Reduction of working time: Does it lead to a healthy lifestyle?

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ABSTRACT

I examine whether working hours have a causal effect on the health behaviors of workers. In assessing the causal relationship, I estimate fixed-effects instrument variable models by using exogenous variation in adopting a reduced workweek in South Korea as an instrument for work hours. The estimation results reveal that shortening work hours induces individuals to exercise regularly and decreases the likelihood of smoking, with impacts more pronounced for heavy smokers. While a work-hour reduction substantially increases the probability of drinking participation, it decreases the likelihood of frequent and daily drinking habits. In addition, the effect of a work-hour reduction on regular exercise is salient among females and older groups, and on smoking behaviors, more pronounced among males and the middle-aged groups.

JEL categories: I10, J80, C20
Keywords: Working time, Health behavior, South Korea

I. Introduction

Working time has long been recognized as strongly linked with the health and well-being of working people, and has therefore received attention from both researchers and policy makers (Bosch, 1999; Caruso, 2006). For example, long working hours are shown to be associated with cardiovascular disease, high risk of diabetes, stress and poor mental health, and work–family conflicts (Caruso, 2006; Nakanishi et al., 2001; Sparks et al., 1997; Virtanen et al., 2012).

What are the effects of work hours on the workers' lifestyle habits that affect their health? Long working hours are associated with ill health and unhealthy behaviors such as smoking, heavy alcohol consumption, and lack of physical exercise (Maruyama and Morimoto, 1996; Siegrist and Rödel, 2006; Taris et al., 2011), which are important contributors to largely preventable chronic diseases. Studies have shown that workers compensate for overtime-related job stress by consuming more fatty and sweet food (Oliver and Wardle, 1999), and that long working time acts as potential barriers to regular exercise by limiting the time available for non-work activity (Schneider and Becker, 2005). Furthermore, job stress is believed to induce smokers to smoke more and tempt those who quit smoking to relapse, because smoking is supposed to ease stress (Green and Johnson, 1990).

A related strand of research in economics emphasizes the role of unemployment rate, another measure of economic activity, in influencing the health behaviors of individuals. Earlier studies used state-level data to examine the relationship between local unemployment rates and the drinking and alcohol-related behaviors of workers (Ruhm, 1995; Freeman, 1999). To eliminate the unobserved local economic factors spuriously correlated with health-risk behaviors, these studies used fixed-effects models and found that alcohol consumption and drunk driving increase with economic activity. Several recent studies use individual-level data and exploit the within-person variations in health behaviors to obtain mixed results.

While some researchers find a positive relationship between economic activity and alcohol consumption, physical inactivity, and smoking behaviors (Ruhm, 2000; 2005; Ruhm and Black, 2002), others find evidence of counter cyclicality of drinking (Dee, 2001) or little evidence of the cyclicality of drinking, physical activity, and smoking behaviors (Charles and DeCicca, 2008).

Despite considerable evidence linking working time, economic activity, and health-risk behaviors, the causal effects of work hours are still unclear. In the absence of experimental evidence, it is very difficult to assess whether workers' health behaviors are affected by working time, or whether unobserved third factors such as attitudes toward smoking or drinking influence both working time and health-risk behaviors. Another possibility is reverse causality—health habits and lifestyle choices influence employment and working time.

The goal of this paper is to investigate whether working hours have causal effects on workers' health behaviors. In assessing the causal relationship, I employ within-individual estimators (or individual fixed-effect models) to eliminate the unobserved factors that yield biased estimates. More importantly, I carry out estimation with fixed-effects models, using exogenous variation in policy adoption as an instrument for work hours. Specifically, I exploit the timing of implementing the legislated workweek reduction in South Korea based on establishment size. South Korea experienced a dramatic reduction in working hours during the past decade following introduction of a 40-hour workweek standard, providing a good source of variation in an individual's work time. The 40-hour workweek limit was gradually adopted depending on establishment size from 2004 to 2011. In order to increase robustness of the identification strategy in instrumenting work hours, I use the size data of the establishment at which each individual worked the year prior to the initial observation. This fixed-effects instrumental-variables (FE-IV) estimator provides consistent results on the causal effects of work hours, addressing both individual heterogeneity and endogenous changes in working time.

The estimation results suggest that a reduction in work hours leads to individuals' healthy lifestyles. Reducing work hours induces individuals to exercise regularly. A reduction in work hours also decreases the likelihood of smoking, with impacts somewhat more pronounced for heavy smokers. While work-hour reduction substantially increases the probability of drinking participation, it decreases the likelihood of frequent and daily drinking habits. In addition, the results from a population subgroup analysis indicate that the effect of work-hour reduction on regular exercise is salient among females and older groups, and on smoking behaviors, more pronounced among males and the middle-aged groups.

