

Association of socioeconomic factors with hikikomori in Japan from 2010–2019: a correlational study

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Abstract

Background

Although several surveys have suggested that socioeconomic factors function as background variables for the expression of *hikikomori* (prolonged social withdrawal), no research has directly examined whether socioeconomic indicators increase the occurrence of *hikikomori*. This study aimed to examine the relationship between socioeconomic factors and the expression of *hikikomori* using data covering a 10-year period.

Methods

We collected socioeconomic data between 2010 to 2019 from members of a multi-branch Japanese association for family members of *hikikomori* patients.

Results

The results of the partial correlation analysis and meta-analysis showed that the higher the unemployment rate, the greater the occurrence probability of *hikikomori*.

Conclusion

The findings suggest that socioeconomic factors relate to the increase in *hikikomori*, and that these factors should be included when identifying the individual or cultural factors that cause *hikikomori*.

Background

Socioeconomic factors such as unemployment are commonly related to mental health problems. For example, previous studies have reported that the number of suicides is related to the unemployment rate in various countries [1]. *Hikikomori* or prolonged social withdrawal is also a mental health problem and can be presumed to be related to socioeconomic factors. *Hikikomori*—a phenomenon characterized by avoidance of social interactions for more than six months [2]—has been recognized as a serious social problem in Japan for over 20 years [3, 4]. *Hikikomori* has a significant negative impact on psychological and physical health, such as comorbid psychiatric and nutritional disorders, leading to a deterioration of an individual's quality of life [5–8].

Hikikomori or similar phenomena have been reported in various other countries, including France [9], Australia, Thailand, Taiwan, Bangladesh, Iran, India, Korea, the USA [10, 11], Oman [12], and Spain [13]. An epidemiological study of *hikikomori* in Japan in a community-based population aged 20–49 years revealed that 1.2% of that population had experienced the phenomenon in their lifetime [14], while a cross-sectional telephone-based survey in Hong Kong revealed that 1.9% of 12–29-year-olds had experienced it [15].

It can be assumed that biological, psychological, and social factors relate to the expression of *hikikomori*, although its causes are not yet well understood. In terms of biological factors, *hikikomori* can cause other psychiatric disorders and vice versa [16]. Kondo et al. [5] found that 80.3% of individuals with *hikikomori* were diagnosed with psychiatric disorders such as developmental, mood, anxiety, and personality disorders. Furthermore, Hayakawa et al. [17] found that *hikikomori* was related to serum uric acid levels in men and high-density lipoprotein cholesterol levels in women. Regarding psychological factors, previous studies have found *hikikomori* to be related to a loss of secure attachment during childhood [18], difficulties in interpersonal relationships [19], depression and anxiety [20], Internet addiction [21], and loneliness [11]. Among social factors, many researchers have examined the relationship between *hikikomori* and family-related factors, because individuals with *hikikomori* spend most of their time at home. However, while some studies have found an association between family dysfunction and *hikikomori* [20, 22], others have reported that the parents' childrearing style was unrelated to the expression of *hikikomori* [23], and that family interactions in *hikikomori* and non-*hikikomori* cases did not differ [24]. These findings suggest that this issue still requires further research and investigation.

Socioeconomic factors may be considered as major external factors related to *hikikomori*. For example, the results of a community-based survey of Japanese residents aged 15–39 years conducted by the Japanese Cabinet Office reported that many cases of *hikikomori* have work-related causes, such as poor work environment and being currently unemployed [25]; another Cabinet Office study of residents aged 40–64 years found that the most common reason for social withdrawal was leaving one's job (17 out of 47 *hikikomori* patients [26]. This implies that other socioeconomic factors, such as the unemployment rate [27], number of active job openings, and average household income, relate to the expression of *hikikomori*. However, previous reports have only examined individual reasons for *hikikomori*, and it is not clear whether broader socioeconomic factors influence the increase in *hikikomori* cases. It can be presumed that employees often leave a company due to worsening socioeconomic factors, poor physical and mental health, and/or poor relationships with others in the workplace. To the best of our knowledge, however, no research has been conducted to examine the relationship between socioeconomic indicators and the increase in the occurrence of *hikikomori*.

