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Social Class and Gender in a Solitary Society:
The Impact of COVID-19 Pandemic in Japan

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1. Introduction

The initial confirmed cases of the coronavirus disease 2019 (COVID-19) infection in Japan were officially reported on January 15, 2020. By the end of January, the World Health Organization had declared it a public health emergency of international concern. In February, the effectiveness of the quarantine system was questioned when it was revealed that many passengers on a cruise ship returning to Yokohama were infected. The first reported deaths were around mid-February. There was a considerable surge in the number of infections, coupled with the rapid and severe spread of the disease. The heightened risk, particularly among the elderly and individuals with preexisting medical conditions, along with the potential for asymptomatic infections that often went unnoticed, led to widespread public concern.

In response, precautionary measures were swiftly implemented in Japan. On March 2, all schools were temporarily closed. The scheduled Olympic Games were postponed on March 25. Subsequently, on April 7, a state of emergency was declared in metropolitan areas, and on April 16, it was extended nationwide.

As preventive measures and the availability of vaccines increased, the situation gradually stabilized. However, substantial fluctuations were observed in the number of infections. Following the initial nationwide emergency declaration, subsequent emergency declarations were issued in January and February (partially in March) 2021 as well as during May–June and late August–September of the same year.

There were considerable limitations on direct interpersonal contact among people. While this was viewed positively by some as a way to "escape from ties," the increased time spent at home, resulting from restrictions on going out, may have made it more challenging to engage in social interactions and contributed to feelings of isolation. In Japan, a noticeable division of gender roles in domestic labor exists, which may have placed an additional burden on women. Moreover, occupations in the service industry that often involve face-to-face interactions predominantly involve women. The heightened stress caused by infection prevention measures made it increasingly difficult for women to sustain employment.

2. Data

The Japanese Life Course Panel Survey (JLPS) has been conducted annually in Japan since 2007 by the Institute of Social Science at the University of Tokyo. The sample consists of men and women between the ages of 20 and 40 years as of 2007, who were randomly selected to match the proportions of age groups and genders. We informed the participants in advance by mail that this was a panel survey and requested their cooperation. Enumerators then visited individual homes to collect questionnaires. The first-wave sample was 4,800, and follow-up surveys were conducted every year, with an average retention rate of approximately 80%. Owing to sample dropouts, we added a new sample of 963 men and women in 2011. Additionally, we added 2,049 men and women to the sample of 20–31 year olds as of 2019 to incorporate a younger demographic. A web survey was conducted in August 2020 to determine the impact of the COVID-19 pandemic.

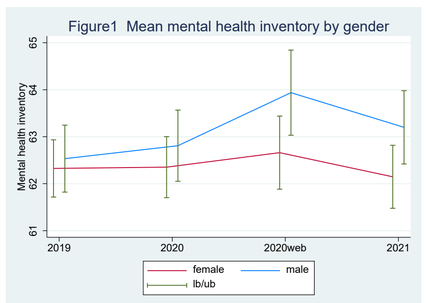
This study used regular follow-up survey data from 2019 to 2021 and web survey data from August 2020. Thus, it was possible to compare changes in mental health before and after the pandemic.

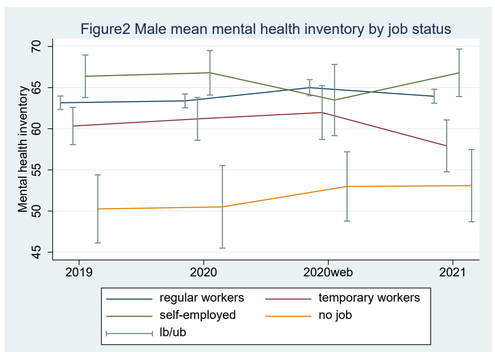
3. Dependent Variable

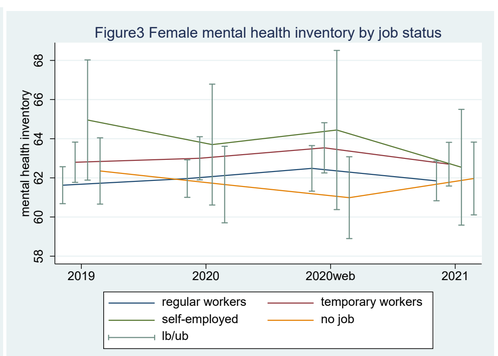
How much of the time during the last month have you …

