks of gestation.

BACKGROUND

Smoking during pregnancy has been found to adversely affect the health of both mother and infant. Maternal smokers have infants that are smaller at each gestational age than infants born to nonsmokers and are born at earlier gestations (USDHHS, 2001; USDHHS, 2006). Low birth weight and premature infants need more resources at delivery and beyond. In addition, maternal smoking and environmental smoke have been strongly associated with the probability of Sudden Infant Death Syndrome (SIDS) (DiFranza and Lew, 1995; Schoendorf and Kiely, 1992; Scragg et al. 1993; Markowitz 2008), respiratory illness in children (Stoddard and Miller,

1995) and additional health care costs (Florence et al. 2007). In the United States, prenatal smoking is responsible for 5-8 percent of preterm deliveries, 13-19 percent of term, low birth babies, and 23-34 percent of deaths due to SIDS (Dietz et al. 2010). Despite these adverse effects, in 2005 around 13 percent of women self-report smoking during pregnancy based on birth certificates or PRAMS data (Tong et al 2009). Although the national data indicate an almost 45 percent drop from the 18.4 percent reported in 1990, at least half of mothers who smoke pre-pregnancy continue to smoke postpartum (Wakschlag, et al., 2003; Adams et al. 2008). With little change in postpartum relapse rates occurring (Colman et al. 2003), permanent changes in maternal smoking will require additional tobacco control efforts.

Earlier studies have analyzed the effects of cigarette taxes on maternal smoking (Ringel and Evans, 2001; Gruber and Koszegi, 2001; and Colman et al. 2003). These studies largely use state-level policies and fixed-effects models adjusted for time and clustering of observations within states to address maternal smoking. The studies of birth certificate data indicate tax elasticities for mothers in the range of -.35 to -.70. The Colman analysis of PRAMS data helped establish that the responsiveness of women during pregnancy (-.91) was different from that of pre-pregnancy (-.30). However, their pre-pregnancy estimate was insignificant due perhaps to a lack of variation in cigarette taxes in their PRAMS sample; only four of the ten study states increased taxes over the study period.

Evans and Ringel (1999) and Lein and Evans (2005) estimate reduced form models to quantify the direct effects on birth weights of raising cigarette taxes. Evans and Ringel (1999) use birth certificate data of babies born between 1989 -1992. They measure birth weight first in grams, and second, as the probabilities of infants being born low birth weight or very low birth weight. They find that increases in cigarette taxes are associated with increases in grams, while

higher taxes have a negative, but statistically insignificant effect on the probabilities of low and very low birth weights. Power calculations suggest that sample size is too low to detect statistically significant tax effects for the probability measures. In this study, Evans and Ringel also include indicators for clean indoor air laws in the models, and while they note that including these laws does not change the magnitudes of their tax effects, these analytic results are not reported.

Lein and Evans (2005) use birth certificate data from 1990-1997 to examine the effects on maternal smoking and birth weight of large cigarette tax increases in four states (AZ, IL, MA, MI). Birth weight is measured in grams and through the probability of being low birth weight. This study reveals that tax increase improves both of these outcomes, but the magnitudes are fairly small. For example, they conclude that a 29-cent increase in cigarette excise taxes nationwide would reduce the incidence of low birth weight babies by 0.45 percent, or 1,380 babies.

As noted, the tobacco control environment has changed much since this prior research was conducted. In this paper, we estimate a reduced form model of tobacco control policies on birth outcomes, extending the literature by examining cigarette taxes and prices inclusive of state sales taxes, and clean indoor air laws pertaining to private workplaces and restaurants. We examine birth weights, as has been done previously and gestational age, which has not been previously examined. We further extend the literature by using ordered probit models of different categories of birth weight and gestational weeks. These models allow the effects of cigarette policies to vary across different points in the distribution of birth weights and gestational weeks. This is an important refinement since the true effects of cigarette smoking on birth outcomes may occur at levels that are far from the mean values. Lastly, we estimate the

effects separately based on maternal age groupings. As our results indicate, younger mothers tend to behave differently with regards to smoking than older mothers.

METHODS

The empirical specification is based on the notion that smoking during pregnancy leads to worsened infant health outcomes. Therefore, the exogenous determinants of cigarette consumption, for example cigarette prices and regulations, can improve birth outcomes through decreased consumption. The general model is specified as follows:

1) $B_{ijt} = f(P_{jt}, X_{ijt}, T_t, S_j)$.

Equation (1) shows that birth outcomes (B) for child (i) in state (j) in year (t) is a function of the full price of cigarettes (P_{jt}), which includes monetary prices and clean indoor air laws, other mother and child specific determinants of birth outcomes (X_{ijt}), year effects (T_t) and state effects(S_j). Unobserved, omitted state-level factors may bias the coefficients on the included variables if the omitted factors are correlated with both infant outcomes and states' policies regarding smoking. For example, a state's population may have strong preferences against government regulation which could manifest itself in both lower cigarette taxes and weak public programs supporting maternal and infant health. Omitting such "sentiment" could result in biased estimators. We include state fixed effects to address this issue. Given that the time span of our data is short, unobserved state sentiment is likely to be fairly stable over time and therefore well captured by the state fixed effects. However, time-varying unobserved state sentiment may still remain in the error term.

The propensity for cigarette policies to affect birth outcomes depends on the effectiveness of the policies in reducing smoking by pregnant women. We therefore also estimate a demand

function for cigarettes (C) by pregnant women:

2) $C_{ijt} = f(P_{jt}, X_{ijt}, T_t, S_j)$.

In estimating equation 2, we consider both the probability of smoking and the frequency of cigarettes conditional on smoking as two separate dependent variables.

