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Effects of pregnancy and birth on smoking and drinking behaviors: a comparative study between men and women

Eiji Yamamura*
Seinan Gakuin University

Yoshiro Tsutsui¶
Konan University

Abstract

Using panel data obtained from monthly surveys for 3 years, we examined how the effects of life events such as marriage, pregnancy, and birth on smoking and drinking behaviors differ between men and women. Key findings were: (1) marriage did not reduce smoking for men or women. (2) Both men and women's consumption of alcohol and cigarettes were lower during pregnancy and after childbirth than before pregnancy. The degree of the effects of pregnancy for women was approximately 5–7 times larger than that for men. (3) Giving birth reduced consumption by roughly 11 cigarettes per day for women and two cigarettes per day for men compared with before pregnancy. These results indicate that a predicted negative externality to infants from their parents' drinking and smoking behaviors gives parents an incentive to avoid consuming alcohol and tobacco.

Keywords: Externality, Passive smoking, Pregnancy
JEL Classification: I12, D03

*Corresponding author. Department of Economics, Seinan Gakuin University, 6-2-92 Nishijin, Sawara-ku Fukuoka 814-8511, Japan. *E-mail address*: yamaei@seinan-gu.ac.jp Tel: +81 92 823 4543; Fax: +81 92 823 2506
¶Faculty of Economics, Konan University, 8-9-1 Okamoto, Higashinadaku, Kobe 658-8501 Japan, e-mail tsutsui@center.konan-u.ac.jp

Highlights

We use panel data obtained from monthly surveys for 3 years.

Effects of pregnancy and birth on smoking and drinking behaviors are examined.

Alcohol and cigarette consumption were lower during pregnancy and after childbirth.

The degree of effects for women was larger than that for men.

1. Introduction

It is evident that maternal smoking and drinking have detrimental effects on unborn babies and, later, parents' cigarette consumption causes children to be subjected to passive smoking, which hampers children's health (e.g., Abrevaya 2006; Adda and Cornaglia, 2010; Frijters et al., 2011)[1]. Maternal smoking during pregnancy increases the likelihood of admission to neonatal intensive care units, which leads to an increase in neonatal costs (Adams 2002). A number of works indicate that policies such as cigarette taxes and smoking bans are effective to reduce these costs. This is because such policies reduce the externality of maternal smoking, which has been found to improve the health status of newborn babies (e.g., Evans and Ringel 1999; Colman et al, 2003; Sen and Perard 2011; Lien and Evans 2005; Bhardwaj et al., 2014). In addition to smoking, parental drinking behavior is thought to hamper the health of newborns (e.g., Russell et al., 1996; Huizink and Mudder, 2006; O'Connor and Whaley 2007) and can lead to fatal deaths (e.g., Kline et al., 1980; Barreca and Page 2015). If parents place importance on their children's health, they will voluntarily attempt to quit drinking and smoking to reduce the negative externality. Researchers have also investigated how pregnancy is related to women's cigarette consumption (e.g., Evans and Ringel 1999; Bradford 2003).

The externality of smoking harms not only children's health but also that of other family members. The husband's smoking is considered to cause a negative externality from the negative effect of passive smoking on his wife. Furthermore, the effect during pregnancy on the mother of passive smoking owing to the father's smoking is detrimental to the birth outcomes of the infant (Goel et al., 2004; Qui et al., 2014). However, the classical work of Wakefield et al. (1998) found that men were largely unaware that their own smoking could pose a specific risk to the fetus, thus they were unlikely to quit smoking. Similarly, Blackburn et al. (2005) did not find that pregnancy led fathers to quit smoking and argued that improving knowledge levels among fathers about the effects of passive smoking on infants may encourage more attempts to stop smoking[2]. Today, more people appear to have become better informed about the negative effects of passive and parental

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[1] Parental and maternal cigarette consumption lead to sudden infant death syndrome (DiFranza and Lwe 1995), low birth weight (Olds et al, 1994, Chomiz et al, 1995; Walker et al., 2009; Yan 2013), extremely small size for gestational age (Fantuzzi et al., 2008), and hinders child neurodevelopment (Wehby et al., 2011).