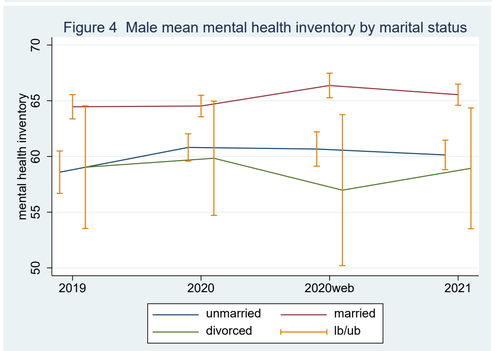
1) been a very nervous person?
2) felt downhearted and blue?
3) felt calm and peaceful?
4) felt so down in the dumps that nothing could cheer you up?
5) been a happy person?

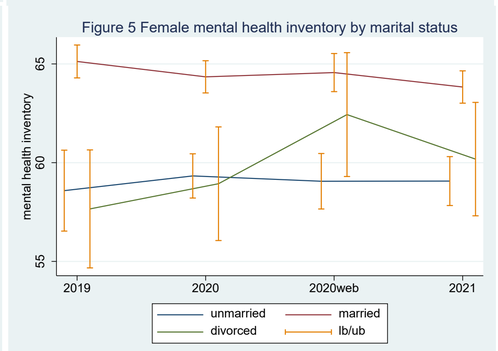
Five-stage Likert scale.
4=all of the time, …, 0=none of the time (1, 2, 4)
4=none of the time, …, 0=all of the time (3, 5)
The sum of the scores for these five items is multiplied by four to yield a composite variable that can range in value from 0 to 100.











4. Independent Variables

In the 2019 survey, respondents were asked about their living arrangements, specifically whether they resided alone. Simultaneously, they were also asked to indicate from whom they receive help in the following five areas: "work or study," "obtaining job referrals," "relationships with friends, partners, and spouses" "seeking a significant loan in times of unemployment or illness-induced financial need," and "seeking assistance when they or a family member require support due to illness or accidents." Participants were given the option to choose from a range of individuals, including parents, spouse or partner, children, siblings, relatives, work colleagues, school friends, other friends and acquaintances, or even select "no one." The availability of "no one" as a choice was intentionally included. In this section, we focused on those who responded with "no one." For the purpose of this study, individuals who specifically indicated "no one" across all five items were classified as experiencing a state of loneliness.

5. Model

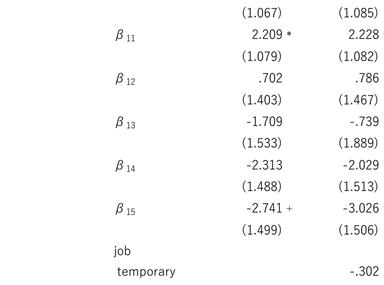
- $$y_{ij} = \beta_0 + \beta_1 t_{1j} + \beta_2 t_{2j} + \beta_3 t_{4j} + \beta_4 g_j + \beta_5 l_j + \beta_6 t_{1j} g_j + \beta_7 t_{2j} g_j + \beta_8 t_{4j} g_j$$
$$+\beta_9 t_{1j} l_j + \beta_{10} t_{2j} l_j + \beta_{11} t_{4j} l_j + \beta_{12} g_j l_j + \beta_{13} t_{1j} g_j l_j + \beta_{14} t_{2j} g_j l_j + \beta_{15} t_{4j} g_j l_j$$
$$+(control\ variables) + \zeta_{1j} + \zeta_{2j} t_{ij} + \varepsilon_{ij}$$

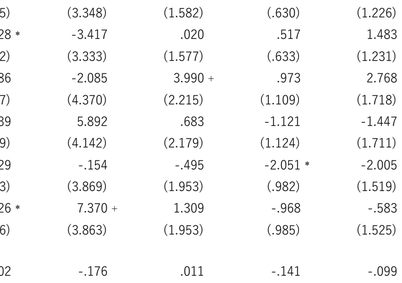
t_1=2019, t_2=2020, t_3(base)=2020web(August), t_4=2021, g=gender(male=1) dummy, l=solitude (social isolation=1) dummy, control variables=job status, marital status
i=number of wave (year), j=respondent (person) β=fixed effects, ζ=random effects, ε=error