Both equations 1 and 2 are estimated separately for mothers in different age groups. Previous research has shown that the elasticity of demand for cigarettes varies by age for all individuals (Chaloupka and Warner 2000) and among pregnant women (Ringel and Evans 2001). Levy and Meara (2006) find that the 1998 tobacco MSA resulted in the largest reductions in smoking among teenagers. This is contrast to results from Ringel and Evans (2001) who show that women over age 30 tend to be more price sensitive than younger women. The difference in these studies may simply be that they look at very different time periods in tobacco control, with the Ringel and Evans study using older data from 1989-1995. Nonetheless, these findings suggest that pregnant mothers of different ages may respond differently to tobacco control policies. The age groups we consider are teenagers ages 11-19, young adults ages 20-24, women ages 25-34 and women 35 and older.

DATA

The Pregnancy Risk Assessment Monitoring System (PRAMS) is a state-level population-based surveillance system that assesses maternal behaviors, experiences, and insurance coverage before and during a woman's pregnancy and during her child's early infancy (Williams et al., 2003; Adams et al., 2003). PRAMS has been administered by the CDC Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion through cooperative agreements with participating states since 1987. In all participating states, new

mothers are randomly selected monthly from birth certificates by stratified systematic sampling with a random start. States over-sample women at risk for adverse pregnancy outcomes, variously defined by the states as women with low birth weight infants or of minority race/ethnicity. Sampled mothers are sent a self-administered questionnaire two to six months after delivery; after repeated mailings, non-respondents are contacted and interviewed by telephone. Annual state sample sizes range from 1300 to 3000 women; however, we limit the sample to women with singleton births only which slightly reduces the sample sizes. The PRAMS survey includes core and state-specific questions. Survey data are linked to selected birth certificate data and weighted for sample design, nonresponse, and noncoverage. Research files have been made available only when a 70 percent response rate is achieved for a given state and year. Survey weights are used in all analyses.

Measures of Infant Health

Birth certificates provide the birth weight and gestational age of the babies. Birth weight is expressed in grams, and gestational age is in completed weeks.[1] Initially, we treat these variables as continuous variables and estimate the models with survey weighted least squares. The results from this estimation will show a constant marginal effect of the cigarette policy variables on the health outcomes across the distribution of birth weights and gestation weeks. However, because the policies may have differential effects at different levels of birth weight and gestation weeks, we alternatively treat the outcomes as categorical variables and estimate the models with survey weighted ordered probit to allow the marginal effects to differ along the

[1] Gestational weeks in PRAMS are provided in two ways. One is a clinical estimate of gestational age from the birth certificate and the other is calculated from the birth date and date of last menses. In about two percent of the observations there are large differences between these measures. We used the baby's birth weight to help us reconcile the differences and use the proper gestational age. Details are available upon request.

distribution. For birth weight the categories are as follows: 1) very low birth weight defined as <1500 grams; 2) low birth weight defined as 1500 grams to 2499 grams; and 3) normal birth weight defined as 2500 grams and up. For gestation weeks, we consider four groupings: 1) 20-27 weeks; 2) 28-33 weeks; 3) 34-36 weeks; 4) 37 or more weeks. Survey weighted summary statistics for these and all other variables are presented in Table 1.

The monetary prices of cigarettes are represented by the real state excise tax on cigarettes and by the real state average price of cigarettes. Taxes come from *The Tax Burden on Tobacco* and our measure includes relevant local taxes. States such as Illinois that have localities with additional excise taxes were assigned a population-weighted average of the state tax and the state plus local tax. Note that New York City is treated as a separate geographical unit in the PRAMS data. This allows us to directly assign respondents in New York City the relevant taxes and policies, which are different from that of New York state. There is a tremendous amount of variation in the taxes during our sample period with twenty-two of the thirty states changing their tax rate at least once and ten states, changing their tax rate two or more times.

Cigarette prices also come from *The Tax Burden on Tobacco* and are inclusive of excise taxes. In order to measure the total monetary price paid by consumers, we also add the state general sales tax to the cigarette price, where applicable. There is variation in the way states apply general sales taxes to cigarettes. Some states add the sales tax on top of the excise taxes, others calculate the sales tax before the excise tax, and yet other states do not apply the sales taxes to cigarettes. We apply the relevant sales tax rate to the average price reported, and deflate the total by the CPI to generate real prices expressed in 2005 dollars.

The clean indoor air policies are state smoke free air laws banning the smoking of cigarettes in restaurants and private worksites. States with these laws may ban smoking

completely in a given area or may simply require designated smoking areas or designated smoking areas with separate ventilation, while other states had not implemented such laws during the study period. Previous research has found that the bans in private workplaces and restaurants have the largest effects (Evans et al. 1999; Tauras 2004). We include the laws for bans and restrictions on smoking in workplaces and restaurants separately in the models because of multicollinearity as states tend to pass similar laws simultaneously. Despite the short time span of our data, we do observe quite a few states changing these policies over time. Of the thirty areas represented in our sample, eight changed their smoke free air laws in private workplaces, and seven changed the smoke free air laws in restaurants.

Cigarette policies were matched to the PRAMS observations by state and time. For prices and taxes, we use the mean value that existed during the third trimester, that is, the three months before delivery. The clean indoor air laws were matched to previous year's regulation if delivery was in the first quarter of the year and the current year's regulation if delivery was in the last three quarters of year.

Maternal characteristics from the PRAMS data include maternal race/ethnicity, age, marital status, education, insurance (private, Medicaid, uninsured), child gender, prior births, and indicators for whether the mother had diabetes or hypertension. We also include indicators for WIC receipt and the trimester during which the mother began prenatal care. Because the CDC collaborates with individual state health departments to collect PRAMS data, there is considerable variation (and even exclusion) among states in the collection of certain variables, namely income; thus, this variable was omitted from our analysis. Income is highly correlated with both insurance status and education; hence, we believe that our model captures this

maternal characteristic with the inclusion of these two variables. We also include real state per capita income as an additional way of controlling for income.