The rest of the paper is organized as follows. Section II describes the background and implementation process of the new statutory working hours in South Korea. Section III presents and discusses the FE-IV process and analyzes the causal effects of work hours on health-related behaviors. Section IV describes the data used in empirical analysis. Section V discusses the findings, and section VI concludes this paper.

II. Institutional background

The working hours of South Korea have been among the highest in the industrialized world. However, South Korea has experienced the fastest decline in working hours among the OECD countries over the past decade—the average annual working hours per worker decreased from 2,512 in 2000 to 2,090 in 2011 (see figure 1). This dramatic reduction in working hours is mainly due to the stepwise introduction of a 40-hour workweek standard from 2004.

The standard workweek is defined in the Labor Standard Act (LSA), and was set at 44 hours per week for all workplaces by 1991. In the wake of the 1997 Asian economic crisis, reducing the statutory workweek was discussed as a way to tackle massive unemployment.

However, as the economy recovered at a quick pace, the motivation for workweek reduction shifted toward reconciling work–family responsibilities and improving the quality of life (Lee et al., 2007). In October 2000, the Economic and Social Development Commission, a tripartite presidential advisory board consisting of labor, management, and government representatives, arrived at a consensus in principle on the gradual adoption of a 40-hour workweek (or a five-day workweek) standard, without deteriorating the quality of working life. In late 2002, a bill to revise the LSA was submitted by the government, and it finally passed Congress in August 2003.

The new LSA mandated adopting the 40-hour workweek system stepwise based on firm size in order to allow employers the time needed to reduce their working hours. First, the establishments with 1000 employees or more were brought under the purview of the new legislative limit from July 2004. Subsequently, the new limit covered the establishments with 300 employees or more from July 2005, 100 employees or more from July 2006, and 50 employees or more from July 2007; the establishments with more than 20 employees were covered from July 2008. Most recently, that is, in July 2011, the limit was extended to all establishments with five or more workers.

Under the new law, the hours worked beyond the statutory standard should be shown as overtime and compensated for. The maximum overtime is 12 hours per week, but can be extended to 16 hours during the transition period—the first three years after adopting the 40-hour workweek. The overtime premium is 50% of the normal wage rate, but during the transition period, it is 25% for the first four hours of overtime.

III. Empirical framework

In this paper, I examine three common health-related behaviors—regular physical exercise, smoking, and drinking. The econometric specification on which I base my health-related behavior analysis can be shown as

$$Y_{it} = \beta h_{it} + X_{it}\Gamma + \alpha_i + \varepsilon_{it} \quad (1)$$

where Y represents the health-related behavior of individual i in year t, h measures an individual's actual workweek, X is a vector of the individual's characteristics and local environment, ε is an idiosyncratic error term, and α represents the individual fixed effects.

The individual fixed-effect estimates (within-individual estimates) of an impact of work hours on health-related behaviors (β^{FE}) compare the weekly hours worked across time at the individual level and relate these to the changes in health behaviors, again at the individual level. While this strategy can eliminate any unobserved time-invariant factors, for example, attitudes toward smoking and alcohol use, which are also related to work-hour decisions, certain time-varying factors absorbed in the error term can influence both health behaviors and work intensity. For example, one's spouse may develop an alcohol addiction, and a situation may arise wherein the individual may have to reduce working hours and even quit smoking or drinking for spousal care. A within estimator cannot account for these unobserved changes in family environment that affect work and lifestyle. In addition, an attenuation bias that may arise from measurement error in working hours is likely to be more exaggerated in fixed-effects estimates.

To account for unobserved and potentially endogenous changes in work hours and mitigate any bias from measurement error, I carry out a within-two-stage least-squares (within-2SLS) analysis by using exogenous variation in policy adoption as an instrument for work hours. Specifically, I exploit the timing of implementing the legislated workweek reduction in South Korea. Since the reduced workweek was adopted stepwise depending on establishment size from 2004 to 2011, to instrument for weekly hours worked in t, I create a dummy indicating whether the 40-hour workweek is expected to be mandated in the individuals' workplaces. More importantly, I create this workweek dummy variable based on size of establishment at which the respondents worked in 2000 or 1999, which is *before* the initial observation period and much before the new law was passed by Congress in 2003. The variations in this predicted dummy variable are driven solely by the differences in the schedule of law implementation, and not by the differences in the individuals' job change patterns or employment behaviors. This FE-IV procedure yields consistent estimates ($\beta^{FE\text{-}IV}$) on the causal effects of work hours on health behaviors, addressing both individual heterogeneity and endogenous changes in working time based on individual selection.

IV. Data

A. Sample selection

The data used in this paper are from the Korean Labor and Income Panel Study (KLIPS). The KLIPS is a longitudinal survey of urban households in Korea, modeled after a set of successful panel studies, such as the Panel Study of Income Dynamics (PSID) of the United States and the Socio-Economic Panel Study (SEOP) of Germany. The KLIPS was conducted in 1998 by the Korea Labor Institute (KLI), who surveyed a nationally representative sample of 5,000 urban households and their members aged 15 years or older. Interviews have been conducted annually ever since. The data I use are from the 2001 and 2005–2010 interviews, when data on the respondents' health behaviors were collected.