[2] As observed in a study in Sweden during the 1980s, women with low education levels and who were not living with the father of their infant had increased risk of smoking before pregnancy and continued smoking in early pregnancy (Cnattingius and Thorslund 1990). More recently in Australia, a study found that smoking cessation even during pregnancy was not a priority for most women, partly because smoking reduced stress and provided opportunities for relaxation (Wood 2008).

smoking on the fetus. Our paper deals with this issue in modern Japanese society where men's views about their role in the family have changed[3]. A published government report states that "about 80% of men in their 20s to 40s with children are involved in housekeeping, childcare, and family care in some way, and their participation rate is higher than the approximately 40% of men of the same generation without children and 55% of all men including other generations" (Gender Equality Bureau Cabinet Office of Japan 2009, p.15). This indicates that men's participation in child rearing is promoted and has become widespread in modern society. Therefore, it is valuable to explore how the wife's pregnancy changes smoking behavior in the husband[4]. In contrast to smoking, drinking does not have an externality to surrounding people, such as family members, unless the person who is consuming alcohol behaves in a questionable manner toward them. To put it in another way, drinking does not automatically and unintentionally harm children's health; there is no "passive drinking effect" on infants. Differences in the influence of smoking and drinking seem to affect parents' quitting behavior during pregnancy and during the period of child care[5].

Pregnancy and infant care are thought to influence drinking and smoking behaviors in both men and women. However, little is known about how the effects of life events on parental behaviors differ, according to the types of externality from smoking and drinking, and also according to their sex.. We used panel data collected using monthly surveys to compare the effects of life events on drinking and smoking behaviors between man and woman. We found that men's and women's consumption of cigarettes and alcohol were reduced during pregnancy period and after having a child, compared with before pregnancy. We propose testable hypotheses in Section 2. An overview of the data and empirical method is presented in Section 3. Section 4 presents and discusses the major findings. Section 5 concludes the paper.

2. Hypotheses

According to the classical work of Smith (1853, p.321), in reference to men in the family, "the members of his own family, those who usually live in the same house with him, his parents, his children...are naturally the objects of his warmest affections. They are naturally and usually the

[3] The rate of men who support the view that "a husband should go to work, a wife should stay home and take care of the family" is lower among younger generations (Gender Equality Bureau Cabinet Office of Japan 2009).

[4] An individual's own current smoking and their partner's past smoking are statistically independent, which indicates positive assortative matching in marriage over smoking in the marriage market (Clark and Etile, 2006).

[5] Smoking and drinking have a complementary relationship in Japan (Yamamura 2011). Hence, there is a possibility that quitting smoking during pregnancy also reduces alcohol consumption (Wehby et al., 2013).

persons upon whose happiness or misery his conduct must have the greatest influence" (1853, p. 321). Naturally, parents' decision making depends not only on their own desire but also on the happiness of family members. According to the definition of Becker (1981), "altruistic" means that the father's (or mother's) utility function positively depends on the well-being of their children.

The framework of Becker can be applied to parents' drinking and smoking behaviors. Even if parents enjoy smoking and drinking, externalities from alcohol and tobacco consumption hinder their children's health. Therefore, we assume that goods *K* (alcohol or cigarettes) directly increase parents' utility, but indirectly decrease their utility through the negative externality on their children's health. If parents are effectively altruistic, a certain amount of consumption of goods *K* decreases parents' utility when the decrease in utility from externality caused by consumption of goods *K* outweighs the increase in utility from the consumption of *K*. If parents adopt a sufficiently serious attitude about the externality on their children's well-being, having a child leads parents to reduce the consumption of goods *K*.

Many studies have reported the negative externalities from women consuming cigarettes (e.g., Wehby et al., 2011; Yan 2013) and alcohol (e.g., O'Connor and Whaley 2007; Barreca and Page 2015). Men's smoking during their wife's pregnancy exerts a negative influence on the birth outcomes of the infant (Goel et al., 2004; Qui et al., 2014). Accordingly, we proposed the following hypothesis:

Hypothesis 1: Pregnancy reduces not only women's alcohol and cigarette consumption but also men's cigarette consumption.

Parents' cigarette consumption inevitably leads to their infant being subjected to passive smoking, which harms the child's health (e.g., Abrevaya 2006; Adda and Cornaglia, 2010; Frijters et al., 2011). Hence, we proposed a second hypothesis:

Hypothesis 2: Compared with the period before pregnancy, the birth of a child reduces not only women's cigarette consumption but also that of men.