Results

Table 1 shows the means of all variables by age groups. It is clear from this table that the birth outcomes, smoking behaviors and maternal characteristics differ dramatically across the age groups. For example, teenagers and young adults are much more likely to smoke during pregnancy with an estimated 18 percent reporting third-trimester smoking for both groups, as compared to the older groups that have smoking rates of around 10 percent. Teenage mothers on average also have lighter weight babies than the other groups, although average gestational age is fairly stable across the groups with a mean of 39 weeks. Teenage and young adult moms also live disproportionately in states with lower cigarette taxes and fewer bans on smoking than women in the older ages. That is, these women tend to live in the southern region of the US where cigarette policies are in general, less restrictive than other areas.

As for the maternal characteristics, teenage moms are much more likely than all other age groups to be black, unmarried, insured by Medicaid, to receive WIC and to delay prenatal care. The young adult group (ages 20-24) is similar to teenagers, and are also more likely than the older groups to be black, unmarried, have low education, insured by Medicaid, to receive WIC and to delay prenatal care.

Tables 2-5 contain the results from estimating Equation 1, the birth outcomes equation. Table 2 considers as the outcome variables birth weight in grams and gestational weeks of babies born to women ages 19 and under. The outcome variables in Table 2 are treated as continuous variables. We change this assumption in Table 3 and estimate ordered probit models of different

categories of birth weight and gestation weeks as described above. As in Table 2, Table 3 shows these results only for babies of teenage mothers. Tables 4 and 5 contain similar models for the older age groups.

The various columns of Table 2 include the estimated effects of real excise tax and real price of cigarettes alternatively. One of models includes the restrictions on smoking in private workplaces, and another model includes the restrictions on smoking in restaurants. The results in Columns 1 through 4 of Table 2 show that higher taxes and prices are effective in increasing the average birth weights of babies born to teenage mothers. Depending on the model under consideration, a one dollar increase in the real tax on cigarettes is associated with a 50 to 56 gram average increase in birth weight. Note that a one dollar increase in taxes is rather large, representing a 52 percent increase over the mean tax rate of $0.66 observed for our study states. The magnitude of the effect for a one dollar price increase is similar, ranging from 41 to 44 grams. By contrast, the restrictions on smoking in private workplaces and restaurants have little to no effect on average birth weights. The coefficients on workplace restrictions are always positive, but fail to achieve statistical significance at conventional levels.

Columns 5 through 8 of Table 2 show the results for gestation weeks. Here, prices and taxes have no influence on mean weeks, although the sign of the coefficients are all positive. However, workplace smoking restrictions and bans do appear to influence the average number of weeks, with the presence of a smoking restriction increasing the number of weeks by about a third of a week, and the presence of a smoking ban increasing the number of weeks by about a seventh (or one day). These are clearly very small effects, and the coefficients on the ban are only significant at levels just above 10 percent level.

In order to see if the cigarette policy variables affect the birth outcomes differently at various levels along the distribution for the teenage mothers, Table 3 shows the results of the categorical analyses. The results here are strikingly different. In Table 2, higher cigarette prices and taxes increase average birth weights, but the results in Table 3 show that these effects are not large enough to push birth weights into the different categories (<1500g , 1500-2500g, >2500g). In Table 2, higher prices and taxes have no effects on average gestation weeks, which is logical given that the mean is full term at almost 39 weeks. However, Table 3 reveals that taxes can influence different categories of gestation weeks: A one dollar increase in the excise tax decreases the probabilities of being in born at 20-27 weeks, 28-33 weeks and 34-36 weeks, while increasing the probability of being born at 37 or more weeks among teens. The magnitude is to increase the probability of being full term by 2.4 percentage points. Given that 90 percent of the sample is already full term, this is a sizeable effect. One caveat on this finding is that the results do not quite hold when including the price of cigarettes. The magnitude is a bit smaller at 1 percentage point, and the price coefficient is not statistically significant at conventional levels.

Tables 4 and 5 show select results for older mothers. These tables reveal that cigarette taxes, prices, and smoking restrictions have almost no influence on the birth outcomes of babies born to mothers in age groups 20-24, 25-34 and 35 and up. The only exception is that workplace restrictions may increase the gestational length of babies born to mothers ages 25-34 as shown in Table 5. Here, the probability of a full term birth increases by just over one percentage point from the restriction. However, this result is significant only at the 10 percent level.

The results of Tables 2-5 lead to the general conclusion that certain smoking-related policies are effective in improving birth outcomes of some babies. Of note, babies born to

teenage mothers may experience improved birth outcomes through states' imposition of higher cigarette taxes and workplace smoking laws.

In order to better understand the divergent birth outcome results based on the age of the mother, we examine demand equations for smoking by age group in Table 6. Doing so first serves as a check on the validity of the birth outcome results, and second, to see if smoking by new mothers of different age groups respond differently to cigarette policies. The dependent variable in Table 6 is the probability of self-reported smoking during the third trimester taken from the PRAMS data. Third trimester smoking is the most relevant time period since previous research has shown that the greatest effect on birth weight arises from smoking during this period, and birth weights of babies born to smokers who quit by the third trimester are similar to that of non-smokers (Ahlsten et al. 1993; Bernstein et al. 2005). One problem with the demand equations is the significant underreporting of smoking among these women. While we cannot know the degree to which women in PRAMS misreport, Dietz et al. (2011) find such underreporting to be large. Using the 1999–2006 National Health and Nutrition Examination Survey, Dietz et al. compare self-reported smoking rates to rates derived from serum cotinine concentration levels taken from blood samples, and find that 23 percent of pregnant smokers did not disclose their smoking. Given these potential problems, we treat the smoking results as suggestive, but not conclusive.