We investigated over 20 years of data from a Japanese association of family members of *hikikomori* patients to examine the relationship of socioeconomic indicators, such as the unemployment rate and active job openings ratio, with the expression of *hikikomori*. Furthermore, for comparison with *hikikomori*, we investigated the relationship between socioeconomic factors and the number of occurrences of students not attending school— a concept similar to *hikikomori*, characterized by students who do not or cannot attend school for 30 days or more per year, mainly due to psychological, emotional, physical, or social factors, excluding cases of illness or those involving financial reasons [28].

Methods

Data collection

We used data covering the years 2010 to 2019 from members of the KHJ (Kazoku [meaning “family” in Japanese] *Hikikomori* Japan) or the National Federation of Families with *Hikikomori* Persons in Japan, an association with more than 50 branches throughout the country. While the data collected from KHJ members included those in the year 1999 onwards, some items used in the current study only included those beginning in 2010. Some of the data used in the present study were also used by Nonaka et al. [29], Makabe et al. [30], Nonaka et al. [31], Nonaka et al. [32], and Nonaka, Shimada, and Sakai [24], to investigate family characteristics in cases of *hikikomori*. We used the age of the individuals with *hikikomori* and the age at the onset of *hikikomori* to calculate the number of expressions of *hikikomori* each year. Furthermore, to be eligible to participate in this study, participants were required to provide their age and gender, as well as those of the family member with *hikikomori* and the duration of the syndrome. If *hikikomori* occurred more than once, participants provided the duration and age at onset for each instance.

Procedure

Participation in the family association involved monthly meetings, during which family members were asked to participate in the investigation; questionnaires were then sent by postal mail. Informed consent was obtained before the participants responded to the questionnaire. The participants answered the questionnaires anonymously and were free to withdraw from the study at any time. The study was approved by the local research ethics committee of the institutes to which the authors belong and followed the principles of the Declaration of Helsinki which excluded research pre-registration in a database.

Instruments

Demographics. Participants reported their age; relationship with the individual with *hikikomori* (father, mother, or other, including sibling); and the age, gender, and duration of the syndrome for the individual with *hikikomori* [2]. We calculated the year at which the individuals’ *hikikomori* first occurred by subtracting the age of the individuals at the onset of *hikikomori* from their age at the time of data collection”. For example, in the case of research conducted in 2018, if a 30-year-old individual first experienced *hikikomori* at age 20, we determined that *hikikomori* was initially “expressed” in 2008 by using the following formula: $2018 - (30 - 20) = 2008$. Then, we counted the number of expressions of *hikikomori* every year to examine its relationship with the socioeconomic situation.

Socioeconomic indicators. We used Japan’s unemployment rate [27], active job opening rate [33], and average household income [34] for each year of the study as socioeconomic indicators. The unemployment rate is the proportion of unemployed persons (persons who have no jobs, are looking for jobs) in the labor force (people aged 15 and over who can currently work). The active job opening rate is calculated by dividing monthly active job openings by monthly active job applications.

Number of instances of school non-attendance by children at elementary and junior high schools. We used the number of children not attending Japan’s elementary and junior high schools [35] as a phenomenon analogous to *hikikomori* because it is characterized by the avoidance of social interaction, and examined its association with socioeconomic factors. These students were defined as those who do not or cannot attend school for 30 days or more per year, mainly due to psychological, emotional, physical, or social factors, excluding cases of illness or those involving financial reasons [28]. We calculated the number of annual

occurrences of school-non-attending students by excluding the number that had continued from the previous year from the current number of instances. As school non-attendance has various evidenced background factors such as mental health and family member influence [28], we presumed that it was not strongly related to socioeconomic factors.

Data Analysis

We performed correlation analyses to examine the association of socioeconomic indicators with the expression of *hikikomori*, unemployment rate, active job opening rate, average household income, and number of expressions of *hikikomori* per year. We excluded outliers in the year of *hikikomori* onset for each person. We performed a random effects meta-analysis using the restricted maximum-likelihood estimator (REML).

