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Area income distribution and health in Japan[*] [**]

Masako Oyama[a], Fumio Ohtake[b]

Abstract

The association between area-level income distribution and individual health is estimated using a nationwide panel micro data in Japan for the first time. Five measures of income inequality which are the Gini index, the Gini index of the individual income of equivalence scale and lagged Gini index, income shares of the top and bottom 10% of the population, and lagged income shares of the top and bottom 10% are used. As for the health measures, six measures such as self-rated health, mental health, hospital visits and hospitalization are used in the estimations. The panel logit model estimation and the panel ordered logit model estimation results show that more equal area income distribution is associated with better individual health, if lagged income distribution measures are used. In addition, age, gender, schooling, marital status, smoking and drinking habit, household income and trust to others are also associated with individual health statistically significantly.

Keywords: income distribution, health, panel data

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[**] This research utilizes the micro data from the Preference Parameters Study of Osaka University's 21st Century COE Program 'Behavioral Macrodynamics Based on Surveys and Experiments' and its Global COE project 'Human Behavior and Socioeconomic Dynamics'. I acknowledge the program/project's contributors: Yoshio Tsutsui, Fumio Ohtake, and Shinsuke Ikeda.

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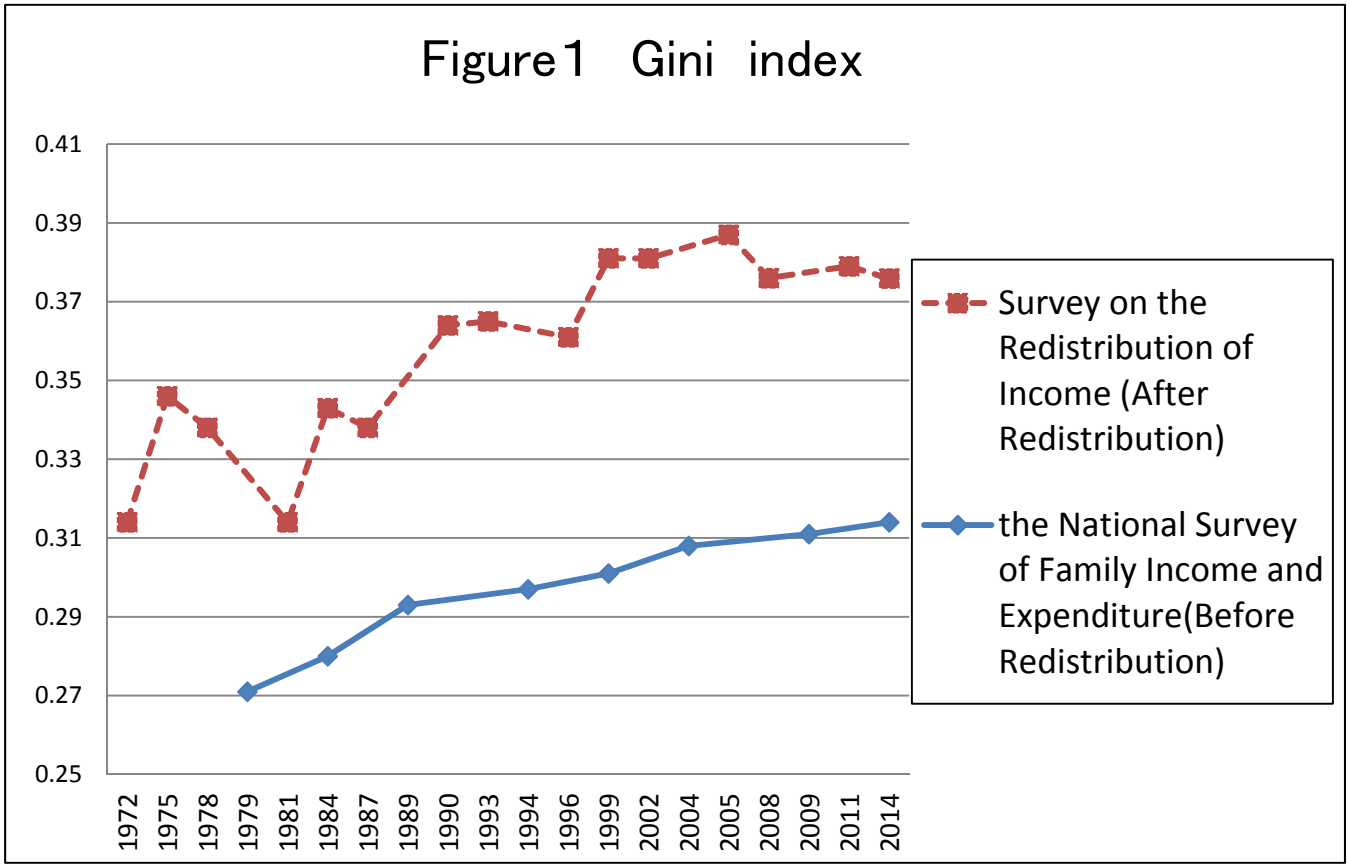
Introduction

Recently empirical studies have investigated the association between income inequality and individual health, following a research by Wilkinson (1992). According to Oshio (2014), the existing researches showed that people who live in more unequal area tend to have lower health, to some extent. However, it is also pointed out that in countries other than the U.S., the relationship between income inequality and health is not very clear, compared to the U.S.