Probit models are used to estimate the demand equations, and marginal effects are presented in square brackets. The included variables are the same as those in the birth outcomes models. It is questionable as to whether some of the included variables, such as the timing of prenatal care or the prior birth variables, belong in the smoking equation, however, excluding these variables does not change the results. The results in Table 6 are not out of line with that of

the birth outcome models. Teenagers are the only age group whose smoking probability is responsive to higher cigarette taxes, and women ages 25-34 reduce smoking in response to higher prices and bans (rather than restrictions) on smoking in private workplaces. No policy affects the probability of smoking for any of the other age groups.

Conclusions

In recent years, many states and localities have imposed strong restrictions on smoking, either through higher taxes on cigarettes or laws regulating the locations in which a person can smoke. These policies were enacted, in part, with the goals of reducing smoking and improving health. Other studies have found reductions in smoking rates among the general population, primarily as a result of higher cigarette taxes, but the effects on new mothers and their babies is not yet fully known. In this paper, we examine and quantify the direct relationships between smoking policies, smoking rates, and birth outcomes using data from PRAMS. Our results show that despite the incentives inherent in the stricter cigarette policies, the effects of these policies are limited in respect to birth outcomes.

Teenage mothers account for a small proportion of births (about 13 percent in the PRAMS data) but their babies are born at lower birth weights and fewer weeks than babies born to older women. They are also highly represented among unintended births and as noted, teenage moms smoke at relatively high rates. Previous research has shown that teenagers in general are more responsive to tax changes than other groups, and it is not surprising that we observe changes in smoking behaviors and improvements in birth outcomes among pregnant teenagers as well. Our results confirm the findings of Levy and Meara (2006) who find that the tobacco MSA resulted in the largest reductions in smoking among teenage moms. Our results

are in slight contrast to that of Ringel and Evans (2001) who show that while all pregnant women are responsive to tax changes, women over age 30 tend to be more price sensitive. The difference in these results most likely stems from the changing tobacco control environment and differences in the proportions of women who smoked at the time of the studies.

The magnitudes of the effects on birth weight are small--a one dollar increase in the real tax on cigarettes is associated with a 50 to 56 gram average increase in birth weights. But this tax effect is not large enough to re-categorize a baby from very low to low birth weight, nor from low to normal weight. By contrast, the effect on gestational weeks is considerable. A one dollar increase in the real cigarette tax leads to a 2.4 percentage point increase in the probability of being born at 37 or more weeks, or an increase from 90 percent to 92.4 percent of babies born to teenage mothers. The same change in tax leads to a 0.2 percentage point decrease in the probability of being born at 20-27 weeks (a decrease from 1 percent to 0.8 percent of births), a 0.6 percentage point decrease in the probability of being born at 28-33 weeks (a decrease from 2 percent to 1.4 percent of births), and a 1.5 percentage point decrease in the probability of being born at 34-36 weeks (a decrease from 7 percent to 5.5 percent of births).

The other group responsive to a smoking policy is women ages 25-34. While these women account for almost half of all births, only 10 percent of them report smoking in the third trimester. The demand equations show a negative relationship between the probability of smoking and cigarette taxes, prices and workplace smoking bans, although the tax coefficient is statistically significant at about the 11 percent level. In the birth outcomes models, the workplace restrictions (rather than bans) are associated with a 1.1 percentage point increase in the probability of the birth being at 37 weeks or more. It is curious that the probability of smoking by women in only this age group is responsive to workplace smoking policies. One

simple reason may be that they are working (and exposed to the laws) at higher rates than the younger age groups. For example, estimates from the Bureau of Labor Statistics's Current Population Survey shows that in 2005, the last year of our data, approximately 64 percent of women ages 20-24 were employed, as compared to 70 percent for women ages 25-34.

A new 2010 Surgeon General's report on tobacco concludes with the recommendations that states and the federal government should continue to raise excise taxes on cigarettes and that states should ban smoking in all nonresidential indoor locations (USDHHS 2010). While there may be substantial health benefits to the general population from doing so, the results of our paper suggest that the benefits of such policies on the health of new babies are perhaps limited. We find that raising excise taxes and enforcing smoking laws improve birth outcomes but only among teenagers and women ages 25-34 years. Yet, our finding that policies affecting the general public can also affect the number of preterm deliveries averted has substantial public health importance since few interventions have been found to affect this outcome. Other interventions, such as implementing universal clinic-based, psychosocial smoking cessation interventions, have been estimated to have even smaller effects while costing more (Kim et al. 2009). Policy makers face a difficult task when it comes to reducing smoking among pregnant women, but broad-based policies that are successful in reducing smoking initiation and/or increasing quitting will go far in improving health endowments at birth.

