＜論文＞

The effect of the introduction of the Japanese long-term care insurance on the time allocation decisions of family caregivers

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Abstract

This paper examines the effect of the introduction of the Japanese public long-term care insurance (LTCI) in 2000 on the time allocation decisions of family caregivers. A sample is drawn from the waves of 1996, 2001, and 2006 of the Survey on Time Use and Leisure Activities. I estimate the relationship between the LTCI introduction and the time allocation decisions of family caregivers on caregiving, sleep, home production, and leisure as well as market work while controlling for the heterogeneity across prefectures that has existed before the LTCI introduction. I find that the effects of the LTCI introduction on the time allocation decisions of family caregivers depend on the gender of caregivers. The introduction of the LTCI has little impact on the time allocation decisions of male caregivers. On the other hand, among female caregivers, time spent on caregiving decreases in 2001 and 2006 while time spent on leisure increases only in 2001.

※This paper uses microdata of the Survey on Time Use and Leisure Activities (STULA) made available by the Statistics Bureau of the Ministry of Internal Affairs and Communications of Japan under Article 33-2 of the Statistics Act. Because the STULA is a sample-based survey, sampling errors may remain in cases in which the number of observations is small. I am solely responsible for the analysis of this paper, and findings reported in this paper could be inconsistent with the statistics of the STULA published by the government. I would like to thank seminar participants at Chiba Keizai University for their comments. Address: Department of Economics, Chiba Keizai University, 3-59-5 Todoroki, Inage, Chiba 263-0021, Japan. E-mail address: mazuma@cku.ac.jp

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1．Introduction

Family members provide a great amount of care for elderly persons in Japan. According to the Ministry of Health, Labour and Welfare (2001), 78.6 percent of major caregivers for those who require care are family members. Providing informal care can cause stress to family caregivers.[1] The Japanese government has introduced the long-term care insurance (LTCI) in 2000 to socialize the burden of elder care that family members of elderly persons have mainly shouldered. Has the LTCI introduction improved the well-being of family caregivers? A critical determinant of one's well-being is leisure; therefore, it would help us understand the effectiveness of the LTCI to examine the effect of the LTCI introduction on family caregivers' time allocation decisions on non-market activities such as leisure, caregiving, and sleep as well as market activities.

Several existing studies examine the effect of the LTCI on the time allocation decisions of family caregivers. Fu, Noguchi, Kawamura, Takahashi, and Tamiya (2017) show that the LTCI introduction increases the labor force participation rate for both female and male family caregivers. Kuroda (2016) shows that time spent on caregiving among family caregivers who work for regular jobs decreases from the year 2001 to the year 2011; Kuroda concludes that the LTCI can't fully explain the decrease in time spent on caregiving. Kan and Kajitani (2014) and Azuma (2018) examine the effect of the LTCI introduction on family caregivers' time use for caregiving and market work as well as leisure and other

[1] See, for example, Oshio (2015) who examines the relationship between caregivers' psychological distress and prolonged caregiving.

activities.

The effect of the LTCI introduction on the time allocation decisions of family caregivers may depend on unobserved heterogeneity across prefectures. Abe (2013) and Asai, Kambayashi, and Yamaguchi (2015) show the critical role of unobserved heterogeneity such as social norms and traditional family values across prefectures in Japan in explaining the regional variations of women's labor force participation decisions. Unobserved heterogeneity across prefectures may also influence one's other time allocation decisions than labor force participation decision. However, existing studies that examine the LTCI introduction on family caregivers' time allocation decisions have not controlled for the heterogeneity across prefectures that has existed before the LTCI introduction.

The purpose of this study is to examine the effect of the LTCI introduction on the time allocation decisions of female and male family caregivers while controlling for the heterogeneity across prefectures that has existed before the LTCI introduction. Drawing a sample from the waves of 1996, 2001, and 2006 of the microdata of the Survey on Time Use and Leisure Activities (STULA), I estimate the relationship between the LTCI introduction and time use of female and male caregivers for caregiving, sleep, home production, leisure, and paid work. In contrast to the restricted version (*tokumei* data) of the STULA that Azuma (2018) has used, the microdata version of the STULA provides information on the prefecture of residence of respondents, which enables me to include prefecture dummies in the estimation.