Although men in Japan are more inclined to participate in infant care than ever before (Gender Equality Bureau Cabinet Office of Japan 2009), women are likely to be more involved with bringing up children. Especially during the breastfeeding period directly after giving birth, mothers have to breastfeed and care for their infant. Even in a state of only slight intoxication, a mother cannot appropriately cope with any incident that may occur with her baby. In short, mothers must keep an eye on their infant at all times, so they cannot afford to drink alcohol. In other words, the opportunity cost of drinking is very high because a mother's drinking could possibly cause her baby to be subjected to life-threatening situations while in her care. Thus, if

there is no negative externality from passive smoking, drinking is avoided by women after giving birth. Hence, we proposed a third hypothesis.

Hypotheses 3: Compared with the period before being pregnant, giving birth reduces women's consumption of alcohol.

If there is no externality from the consuming goods *K*, the existence of other family members is unlikely to change one's consumption behavior. Different from cigarette consumption, a father's consumption of alcohol does not generate externality on his baby in periods of his spouse's pregnancy and infant care. Here, we postulate a fourth hypothesis.

Hypotheses 4: Neither pregnancy nor childbirth change men's drinking behavior.

3. Data and methods

3.1. Data

We aimed to examine how life events such as marriage, pregnancy, and having a child influence consumption behaviors. To this end, the targets of the survey were limited to men and women who were married or planned to get married in the future. Men and women who planned to have a child in the future were included as survey participants Participant ages were between 17 and 51 years. We gathered individual-level panel data from all regions of Japan via internet surveys. More specifically, we commissioned a market research company, INTAGE Communications Inc., to conduct the research under the direction of the authors. Monthly surveys were carried out for 3 years, from March 2012 to March 2015, a total of 37 surveys during this period. A total 1,049 individuals participated in the first survey. However, during the 3-year survey period, other individuals were included, for a total 1,855 participants during the survey period. Surveys were conducted monthly; however, some participants failed to respond and others dropped out of the surveys, giving a response rate of 60.1%. Finally, the sample size was reduced to 24,418 completed surveys. Questionnaires included items querying individual socioeconomic characteristics such as age, sex, household income, educational level, and work status. In addition, every month participants were asked what events had occurred during the previous month such as marriage, pregnancy (one's own or a partner's pregnancy), or birth of a baby. Such events often occurred frequently during the survey period. The monthly panel surveys allowed us to compare behaviors before and after these events for the same individual. We also obtained detailed information about other events, such as experiences of annoyance, during each month. This enabled us to investigate temporary effects concerning relationships with a partner and in daily life. The quantities of alcohol and cigarettes consumed within a month were also queried, which enabled us to explore how life events influenced drinking and smoking behaviors.

Table 1 presents definitions of the variables used in this research and their mean values, based

on the men and women sampled. The mean value for DRINKING (consumption of alcohol measured by the number of cans of beer per day) was about 0.77 for men and 0.34 for women, which suggests that men drank alcohol more frequently than women. The mean value of SMOKING (cigarette consumption per day) was 4.77 and 1.14 for men and women, respectively. Hence, men were more inclined to drink and smoke than women. PREG values were 0.10 for men and 0.11 for women, suggesting that about 10% of the sample had a pregnancy during the survey period. After the pregnancy period, participants experienced the birth of a baby if miscarriage or abortion did not occur. Values for BABY were 0.37 for men and 0.31 for women, implying that over 30% of the sample was caring for an infant during the survey period. MARRI values were 0.52 for men and 0.48 for women, indicating that around 50% of the sample had a spouse. The values for the variable ANNOY were slightly larger for women than for men. These values possibly differed according to each individual, even if they experienced the same type of event; hence, these were subjective values about perceptions of daily life and differences in these values are thought to reflect, to a certain extent, differences in perception between men and women.

Figures 1 and 2 compare consumption using the variables DRINKING and SMOKING, respectively, between men and women. Figure 1 shows that around 40% (60%) of male (female) respondents did not drink and this group accounted for the highest share; this tendency was more clearly observed for SMOKING. Figure 2 shows that nonsmokers accounted for roughly 70% of men and 90% of women. Generally, men are more likely to drink and smoke than women, although quite a few men in our sample hardly drank and smoked.