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Table 1: Weighted Means

	Age < 20	Age 20-24	Age 25-34	Ages 35 and up
Smoked during third trimester	0.18	0.19	0.10	0.10
Birth weight in grams	3188.24	3275.11	3375.99	3378.05
Gestation weeks	38.80	38.88	38.93	38.76
Very low birth weight (<1500g)	0.01	0.01	0.01	0.01
Low birth weight (≥1500g and <2500g)	0.08	0.06	0.04	0.05
Normal birthweight (≥2500g)	0.91	0.93	0.95	0.94
Gestation weeks 20-27	0.01	0.00	0.00	0.00
Gestation weeks 28-33	0.02	0.02	0.01	0.02
Gestation weeks 34-36	0.06	0.06	0.05	0.06
Gestation weeks 37 and up	0.91	0.92	0.93	0.92
Real cigarette tax	0.66	0.69	0.78	0.88
Real cigarette price	4.06	4.10	4.23	4.37
Workplace smoking restriction	0.09	0.12	0.12	0.10
Workplace smoking ban	0.12	0.13	0.13	0.16
Restaurant smoking restriction	0.37	0.37	0.41	0.42
Restaurant smoking ban	0.13	0.15	0.15	0.18
Female baby	0.49	0.49	0.49	0.49
Mother black	0.29	0.21	0.12	0.11
Mother Hispanic	0.19	0.18	0.14	0.13
Mother Asian	0.02	0.02	0.05	0.05
Mother Native American	0.02	0.02	0.01	0.01
High school education	0.35	0.45	0.25	0.22
College education	0.06	0.30	0.63	0.68
Education unknown	0.01	0.01	0.01	0.01
Medicaid insurance	0.72	0.59	0.26	0.18
No insurance	0.08	0.08	0.06	0.06
Insurance missing	0.02	0.01	0.01	0.01
Real state income per capita (in 1000s)	16.55	16.60	17.06	17.49
Married	0.17	0.47	0.79	0.85
Marital status missing	0.0001	0.0005	0.0004	0.0004
Prior normal birth	0.12	0.38	0.51	0.60
Prior problem birth	0.04	0.10	0.10	0.11
Prior birth unknown	0.02	0.03	0.05	0.06
Diabetes	0.01	0.02	0.04	0.06
Hypertension	0.05	0.05	0.05	0.06
WIC	0.79	0.64	0.31	0.22
WIC missing	0.01	0.01	0.01	0.01
2^{nd} trimester prenatal care	0.25	0.17	0.10	0.09
3^{rd} trimester prenatal care	0.05	0.03	0.02	0.02
No prenatal care	0.01	0.01	0.01	0.01
Prenatal care missing	0.03	0.03	0.03	0.03
N obs	29,381	58,185	102,888	27,577

Table 2: Birth outcomes of Babies Born to Teenage Mothers (Age <20)

Dependent Variable:	Grams	Grams	Grams	Grams	Weeks	Weeks	Weeks	Weeks
Real cigarette tax	56.339	49.591			0.125	0.079		
	(1.95)	(1.72)			(1.14)	(0.73)		
Real cigarette price			44.014	41.067			0.087	0.068
			(1.99)	(1.86)			(1.08)	(0.86)
Workplace smoking restriction	49.895		46.219		0.312		0.303	
	(1.18)		(1.10)		(1.90)		(1.86)	
Workplace smoking ban	28.401		25.327		0.141		0.133	
	(1.26)		(1.13)		(1.63)		(1.55)	
Restaurant smoking restriction		-11.707		-9.065		-0.019		-0.015
		(-0.33)		(-0.25)		(-0.13)		(-0.10)
Restaurant smoking ban		3.197		2.795		0.021		0.021
		(0.07)		(0.06)		(0.11)		(0.11)
Female baby	-90.373	-90.397	-90.549	-90.544	0.004	0.005	0.004	0.004
	(-10.05)	(-10.05)	(-10.08)	(-10.08)	(0.13)	(0.13)	(0.12)	(0.13)
Mother black	-184.51	-184.68	-184.56	-184.72	-0.354	-0.355	-0.354	-0.355
	(-16.08)	(-16.09)	(-16.08)	(-16.10)	(-7.87)	(-7.89)	(-7.87)	(-7.89)
Mother Hispanic	-54.347	-54.044	-54.358	-54.072	-0.102	-0.100	-0.102	-0.100
	(-4.11)	(-4.09)	(-4.12)	(-4.09)	(-2.01)	(-1.97)	(-2.01)	(-1.97)
Mother Asian	-180.72	-181.02	-181.45	-181.67	-0.250	-0.252	-0.251	-0.253
	(-5.12)	(-5.13)	(-5.17)	(-5.18)	(-1.53)	(-1.55)	(-1.55)	(-1.55)
Mother Native American	66.454	66.153	66.713	66.441	0.095	0.095	0.096	0.095
	(2.42)	(2.41)	(2.44)	(2.43)	(1.01)	(1.01)	(1.02)	(1.01)
High school education	40.108	40.283	40.390	40.516	0.093	0.094	0.093	0.094
	(4.17)	(4.19)	(4.20)	(4.22)	(2.54)	(2.57)	(2.56)	(2.58)
College education	83.316	83.388	83.676	83.725	0.145	0.146	0.146	0.147
	(4.47)	(4.47)	(4.49)	(4.49)	(2.01)	(2.02)	(2.02)	(2.03)
Medicaid insurance	-8.553	-8.526	-8.645	-8.628	0.092	0.091	0.092	0.091
	(-0.64)	(-0.64)	(-0.65)	(-0.65)	(1.91)	(1.89)	(1.90)	(1.89)
No insurance	14.698	15.001	14.546	14.859	0.183	0.185	0.183	0.184