Results

Participant demographics

Table 1 shows the age and gender of the family respondents, the age and gender of the persons with *hikikomori*, and the duration of *hikikomori* for each year the research had been conducted. There were 2,461 family respondents across the 8 instances of data collection over 10 years. The average age of individuals with *hikikomori* across the period of data collection was 30.94 to 34.78, and the duration of *hikikomori* was 112.80 to 144.32 months.

Table 1
Participant demographics.

		2010	2011	2012	2015	2016	2017	2018	2019
	<i>N</i>	257	271	241	300	341	467	263	321
Hikikomori patient									
Age	<i>M</i>	31.36	30.94	32.61	32.37	32.99	33.70	34.19	34.78
	<i>SD</i>	7.03	7.02	6.51	7.30	7.82	7.62	8.18	8.71
Gender	Male	212	224	190	238	282	351	207	251
	Female	45	47	50	62	58	115	56	70
	N/A	0	0	1	0	1	1	0	0
Hikikomori duration	<i>M</i>	118.63	112.80	123.30	130.09	131.94	138.29	144.32	140.61
	<i>SD</i>	68.68	72.18	76.88	74.88	92.71	86.26	90.47	90.37
Family member									
Age	<i>M</i>	61.25	60.98	62.64	62.78	63.87	63.98	65.10	65.08
	<i>SD</i>	7.09	6.96	6.45	7.73	7.84	7.73	7.77	8.37
	N/A	0	3	1	1	1	1	2	1
Gender	Male	166	188	165	222	245	344	192	246
	Female	85	80	72	73	93	113	67	70
	Other	4	2	4	3	3	10	3	4
	N/A	2	1	0	2	0	0	1	1

Correlation between socioeconomic indicators and expression of hikikomori

The plots of the number of expressions of *hikikomori* correlated with the unemployment rate (Fig. 1), active job opening rate (Fig. 2), and average household income (Fig. 3) are shown by research year. Table 2 shows the correlation analysis results for the socioeconomic indicators and the expression of *hikikomori*.

Spearman's ρ was .38 to .68 ($M = .53$, $SD = .10$) for the unemployment rate, $-.24$ to $-.61$ ($M = -.42$, $SD = .12$) for the active job opening rate, and $-.29$ to $.63$ ($M = .21$, $SD = .29$) for the average household income. The partial correlation analysis was performed between each socioeconomic indicator and the expression of *hikikomori*, with the other socioeconomic indicators as the control variables. Spearman's ρ was found to be .18 to .63 for the unemployment rate, $-.34$ to $.21$ for the active job opening rate, and $-.29$ to $.71$ for the average household income (Table 3). The unemployment rate was significantly correlated with the expression of *hikikomori* except for the research in 2018.

Table 2
Correlation coefficients between socioeconomic indicators and the number of expressions of hikikomori (2010–2019).

		2010	2011	2012	2015	2016	2017	2018	2019
Unemployment rate	ρ	0.422	0.544	0.584	0.680	0.601	0.546	0.378	0.498
	p	0.040	0.005	0.002	< .001	< .001	0.002	0.043	0.005
Active job opening rate	ρ	-0.398	-0.268	-0.481	-0.477	-0.605	-0.474	-0.417	-0.238
	p	0.054	0.195	0.015	0.014	< .001	0.009	0.024	0.205
Household income	ρ	0.631	0.323	0.554	0.058	0.167	0.114	0.089	-0.289
	p	< .001	0.116	0.004	0.778	0.388	0.555	0.648	0.122
Number of hikikomori expression years		24	25	25	26	29	29	29	30
Note. ρ : Spearman's rho.									

Table 3
Partial correlation coefficients between socioeconomic indicators and the number of expressions of hikikomori (2010–2019).