The KLIPS collects detailed information on individuals, such as their employment, hours worked, earnings, education, and other demographic and household characteristics. In addition to a survey on labor market activities and income, a supplemental survey on the respondents' health behaviors was conducted in 2001. Four years later, in 2005, a set of questions on health-related behaviors was added to the regular survey questionnaire.

For the purpose of this study, I focus on the workers who were paid workers in the initial period, because the goal of this study is to examine the link between working hours and the lifestyle of the general working population covered by the LSA. Additionally, I exclude all cases that do not contribute to any usable observations on workweek or establishment size. The resulting sample consists of 4,540 respondents, which provide 23,276 person-year observations—5.1 years per individual on average.

B. Variables

Figure 2 shows the distribution of the workers' actual workweek. The distribution for workers in the establishments under the new legislative limit shows that the lion share of about 28% actually worked for 40 hours a week. While a large portion of workers not covered by the new limit also actually worked for 40 hours a week, the weekly working hours are seen spread over longer hours (44, 50, and 60) relative to those who are covered by the new law. Table 1 presents the trends in actual work hours over the observation period. As shown in the table, the average workweek decreases over a ten-year period (from 52.1 to 49.8). The average actual workweek for those not covered by the new law, however, barely changes over time, implying that the decrease in work hours is largely due to increases in the percentage of workers covered by the 40-hour workweek standard—from 20.1% in 2005 to 61.9% in 2010.

Now, I consider the dependent variables and other covariates in the analysis. Table 2 provides the summary statistics of the variables considered in the health behavior analysis. From the answers to questions on lifestyle, I create a dichotomous variable indicating "regular exercise" against irregular or no exercise. About a quarter of observations indicate exercises on a regular basis. With regard to smoking, I classify the respondents as "current smokers" if they smoke regularly. Because the survey collects data on the amount of daily consumption of cigarettes, I create another dichotomous variable indicating consumption of at least 20 cigarettes per day (heavy smokers). Slightly more than one-third (35.7%) of observations are current smokers, and one-third of them (12.3% of the total) heavy smokers.

Table 2 indicates that more than 60% of observations in the sample drink regularly, and about 35% (56% among drinkers) drink rather frequently, that is, at least five times a month. Slightly fewer than 3% of the total observations drink every day. As a composite indicator for unhealthy lifestyle, I define “multiple health risks” for persons with two or more risk factors among physical inactivity, current smoking, and drinking at least five times a month.

The personal characteristics included in the analysis are age dummies (ages 18–30, 31–55, and 56–65) and dummy variables of marital status (married, divorced/separated, and widowed; never married is the omitted category). More than 70% of respondents in the sample period are in the prime age group (31–55), and about the same percentage of individuals are married. While the variables for respondents’ gender and education levels—both time-invariant in my data—are omitted owing to within-individual estimator limitations, about 41% of observations are female, with a large proportion (41.1%) high school graduates. In an augmented specification, as a control for respondents’ financial and labor market environments, I include total household income and the unemployment rate in the respondents’ current region of residence. These characteristics can be correlated with the respondents’ employment decisions and lifestyle via their macroeconomic conditions and income effects (Ruhm, 2005; Ruhm and Black, 2002). Consistent with recent statistics showing the unemployment rate in Korea stable and among the lowest in the OECD countries in the past decade (OECD, 2012), the average unemployment rate is quite low (3.5%) during the observation period.

V. Estimation results

A. Basic specifications

In this section, I discuss the results of the health behavior models shown in section III. Although the proposed estimation strategy uses variations in policy adoption as an instrumental variable, I rather consider a naïve model that accounts for only the time-invariant fixed factors that affect both work hours and health-related behaviors. Table 3 presents the predicted effects of a one-hour workweek increase on physical activity, smoking, drinking, and multiple health risks in a fixed-effects model.

Specification 1 in Table 3 excludes both household income and the local unemployment rate. As the table shows, health behaviors are significantly associated with working time, although the magnitudes are quite small: a one-hour drop in workweek increases the probability of regular exercise by 0.13 percentage points (0.5%) and reduces the probability of smoking by 0.03 percentage points (0.09%). Decline in tobacco use is more pronounced among the heavy smokers who consume at least 20 cigarettes a day. Interestingly, reduction in work hours has different effects on drinking participation and the frequency of drinking: while a one-hour reduction in workweek increases the probability of drinking by 0.07 percentage points (0.12%), the same change decreases the probability of drinking at least five times a month by 0.30% and that of daily drinking by 0.41%. Since moderate alcohol use has been linked to health benefits (Gaziano et al., 1993), these results suggest that a reduced workweek may induce healthy drinking habits. Finally, multiple risks also decline as the working hours decrease by 0.11 points (0.28%).