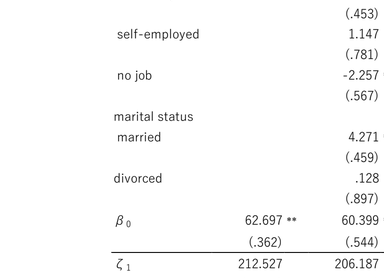
6. Results

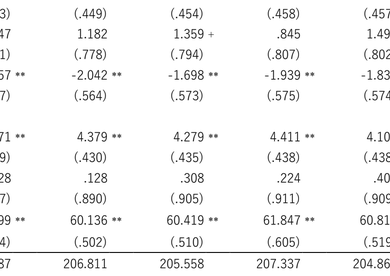
	Model(1)	Model(2)	Model(3)	Model(4)	Model(5)	Model(6)	Model(7)	Model(8)
β_1	-.263	-.013	.140	-.113	-.192	.016	.250	.225
	(.334)	(.372)	(.358)	(.366)	(.485)	(.374)	(.387)	(.372)
β_2	-.343	-.428	-.257	-.208	-.819 +	-.380	-.175	-.101
	(.326)	(.325)	(.310)	(.318)	(.424)	(.325)	(.335)	(.324)
β_3	-.789 *	-.813 *	-.513 +	-.534 +	-.785 +	-.670 *	-.396	-.512
	(.330)	(.327)	(.311)	(.319)	(.425)	(.327)	(.337)	(.326)
β_4	1.132 *	.971	1.365 *	1.460 *	.629	1.818 **	1.685 **	1.241 **
	(.565)	(.596)	(.566)	(.591)	(.744)	(.621)	(.621)	(.597)
β_5	-3.444	-1.807 +	-8.395 *	-9.163 **	-4.144 **	-8.235 **	-4.523 **	-7.610 **
	(1.000)	(1.076)	(3.780)	(1.801)	(.716)	(1.391)	(1.029)	(1.326)
β_6	-.733	-1.248 *	-1.454 **	-1.384 *	-.905	-1.341 *	-1.532 *	-1.526 **
	(.527)	(.587)	(.557)	(.578)	(.735)	(.608)	(.612)	(.585)
β_7	-.450	-.322	-.576	-.464	.356	-.267	-.605	-.474
	(.516)	(.514)	(.485)	(.506)	(.648)	(.532)	(.535)	(.512)
β_8	.411	.352	-.194	-.090	.487	-.046	-.254	.034
	(.521)	(.516)	(.486)	(.507)	(.651)	(.533)	(.536)	(.514)
β_9	1.281	.261	-3.491	-.387	.619	1.477	-.893	-1.513
	(1.108)	(1.422)	(3.535)	(1.755)	(.725)	(1.378)	(1.021)	(1.340)
β_{10}	2.023 +	1.746	2.118	.097	1.318 *	1.563	-.100	-1.219
	(1.067)	(1.085)	(3.348)	(1.582)	(.630)	(1.226)	(.905)	(1.160)
β_{11}	2.209 *	2.228 *	-3.417	.020	.517	1.483	-.938	-.117
	(1.079)	(1.082)	(3.333)	(1.577)	(.633)	(1.231)	(.915)	(1.166)
β_{12}	.702	.786	-2.085	3.990 +	.973	2.768	-1.038	2.607
	(1.403)	(1.467)	(4.370)	(2.215)	(1.109)	(1.718)	(1.455)	(1.819)
β_{13}	-1.709	-.739	5.892	.683	-1.121	-1.447	1.027	1.950
	(1.533)	(1.889)	(4.142)	(2.179)	(1.124)	(1.711)	(1.455)	(1.836)
β_{14}	-2.313	-2.029	-.154	-.495	-2.051 *	-2.005	.299	.023
	(1.488)	(1.513)	(3.869)	(1.953)	(.982)	(1.519)	(1.285)	(1.608)
β_{15}	-2.741 +	-3.026 *	7.370 +	1.309	-.968	-.583	1.765	.205
	(1.499)	(1.506)	(3.863)	(1.953)	(.985)	(1.525)	(1.297)	(1.616)
job								
temporary		-.302	-.176	.011	-.141	-.099	-.021	.129
		(.453)	(.449)	(.454)	(.458)	(.457)	(.454)	(.453)
self-employed		1.147	1.182	1.359 +	.845	1.493 +	1.397 +	1.515 +
		(.781)	(.778)	(.794)	(.807)	(.802)	(.796)	(.795)
no job		-2.257 **	-2.042 **	-1.698 **	-1.939 **	-1.838 **	-1.963 **	-1.759 **
		(.567)	(.564)	(.573)	(.575)	(.574)	(.570)	(.571)
marital status								
married		4.271 **	4.379 **	4.279 **	4.411 **	4.104 **	4.330 **	4.157 **
		(.459)	(.430)	(.435)	(.438)	(.438)	(.434)	(.435)
divorced		.128	.128	.308	.224	.408	.598	.459
		(.897)	(.890)	(.905)	(.911)	(.909)	(.907)	(.901)
β_0	62.697 **	60.399 **	60.136 **	60.419 **	61.847 **	60.818 **	60.695 **	60.702 **
	(.362)	(.544)	(.502)	(.510)	(.605)	(.519)	(.525)	(.516)
ζ_1	212.527	206.187	206.811	205.558	207.337	204.869	206.235	203.852
	(7.894)	(9.277)	(9.226)	(9.199)	(9.306)	(9.257)	(9.244)	(9.186)
ζ_2	5.624	4.886	5.107	5.220	5.255	5.179	5.276	5.206
	(.692)	(.775)	(.769)	(.770)	(.773)	(.774)	(.773)	(.770)
ε	108.512	103.401	102.934	102.347	101.965	102.628	102.456	102.423
	(1.704)	(1.788)	(1.772)	(1.775)	(1.783)	(1.790)	(1.780)	(1.777)
cov(wave, cons)	-9.501	-7.815	-8.617	-8.941	-9.357	-8.784	-9.229	-8.858
	(1.999)	(2.289)	(2.276)	(2.274)	(2.294)	(2.289)	(2.288)	(2.275)
N of obs	18568	15859	15945	15582	15292	15486	15545	15560
N of groups	5767	5131	5136	4947	4850	4892	4935	4937
Log Likelihood	-75785.808	-64504.247	-64814.351	-63266.416	-62068.840	-62562.316	-63121.280	-63164.011