The meta-analysis in Kondo et al. (2009) also showed that income inequality was associated with poor self rated health. However, studies reviewed were highly heterogenous, and the associations between income inequality and health is stronger if the Gini index is larger than a threshold of 0.3, or effect has a lag which is longer than 7 years.

As for the empirical researches in Japan, Oshio and Kobayashi (2009, 2010) have shown that regional inequality is associated with poor health. However, Shibuya et al. (2002) found no significant relationship between inequality and health, and individual income has a stronger association with self rated health at the prefecture level.



Some research examines whether different income distribution measures are associated with individual health differently. Kawachi and Kennedy (1997) obtained a result that the association between income distribution and health is not different, even if we use different measures of income distribution. However, Maio (2007) obtained a result that different measures of income distribution are associated with individual health differently.

The contribution of this research is that we use a panel micro data in Japan for the first time, in the estimations of the association between income distribution and health. The finding of this research is consistent with the most existing research in the sense that more equal area income distribution is associated with better health, if we use the income distribution measures with 7-year lag.

The figure 1 shows the change of the Gini index of income after redistribution from the Survey on the Redistribution of Income, and the Gini index of income before redistribution from the National Survey of Family Income and Expenditure. The Gini indices from the both survey show that the income distribution in Japan tend to be more unequal recently.

Although the effects of population aging and increase of small number households may explains about half of the increase, the increase of consumption inequality within the same generation is also observed (Ohtake et.al. 2010). Consumption reflect permanent income rather than temporary income, so more consumption inequality means the inequality of permanent income increased in recent Japan and analyzing such increase of inequality is important.

Data

We utilize the nationwide panel micro household data from the Preference Parameters Study of Osaka University's 21st Century COE Program 'Behavioral Macrodynamics Based on Surveys and Experiments' and its Global COE project 'Human Behavior and Socioeconomic Dynamics'. Specifically, surveys about households in 2011 and 2016 are used in this research. In addition, data of income distribution is obtained from "the National Survey of Family Income and Expenditure (2004, 2009, 2014)."

health

The dependent variables are the variables on health. We use two variables on self rated health. Health5Level takes variable 1(poor) to 5(excellent) about self rated health.

Then, Health2Level is a dichotomous variable which takes 1 if the reported self rated health is 3 to 5(excellent), and takes 0 if self rated health is 1(poor) or 2.

HospitalVisit is a dummy variable which takes 1, if the respondent visits a hospital now. #HospitalVisit is the average number of hospital visits the respondents make in one month. Hospitalization is a dummy variable which takes one if the respondent was hospitalized in the previous year.

MentalHealth is a variable which is made by summing up the values of the four questions about respondent's recent mental health (stressed out, depressed, cannot sleep well, isolated), and each variable takes 1(very applicable) to 5(not applicable at all). Since answers to each question takes value from 1 to 5, the summed-up variable takes values from 4 to 20.

Income distribution

The Gini index of the yearly household pretax income (Gini), the Gini index of equivalence scale income (GiniEqScale), and the lagged Gini index (LaggedGini) are taken or calculated from "the National Survey of Family Income and Expenditure." These data are the Gini index in each of the 47 prefectures in Japan. This survey is conducted in every five years. Therefore, as for the Gini and GiniEqScale, the income distribution data in 2009 are used with the micro data of individual health in 2011. As for the data on LaggedGini, seven-year lag is taken, and the data of the Gini index in 2004 is used with the micro data of health in 2011, and the data of the Gini in 2009 is used with the micro data of health in 2016.

In addition, the income shares of the top and bottom 10% of people are used as Top10Share and Bottom10Share as other income distribution variables. LaggedTop10Share and LaggedBottom10Sh are the 7-year lagged income shares of the top and bottom 10% of people.

Some existing studies have shown that the inequality affected health with lag longer than seven years (Kondo et.al.2009). Since this research uses panel data, we can investigate whether the lagged income distribution is associated with variables of health.