Based on our sample of men, Table 2 presents the mean values of DRINKING and SMOKING between the periods of the wife's pregnancy (PREG=1), the period of having a baby (BABY=1), and reference periods (PREG=0 and BABY=0). We performed a mean difference test between the pregnancy and reference periods, and the infant care and reference periods. Consumption of alcohol and cigarettes were lower during the period of pregnancy than the reference periods. The difference for alcohol consumption was statistically significant whereas that for cigarette smoking was not significant. Consumption of alcohol and cigarettes were lower after having a baby than in the reference periods, and were statistically significant. All in all, pregnancy and child rearing reduced the consumption of alcohol and cigarettes. The results among our sample of women (Table 3) suggest that consumption of alcohol and cigarettes were lower during pregnancy and while caring for a baby than during the reference periods. What is more, these differences were statistically significant. This is in line with our hypotheses in Section 2. Further, considering Tables 2 and 3 together indicates that the difference in mean values for women is far larger than that for men. This implies that the effect of pregnancy and having a baby on drinking and smoking behaviors for women is larger than for men. However, Tables 2 and 3 did not control for unobservable individual characteristics and various control variables. To control for these factors,

regression estimations were conducted and the results are reported in the following sections.

3.2. Methods

To assess the effects of pregnancy and giving birth on drinking and smoking behaviors, the estimated function takes the form:

$$\text{SMOKING (or DRINKING)}_{it} = \alpha_0 + \alpha_1 \text{PREG}_{it} + \alpha_2 \text{BABY}_{it} + \alpha_3 \text{MARRI}_{it} + \alpha_4 \text{INCOM}_{it} + \alpha_5 \text{ANNOY}_{it} + \alpha_6 \text{AGE}_{it} + \alpha_7 \text{AGESQ}_{it} + \alpha_8 \text{NOWORK}_{it} + \alpha_9 \text{PARTWORK}_{it} + e_i + m_t + u_{it},$$

where SMOKING (or DRINKING)$_{it}$ represent the dependent variables for individuals i and survey time points t, and α represents the marginal effect of independent variables. As explained in the previous section, surveys were conducted every month for 3 years and dummy variables for the survey period were included to control for m, which includes factors that commonly affected respondents at t[6]. Further, unobservable individual characteristics, e_i, were controlled for by using the panel data analysis. Furthermore, both an upper limit (5 for DRINKING and 41 for SMOKING) and lower limit (0 for DRINKING and SMOKING) were included. Therefore, the two-limit Tobit model was appropriate for estimation, and the random effects Tobit model was used.

The key independent variables were PREG to capture the period of pregnancy and BABY to capture the infant care period. Thus, PREG is exclusive to BABY, and the reference period for PREG and BABY is the period before the pregnancy. Further, subsamples of men and women were used for estimation, to compare the effects of PREG and BABY between men and women. For women, from hypothesis 1 proposed in Section 2, negative values for PREG and BABY would be expected when DRINKING and SMOKING are dependent variables. On the other hand, for men, hypothesis 2 leads us to predict that PREG and BABY would have a negative sign when SMOKING is the dependent variable.

Apart from PREG and BABY, life events concerning family structure was controlled for by MARRI. If there is a peer effect from the spouse, the effect would depend on the smoking and drinking behavior of the respondent's spouse. However, information about spouses' smoking and drinking behavior was not available owing to limited data. If relationships with other people generate stress, people are likely to drink or smoke. ANNOY is predicted to have a positive sign for estimation of SMOKING and DRINKING. Economic and demographic conditions were controlled by INCOM and AGE. Drinking and smoking behavior are possibly nonlinear to age and so the square of age (AGESQ) was included. Work-related stress has been found to increase

[6] Surveys were conducted from March 2012 to March 2015. Hence, there were 37 surveys so 36 time-period dummy variables were included.

alcohol and cigarette consumption (Ayyagari and Sindelar 2010; Goel 2014). NOWORK and PARTWORK were dummy variables for work status.

4. Results and Discussion

Estimation results of the random Tobit model are reported in Table 4. Columns (1) and (2) indicate the results when DRINKING was the dependent variable, whereas columns (3) and (4) show the results when SMOKING was the dependent variable. The sample was divided into men and women; the results for the men's sample are presented in columns (1) and (3) and those of the women's sample are in columns (2) and (4). In each table, time point dummies are included but not reported.