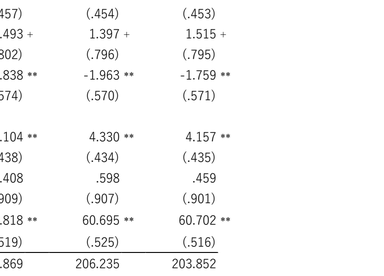
Note: + p<.10 * p<.05 ** p<.01

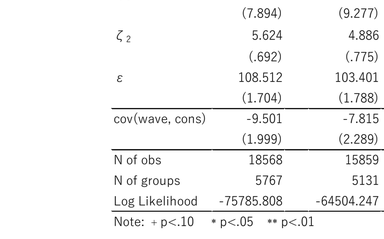


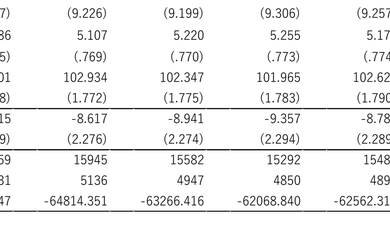


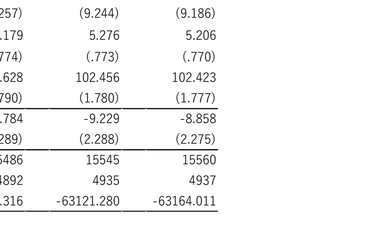












※definition of solitude

model1 and 2: living alone, model4: not receiving help for work or study, model5: not receiving help for obtaining job referrals, model6: not receiving help for relationships with friends, partners and spouses, model7: not receiving help for seeking a loan, model8: not receiving help for seeking assistance when they require support due to accidents, model3: not receiving any help of these five areas.

7. Conclusion

Living alone was originally associated with substantially lower mental health in both men and women. However, in the summer of 2020, the gender gap widened with a change in a different direction: improving for men and worsening for women. However, considering marital status, the significant effect of whether or not one lived alone disappeared.

If they have no one to talk to, their mental health will be worse than those who do. While there was no significant change for men, the results for women with no one to talk to gradually worsened since 2020.

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