		2010	2011	2012	2015	2016	2017	2018	2019
Unemployment rate	ρ	0.457	0.585	0.625	0.564	0.387	0.380	0.176	0.437
	p	0.010	0.001	< .001	0.001	0.032	0.035	0.343	0.014
Active opening rate	ρ	-0.072	0.213	-0.064	-0.070	-0.338	-0.177	-0.234	0.050
	p	0.701	0.328	0.773	0.745	0.085	0.376	0.206	0.791
Household income	ρ	0.710	0.451	0.709	0.110	0.191	0.135	0.071	-0.291
	p	< .001	0.031	< .001	0.608	0.339	0.469	0.704	0.112
Number of hikikomori expression years		24	25	25	26	29	29	29	30

The results of the meta-analyses indicated that the partial correlation coefficient was .44 (95% CI .34 to .55, $p < .001$; $Q(7) = 5.92$, $p = .55$; $I^2 = 0.00\%$) for the unemployment rate (Fig. 4); $-.09$ (95% CI $-.22$ to $.04$, $p = .17$; $Q(7) = 6.07$, $p = .53$; $I^2 = 0.00\%$) for the active job opening rate (Fig. 5); and $.24$ (95% CI $-.01$ to $.49$, $p = .06$; $Q(7) = 43.35$, $p < .001$; $I^2 = 82.22\%$) for the average household income (Fig. 6). The effect sizes of the unemployment rate were medium, while the effect sizes of the average household income and active job opening rate were small [36]. The household income showed high heterogeneity. These results suggest that unemployment increases the likelihood of *hikikomori* occurrence, but that an increase in job openings alone may not be enough to prevent *hikikomori*.

Correlation between socioeconomic indicators and school non-attendance

Children's school non-attendance showed a significant partial correlation coefficient with unemployment rate ($\rho = .49$, 95% CI .09 to .75, $p = .02$), but not with active job opening rate ($\rho = .24$, 95% CI $-.19$ to .59, $p = .28$) or household income ($\rho = -.24$, 95% CI $-.59$ to .19, $p = .28$). Spearman's correlation coefficient between expression of *hikikomori* data from 2010 to 2019 and school non-attendance was $-.11$ to .52, and the results of the meta-analysis were .19 (95% CI .01 to .37, $p = .04$; $Q(7) = 10.58$, $p = .16$; $I^2 = 37.47\%$). The correlation coefficient for the unemployment rate was the same as that for the expression of *hikikomori* and was not significant for the active job opening rate and household income.

Discussion

This study aimed to examine the relationship between socioeconomic factors and the expression of *hikikomori*. The data were collected 8 times over a period of 10 years, and have a major limitation in that it is not clear how many participants overlapped between the data collection points (i.e., annually). Even with this limitation, the findings of the current study are important, as it is the first study to demonstrate a relationship between socioeconomic factors and the expression of *hikikomori*, which affects a reclusive and hard-to-access clinical population.

In the current study, many individuals with *hikikomori* were long-term cases, compared with previous research targeting 18- to 34-year-olds in France (mean duration = 29 months; [9]) and 16- to 35-year-olds in Japan (mean duration = 4.3 years; [5]). However, recent epidemiological studies in Japan have shown that 34.7% of individuals with *hikikomori* aged between 15 and 39 years have had the disease for more than 7 years [25, 37], while 38.2% of those aged between 40 and 64 years have had *hikikomori* for more than 7 years [26]. The duration of *hikikomori* in this study was similar to the aforementioned findings. The gender ratio of about 80% male was also similar to that in several previous studies in Japan and elsewhere—a ratio of 76.6% male was determined by the Japanese Cabinet Office [26], 80% by Chauliac et al. [9], 76.4% by Funakoshi and Miyamoto [38], 74.8% by Kondo et al. [5], and 75.6% by Lee et al. [20]. A possible reason for this gender ratio is the Japanese socio-cultural background, in which men typically experience more work-related psychological pressure than women do [39]. School non-attendance showed almost the same correlation coefficient as *hikikomori*. The relationship between school non-attendance and unemployment rate supports previous research [40]. As both showed a low correlation coefficient, further research is needed to clarify the reason for this. For example, school non-attendance, unlike *hikikomori*, may occur indirectly due to economic and psychological changes in the family as a result of parental unemployment, and may often involve antisocial behavior rather than asocial behavior.