Household income

The respondents are asked their household income for the previous year (2010, 2015) in twelve categories. The median value of each category is taken as the household's income. Then, the household income is transformed into log

(LogHHIncome), because the relationship between the income and health is non-linear.

Age, gender, and marital status

Age are categorized into group of 20-39, 40-49, 50-59, 60 or above, and 60 or above is used as the base category. As for gender, we use a female dummy for one if the respondent is a female. married is a dummy variable for one if the respondent is married.

Education

We made a dummy variable College for the graduates from college or beyond.

Smoking and drinking habit

The variable Smoke3Level takes value from 0 to 2, 0 means that the respondent does not smoke, and 2 means that the respondent smokes 21 or more cigarettes a day. The variable Drink3Level takes value of 0 to 2, 0 means that the respondent does not drink or seldom drinks, and 2 means that the respondent drinks more than three 350ml cans of beers or equivalent every day.

Social capital

The variable CanTrust takes the value 5 if the respondents chose "completely agree" to the idea that "generally, people can be trusted". The variable takes the value 1 if the respondents choose "Completely disagree" to the same idea.

Area dummies

The variables Hokkaido, Tohoku, Kanto, Chubu, Kinki, ChugokuShikoku are the area dummies for the respective areas in Japan. The Kyushu area is the base category.

Methods

Since the data we use is a panel data with discrete independent variables, the estimations are made with panel logit estimations and panel ordered logit estimations.

Estimation results

Estimation results with self-rated health and the Gini index is shown in table2. In table3, the estimation results using the GiniEqScale are shown. In these estimation

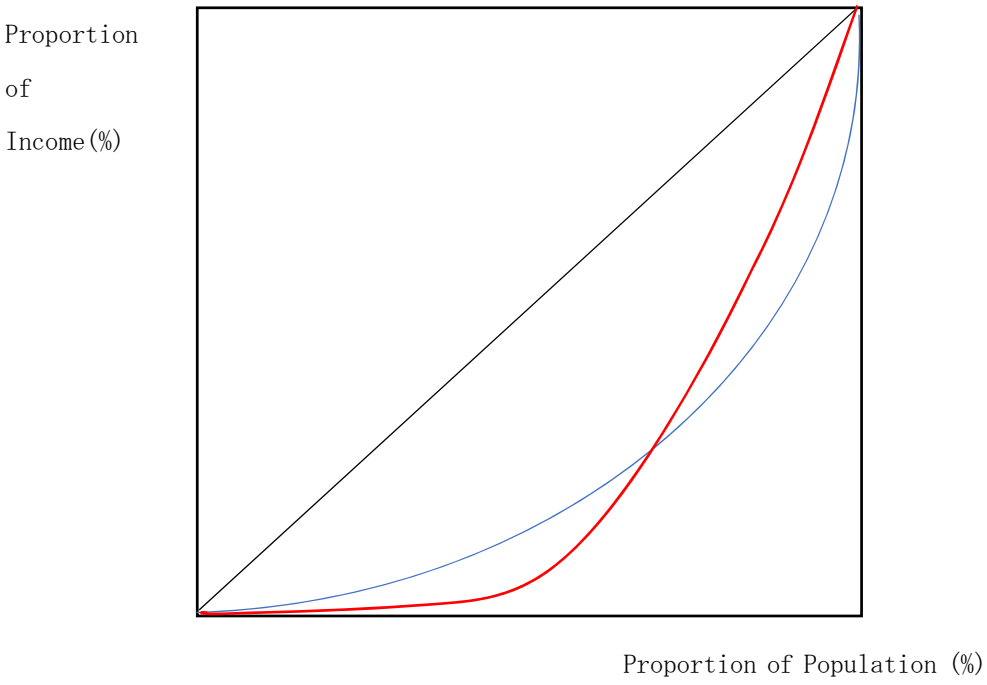
results with the Gini index and the Gini index of the equivalence scale income, inequality is associated with poorer self rated health measured with Health2Level, but with less probability of visiting hospital and being hospitalized. Since people get less healthy but visit hospitals and get hospitalized with lower probability, these two estimation results are contradictory.

As for the other variables, people tend to be healthier if they are younger, married, college graduates, non-smoking, drinking, with higher household income, and have more social capital measured with CanTrust.

Table4 shows the association of health and the Gini index with 7-year lag. These results show that higher inequality is associated with poorer health and higher probability of visiting hospital and being hospitalized. Therefore, if we take 7-year lag, the association of health and inequality has expected sign.

The contradictory results of table2 and table3 may be caused by the characteristics of the Gini index. That is, if two Lorenz curves cross each other as in the Figure2, the calculated Gini index may not be able to differentiate the different Lorenz curves. In that case, the Gini index become unstable and that may have caused the contradictory estimation results.