Specification 2 in Table 3 presents the augmented model estimates that consider controls for the income and labor market environments. The predicted effects are virtually the same as in specification 1 except for drinking participation. The positive effect of a workweek reduction on drink participation decreases from 0.734 to 0.499 (by 31%), suggesting some contribution of income and labor market conditions to linking working hours and drink use.

To account for any possible endogeneity of changes in working time and control for measurement error, I estimate the FE-IV model discussed in section III. Before presenting those instrumental variable estimates, I briefly discuss the results of the first stage-equation for workweek; the estimates are presented in Table A1. The estimated coefficients of the exogenous dummy variable indicating whether a 40-hour workweek will be mandated in the individuals' initial workplaces implies that the new legislative limit certainly has a significant effect and decreases the actual workweek by 3.1 hours (or by 2.5 hours when household income and unemployment rate are included). The *F*-statistics for the instrumental variable given at the bottom of the table is 57.7 (or 35.9), which is well in excess of 10, the criterion of Staiger and Stock (1997) to avoid weak instrument.

Table 4 shows the predicted effect of a one-hour increase in workweek on the health behaviors estimated from FE-IV models. In all outcomes of specifications 1 and 2, the estimated work-hour impacts are substantially larger compared to the estimates in Table 3, probably suggesting that the naïve fixed-effects model underestimates the influences of work hours on health behaviors. For instance, as specification 2 shows, a one-hour drop in workweek is predicted to increase the probability of regular exercise by 0.61 percentage points (2.4%), which is five times larger than the Table 3 estimate. The same reduction in work hours reduces the likelihood of smoking in general by 0.93–1.0 percentage points (2.6–2.8%) and heavy smoking by 0.54–0.71 percentage points (4.4–5.8%). Regarding drinking behavior, a one-hour reduction in work hours increases the probability of drinking participation by 6.2 percentage points (10%), and decreases the likelihood of frequent drinking by 0.44–0.46 percentage points (1.27–1.35%) and daily drinking by 0.20–0.21 percentage points (7.0–7.5%). The estimates of frequent and daily drinking habits, however, are statistically insignificant in specification 2. Multiple health risks are predicted to decrease by 1.01–1.13 percentage points (2.46–2.74%) in response to a one-hour reduction in workweek.

The magnitudes of the effects of a workweek reduction on health behaviors are quite substantial. The reduction for a standard workweek is four hours, from 44 to 40 hours. That being said, for typical workers who work the standard hours, the mandatory workweek reduction increases the likelihood of regular physical activity by 9.6–11.6%, that is, four times the estimated one-hour effect. In the same manner, a workweek reduction can decrease the probability of smoking and heavy smoking by 10.4–11.2% and 17.6–23.2%, respectively. While a reduced workweek decreases the chances of frequent or daily drinking by 5.1–30%, the estimates are statistically insignificant in specification 2. Drink participation, however, markedly increases in view of standard work reduction by more than 40%. Finally, the mandatory workweek reduction lessens the likelihood of multiple health risks by 9.8–11.0%.

B. Population subgroups

I have shown that a reduction in working hours has a significant effect on physical activity, smoking, and drinking. However, the model estimates so far are assumed to be homogenous across different demographic groups. In Table 5, I present the predicted effects of a one-hour workweek increase on health behaviors stratified by gender, education, and age group.

The estimates reveal that the effects of reduced working time on health-related behaviors are heterogeneous among the different population subgroups. Reduction in working hours is predicted to have a beneficial effect on physical activity for females, the less educated (high school or less), and the older population (ages 56–65), while the impacts are not significant among males, the more educated (more than high school), and younger people (under age 56). Regarding smoking participation and heavy smoking, males, the more educated, and the middle-aged groups (ages 31-55) are significantly influenced by work hours.

A reduction in work hours increases drink participation in all demographic groups except for the older population (ages 56–65). With regard to frequent and daily drinking behaviors, a work reduction seems to have little or insignificant effect in most groups, whereas its impact on the frequent drinking behavior is marginally significant for the female group. Finally, while multiple health risks increase with hours of work in both genders and among all the education groups, the impact is highly concentrated among the middle-aged groups.

VI. Conclusion

In this paper, I examine whether a reduction in working hours has beneficial effects on health-related behaviors. To address the endogeneity of workweek, I carry out my estimation with fixed-effects instrument variable models using exogenous variation, timing of implementing the reduced workweek in South Korea as an instrument for work hours.

The estimates suggest that work hours have causal effects on health-related behaviors. The estimation results indicate that a reduction in work hours induces individuals to exercise regularly. A reduction in work hours also decreases the likelihood of smoking, with impacts somewhat more pronounced for heavy smokers. While a work-hour reduction substantially increases the probability of drink participation, it decreases the likelihood of frequent and daily drinking. In addition, the results of my population subgroup analysis shows that the effect of a work-hour reduction on regular exercise is salient among females and older groups, and on smoking behaviors, more pronounced among males and the middle-aged groups.