Previous studies have shown that unemployment was the most common cause of *hikikomori* for residents aged 40–64 years [26]. The current results suggest that a preventive approach to long-term *hikikomori* could involve mental health and reemployment support for the unemployed population. On the other hand, the active job opening rate, which is the number of jobs available divided by the number of jobseekers, an important indicator of overall employment conditions, did not have a high correlation with *hikikomori*. As individuals with *hikikomori* often stop seeking jobs [26], the active job opening rate may not be related to the

number of *hikikomori* cases. Considering that *hikikomori* cases may not necessarily occur in all countries with a high unemployment rate, sociocultural factors such as family relationships and psychological factors such as personality traits may serve as moderators of the expression of this effect.

Average household income was also not linked to the expression of *hikikomori* based on the meta-analysis results. This stands to reason, as it is difficult to maintain *hikikomori* without the support of a household income. However, the results showed that the correlation coefficient of household income varied widely from year to year, indicating no clear correlation between household income and the expression of *hikikomori*. In addition, considering that Yong and Nomura [19] reported that social class was not significantly different between *hikikomori* and non-*hikikomori* cases, further research is needed to clarify the relationship between the family economic situation and expression of *hikikomori*. The data representing average household income exhibited heterogeneity, and the partial correlation coefficient was different for the data collected from 2010 to 2012 and from 2015 to 2019. Therefore, the relationship between the expression of *hikikomori* and household income may have changed between 2012 and 2015. This result suggests that various individuals with *hikikomori* and their families may have started to use support centers and family associations, as the relevant support systems in Japan were enhanced between 2009 and 2013 [41].

There are several limitations to this study. First, while the results showed the relationship between socioeconomic factors and expression of *hikikomori*, we could not determine causation. Future research is also needed to determine whether other variables, such as mediators and moderators, further affect this relationship.

Second, sample bias is an important limitation. As most of the participants were concerned with solving the problems of their *hikikomori* family members, the possibility of sample bias cannot be excluded. It is important to note, however, that since individuals with *hikikomori* are likely to avoid interpersonal situations including treatment [42], research targeting family members may be more expedient and may potentially reduce the effect of the bias of the person with *hikikomori*. Telephone-based surveys [15] and online counseling via e-mail [43] may also be useful in reducing bias, due to the *hikikomori* characteristic of avoiding going out, although it may be difficult to reduce the bias due to avoidance of other people. Clinically, family training aimed at easing access to individuals with *hikikomori* has shown its efficacy [44–46], and may be helpful for engaging the individual with *hikikomori* in treatment.

Issues with research design robustness are also a limitation of this study. Although long-term follow-up is desirable, dropouts are likely to occur in large-scale follow-up studies, especially given the reclusiveness of *hikikomori*, or in cases when *hikikomori* is resolved. This may help explain the dearth of longitudinal studies of *hikikomori*, though one 12-month follow-up study has been reported in recent years [42]. One way to solve this problem is through Internet-based research; however, considering that the proportion of individuals with *hikikomori* (29.8%) who use the Internet on a daily basis is lower than that of non-*hikikomori* individuals (43.3%) [26], this may introduce another source of bias. Moreover, it must be considered whether the findings of this study are applicable outside of Japan, especially in less economically developed countries.

Naturally, in addition to socioeconomic factors, various other biological, psychological, and social factors will influence the expression of *hikikomori*. Further comprehensive studies are needed to clarify the influence

of these additional factors.

Declarations

Ethics approval and consent to participate

The study was approved by the local research ethics committee of the institutes to which the authors belong.

Consent for publication

Not applicable

Availability of data and materials

Not applicable

Competing interests

The authors have no conflicts of interest directly relevant to the content of this article.

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Authors' contributions

S.N. conducted the analysis and wrote the manuscript. Both authors contributed to study design and data interpretation, and reviewed the manuscript.