Figure2 Crossing Lorenz Curves



Therefore, in table5 and table6, we use the income share of the top and the bottom

10% of people as the income distribution measures. In table5, the Top10Share and Bottom10Share are used and the estimation results show that more inequality is associated with poorer health measured with self-rated health, but less probability of being hospitalized. Therefore, we get contradictory result again in these estimations.

However, in table6 where we used the income shares with 7-year lag, higher inequality is associated with lower health, both measured with self rated health and the probability of visiting hospitals. Therefore, if we use lagged distribution measures, the estimation results again show that higher inequality is associated with poorer health. Some existing literature show that the association between inequality and health is stronger if we take lag, and our results are consistent with this observation.

Conclusion

In this paper, the association between income inequality and health is estimated. Five measure of income inequality, six measures of health are used in the panel logit model estimations and panel ordered logit model estimations. In some estimation results, we did not get consistent association between inequality and health. However, if we take 7-year lag between income distribution measures and health measures, we find that higher inequality is associated with poor health. This result with lag is consistent with the existing literature. In addition, age, educational background, marital status, smoking and drinking habit, household income, and trust to others affected individual health statistically significantly.

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		Table1 Summary Statistics				
		2011			2016	
	No.of obs.	Mean	Std.Dev.	No.of obs.	Mean	Std.Dev.
Health5Level	4886	3.3490	0.9493	2929	3.2643	0.9269
Health2Level	4886	0.8350	0.3712	2929	0.8105	0.3920
MentalHealth	4902	10.3266	3.4203	2924	10.3830	3.4641
HospitalVisit	4872	0.4403	0.4965	2928	0.5219	0.4996
#HospitalVisit	4806	0.9979	2.1481	2909	1.1090	2.0705
Hospitalization	4842	0.0748	0.2630	2938	0.0892	0.2850
Gini	4934	0.3058	0.0143	2948	0.3081	0.0146
GiniEqScale	4934	0.2952	0.0171	2948	0.2940	0.0147
LaggedGini	4934	0.3034	0.0118	2948	0.3061	0.0141
Top10Share	4934	0.2374	0.0119	2948	0.2385	0.0118
Bottom10Share	4934	0.0300	0.0025	2948	0.0301	0.0024
LaggedTop10Sh	4934	0.2375	0.0115	2948	0.2377	0.0121
LaggedBottom10Sh	4934	0.0308	0.0022	2948	0.0299	0.0024
LogHHIncome	4421	6.2399	0.6766	2696	6.1766	0.6934
female	4934	0.5338	0.4989	2948	0.5407	0.4984
married	4934	0.7987	0.4010	2948	0.8063	0.3953
HighSchool	4934	0.4560	0.4981	2948	0.4423	0.4967
College	4934	0.5338	0.4989	2948	0.2463	0.4309
Smoke3Level	3938	0.3888	0.5929	2432	0.3549	0.5520
Drink3Level	4934	0.5784	0.7138	2948	0.5634	0.7022
CanTrust	4926	3.1311	0.7376	2942	3.2349	0.6960
age2030	4934	0.1834	0.3871	2948	0.0753	0.2639
age40	4934	0.2108	0.4079	2948	0.1784	0.3829
age50	4934	0.2375	0.4256	2948	0.2592	0.4382
Hokkaido	4934	0.0397	0.1953	2948	0.0366	0.1879
Tohoku	4934	0.0734	0.2608	2948	0.0753	0.2639
Kanto	4934	0.2949	0.4560	2948	0.2968	0.4569
Chubu	4934	0.2029	0.4022	2948	0.2222	0.4158
Kinki	4934	0.1767	0.3815	2948	0.1750	0.3801
ChugokuShi~u	4934	0.0995	0.2994	2948	0.0892	0.2851