I find that the LTCI introduction has a small impact on female caregivers' time allocation decisions while it has little impact on male caregivers' decisions. Female caregivers are less likely to sleep by 33 minutes per

week than non-caregivers before the LTCI introduction. This gap remains unchanged in 2001 and widens by 34 minutes per week in 2006. Female caregivers are less likely to spend their time on paid work and more likely to spend their time on home production compared to non-caregivers before the LTCI introduction. These patterns remain unchanged after the LTCI introduction. Female caregivers are less likely to spend their time on leisure by 4.5 hours per week compared to non-caregivers before the LTCI introduction. This gap gets smaller by 1.1 hours per week only in 2001. Restricting the sample to female caregivers, I find that time spent on caregiving decreases by 1.4 hours per week in 2001 and that caregiving time decreases by 2.4 hours per week in 2006 compared to caregiving time before the LTCI introduction.

Among male respondents, there is no significant difference in time spent on sleep between caregivers and non-caregivers before and after the LTCI introduction. Male caregivers are less likely to spend their time on paid work by 1.5 hours per week compared to non-caregivers before the LTCI introduction. This gap remains unchanged after the LTCI introduction. Male caregivers are more likely to spend their time on home production by 4.6 hours per week and are less likely to spend their time on leisure by 2.4 hours per week compared to non-caregivers before the LTCI introduction. These patterns remain unchanged after the LTCI introduction. Restricting the sample to male caregivers, I find that the LTCI introduction has little impact on time spent on caregiving.

These findings imply that the LTCI introduction has achieved its goal to socialize the burden of elder care for female family caregivers by enabling them to reduce time spent on caregiving. On the other hand, the LTCI introduction has little impact on the time allocation decisions of male

caregivers.

The rest of this paper is organized as follows. Section 2 describes a sample drawn from the STULA. Section 3 presents an empirical specification and discusses the results. This is followed by a concluding section.

2. Sample from the Survey on Time Use and Leisure Activities (STULA)

This section describes a sample drawn from the microdata of the Survey on Time Use and Leisure Activities (STULA), which is provided by the Statistics Bureau of the Ministry of Internal Affairs and Communications. The STULA randomly draws households from the nationwide every five years and asks each household member aged 10 and over of the household to record his or her time use of two consecutive days.

A sample is drawn from the waves of 1996, 2001, and 2006 of the STULA, which covers the year 2000 in which the LTCI has been introduced. This paper examines the effect of the LTCI introduction on the time allocation decisions for female caregivers and male caregivers separately. In particular, the sample is restricted to women in their 30s through 60s and men in their 30s through 60s. This is because labor force attachment and the willingness to provide elder care for family members tend to depend on the gender of caregivers.

Following Kuroda (2016), this study uses the information on time use recorded on ordinary day. The STULA asks respondents to choose the type of day on which time use is recorded from seven categories: (1) private trip, (2) excursion, (3) event or ceremony, (4) business trip or training, (5) medical treatment, (6) day off, and (7) other. The type of day is defined as ordinary day if a respondent chooses the category (7). When the time use of

the first day and that of the second day are recorded on ordinary day, I take an average of the time use of two days for each activity.

To examine family caregivers' time allocation decisions, I focus on time use for sleep, paid work, home production, and leisure.[2] Time use for paid work, home production, and leisure is defined as follows. Paid work is defined as time spent on market work and commuting. Home production is defined as time spent on having meals, taking care of oneself, household work, caregiving for a family member, child rearing, and shopping. Leisure is defined as time spent on watching television, listening to the radio, reading newspapers and magazines, rest, learning, hobby, sports, volunteering, and socializing.

Table 1 reports descriptive statistics for female respondents and Table 2 for male respondents. The second and third columns of Tables 1 and 2 report mean and standard deviation of variables used in the estimation for respondents drawn from the 1996 wave; the fourth and fifth columns for respondents from the 2001 wave; the sixth and seventh columns for respondents from the 2006 wave.

Over the ten years of the sample period, the proportion of caregivers has gradually increased among female and male respondents. Among female respondents, there has been a small decrease in time spent on sleep and home production while there has been a small increase in time spent on leisure. Among female caregivers, time spent on caregiving has decreased by 1.8 hours per week (from 8.5 hours in 1996 to 6.7 hours in 2006.)