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Figures

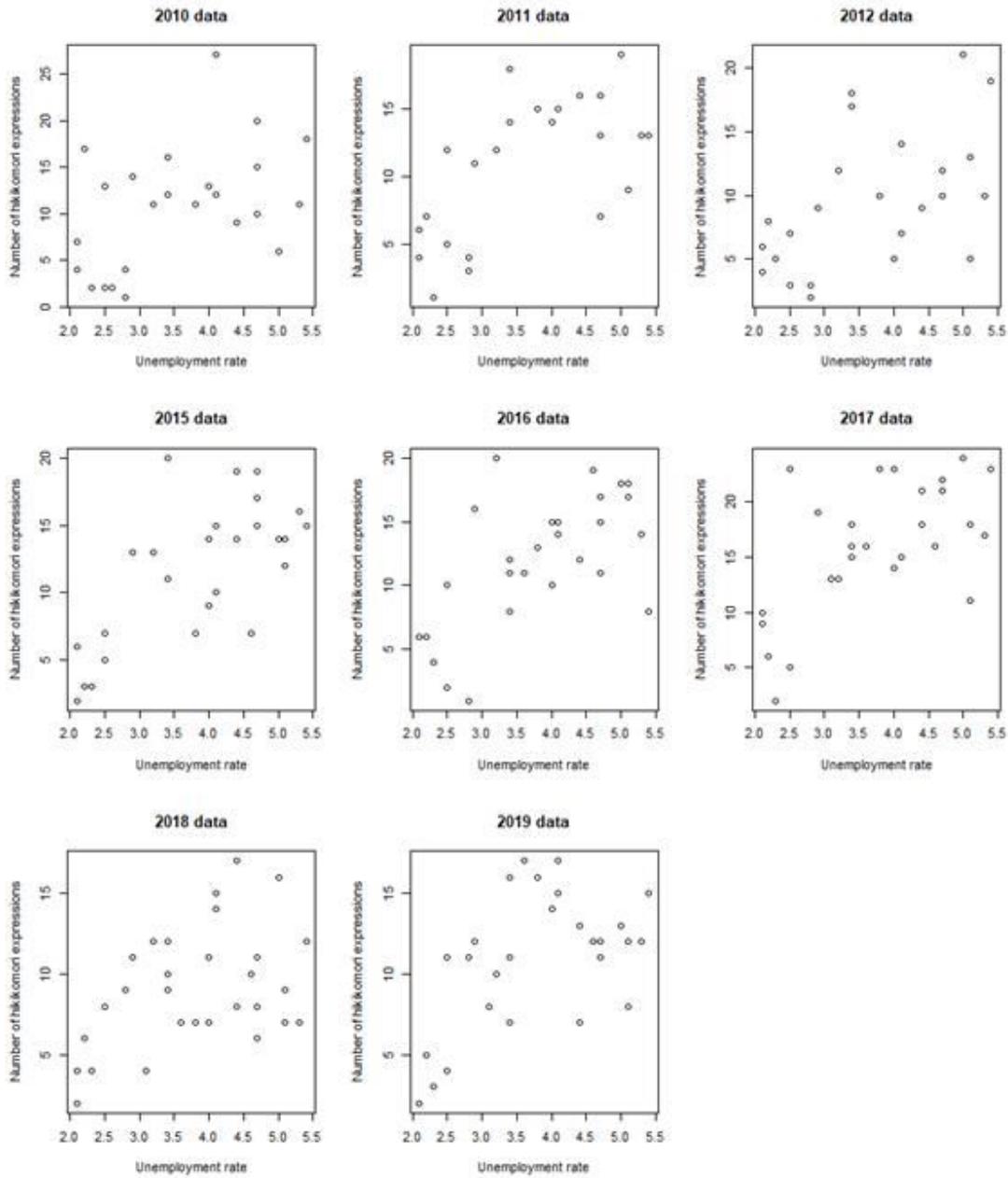


Figure 1

Relationship between unemployment rate and the number of expressions of hikikomori