Table2: Panel ordered logit model and panel logit model estimation results with Gini						
VARIABLES	Health5Level	Health2Level	MentalHealth	HospitalVisit	#HospitalVisit	Hospitalization
Gini	-3.213	-8.296***	3.391	-3.912***	-1.602	-4.414***
	(3.203)	(0.0362)	(2.860)	(0.0272)	(3.324)	(0.0319)
age2030	1.275***	1.653***	0.251*	-3.269***	-2.645***	-0.217***
	(0.140)	(0.00165)	(0.129)	(0.00140)	(0.180)	(0.00114)
age40	0.454***	0.476***	0.455***	-2.522***	-1.954***	-0.662***
	(0.116)	(0.00146)	(0.107)	(0.00128)	(0.137)	(0.00135)
age50	-0.135	0.114***	0.577***	-1.344***	-0.930***	-0.367***
	(0.0973)	(0.00133)	(0.0980)	(0.00107)	(0.0993)	(0.00117)
female	0.0625	-0.0619***	-0.0219	0.217***	0.271**	0.283***
	(0.132)	(0.00126)	(0.132)	(0.000940)	(0.125)	(0.00102)
married	0.658***	0.890***	-0.821***	-0.515***	-0.487***	0.283***
	(0.142)	(0.00136)	(0.140)	(0.00102)	(0.140)	(0.00109)
College	0.319***	0.370***	-0.0462	-0.276***	-0.242**	-0.0229***
	(0.0999)	(0.00112)	(0.0940)	(0.000809)	(0.103)	(0.000990)
Smoke3Level	-0.373***	-0.666***	0.124	0.301***	0.259**	0.323***
	(0.103)	(0.000996)	(0.0950)	(0.000763)	(0.106)	(0.000799)
Drink3Level	0.280***	0.441***	0.00547	-0.268***	-0.211***	-0.0863***
	(0.0826)	(0.000871)	(0.0742)	(0.000645)	(0.0749)	(0.000702)
LogHHIncome	0.153**	0.0453***	-0.171**	0.0495***	-0.0160	-0.240***
	(0.0768)	(0.000784)	(0.0824)	(0.000599)	(0.0772)	(0.000638)
CanTrust	0.390***	0.449***	-0.386***	-0.182***	-0.139**	0.0786***
	(0.0678)	(0.000680)	(0.0666)	(0.000516)	(0.0649)	(0.000586)
Hokkaido	-0.361	-0.313***	0.662	0.612***	0.0214	-0.262***
	(0.354)	(0.00322)	(0.522)	(0.00246)	(0.289)	(0.00252)
Tohoku	-0.0978	-0.116***	-0.0580	0.513***	0.319	0.125***
	(0.241)	(0.00260)	(0.249)	(0.00198)	(0.221)	(0.00192)
Kanto	0.105	0.326***	0.0710	0.0390***	0.124	-0.376***
	(0.175)	(0.00189)	(0.173)	(0.00141)	(0.163)	(0.00145)
Chubu	-0.234	-0.273***	0.158	0.105***	0.0868	-0.112***
	(0.192)	(0.00207)	(0.187)	(0.00158)	(0.173)	(0.00157)
Kinki	0.218	0.179***	-0.0787	0.0314***	0.231	-0.0991***
	(0.193)	(0.00210)	(0.187)	(0.00158)	(0.179)	(0.00157)
ChugokuShikoku	-0.0369	-0.290***	-0.0130	0.240***	0.199	-0.0354***
	(0.237)	(0.00246)	(0.215)	(0.00187)	(0.208)	(0.00185)
Constant		2.690***		2.824***		-0.109***
		(0.0127)		(0.00960)		(0.0109)
Observations	5,711	5,711	5,713	5,709	5,652	5,687
Number of PANELID	3,810	3,810	3,817	3,808	3,787	3,799
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