[2] The STULA also provides information on time spent on (1) moving (excluding commuting), (2) medical treatment, and (3) other (uncategorized). Following Kuroda (2016), this study does not use the information on time use for these three categories. Therefore, the sum of time use for sleep, market work, home production, and leisure does not equal to 24 hours.

Turning to male respondents, I find a small decrease in time spent on sleep and paid work and a small increase in time spent on leisure and home production over the sample period. Among male caregivers, time spent on caregiving has increased by 0.3 hours per week (from 2.5 hours in 1996 to 2.8 hours in 2006).

3. Empirical specification and estimation results

This section presents an empirical specification and discusses the results.

3.1 Empirical specification

This study examines the relationship between the LTCI introduction and the time allocation decisions of female and male caregivers using a regression model. The regression model is specified as follows:

$$T_{ipt} = \beta_0 + \beta_1 1(year = 2001) + \beta_2 1(year = 2006) + \beta_3 C_{ipt} + \beta_4 C_{ipt} 1(year = 2001) + \beta_5 C_{ipt} 1(year = 2006) + X_{ipt}\beta_6 + \gamma_p + \varepsilon_{ipt}.$$

The dependent variable T_{ipt} is time spent on each activity by a respondent i in prefecture p in year t (1996, 2001 or 2006): (1) sleep, (2) paid work, (3) home production, (4) leisure, and (5) caregiving for her family member. The unit for time spent on each activity is measured in hours per week. Let 1(year = 2001) denote a dummy variable for the year 2001 and 1(year = 2006) for the year 2006. Let C_{ipt} denote an indicator for whether the respondent i is a caregiver for his or her family member. A respondent is defined as a caregiver if he or she reports that he or she cares for a family member. Let γ_p denote prefecture dummies and ε_{ipt} an error term. I report standard errors that are clustered at the prefecture level.

Let X_{ipt} denote a vector of demographic characteristics of the respondent i and information on his or her household. Demographic characteristics

include marital status, age, and educational attainment of the respondent. Marital status is measured by three categories: divorced or widowed, single, married (married as reference). Educational attainment is measured by four categories: less than high school, high school, junior college, college or graduate degree (high school as reference).

The information on the spouse of the respondent includes an indicator for whether the spouse participates in the labor force. The information on the household includes the number of household members, an indicator for home ownership, household income, and an indicator for whether children who are under six years old are present in the household. The level of household income is groupd in four categories: less than 3 million yen; between 3 and less than 6 million yen; between 6 and less than 10 million yen; more than 10 million yen (between 3 and less than 6 million yen as reference).

3. 2　Estimation results

Table 3 reports the estimates for the relationship between the LTCI introduction and the time allocation decisions for female respondents and Table 4 reports the estimates for male respondents. To derive the estimates for time spent on caregiving, I restrict the sample to caregivers.

Female caregivers are less likely to sleep by 33 minutes per week than non-caregivers before the LTCI introduction. This gap remains unchanged in 2001 and widens by 34 minutes per week in 2006. Female caregivers are less likely to spend their time on paid work by 3.2 hours per week compared to non-caregivers before the LTCI introduction. This gap remains unchanged after the LTCI introduction. Before the LTCI introduction, female caregivers are more likely to spend their time on home production

by 9.2 hours per week compared to non-caregivers. This gap also remains unchanged after the LTCI introduction. Before the LTCI introduction, female caregivers are less likely to spend their time on leisure by 4.5 hours per week compared to non-caregivers. This gap gets smaller by 1.1 hours per week only in 2001. As reported in the previous section, female caregivers spend 8.5 hours per week on caregiving on average before the LTCI introduction. Restricting the sample to female caregivers, I find that time spent on caregiving decreases by 1.4 hours per week in 2001 and that caregiving time decreases by 2.4 hours per week in 2006 compared to time spent on caregiving before the LTCI introduction.[3] After the LTCI introduction, female caregivers spend less time on caregiving in 2001 and 2006 while they spend more time on leisure only in 2001. Time allocation decisions on other activities than caregiving and leisure remain unchanged after the LTCI introduction, except a small decrease in time spent on sleep in 2006.