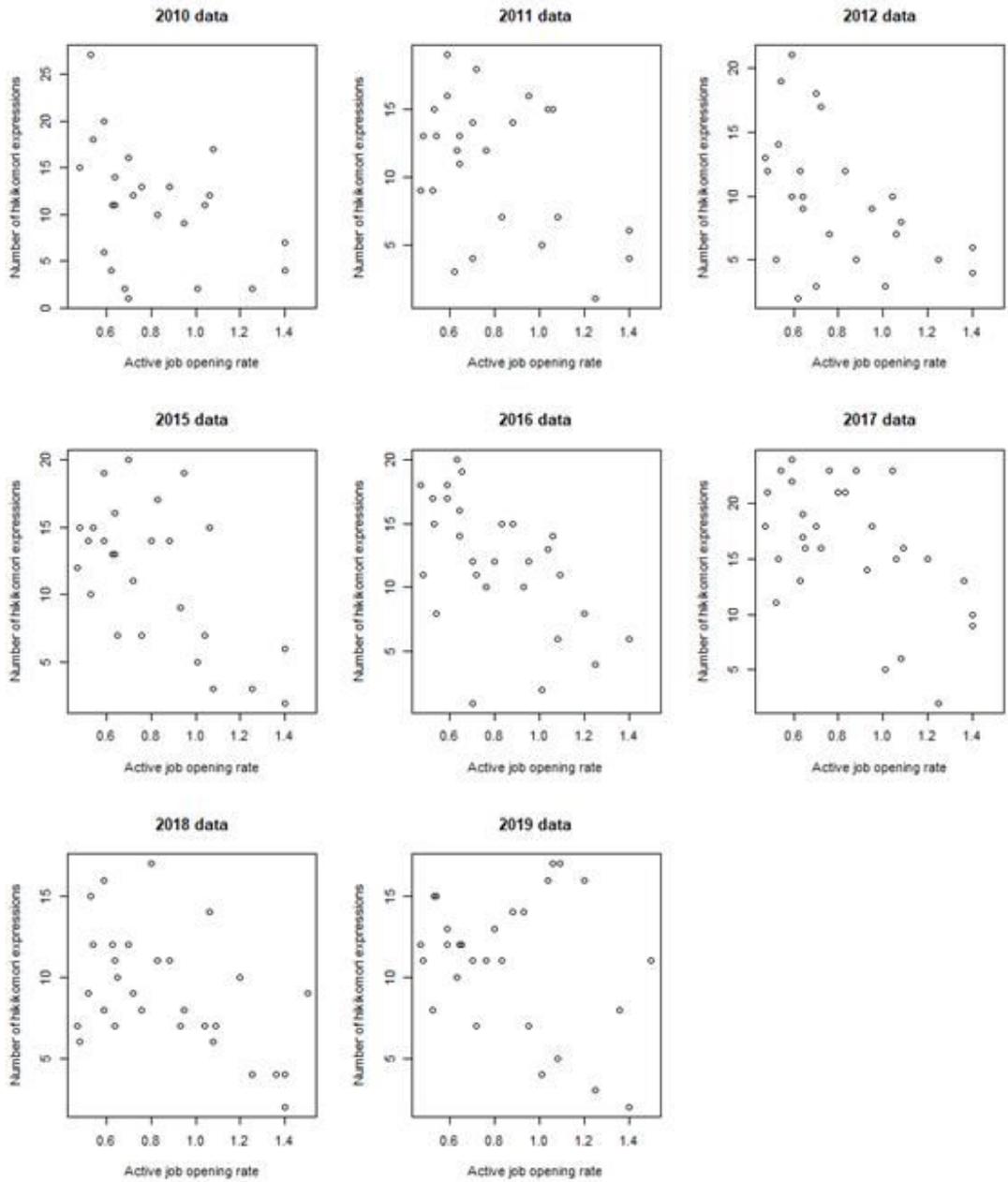


Figure 2

Relationship between active job opening rate and the number of expressions of hikikomori