	(0.75)	(0.77)	(0.75)	(0.76)	(2.33)	(2.34)	(2.32)	(2.34)
Real state income per capita	21.626	24.466	24.444	27.466	0.010	0.027	0.013	0.033
	(1.15)	(1.31)	(1.28)	(1.45)	(0.13)	(0.36)	(0.17)	(0.43)
Married	51.012	50.678	51.059	50.757	0.100	0.098	0.100	0.098
	(4.16)	(4.13)	(4.16)	(4.14)	(2.19)	(2.16)	(2.20)	(2.16)
Prior normal birth	97.076	97.040	96.800	96.791	-0.001	-0.001	-0.001	-0.001
	(7.03)	(7.03)	(7.01)	(7.01)	(-0.01)	(-0.01)	(-0.02)	(-0.02)
Prior problem birth	-177.66	-177.66	-177.75	-177.76	-0.969	-0.969	-0.969	-0.969
	(-7.44)	(-7.45)	(-7.46)	(-7.47)	(-10.50)	(-10.51)	(-10.49)	(-10.51)
Diabetes	126.527	127.358	125.089	125.922	-0.005	0.001	-0.008	-0.001
	(2.36)	(2.39)	(2.34)	(2.37)	(-0.03)	(0.01)	(-0.05)	(-0.01)
Hypertension	-240.73	-240.81	-241.11	-241.13	-1.089	-1.089	-1.090	-1.089
	(-11.30)	(-11.30)	(-11.31)	(-11.31)	(-13.54)	(-13.53)	(-13.55)	(-13.54)
WIC	30.059	30.033	30.127	30.112	0.118	0.119	0.119	0.119
	(2.53)	(2.53)	(2.54)	(2.53)	(2.55)	(2.56)	(2.56)	(2.56)
2^{nd} trimester prenatal care	-0.459	-0.610	-0.329	-0.436	0.089	0.088	0.089	0.089
	(-0.04)	(-0.06)	(-0.03)	(-0.04)	(2.14)	(2.13)	(2.15)	(2.14)
3^{rd} trimester prenatal care	45.050	44.880	46.335	46.052	0.231	0.229	0.233	0.231
	(2.18)	(2.18)	(2.25)	(2.24)	(2.82)	(2.81)	(2.85)	(2.83)
No prenatal care	-229.96	-229.89	-230.91	-230.63	-1.318	-1.315	-1.320	-1.316
	(-4.58)	(-4.57)	(-4.59)	(-4.57)	(-5.09)	(-5.08)	(-5.09)	(-5.08)

Notes: T-statistics in parentheses, intercept not shown. Models also include indicator variables for missing values on education, insurance status, marital status, prenatal care, prior births and WIC. N=29,381.

Table 3: Ordered Probits of Birth Weight and Gestational Weeks, Teenage Mothers

Panel A: Dep. Variable: Birth weight categories

	Cigarette tax	Workplace smoking restriction	Workplace smoking ban	Cigarette price	Workplace smoking restriction	Workplace smoking ban
Coefficient	0.025	0.080	0.026	0.024	0.079	0.025
z-statistic	(0.36)	(0.89)	(0.57)	(0.50)	(0.89)	(0.56)
Change in probability of very low birth weight	*-0.0005* *(-0.360)*	*-0.0014* *(-0.960)*	*-0.0005* *(-0.580)*	*-0.0005* *(-0.500)*	*-0.0014* *(-0.950)*	*-0.0005* *(-0.580)*
Change in probability of low birth weight	*-0.0025* *(-0.360)*	*-0.0076* *(-0.930)*	*-0.0025* *(-0.580)*	*-0.0023* *(-0.500)*	*-0.0076* *(-0.930)*	*-0.0025* *(-0.570)*
Change in probability of normal birth weight	*0.0029* *(0.360)*	*0.0091* *(0.940)*	*0.0030* *(0.580)*	*0.0028* *(0.500)*	*0.0090* *(0.930)*	*0.0029* *(0.570)*

Panel B: Dep. Variable: Gestational Weeks Categories

	Cigarette tax	Workplace smoking restriction	Workplace smoking ban	Cigarette price	Workplace smoking restriction	Workplace smoking ban
Coefficient	0.172	0.086	0.032	0.089	0.072	0.018
z-statistic	(1.99)	(0.82)	(0.52)	(1.41)	(0.69)	(0.30)
Change in probability of weeks 20-27	*-0.002* *(-1.92)*	*-0.001* *(-0.87)*	*-0.0004* *(-0.54)*	*-0.001* *(-1.38)*	*-0.001* *(-0.73)*	*-0.0002* *(-0.31)*
Change in probability of weeks 28-33	*-0.006* *(-1.94)*	*-0.003* *(-0.86)*	*-0.001* *(-0.53)*	*-0.003* *(-1.39)*	*-0.003* *(-0.72)*	*-0.001* *(-0.31)*
Change in probability of weeks 34-36	*-0.015* *(-1.97)*	*-0.007* *(-0.85)*	*-0.003* *(-0.53)*	*-0.008* *(-1.40)*	*-0.006* *(-0.71)*	*-0.002* *(-0.31)*
Change in probability of weeks 37 and up	*0.024* *(1.96)*	*0.011* *(0.85)*	*0.004* *(0.53)*	*0.012* *(1.40)*	*0.010* *(0.72)*	*0.003* *(0.31)*

Notes: T-statistics in parentheses, intercept not shown. Marginal effects in italics. Models also include all variables shown in Table 2. N=29,381

Table 4: Birth Outcome of Babies Born to Mothers Ages 20-24, 25-34, and 35 and up