Among male respondents, there is no significant difference in time spent on sleep between caregivers and non-caregivers before and after the LTCI introduction. Male caregivers are less likely to spend their time on paid work by 1.5 hours per week compared to non-caregivers before the LTCI introduction. This gap remains unchanged after the LTCI introduction. Male caregivers are more likely to spend their time on home production by 4.6 hours per week and are less likely to spend their time on leisure by 2.4

[3] Time spent on caregiving can change for reasons unrelated to the LTCI introduction. This study derives the estimates on time spent on caregiving by comparing time spent on caregiving among caregivers after the LTCI introduction with time spent on caregiving among caregivers before the introduction; therefore, it is unable to control for changes in time spent on caregiving that are caused by factors unrelated to the LTCI introduction.

hours per week compared to non-caregivers before the LTCI introduction. These patterns also remain unchanged after the LTCI introduction. As reported in the previous section, male caregivers spend 2.5 hours per week on caregiving on average before the LTCI introduction. Restricting the sample to male caregivers, I find that the LTCI introduction has little impact on time spent on caregiving.

These findings imply that the LTCI introduction has achieved its goal to socialize the burden of elder care for female caregivers by enabling them to reduce their time spent on caregiving. On the other hand, the LTCI introduction has little impact on the time allocation decisions of male caregivers. Given men's strong labor force attachment, male caregivers may be unable to change their time allocation decisions flexibly.

I also estimate the relationship between the LTCI introduction and the time allocation decisions of family caregivers without prefecture dummies.[4] Comparing the estimates without prefecture dummies with the estimates with prefecture dummies, I find no significant difference between these estimates. This finding implies that the heterogeneity that has existed across prefectures before the LTCI introduction is not large enough to change the estimates.

4. Conclusion

This study examines the effect of the LTCI introduction on the time allocation decisions of female and male family caregivers. Using a sample drawn from the waves of 1996, 2001, and 2006 of the STULA, I estimate the relationship between the LTCI introduction and time allocation decisions

[4] The estimates are available upon request.

of family caregivers on caregiving, sleep, home production, leisure as well as paid work with prefecture dummies. I find that the LTCI introduction influences female caregivers' decisions differently from male caregivers' decisions. In particular, after the LTCI introduction, female caregivers spend less time on caregiving in 2001 and 2006 while they spend more time on leisure only in 2001. On the other hand, the LTCI introduction has little impact on male caregivers' time allocation decisions. I also find that the estimates with prefecture dummies remain almost unchanged with the estimates without prefecture dummies. These findings imply that the LTCI introduction has achieved its goal of socializing the burden of elder care for female caregivers and that the heterogeneity across prefectures that has existed before the LTCI introduction is not large enough to change the effect of the LTCI introduction on family caregivers' time allocation decisions.

Finally, I discuss the limitations of this study. As discussed in introduction, Fu, Noguchi, Kawamura, Takahashi, and Tamiya (2017) find that the LTCI introduction increases the labor force participation rate of both male and female caregivers. On the other hand, this study finds that the LTCI introduction has little impact on the time allocation decisions of male caregivers. While Fu et al. (2017) take account of the possibility that being a caregiver is endogenous to one's labor force participation decision by applying difference-in-difference propensity score matching, this study does not address the endogeneity bias. Moreover, there is a possibility that the sample composition of caregivers has changed after the LTCI introduction. Addressing the endogeneity bias and the selection bias is left for future research.

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Table 1: Descriptive statistics for female respondents