As demonstrated in Figures 1 and 2, the percentages for zero consumption of alcohol and tobacco are sufficiently high, which inevitably influences the estimation results. So as to take this into consideration, the random Tobit model was preferred. As presented in Table 4, left-censored observations (at the lower bound, as were zero consumption observations) were 2677, 5843, 8204, and 10400 in columns (1), (2), (3), and (4), respectively. In comparison, right-censored observations, which were at the upper bound, were small but controlled in the estimation. Table 4 shows that the coefficients of PREG and BABY have a negative sign and are statistically significant in all columns. Therefore, pregnancy and infant care give not only women but also men an incentive to reduce their alcohol and cigarette consumption during pregnancy and over the course of baby care. As a whole, this supports hypotheses 1 and 2, and 3. On the other hand, both infant care and giving birth served to deter men's drinking behavior, which is inconsistent with hypothesis 4. We interpret this to mean that drinking does not allow men to care for their pregnant wives and increases the burden of housework on wives, which in turn exerts a negative influence on the fetus. What is more, childbirth generally increases the burden for women owing to the division of labor within a household. In cases where the husband drinks alcohol, he is less likely to help with infant care, which in turn increases the burden on the wife. Consequently, the woman's stress from baby rearing leads to marital quarreling or, in extreme cases, infant abuse or neglect. Therefore, men have an incentive to refrain from drinking while their wives are pregnant and caring for a child.

Regarding the absolute values of coefficients, values for women are generally larger than those for men, implying that women have a stronger incentive to avoid drinking and smoking than men. Absolute values of PREG for women were roughly six times higher than those for men when the dependent variable was DRINKING as well as SMOKING. This might reflect that women are more directly influenced by pregnancy and are more inclined to care for the baby than men.

We examined the results of key variables more closely. For estimation of DRINKING based on the men's sample, the absolute value of the coefficient for PREG was 0.15, which is nearly the

same as that for BABY. On the other hand, for the sample of women, the absolute value of the coefficient for PREG was 0.96, which is 0.17 points larger than that for BABY. That is, the effect of BABY is smaller than that of PREG for women. The reason for these different effects of PREG and BABY for women might be that a woman's drinking directly influences her fetus but does not directly influence her newborn. The effect of men's drinking on the fetus and infant is also indirect. However, the coefficient of BABY for women is larger than those of PREG and BABY for men. In our interpretation, more time is generally spent by women caring for a baby than by men, so women's drinking has a larger effect on the baby. As a consequence, women have a greater incentive to reduce their consumption of alcohol. When it comes to men, the absolute value of the coefficient for PREG is nearly the same as that for BABY. Men demonstrated motivation to reduce their alcohol consumption, probably out of concern for their wives who bear a larger burden during periods of pregnancy and infant care. Hence, there was not much difference between PREG and BABY. Consequently, the gender gap in reduction of alcohol consumption during the pregnancy period became smaller during the infant care period, overall.

Regarding estimation of SMOKING, the absolute value of PREG was 2.07 for men and 11.2 for women, which is interpreted as suggesting that cigarette consumption was reduced by 2.07 cigarettes per day for men and by 11.2 per day for women during the period of pregnancy compared with before pregnancy. However, the absolute value of BABY increased to 2.85 for men, while it was 11.2 for women, nearly the same as that of PREG. Differences in coefficient values between PREG and BABY for men is explained by the direct negative passive smoking effect on the baby, which is larger than the indirect negative effect on the fetus because it is protected by the mother's body. That is, the negative externality from passive smoking strongly prevented men from smoking so as to care for their baby's health. On the other hand, women's smoking has a direct negative effect on her fetus during pregnancy and on the baby during the period of infant care. Hence, the gap between sexes in the reduction of cigarette consumption during the child care period was smaller than that during the pregnancy period. Considering these estimation results together, it became evident that pregnancy has a larger effect on women's drinking behavior than does baby care whereas caring for an infant has a larger effect on men's smoking behavior than does pregnancy because of the negative externality of passive smoking.

As for control variables, MARRI was not statistically significant for three of four estimation results. Concerning the exceptional case in column (2), MARRI had a negative sign, which is statistically significant. We interpret this to mean that women become busy after marriage because of increased household work, which serves to deter women from drinking. As a whole, respondents did not consider the externality for their spouse. Accordingly, not only women but also men put greater importance on their baby's health than on that of their spouse. This can be interpreted in various ways. First, from the results of MARRI, we assert that parents adopt

altruism behavior toward their children but not toward their spouse. Second, the externality from consumption on family members varied according to age. That is, the negative effect on adults is thought to be distinctly smaller than that on a fetus or baby, such that getting married is less likely to influence consuming behaviors. There was a significantly positive sign of ANNOY for women when DRINKING was the dependent variable. However, for men, ANNOY did not yield a significant sign in any columns. Therefore, compared with men, women are more likely to feel stress from annoyance in their daily lives, which could lead to drinking.