Table3: Panel ordered logit model and panel logit model estimation results with GiniEqScale						
VARIABLES	Health5Level	Health2Llevel	MentalHealth	HospitalVisit	#HospitalVisit	Hospitalization
GiniEqScale	0.887	-0.848***	-0.452	-6.886***	-3.631	-1.318***
	(3.045)	(0.0338)	(2.793)	(0.0256)	(3.266)	(0.0283)
age2030	1.282***	1.665***	0.244*	-3.269***	-2.646***	-0.211***
	(0.140)	(0.00165)	(0.129)	(0.00140)	(0.180)	(0.00114)
age40	0.456***	0.480***	0.453***	-2.524***	-1.955***	-0.660***
	(0.115)	(0.00146)	(0.107)	(0.00128)	(0.137)	(0.00135)
age50	-0.133	0.119***	0.574***	-1.346***	-0.931***	-0.365***
	(0.0973)	(0.00133)	(0.0980)	(0.00107)	(0.0995)	(0.00117)
female	0.0639	-0.0621***	-0.0227	0.220***	0.273**	0.283***
	(0.132)	(0.00126)	(0.132)	(0.000942)	(0.125)	(0.00102)
married	0.658***	0.890***	-0.820***	-0.514***	-0.487***	0.282***
	(0.142)	(0.00136)	(0.139)	(0.00102)	(0.140)	(0.00109)
College	0.322***	0.374***	-0.0503	-0.272***	-0.240**	-0.0206***
	(0.0997)	(0.00112)	(0.0940)	(0.000809)	(0.103)	(0.000989)
Smoke3Level	-0.373***	-0.666***	0.124	0.301***	0.259**	0.322***
	(0.103)	(0.000996)	(0.0950)	(0.000764)	(0.106)	(0.000798)
Drink3Level	0.282***	0.441***	0.00447	-0.269***	-0.212***	-0.0851***
	(0.0828)	(0.000870)	(0.0742)	(0.000646)	(0.0751)	(0.000701)
LogHHIncome	0.154**	0.0480***	-0.172**	0.0488***	-0.0164	-0.239***
	(0.0767)	(0.000784)	(0.0822)	(0.000600)	(0.0771)	(0.000638)
CanTrust	0.389***	0.447***	-0.385***	-0.184***	-0.140**	0.0774***
	(0.0677)	(0.000680)	(0.0667)	(0.000517)	(0.0650)	(0.000586)
Hokkaido	-0.264	-0.131***	0.567	0.579***	-0.00207	-0.182***
	(0.349)	(0.00316)	(0.519)	(0.00241)	(0.285)	(0.00246)
Tohoku	-0.0706	-0.105***	-0.0794	0.405***	0.263	0.117***
	(0.245)	(0.00266)	(0.252)	(0.00203)	(0.227)	(0.00197)
Kanto	0.128	0.350***	0.0506	-0.0102***	0.0987	-0.372***
	(0.175)	(0.00191)	(0.173)	(0.00143)	(0.164)	(0.00146)
Chubu	-0.166	-0.176***	0.0980	-0.00199	0.0260	-0.0812***
	(0.197)	(0.00215)	(0.192)	(0.00164)	(0.180)	(0.00164)
Kinki	0.247	0.215***	-0.105	-0.00403**	0.213	-0.0834***
	(0.193)	(0.00211)	(0.187)	(0.00159)	(0.179)	(0.00157)
ChugokuShikoku	0.0280	-0.182***	-0.0731	0.177***	0.162	0.00538***
	(0.232)	(0.00247)	(0.215)	(0.00188)	(0.203)	(0.00186)
Constant		0.324***		3.720***		-1.094***
		(0.0118)		(0.00899)		(0.00974)
Observations	5,711	5,711	5,713	5,709	5,652	5,687
Number of PANELID	3,810	3,810	3,817	3,808	3,787	3,799
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

Table4: Panel ordered logit model and panel logit model estimation results with LaggedGini

VARIABLES	Health5Level	Health2Level	MentalHealth	HospitalVisit	#HospitalVisit	Hospitalization
LaggedGini	0.536	-3.162***	-2.801	1.359***	3.161	0.703***
	(3.839)	(0.0430)	(3.520)	(0.0324)	(3.779)	(0.0347)
age2030	1.282***	1.665***	0.242*	-3.256***	-2.638***	-0.211***
	(0.140)	(0.00165)	(0.129)	(0.00139)	(0.180)	(0.00114)
age40	0.456***	0.479***	0.452***	-2.518***	-1.953***	-0.659***
	(0.115)	(0.00146)	(0.107)	(0.00128)	(0.136)	(0.00135)
age50	-0.133	0.119***	0.573***	-1.339***	-0.928***	-0.364***
	(0.0973)	(0.00133)	(0.0980)	(0.00107)	(0.0995)	(0.00117)
female	0.0639	-0.0628***	-0.0233	0.218***	0.271**	0.284***
	(0.132)	(0.00126)	(0.132)	(0.000939)	(0.125)	(0.00102)
married	0.658***	0.889***	-0.821***	-0.514***	-0.486***	0.282***
	(0.142)	(0.00136)	(0.139)	(0.00102)	(0.140)	(0.00109)
College	0.322***	0.374***	-0.0508	-0.273***	-0.242**	-0.0212***
	(0.0997)	(0.00112)	(0.0940)	(0.000807)	(0.103)	(0.000988)
Smoke3Level	-0.373***	-0.665***	0.125	0.300***	0.259**	0.321***
	(0.103)	(0.000996)	(0.0951)	(0.000761)	(0.107)	(0.000797)
Drink3Level	0.282***	0.441***	0.00444	-0.266***	-0.210***	-0.0839***
	(0.0826)	(0.000871)	(0.0742)	(0.000644)	(0.0750)	(0.000701)
LogHHIncome	0.154**	0.0472***	-0.173**	0.0515***	-0.0146	-0.238***
	(0.0768)	(0.000784)	(0.0824)	(0.000598)	(0.0772)	(0.000637)
CanTrust	0.389***	0.448***	-0.384***	-0.183***	-0.140**	0.0774***
	(0.0677)	(0.000680)	(0.0667)	(0.000516)	(0.0650)	(0.000586)
Hokkaido	-0.270	-0.185***	0.514	0.736***	0.130	-0.144***
	(0.360)	(0.00324)	(0.537)	(0.00247)	(0.293)	(0.00253)
Tohoku	-0.0838	-0.105***	-0.0856	0.533***	0.339	0.143***
	(0.240)	(0.00261)	(0.246)	(0.00198)	(0.221)	(0.00192)
Kanto	0.123	0.336***	0.0340	0.0641***	0.153	-0.355***
	(0.175)	(0.00191)	(0.171)	(0.00142)	(0.165)	(0.00146)
Chubu	-0.181	-0.190***	0.0767	0.176***	0.144	-0.0426***
	(0.191)	(0.00206)	(0.184)	(0.00157)	(0.174)	(0.00156)
Kinki	0.240	0.216***	-0.108	0.0580***	0.247	-0.0716***
	(0.192)	(0.00210)	(0.187)	(0.00157)	(0.180)	(0.00155)
ChugokuShikoku	0.0176	-0.199***	-0.0936	0.311***	0.255	0.0341***
	(0.235)	(0.00244)	(0.212)	(0.00185)	(0.207)	(0.00183)
Constant		1.054***		1.156***		-1.721***
		(0.0145)		(0.0109)		(0.0118)
Observations	5,711	5,711	5,713	5,709	5,652	5,687
Number of PANELID	3,810	3,810	3,817	3,808	3,787	3,799
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