	1996 wave		2001 wave		2006 wave	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Sleep	51.45	8.24	51.23	8.54	50.62	8.55
Paid work	19.17	20.08	18.81	20.06	19.90	20.96
Home production	53.11	21.37	52.46	20.85	51.67	21.42
Leisure	31.14	17.92	32.20	18.05	32.40	18.74
Caregiving among caregivers	8.52	15.53	7.26	13.07	6.65	12.65
1 (Caregiver)	0.05	0.23	0.07	0.26	0.08	0.27
1 (Single)	0.04	0.21	0.05	0.23	0.08	0.27
1 (Widowed or Divorced)	0.11	0.32	0.12	0.32	0.14	0.35
1 (Age in 30s)	0.21	0.40	0.19	0.39	0.19	0.39
1 (Age in 40s)	0.28	0.45	0.23	0.42	0.20	0.40
1 (Age in 50s)	0.24	0.42	0.28	0.45	0.28	0.45
1 (Age in 60s)	0.25	0.43	0.28	0.45	0.31	0.46
1 (Less than High School)	0.29	0.45	0.26	0.44	0.20	0.40
1 (High School)	0.52	0.49	0.52	0.49	0.53	0.49
1 (Junior College)	0.13	0.34	0.15	0.35	0.18	0.38
1 (College)	0.05	0.21	0.05	0.23	0.07	0.25
1 (Spouse employed)	0.63	0.48	0.59	0.49	0.51	0.49
1 (Kid < 6 years old)	0.09	0.29	0.08	0.27	0.07	0.26
Number of household members	3.61	1.61	3.46	1.59	3.25	1.55
1 (Owning a home)	0.79	0.40	0.81	0.38	0.81	0.39
1 (Household income < 3 million yen)	0.18	0.39	0.23	0.42	0.30	0.46
1 (Household income b/w 3 & 6 million yen)	0.35	0.47	0.36	0.48	0.37	0.48
1 (Household income b/w 6 & 10 million yen)	0.31	0.46	0.27	0.44	0.22	0.41
1 (Household income ≧ 10 million yen)	0.14	0.34	0.12	0.32	0.09	0.28
Number of observations	56,907		39,922		29,988	

Note: The unit for time spent on each activity is measured in hours per week.

Table 2: Descriptive statistics for male respondents

	1996 wave		2001 wave		2006 wave	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Sleep	53.75	8.99	53.31	9.37	52.93	9.60
Paid work	41.03	20.24	39.20	21.48	39.00	22.89
Home production	20.55	10.26	21.54	11.12	22.49	12.27
Leisure	32.06	20.97	33.76	22.10	33.78	23.32
Caregiving among caregivers	2.53	8.18	2.78	9.15	2.83	8.89
1 (Caregiver)	0.03	0.18	0.04	0.21	0.05	0.22
1 (Married)	0.86	0.34	0.83	0.37	0.81	0.39
1 (Single)	0.09	0.29	0.11	0.31	0.13	0.33
1 (Widowed or Divorced)	0.04	0.20	0.05	0.21	0.05	0.23
1 (Age in 30s)	0.21	0.41	0.19	0.39	0.20	0.40
1 (Age in 40s)	0.30	0.45	0.23	0.42	0.21	0.40
1 (Age in 50s)	0.23	0.42	0.29	0.45	0.30	0.45
1 (Age in 60s)	0.24	0.42	0.27	0.44	0.28	0.45
1 (Less than High School)	0.28	0.45	0.26	0.43	0.20	0.40
1 (High School)	0.46	0.49	0.48	0.49	0.50	0.49
1 (Junior College)	0.04	0.21	0.05	0.22	0.06	0.25
1 (College)	0.19	0.39	0.20	0.40	0.22	0.41
1 (Spouse employed)	0.47	0.49	0.45	0.49	0.44	0.49
1 (Kid < 6 years old)	0.11	0.32	0.10	0.30	0.09	0.29
Number of household members	3.66	1.59	3.50	1.58	3.32	1.50
1 (Owning a home)	0.78	0.40	0.80	0.39	0.80	0.39
1 (Household income < 3 million yen)	0.15	0.36	0.21	0.40	0.24	0.43
1 (Household income b/w 3 & 6 million yen)	0.38	0.48	0.38	0.48	0.40	0.48
1 (Household income b/w 6 & 10 million yen)	0.31	0.46	0.28	0.45	0.25	0.43
1 (Household income ≧ 10 million yen)	0.14	0.34	0.12	0.32	0.09	0.29
Number of observations	48,019		33,730		31,525	

Note: The unit for time spent on each activity is measured in hours per week.

Table 3: Effects of the LTCI introduction on female caregivers' time allocation decisions (N= 126,817)