Our observations support our h*ypotheses 1 and 2,* which leads us to assert that men change their consuming behaviors by attaching importance to the externalities after family life events, such as pregnancy and the birth of a child. This reflects that men in Japan have come to participate in child rearing.

Existing studies have not found that pregnancy causes men to quit smoking (Cnattingius and Thorslund, 1990; Blackburn et al., 2005). There are two possible reasons for this. First, men do not take into account the outcomes of their smoking and drinking behaviors. Second, men do not have sufficient knowledge about the externality on children, although they pay a lot of attention to their children's health. In modern Japanese society, fathers tend to take part in child rearing and appear to be informed about the negative externalities of smoking and drinking. Under this condition, we were able to test whether fathers reduced their alcohol and cigarette consumption in an attempt to care for their children's health.

5. Conclusion

A number of research works have shown that parents' smoking and drinking have a detrimental effect on their children's health. If parents love their children and the children's health condition is related to parents' utility, parents' consumption levels of alcohol and cigarettes are determined by considering the outcome of negative externality from smoking and drinking behaviors on their children.

We found the effect of passive smoking varied according to the circumstances of the baby. The effect of smoking on a fetus seems to differ from the effect on a newborn. More precisely, the degree of the negative externality depends on the period, such as pregnancy or infant care periods, and on the parent's sex. Based on our original panel data from respondents surveyed monthly for 3 years, how pregnancy and childbirth changed alcohol and cigarette consumption was explored by comparing results between men and women. Using a random Tobit model, we found that consumption of alcohol and cigarettes was lower among both men and women during pregnancy and baby rearing periods than before pregnancy. These results indicate that a predicted negative externality to babies from their parents' drinking and smoking behavior gives parents an incentive to control these behaviors. Further, the degree of reduction of men's cigarette

consumption after having a baby is larger than that during his partner's pregnancy period. The findings of this paper have made it evident that not only mothers but also fathers become more careful about the health of their children and change their behaviors by considering the externalities of smoking and drinking.