Table5 Top10Share and Bottom10Share						
VARIABLES	Health5Level	Health2Level	MentalHealth	HospitalVisit	#HospitalVisit	Hospitalization
Top10Share	-1.323	-7.490***	-2.468	-7.670***	-3.348	-1.921***
	(4.582)	(0.0545)	(4.217)	(0.0419)	(4.870)	(0.0487)
Bottom10Share	11.62	6.112***	-40.53*	-11.53***	-8.873	18.91***
	(25.78)	(0.299)	(24.00)	(0.230)	(25.50)	(0.263)
age2030	1.278***	1.654***	0.247*	-3.274***	-2.645***	-0.216***
	(0.140)	(0.00164)	(0.128)	(0.00140)	(0.180)	(0.00114)
age40	0.455***	0.476***	0.450***	-2.527***	-1.956***	-0.661***
	(0.116)	(0.00146)	(0.107)	(0.00128)	(0.137)	(0.00135)
age50	-0.134	0.114***	0.571***	-1.349***	-0.932***	-0.366***
	(0.0973)	(0.00133)	(0.0983)	(0.00108)	(0.0993)	(0.00117)
female	0.0632	-0.0614***	-0.0222	0.218***	0.271**	0.283***
	(0.132)	(0.00126)	(0.132)	(0.000942)	(0.125)	(0.00102)
married	0.658***	0.888***	-0.821***	-0.517***	-0.488***	0.283***
	(0.142)	(0.00136)	(0.139)	(0.00102)	(0.140)	(0.00110)
College	0.320***	0.372***	-0.0466	-0.275***	-0.241**	-0.0223***
	(0.0999)	(0.00112)	(0.0939)	(0.000809)	(0.103)	(0.000989)
Smoke3Level	-0.372***	-0.666***	0.123	0.300***	0.258**	0.323***
	(0.103)	(0.000995)	(0.0949)	(0.000764)	(0.107)	(0.000799)
Drink3Level	0.280***	0.439***	0.00328	-0.270***	-0.212***	-0.0859***
	(0.0827)	(0.000870)	(0.0740)	(0.000646)	(0.0750)	(0.000702)
LogHHIncome	0.153**	0.0472***	-0.168**	0.0519***	-0.0148	-0.240***
	(0.0768)	(0.000784)	(0.0827)	(0.000600)	(0.0771)	(0.000638)
CanTrust	0.389***	0.448***	-0.386***	-0.182***	-0.139**	0.0781***
	(0.0677)	(0.000680)	(0.0667)	(0.000517)	(0.0650)	(0.000586)
Hokkaido	-0.365	-0.285***	0.730	0.618***	0.0419	-0.285***
	(0.364)	(0.00331)	(0.530)	(0.00253)	(0.297)	(0.00260)
Tohoku	-0.0991	-0.121***	-0.0519	0.504***	0.318	0.118***
	(0.241)	(0.00260)	(0.249)	(0.00198)	(0.222)	(0.00192)
Kanto	0.107	0.327***	0.0701	0.0318***	0.122	-0.376***
	(0.176)	(0.00189)	(0.173)	(0.00141)	(0.163)	(0.00145)
Chubu	-0.229	-0.242***	0.190	0.118***	0.0996	-0.115***
	(0.196)	(0.00209)	(0.189)	(0.00159)	(0.175)	(0.00159)
Kinki	0.228	0.209***	-0.0760	0.0483***	0.240	-0.0889***
	(0.192)	(0.00210)	(0.187)	(0.00158)	(0.180)	(0.00156)
ChugokuShikoku	-0.0417	-0.259***	0.0549	0.266***	0.221	-0.0532***
	(0.239)	(0.00253)	(0.217)	(0.00193)	(0.211)	(0.00193)
Constant		1.717***		3.780***		-1.570***
		(0.0203)		(0.0157)		(0.0181)
Observations	5,711	5,711	5,713	5,709	5,652	5,687
Number of PANELID	3,810	3,810	3,817	3,808	3,787	3,799
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