	Sleep		Paid work		Home production	
Variables	Estimates	S.E.	Estimates	S.E.	Estimates	S.E.
1 (Caregiver)	-0.542**	0.140	-3.235**	0.324	9.220**	0.448
1 (Year=2001)	-0.374**	0.060	0.342	0.174	-0.743**	0.179
1 (Year=2006)	-1.163**	0.069	1.563**	0.161	-0.851**	0.154
1 (Caregiver)* 1 (Year=2001)	-0.231	0.185	-0.781	0.456	-0.224	0.668
1 (Caregiver)* 1 (Year=2006)	-0.566*	0.224	-0.045	0.509	-0.586	0.627
1 (Single)	0.198	0.186	12.163**	0.505	-16.645**	0.369
1 (Widowed or Divorced)	-0.581**	0.107	8.175**	0.267	-9.169**	0.209
1 (Age in 30s)	1.427**	0.084	-1.062**	0.223	-0.070	0.230
1 (Age in 50s)	1.095**	0.077	-2.933**	0.208	1.162**	0.230
1 (Age in 60s)	3.644**	0.120	-13.634**	0.322	6.029**	0.269
1 (Less than High School)	1.531**	0.071	1.130**	0.214	-1.630**	0.179
1 (Junior College)	-0.661**	0.061	-0.824**	0.208	1.387**	0.190
1 (College)	-0.665**	0.104	0.148	0.227	0.704**	0.256
1 (Spouse employed)	-1.719**	0.075	2.812**	0.200	0.649**	0.211
1 (Kid < 6 years old)	2.139**	0.110	-12.989**	0.285	18.985**	0.380
Number of household members	-0.070*	0.028	0.697**	0.078	0.520**	0.090
1 (Owning a home)	0.328**	0.072	1.101**	0.289	-0.549**	0.191
1 (Household income < 3 million yen)	0.760**	0.066	-0.666**	0.162	0.433*	0.177
1 (Household income b/w 6 & 10 million yen)	-0.353**	0.053	-0.451**	0.161	-0.003	0.179
1 (Household income ≧ 10 million yen)	-0.675**	0.072	0.497	0.282	-1.017**	0.303
Constant term	51.854**	0.165	15.594**	0.469	47.435**	0.433
R-squared	0.087		0.142		0.167	

Notes: * Significant at 5%, ** significant at 1%. The reference groups are 1(Age in 40s), 1(Married), 1(High School), and 1(Household income between 3 and 6 million yen). Standard errors are clustered at the prefecture level.

Table 3 (continued): Effects of the LTCI introduction on female caregivers' time allocation decisions

	Leisure (all respondents, N=126,817)		Caregiving (caregivers only, N = 9,069)	
Variables	Estimates	S.E.	Estimates	S.E.
1 (Caregiver)	-4.489**	0.267		
1 (Year=2001)	0.396*	0.149	-1.423**	0.366
1 (Year=2006)	-0.019	0.173	-2.427**	0.351
1 (Caregiver)* 1 (Year=2001)	1.137**	0.349		
1 (Caregiver)* 1 (Year=2006)	0.751	0.421		
1 (Single)	0.559	0.380	-0.461	0.673
1 (Widowed or Divorced)	-1.334**	0.229	-2.633**	0.592
1 (Age in 30s)	-0.267	0.194	-1.537**	0.478
1 (Age in 50s)	1.891**	0.141	0.989**	0.358
1 (Age in 60s)	8.774**	0.233	2.680**	0.449
1 (Less than High School)	-0.827**	0.165	-0.376	0.362
1 (Junior College)	-0.205	0.173	-0.698	0.351
1 (College)	-0.968**	0.199	-0.461	0.559
1 (Spouse employed)	-2.473**	0.169	-1.997**	0.335
1 (Kid < 6 years old)	-3.879**	0.287	-0.170	0.739
Number of household members	-1.263**	0.048	-0.257*	0.108
1 (Owning a home)	-1.166**	0.225	-0.847	0.471
1 (Household income < 3 million yen)	-0.130	0.159	1.016**	0.380
1 (Household income b/w 6 & 10 million yen)	0.609**	0.115	-0.540	0.386
1 (Household income ≧ 10 million yen)	0.554**	0.189	-0.582	0.523
Constant term	40.897**	0.325	11.231**	0.592
R-squared	0.098		0.033	

Notes: * Significant at 5%, ** significant at 1%. The reference groups are 1(Age in 40s), 1(Married), 1(High School), and 1(Household income between 3 and 6 million yen). Standard errors are clustered at the prefecture level.