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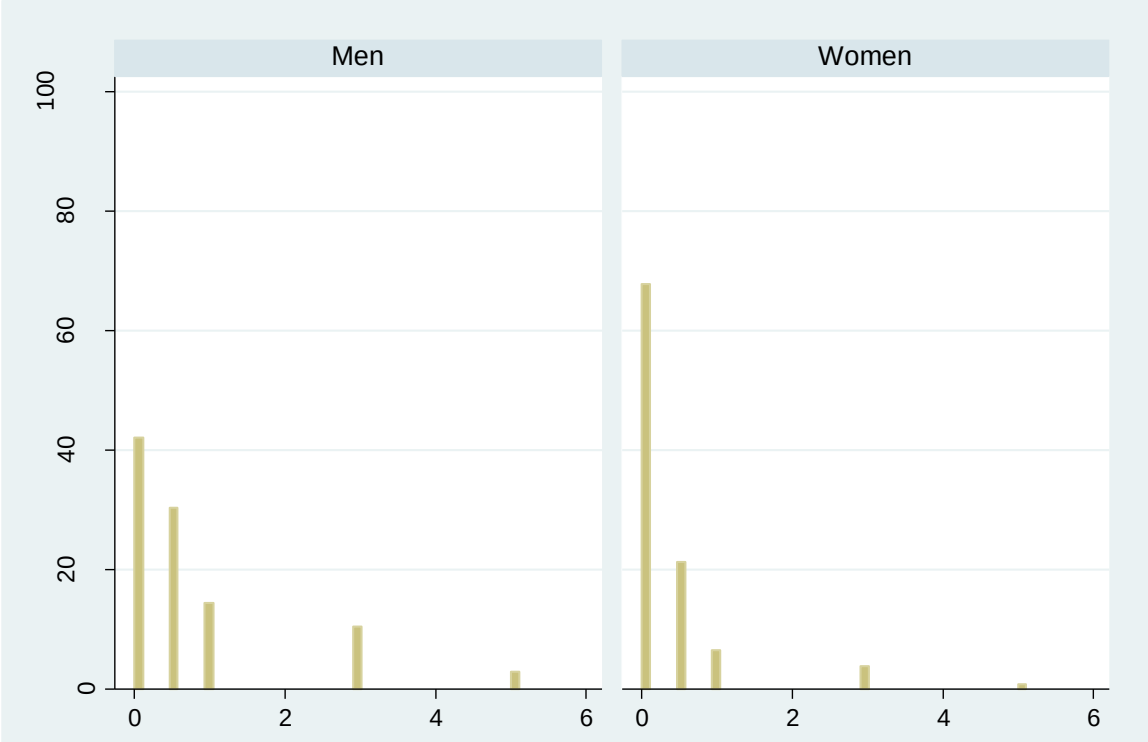
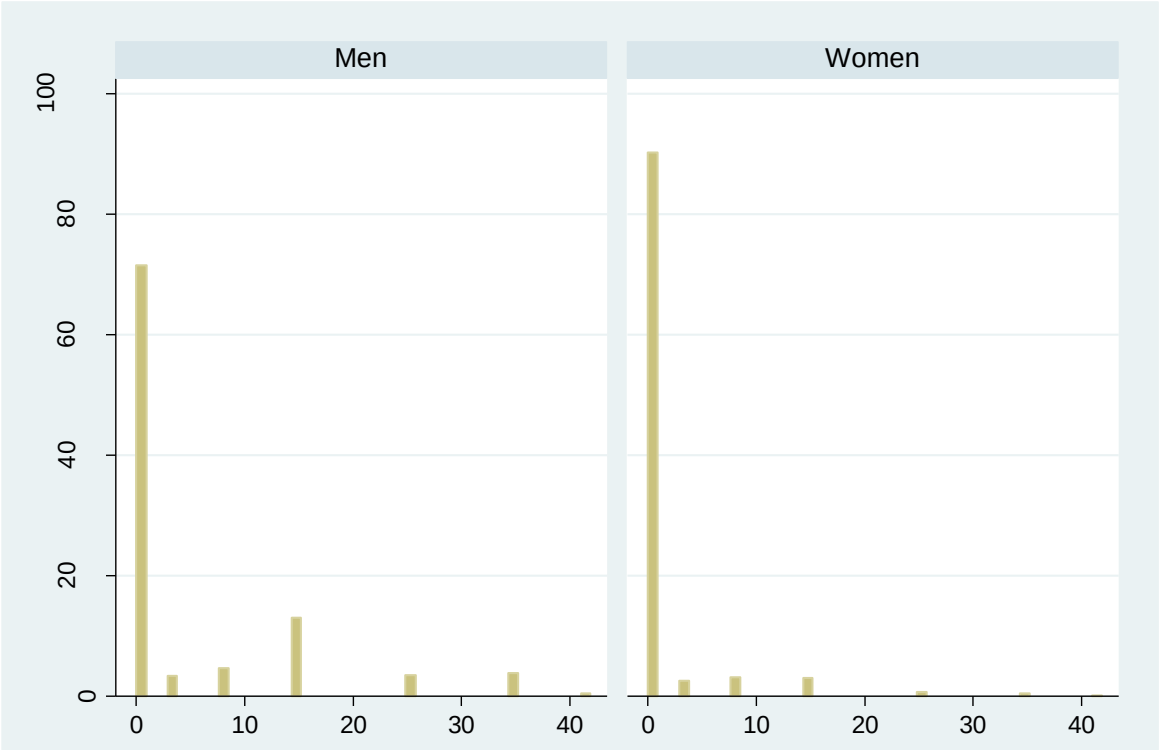
Figure 1. Distribution of the variable DRINKING



Note: As indicated in Table 1, DRINKING is defined as daily consumption of alcohol, which is converted into a number of canned beers consumed (i.e., the number of canned beers (350 ml) respondents drank per day 0–5 (or more). For the question about monthly consumption of alcohol, respondents are asked to select one of five choices: (1) not at all, (2) hardly drink (once or twice a month), (3) sometimes (several times a week), (4) one canned beer a day, (5) three canned beers a day, (6) over five canned beers a day. We converted respondents' answers to daily beers consumed.

Figure 2. Distribution of the variable SMOKING



Note: As is indicated in Table 1, SMOKING is defined as the number of cigarettes respondents smoked per day (0–41 or more). For the question about monthly consumption of cigarettes, respondents were asked to select one of nine choices: (1) not at all, (2) hardly smoke, (3) sometimes smoke, (4) 1–5 cigarettes per day, (5) 6–10 cigarettes per day, (6) 11–20 cigarettes per day, (7) 21–30 cigarettes per day, (8) 31–40 cigarettes per day, (9) 41 or more cigarettes per day. We converted respondents' answers to daily cigarette consumption.