This study's empirical finding that work time is an important determinant for an individual's health behaviors provide some evidence on the benefits of reducing the standard workweek, particularly for societies that have long working hours.

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Figure 1: Average actual work hours per worker annually (Source: OECD Online Employment Database)

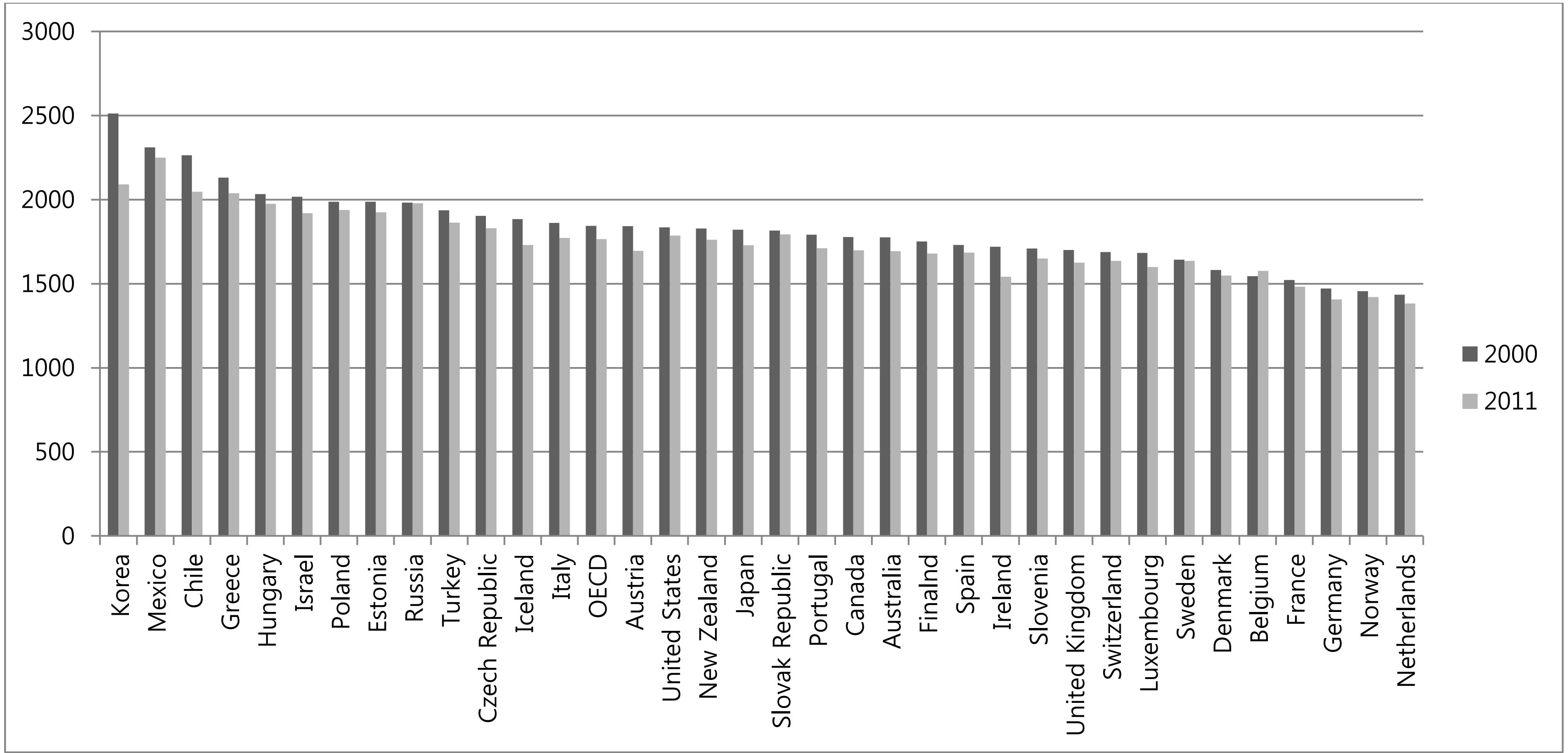

Figure 2: Distribution of workers' actual workweek

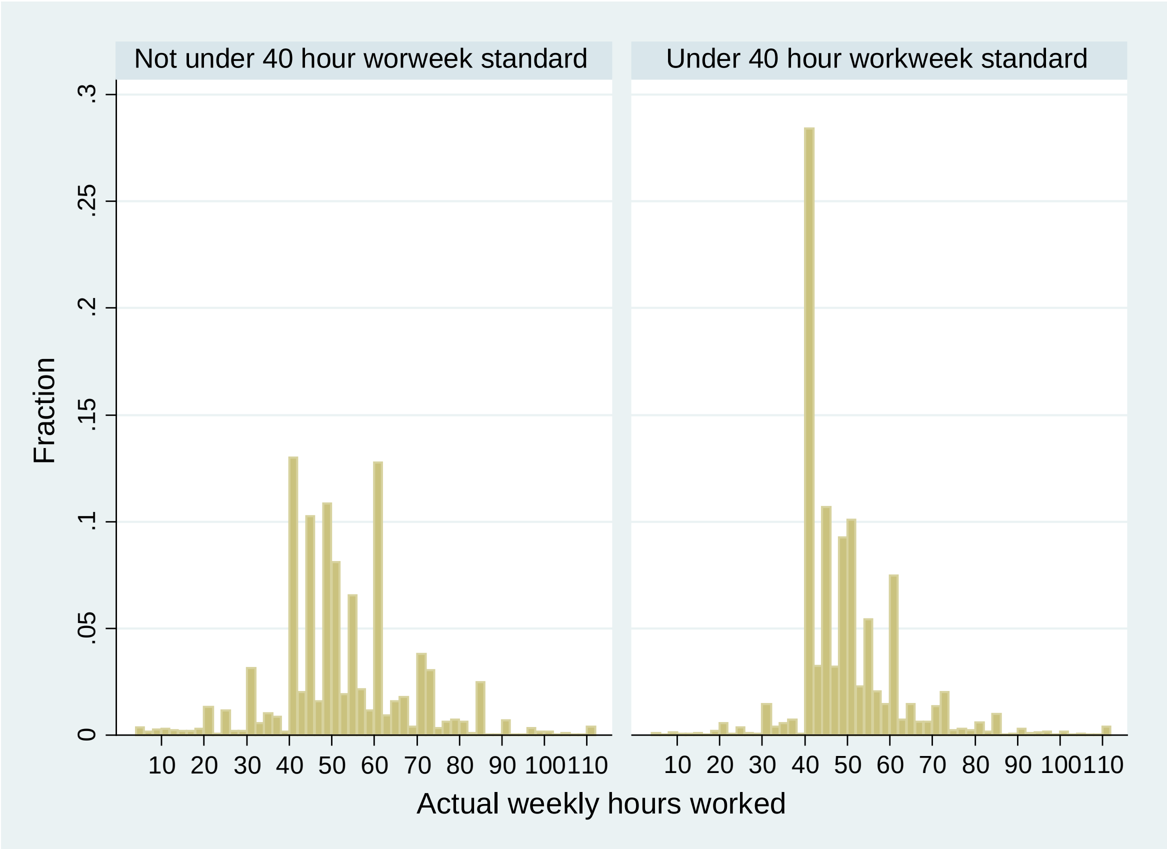

Table 1: Average actual hours worked per week

Year	Not under 40-hour workweek standard	Under 40-hour workweek standard	All
2001	52.1	-	52.1
	[100]		
2005	51.3	48.0	50.6
	[79.9]	[20.1]	
2006	51.6	48.7	50.7
	[71.1]	[28.9]	
2007	52.0	48.8	50.8
	[64.2]	[35.8]	
2008	51.8	50.4	51.0
	[45.6]	[54.4]	
2009	51.8	48.3	49.6
	[37.5]	[62.5]	
2010	51.3	48.9	49.8
	[38.1]	[61.9]	
All	51.7	49.0	50.7
	[64.4]	[35.6]	[100]

Note: The numbers in square brackets are row percentages.

Table 2: Summary statistics for variables used in analysis

Variable	Mean (%)	Std. Dev.
Regular exercise	25.0	43.3
Current smoker	35.7	47.9
Heavy smoker (smokes >= 20 cigarettes per day)	12.3	32.8
Drinker (any use)	61.9	48.6
Drinks ≥ five times per month	34.7	47.6
Drinks everyday	2.9	16.8
Multiple health risks	41.1	49.2
Female[a]	41.0	49.2
Age (years)		
18–30	17.8	38.3
31–55	70.9	45.4
55–65	11.2	31.6
Marital status		
Never married	19.3	39.4
Married	73.1	44.3
Divorced/separated	4.4	20.6
Widowed	3.2	17.5
Education[a]		
Less than high school	22.5	41.8
High school graduate	41.1	49.2
2-Year college	16.3	36.9
4-year college or above	20.1	40.0
Household income (Annual, in million KRW)	37.2	33.7
Local unemployment rate (%)	3.5	0.9
Number of individuals	4,540	
Number of observations	23,276	

Note: [a]Constant across observations for a given individual.