Table 4: Effects of the LTCI introduction on male caregivers' time allocation decisions (N= 113,274)

	Sleep		Paid work		Home production	
Variables	Estimates	S.E.	Estimates	S.E.	Estimates	S.E.
1 (Caregiver)	-0.263	0.208	-1.548**	0.435	4.637**	0.349
1 (Year=2001)	-0.626**	0.067	-0.250	0.137	0.419**	0.077
1 (Year=2006)	-1.025**	0.096	0.472*	0.233	1.038**	0.086
1 (Caregiver)* 1 (Year=2001)	-0.492	0.311	-0.914	0.604	0.643	0.575
1 (Caregiver)* 1 (Year=2006)	-0.607	0.336	-0.145	0.738	0.325	0.546
1 (Single)	0.820**	0.126	-4.442**	0.266	0.816**	0.125
1 (Widowed or Divorced)	0.051	0.139	-0.895**	0.273	2.415**	0.167
1 (Age in 30s)	-0.234**	0.085	2.574**	0.168	-1.305**	0.088
1 (Age in 50s)	1.110**	0.078	-3.637**	0.175	1.326**	0.088
1 (Age in 60s)	4.121**	0.113	-21.949**	0.327	6.625**	0.135
1 (Less than High School)	1.349**	0.064	0.968**	0.191	-0.160	0.083
1 (Junior College)	-0.679**	0.137	0.059	0.272	0.237	0.178
1 (College)	-0.912**	0.084	-0.085	0.158	0.681**	0.090
1 (Spouse employed)	-0.385**	0.061	3.064**	0.147	-0.988**	0.076
1 (Kid < 6 years old)	0.080	0.116	0.878**	0.183	2.260**	0.118
Number of household members	0.361**	0.018	0.264**	0.061	-0.330**	0.027
1 (Owning a home)	0.577**	0.086	-1.896**	0.175	0.817**	0.086
1 (Household income < 3 million yen)	1.544**	0.087	-6.257**	0.305	1.850**	0.117
1 (Household income b/w 6 & 10 million yen)	-0.780**	0.077	2.094**	0.199	-0.514**	0.070
1 (Household income ≧ 10 million yen)	-0.905**	0.084	2.425**	0.313	-0.657**	0.130
Constant term	51.172**	0.102	46.227**	0.326	17.646**	0.147
R-squared	0.080		0.276		0.114	

Notes: * Significant at 5%, ** significant at 1%. The reference groups are 1(Age in 40s), 1(Married), 1(High School), and 1(Household income between 3 and 6 million yen). Standard errors are clustered at the prefecture level.

Table 4 (continued): Effects of the LTCI introduction on male caregivers' time allocation decisions

	Leisure (all respondents, N = 113,274)		Caregiving (caregivers only, N = 4,912)	
Variables	Estimates	S.E.	Estimates	S.E.
1 (Caregiver)	-2.436**	0.476		
1 (Year=2001)	0.437**	0.154	-0.235	0.311
1 (Year=2006)	-0.352	0.246	-0.448	0.274
1 (Caregiver)* 1 (Year=2001)	0.962	0.625		
1 (Caregiver)* 1 (Year=2006)	0.317	0.783		
1 (Single)	4.216**	0.306	1.262*	0.602
1 (Widowed or Divorced)	-0.977**	0.308	0.235	0.756
1 (Age in 30s)	-1.682**	0.197	-0.468	0.412
1 (Age in 50s)	2.299**	0.185	0.833**	0.272
1 (Age in 60s)	17.729**	0.343	2.367**	0.309
1 (Less than High School)	-2.067**	0.187	-0.487	0.261
1 (Junior College)	0.125	0.272	-0.972**	0.338
1 (College)	-0.086	0.171	0.109	0.394
1 (Spouse employed)	-2.457**	0.139	-1.421**	0.258
1 (Kid < 6 years old)	-3.620**	0.209	0.068	0.367
Number of household members	-0.282**	0.069	-0.205*	0.080
1 (Owning a home)	1.167**	0.208	0.479	0.334
1 (Household income < 3 million yen)	4.655**	0.342	1.773**	0.388
1 (Household income b/w 6 & 10 million yen)	-1.591**	0.196	-0.459	0.232
1 (Household income ≧ 10 million yen)	-2.077**	0.341	-0.468	0.465
Constant term	30.696**	0.326	3.141**	0.520
R-squared	0.173		0.051	

Notes: * Significant at 5%, ** significant at 1%. The reference groups are 1(Age in 40s), 1(Married), 1(High School), and 1(Household income between 3 and 6 million yen). Standard errors are clustered at the prefecture level.

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