Table 1. Definitions of variables

	Definition	Men	Women
DRINKING	Daily consumption of alcohol, which is converted into number of canned beer. Number of canned beer (350 ml) respondent drinks per day. 0 -5 (5 or more).	0.77	0.34
SMOKING	Number of cigarettes respondent smoked per day. 0 (not at all)-41 (equal or more than 41 cigarettes).	4.77	1.14
PREG	It is 1 when respondent (or respondent's wife) is pregnant, otherwise 0. Pregnancy term which was predicted based on respondent child's born months (9 months before birth).	0.10	0.11
BABY	It is 1 after respondent's (or respondent's wife's) baby was born, otherwise 0.	0.37	0.31
MARRI	It is 1 if respondent was married, otherwise 0.	0.52	0.48
INCOM	Monthly household income (10 thousands yean)	32	26
ANNOY	Respondent has been annoyed within a month. 0 (not at all)-5 (absolutely annoyed).	3.29	3.37
AGE	Age	35.9	31.9
AGESQ	Square of age	----	----
NOWORK	It is 1 if respondent does not work, otherwise 0.	0.02	0.02
PARTWORK	It is 1 if respondent is part-time worker, otherwise 0.	0.02	0.12

Table 2. Mean difference test of drinking and smoking for men

	His partner was pregnant (PREG=1)	He had a baby (BABY=1)	Reference group (His partner is not pregnant and he does not have baby)	t-value]	t-value
				(1) vs (3)	(2) vs (3)
	(1)	(2)	(3)		
DRINKING	0.65	0.74	0.81	4.59 ***	3.40 ***
SMOKING	4.95	4.32	5.05	0.36	4.22 ***
Observations	1,192	4,542	6,632		

*** indicates significance at the 5% and 1% levels, respectively. PREG=1 indicates that the respondent's wife was pregnant.

Table 3. Mean difference test of drinking and smoking for women in the sample

	She was pregnant (PREG=1) (1)	She had a baby (BABY=1) (2)	Reference group (His partner is not pregnant and he does not have baby) (3)	t-value] (1) vs (3)	t-value (2) vs (3)
DRINKING	0.07	0.15	0.49	4.44 ***	22.6 ***
SMOKING	0.49	0.49	1.62	8.26***	12.7 ***
Observations	1,371	3,709	6,973		

*** indicates significance at the 5% and 1% levels, respectively. PREG=1 indicates that the respondent was pregnant.

Table 4. Random effects Tobit estimation

	(1) DRINKING Men	(2) DRINKING Women	(3) SMOKING Men	(4) SMOKING Women
PREG	−0.15*** (−2.78)	−0.96*** (−17.8)	−2.07*** (−2.57)	−11.2*** (−8.50)
BABY	−0.14** (−2.47)	−0.79*** (−13.8)	−2.85*** (−3.33)	−11.0*** (−8.14)
MARRI	0.07 (1.62)	−0.18*** (−4.66)	−0.21 (−0.34)	0.54 (0.61)
INCOM	−0.34 (−0.86)	1.09*** (2.80)	−8.97 (−1.57)	0.31 (0.03)
ANNOY	−0.005 (−0.59)	0.02*** (2.83)	−0.003 (−0.03)	−0.02 (−0.12)
AGE	0.001 (0.03)	−0.05 (−1.34)	1.73*** (2.81)	1.34** (2.18)
AGESQ	0.0002 (0.38)	0.001 (1.65)	−0.02*** (−2.65)	−0.02** (−2.16)
NOWORK	−0.08 (−0.69)	−0.08 (−0.88)	4.88*** (2.87)	1.20 (0.58)
PARTWORK	−0.12 (−0.86)	−0.20 (−0.36)	−6.33*** (−2.67)	−3.21*** (−2.66)
Wald chi-square	72.5	567.7	84.9	151.8
Number of groups	826	1,029	826	1,029
Left-censored obs	2,677	5,843	8,204	10,400
Right-censored obs	357	86	47	9
Observations	12,365	12,053	12,365	12,053

Note: Numbers in parentheses are z-values. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively. Numbers without parentheses are coefficients of each variable. The coefficient of *INCOM* is multiplied by 1000 for convenience of interpretation. Constant and time of the survey are included, but their results are not reported.