Table 3: Predicted effects of a one-hour increase in workweek on health-related behaviors (FE model)

	Excluding income and unemployment rate (1)		Including income and unemployment rate (2)	
Outcomes	Predicted effect	Percent change	Predicted effect	Percent change
Regular exercise	-0.1346**	[-0.5354]	-0.1320**	[-0.5274]
	(0.0155)		(0.0155)	
Current smoker	0.0330**	[0.0924]	0.0301**	[0.0843]
	(0.0109)		(0.0109)	
Heavy smoker (smokes ≥ 20 cigarettes per day)	0.0379**	[0.3090]	0.0377**	[0.3074]
	(0.0110)		(0.0110)	
Drinker (any use)	-0.0724**	[-0.1163]	-0.0499**	[-0.0792]
	(0.0162)		(0.0160)	
Drinks ≥ five times per month	0.1032**	[0.2971]	0.0986**	[0.2839]
	(0.0150)		(0.0150)	
Drinks everyday	0.0119+	[0.4091]	0.0112+	[0.3851]
	(0.0062)		(0.0062)	
Multiple health risks	0.1147**	[0.2791]	0.1119**	[0.2723]
	(0.0135)		(0.0135)	

Note: Percent changes are calculated by dividing the predicted effect by the mean of the dependent variable.
Standard errors shown in parentheses: ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 4: Predicted effects of a one-hour increase in workweek on health-related behaviors (FE-IV model)

	Excluding income and unemployment rate (1)		Including income and unemployment rate (2)	
Outcomes	Predicted effect	Percent change	Predicted effect	Percent change
Regular exercise	-0.7238*	[-2.8885]	-0.6117+	[-2.4411]
	(0.2900)		(0.3641)	
Current smoker	0.9346**	[2.6162]	1.0016**	[2.8038]
	(0.2301)		(0.2985)	
Heavy smoker (smokes ≥ 20 cigarettes per day)	0.5443**	[4.4375]	0.7103*	[5.7909]
	(0.2091)		(0.2760)	
Drinker (any use)	-6.2034**	[-10.0202]	-6.2181**	[-10.0444]
	(0.8597)		(1.0945)	
Drinks ≥ five times per month	0.4698+	[1.3525]	0.4396	[1.2656]
	(0.2752)		(0.3490)	
Drinks everyday	0.2025+	[6.9622]	0.2182	[7.5019]
	(0.1151)		(0.1469)	
Multiple health risks	1.0090**	[2.4556]	1.1276**	[2.7443]
	(0.2701)		(0.3526)	

Note: Percent changes are calculated by dividing the predicted effect by the mean of the dependent variable.
Standard errors shown in parentheses: ** p<0.01, * p<0.05, + p<0

Table 5: Predicted effects of a one-hour increase in workweek for subgroups (FE-IV model)

Outcomes	Gender		Education		Age[a]		
	Male	Female	High school or less	More than high school	18–30	31–55	56–65
Regular exercise	0.0705	-2.2286*	-1.0937**	0.4334	-0.1304	-0.5125	-1.5287*
	(0.4311)	(0.9624)	(0.4160)	(0.7467)	(1.2792)	(0.4197)	(0.6874)
Current smoker	1.4229**	-0.0644	0.6404*	1.6924*	-0.4630	1.2135**	0.7843+
	(0.4567)	(0.1665)	(0.2943)	(0.6983)	(0.9354)	(0.3694)	(0.4410)
Heavy smoker (smokes ≥ 20 cigarettes per day)	1.0503*	-0.0196	0.3904	1.2759*	-0.1239	0.8800*	0.2577
	(0.4297)	(0.0746)	(0.2952)	(0.5811)	(0.8491)	(0.3432)	(0.3620)
Drinker (any use)	-6.7687**	-5.2305**	-4.9419**	-8.4607**	-7.1187	-7.0614**	-0.5139
	(1.3285)	(1.9482)	(1.0338)	(2.5305)	(4.6686)	(1.3784)	(0.5491)
Drinks ≥ five times per month	0.0750	1.1304+	0.3311	0.5619	0.0251	0.5123	-0.1873
	(0.4667)	(0.6153)	(0.3788)	(0.6901)	(1.2808)	(0.4075)	(0.4801)
Drinks everyday	0.2596	0.0988	0.2033	0.2521	0.4092	0.1710	-0.0544
	(0.2198)	(0.1041)	(0.1782)	(0.2258)	(0.4591)	(0.1815)	(0.3031)
Multiple health risks	1.1285*	1.0215+	0.7884*	1.7421*	0.4002	1.2341**	0.6773
	(0.4560)	(0.5626)	(0.3591)	(0.7762)	(1.1669)	(0.4144)	(0.4769)

Note: [a]Age in year 2001. Standard errors shown in parentheses: ** p<0.01, * p<0.05, + p<0.1