	Dependent Variable: Grams						Dependent Variable: Gestational Weeks					
	Age 20-24		Age 25-34		Age 35 and up		Age 20-24		Age 25-34		Age 35 and up	
Real cigarette tax	4.205		-6.883		2.059		0.055		0.026		0.107	
	(0.22)		(-0.54)		(0.08)		(0.79)		(0.61)		(1.29)	
Real cigarette price		4.785		8.949		-8.338		0.009		0.046		0.077
		(0.32)		(0.92)		(-0.43)		(0.16)		(1.40)		(1.25)
Workplace smoking restriction	25.127	24.998	-11.348	-9.700	-24.688	-25.453	-0.063	-0.071	0.041	0.040	-0.101	-0.115
	(1.10)	(1.10)	(-0.62)	(-0.53)	(-0.65)	(-0.67)	(-0.83)	(-0.93)	(0.68)	(0.67)	(-0.89)	(-1.03)
Workplace smoking ban	-12.493	-12.537	-5.850	-4.034	12.712	11.916	0.0057	-0.002	0.060	0.060	0.042	0.0289
	(-0.69)	(-0.70)	(-0.47)	(-0.33)	(0.51)	(0.48)	(0.09)	(-0.02)	(1.43)	(1.44)	(0.51)	(0.36)
Female baby	-114.677	-114.667	-122.398	-122.344	-107.495	-107.443	0.011	0.011	0.020	0.020	0.066	0.066
	(-17.92)	(-17.92)	(-26.44)	(-26.43)	(-11.16)	(-11.16)	(0.49)	(0.49)	(1.27)	(1.28)	(2.10)	(2.10)
Mother black	-167.989	-167.997	-186.158	-186.251	-190.442	-190.407	-0.425	-0.425	-0.399	-0.399	-0.498	-0.497
	(-18.53)	(-18.53)	(-23.65)	(-23.66)	(-11.23)	(-11.23)	(-12.72)	(-12.73)	(-14.40)	(-14.41)	(-8.40)	(-8.40)
Mother Hispanic	-1.280	-1.285	-2.370	-2.333	16.675	16.657	0.057	0.057	0.031	0.031	-0.043	-0.044
	(-0.12)	(-0.12)	(-0.28)	(-0.27)	(0.85)	(0.85)	(1.57)	(1.57)	(1.10)	(1.10)	(-0.64)	(-0.65)
Mother Asian	-118.560	-118.589	-184.352	-184.399	-143.434	-143.515	-0.036	-0.035	-0.190	-0.190	-0.260	-0.260
	(-5.79)	(-5.79)	(-17.32)	(-17.33)	(-7.16)	(-7.16)	(-0.47)	(-0.47)	(-5.30)	(-5.31)	(-4.12)	(-4.13)
Mother Native American	63.514	63.525	47.748	47.595	-29.672	-29.705	-0.006	-0.006	-0.023	-0.023	-0.204	-0.203
	(2.95)	(2.96)	(2.69)	(2.68)	(-0.70)	(-0.70)	(-0.10)	(-0.09)	(-0.39)	(-0.39)	(-1.63)	(-1.63)
High school education	46.697	46.696	22.392	22.405	9.719	9.481	0.087	0.087	-0.046	-0.046	-0.092	-0.091
	(5.33)	(5.33)	(2.29)	(2.30)	(0.42)	(0.41)	(2.77)	(2.78)	(-1.40)	(-1.40)	(-1.18)	(-1.17)
College education	81.523	81.521	56.773	56.740	58.631	58.467	0.130	0.131	-0.020	-0.020	0.040	0.041
	(8.14)	(8.14)	(5.78)	(5.78)	(2.59)	(2.58)	(3.69)	(3.69)	(-0.61)	(-0.62)	(0.54)	(0.56)
Medicaid insurance	-36.856	-36.891	-49.307	-49.322	-57.655	-57.674	-0.041	-0.041	-0.046	-0.046	-0.013	-0.013
	(-4.24)	(-4.24)	(-6.56)	(-6.57)	(-3.31)	(-3.32)	(-1.34)	(-1.34)	(-1.82)	(-1.83)	(-0.23)	(-0.23)
No insurance	-5.356	-5.369	6.800	6.746	59.130	59.054	0.050	0.050	0.137	0.137	0.157	0.158
	(-0.40)	(-0.40)	(0.64)	(0.64)	(2.59)	(2.59)	(1.03)	(1.04)	(3.97)	(3.96)	(2.19)	(2.20)
Real state income per capita	0.499	1.090	0.680	5.006	-4.025	-7.656	-0.045	-0.052	-0.009	0.001	0.101	0.105

	(0.04)	(0.08)	(0.07)	(0.50)	(-0.19)	(-0.36)	(-0.91)	(-1.02)	(-0.25)	(0.03)	(1.46)	(1.49)
Married	40.773	40.759	51.051	51.093	90.152	90.116	0.056	0.056	0.067	0.067	0.120	0.119
	(5.36)	(5.36)	(7.18)	(7.19)	(5.63)	(5.63)	(2.11)	(2.11)	(2.79)	(2.79)	(2.20)	(2.19)
Prior normal birth	93.759	93.772	144.352	144.448	185.520	185.570	0.046	0.046	0.070	0.070	0.108	0.107
	(13.05)	(13.06)	(27.25)	(27.27)	(15.32)	(15.33)	(1.84)	(1.84)	(3.95)	(3.97)	(2.60)	(2.58)
Prior problem birth	-189.175	-189.156	-140.117	-140.034	-80.338	-80.181	-0.976	-0.976	-0.918	-0.918	-0.750	-0.751
	(-16.04)	(-16.04)	(-15.77)	(-15.76)	(-4.00)	(-4.00)	(-20.62)	(-20.61)	(-29.05)	(-29.04)	(-10.99)	(-11.00)
Diabetes	169.129	169.155	91.603	91.595	59.732	59.852	-0.250	-0.250	-0.392	-0.392	-0.334	-0.334
	(6.43)	(6.43)	(6.18)	(6.18)	(2.75)	(2.75)	(-2.70)	(-2.70)	(-9.38)	(-9.38)	(-5.13)	(-5.13)
Hypertension	-239.192	-239.182	-246.229	-246.037	-309.803	-309.861	-1.072	-1.072	-1.100	-1.099	-1.223	-1.223
	(-14.76)	(-14.76)	(-20.46)	(-20.45)	(-14.26)	(-14.27)	(-17.62)	(-17.62)	(-26.61)	(-26.60)	(-16.29)	(-16.29)
WIC	10.123	10.131	0.738	0.685	30.893	30.832	0.073	0.073	0.055	0.055	0.115	0.115
	(1.32)	(1.32)	(0.11)	(0.10)	(1.96)	(1.96)	(2.63)	(2.63)	(2.38)	(2.37)	(2.21)	(2.21)
2nd trimester prenatal care	5.629	5.692	-10.696	-10.637	-30.098	-30.193	0.145	0.144	0.155	0.155	0.051	0.052
	(0.67)	(0.67)	(-1.29)	(-1.28)	(-1.70)	(-1.71)	(4.61)	(4.60)	(5.30)	(5.31)	(0.85)	(0.86)
3rd trimester prenatal care	-1.072	-1.067	13.753	13.958	-18.724	-18.848	0.238	0.238	0.331	0.332	0.011	0.012
	(-0.06)	(-0.06)	(0.76)	(0.77)	(-0.47)	(-0.47)	(3.26)	(3.25)	(4.87)	(4.88)	(0.07)	(0.08)
No prenatal care	-136.619	-136.628	-167.993	-169.047	-232.566	-232.002	-0.652	-0.652	-0.612	-0.616	-0.922	-0.926
	(-3.72)	(-3.72)	(-4.60)	(-4.63)	(-3.64)	(-3.64)	(-4.68)	(-4.68)	(-5.03)	(-5.06)	(-3.77)	(-3.78)
N obs	58,185	58,185	102,888	102,888	27,577	27,577	58,185	58,185	102,888	102,888	27,577	27,577