Table6 Lagged top 10% share and bottom 10% share						
VARIABLES	Health5Level	Health2Level	MentalHealth	HospitalVisit	#HospitalVisit	Hospitalization
LaggedTop10Sh	-1.787	-0.751***	-2.388	3.065***	4.355	11.03***
	(4.669)	(0.0511)	(4.013)	(0.0385)	(4.508)	(0.0446)
LaggedBottom10Sh	4.401	50.79***	-11.67	-1.521***	-7.462	57.23***
	(25.57)	(0.285)	(23.71)	(0.215)	(25.88)	(0.244)
age2030	1.280***	1.650***	0.251*	-3.258***	-2.638***	-0.228***
	(0.140)	(0.00165)	(0.129)	(0.00140)	(0.181)	(0.00114)
age40	0.456***	0.478***	0.454***	-2.519***	-1.955***	-0.659***
	(0.115)	(0.00146)	(0.107)	(0.00128)	(0.137)	(0.00135)
age50	-0.134	0.114***	0.576***	-1.340***	-0.929***	-0.369***
	(0.0972)	(0.00133)	(0.0980)	(0.00107)	(0.0993)	(0.00117)
female	0.0641	-0.0640***	-0.0220	0.217***	0.270**	0.284***
	(0.132)	(0.00126)	(0.132)	(0.000939)	(0.125)	(0.00102)
married	0.658***	0.886***	-0.819***	-0.515***	-0.486***	0.280***
	(0.142)	(0.00137)	(0.140)	(0.00102)	(0.140)	(0.00110)
College	0.323***	0.372***	-0.0473	-0.274***	-0.243**	-0.0292***
	(0.0997)	(0.00113)	(0.0938)	(0.000808)	(0.103)	(0.000991)
Smoke3Level	-0.373***	-0.666***	0.124	0.300***	0.259**	0.328***
	(0.103)	(0.000998)	(0.0951)	(0.000762)	(0.107)	(0.000799)
Drink3Level	0.281***	0.443***	0.00437	-0.266***	-0.210***	-0.0809***
	(0.0826)	(0.000872)	(0.0742)	(0.000645)	(0.0751)	(0.000703)
LogHHIncome	0.153**	0.0435***	-0.171**	0.0515***	-0.0143	-0.243***
	(0.0769)	(0.000786)	(0.0824)	(0.000599)	(0.0775)	(0.000639)
CanTrust	0.389***	0.450***	-0.386***	-0.183***	-0.140**	0.0809***
	(0.0678)	(0.000681)	(0.0668)	(0.000516)	(0.0652)	(0.000586)
Hokkaido	-0.326	-0.392***	0.609	0.752***	0.154	-0.311***
	(0.366)	(0.00338)	(0.540)	(0.00256)	(0.304)	(0.00263)
Tohoku	-0.0999	-0.113***	-0.0816	0.546***	0.354	0.193***
	(0.242)	(0.00262)	(0.248)	(0.00199)	(0.222)	(0.00193)
Kanto	0.110	0.263***	0.0771	0.0583***	0.146	-0.455***
	(0.178)	(0.00196)	(0.174)	(0.00146)	(0.167)	(0.00150)
Chubu	-0.205	-0.304***	0.138	0.173***	0.141	-0.185***
	(0.196)	(0.00215)	(0.194)	(0.00163)	(0.181)	(0.00164)
Kinki	0.243	0.198***	-0.0838	0.0433***	0.226	-0.149***
	(0.193)	(0.00213)	(0.188)	(0.00159)	(0.180)	(0.00158)
ChugokuShikoku	-0.00895	-0.302***	-0.0447	0.317***	0.264	-0.0697***
	(0.237)	(0.00249)	(0.214)	(0.00190)	(0.212)	(0.00189)
Constant		-1.183***		0.892***		-5.768***
		(0.0183)		(0.0138)		(0.0163)
Observations	5,711	5,711	5,713	5,709	5,652	5,687
Number of PANELID	3,810	3,810	3,817	3,808	3,787	3,799
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						