Table A1: Results for the first-stage model of weekly hours of work

Variables	(1)	(2)
Under 40-hour workweek standard	-3.0871**	-2.4781**
(Using size information of the establishment at which the respondent worked prior to initial year 2001)	(0.4064)	(0.4139)
Age		
31–55	-2.2448**	-1.8325**
	(0.5930)	(0.5943)
55–65	-11.5229**	-10.4571**
	(0.9961)	(1.0015)
Marital status		
Married	-10.6456**	-10.0871**
	(0.7943)	(0.7950)
Divorced/separated	-11.1781**	-9.8848**
	(1.4166)	(1.4215)
Widowed	-18.5280**	-17.4510**
	(2.2594)	(2.2573)
ln (Household income)		0.5806*
		(0.2588)
Local unemployment rate		2.8138**
		(0.3056)
Constant	54.9112**	42.0328**
	(0.6899)	(1.6730)
Number of observations	23,276	23,276
Number of individuals	4,540	4,540
F (excluded instrument)	57.71	35.85

Note: Standard errors shown in parentheses: ** p<0.01, * p<0.05, + p<0.1

Table A2: The coefficient estimates for the FE-IV model of health behaviors

	Regular exercise		Smoker		Heavy smoker		Drink		Drink heavily		Drink daily		Multiple health risks	
Variables	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Weekly work hours	-0.0072*	-0.0061+	0.0093**	0.0100**	0.0054**	0.0071*	-0.0620**	-0.0622**	0.0047+	0.0044	0.0020+	0.0022	0.0101**	0.0113**
	(0.0029)	(0.0036)	(0.0023)	(0.0030)	(0.0021)	(0.0028)	(0.0086)	(0.0109)	(0.0028)	(0.0035)	(0.0012)	(0.0015)	(0.0027)	(0.0035)
Age														
31–55	-0.0228	-0.0227	0.0026	0.0027	0.0089	0.0092	0.0596	0.0596	0.0219	0.0219	0.0025	0.0025	0.0302*	0.0304*
	(0.0156)	(0.0155)	(0.0124)	(0.0127)	(0.0113)	(0.0117)	(0.0463)	(0.0465)	(0.0148)	(0.0148)	(0.0062)	(0.0062)	(0.0145)	(0.0150)
55–65	-0.0469	-0.0366	0.0428	0.0458	0.0427	0.0536	-0.4207**	-0.4075**	0.0206	0.0208	0.0099	0.0107	0.0720+	0.0794+
	(0.0441)	(0.0477)	(0.0350)	(0.0391)	(0.0318)	(0.0361)	(0.1308)	(0.1433)	(0.0419)	(0.0457)	(0.0175)	(0.0192)	(0.0411)	(0.0462)
Marital status														
Married	-0.0744*	-0.0633	0.0525+	0.0570+	0.0474+	0.0608+	-0.5901**	-0.5818**	-0.0232	-0.0243	0.0144	0.0156	0.0199	0.0292
	(0.0371)	(0.0420)	(0.0294)	(0.0344)	(0.0268)	(0.0319)	(0.1100)	(0.1263)	(0.0352)	(0.0403)	(0.0147)	(0.0170)	(0.0346)	(0.0407)
Divorced/separated	-0.0536	-0.0347	0.0497	0.0488	0.0688*	0.0791*	-0.4377**	-0.3836**	0.0043	0.0107	0.0122	0.0124	0.0191	0.0249
	(0.0470)	(0.0493)	(0.0373)	(0.0404)	(0.0339)	(0.0373)	(0.1392)	(0.1481)	(0.0446)	(0.0472)	(0.0186)	(0.0199)	(0.0437)	(0.0477)
Widowed	-0.0849	-0.0613	0.0940	0.1002	0.0957+	0.1192+	-0.9889**	-0.9547**	0.0114	0.0126	0.0294	0.0311	0.0691	0.0849
	(0.0758)	(0.0827)	(0.0601)	(0.0678)	(0.0546)	(0.0627)	(0.2246)	(0.2487)	(0.0719)	(0.0793)	(0.0301)	(0.0334)	(0.0706)	(0.0801)
ln (Household income)		0.0211**		-0.0091+		-0.0001		0.0981**		0.0149**		-0.0013		-0.0029
		(0.0059)		(0.0048)		(0.0044)		(0.0176)		(0.0056)		(0.0024)		(0.0057)
Unemployment rate		-0.0003		-0.0142		-0.0206*		0.0650		0.0133		-0.0028		-0.0165
		(0.0132)		(0.0108)		(0.0100)		(0.0396)		(0.0126)		(0.0053)		(0.0127)
Constant	0.6364**	0.5077**	-0.0870	-0.0389	-0.1587	-0.1688	3.7216**	3.1584**	0.1479	0.0642	-0.0712	-0.0646	-0.0616	-0.0529
	(0.1610)	(0.1553)	(0.1277)	(0.1273)	(0.1161)	(0.1177)	(0.4772)	(0.4668)	(0.1527)	(0.1489)	(0.0639)	(0.0627)	(0.1499)	(0.1504)
Number of individuals	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540
Number of observations	23,276	23,276	23,276	23,276	23,276	23,276	23,276	23,276	23,276	23,276	23,276	23,276	23,276	23,276

Note: Standard errors shown in parentheses: ** p<0.01, * p<0.05, + p<0.1