Notes: T-statistics in parentheses, intercept not shown. Models also include indicator variables for missing values on education, insurance status, marital status, prenatal care, prior births and WIC.

Table 5: Ordered Probits of Birth Weight and Gestational Weeks, Mothers ages 25-34

Panel A: Dependent Variable=Birth weight categories

	Cigarette tax	Workplace smoking restriction	Workplace smoking ban	Cigarette price	Workplace smoking restriction	Workplace smoking ban
Coefficient	0.003	-0.061	0.025	0.006	-0.061	0.025
z-statistic	(0.08)	(-1.44)	(0.98)	(0.25)	(-1.44)	(1.00)
Change in probability of very low birth weight	*-0.00005*	*0.001*	*-0.0005*	*-0.0001*	*0.001*	*-0.0005*
	(-0.08)	*(1.36)*	*(-1.01)*	*(-0.25)*	*(1.36)*	*(-1.02)*
Change in probability of low birth weight	*-0.0002*	*0.005*	*-0.002*	*-0.0005*	*0.005*	*-0.002*
	(-0.08)	*(1.39)*	*(-1.00)*	*(-0.25)*	*(1.39)*	*(-1.01)*
Change in probability of normal birth weight	*0.0003*	*-0.007*	*0.003*	*0.0006*	*-0.007*	*0.003*
	(0.08)	*(-1.38)*	*(1.00)*	*(0.25)*	*(-1.38)*	*(1.01)*

Panel B: Dependent Variable= Gestational Weeks Categories

	Cigarette tax	Workplace smoking restriction	Workplace smoking ban	Cigarette price	Workplace smoking restriction	Workplace smoking ban
Coefficient	0.0267	0.092	0.050	0.045	0.093	0.051
z-statistic	(0.62)	(1.63)	(1.26)	(1.43)	(1.64)	(1.28)
Change in probability of weeks 20-27	*-0.0002*	*-0.001*	*-0.0004*	*-0.0004*	*-0.001*	*-0.0004*
	(-0.62)	*(-1.80)*	*(-1.32)*	*(-1.43)*	*(-1.81)*	*(-1.35)*
Change in probability of weeks 28-33	*-0.001*	*-0.002*	*-0.001*	*-0.001*	*-0.002*	*-0.001*
	(-0.62)	*(-1.75)*	*(-1.31)*	*(-1.43)*	*(-1.76)*	*(-1.33)*
Change in probability of weeks 34-36	*-0.002*	*-0.008*	*-0.004*	*-0.004*	*-0.008*	*-0.004*
	(-0.62)	*(-1.70)*	*(-1.29)*	*(-1.43)*	*(-1.71)*	*(-1.31)*
Change in probability of weeks 37 and up	*0.003*	*0.011*	*0.006*	*0.006*	*0.011*	*0.006*
	(0.62)	*(1.72)*	*(1.29)*	*(1.43)*	*(1.73)*	*(1.32)*

Notes: Marginal effects and associated z statistics in italics. Models include all variables shown in Table 2. N=102,888

Table 6: Probability of Smoking During Third Trimester

	Age < 20	Age 20-24	Age 25-34	Age 35 and up	Age < 20	Age 20-24	Age 25-34	Age 35 and up
Real cigarette tax	-0.173	-0.057	-0.084	-0.015				
	(-1.69)	(-0.88)	(-1.61)	(-0.16)				
	[-0.036]	*[-0.011]*	*[-0.014]*	*[-0.003]*				
Real cigarette price					-0.092	-0.042	-0.098	0.021
					(-1.14)	(-0.82)	(-2.45)	(0.29)
					[-0.019]	*[-0.008]*	*[-0.016]*	*[0.004]*
Workplace smoking	-0.064	-0.006	0.022	0.089	-0.048	-0.001	0.028	0.092
restriction	(-0.47)	(-0.07)	(0.28)	(0.52)	(-0.35)	(-0.02)	(0.35)	(0.53)
	[-0.013]	*[-0.001]*	*[0.004]*	*[0.018]*	*[-0.010]*	*[-0.0002]*	*[0.005]*	*[0.018]*
Workplace smoking ban	-0.058	-0.023	-0.126	0.042	-0.040	-0.019	-0.117	0.045
	(-0.68)	(-0.37)	(-2.33)	(0.44)	(-0.47)	(-0.29)	(-2.18)	(0.48)
	[-0.012]	*[-0.004]*	*[-0.020]*	*[0.008]*	*[-0.008]*	*[-0.003]*	*[-0.018]*	*[0.009]*
N obs	28,644	57,062	101,487	27,146	28,644	57,062	101,487	27,146

Notes: T-statistics in parentheses, marginal effects in brackets, intercept not shown. Models include all variables shown in Table 2.