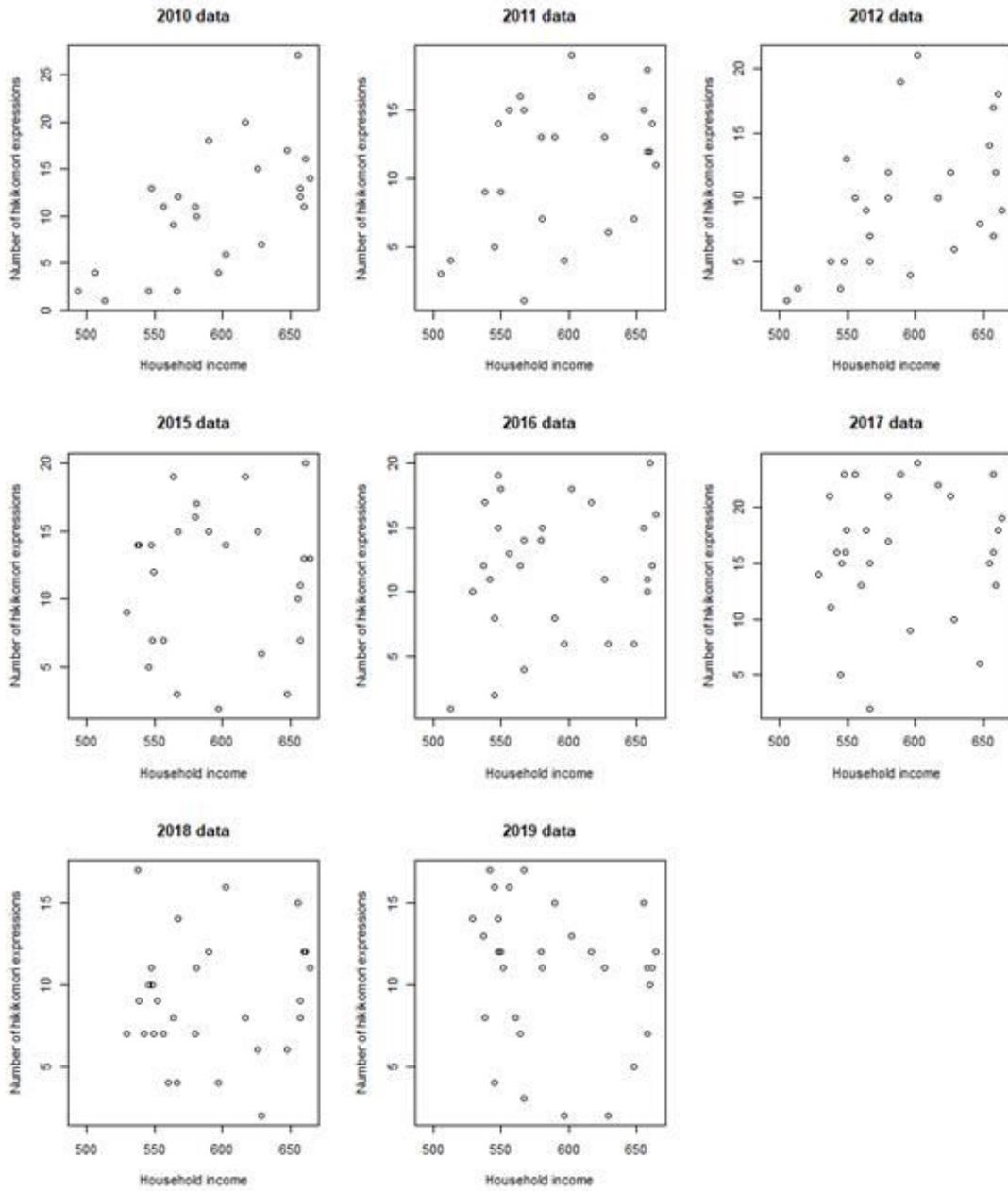


Figure 3

Relationship between average household income and the number of expressions of hikikomori

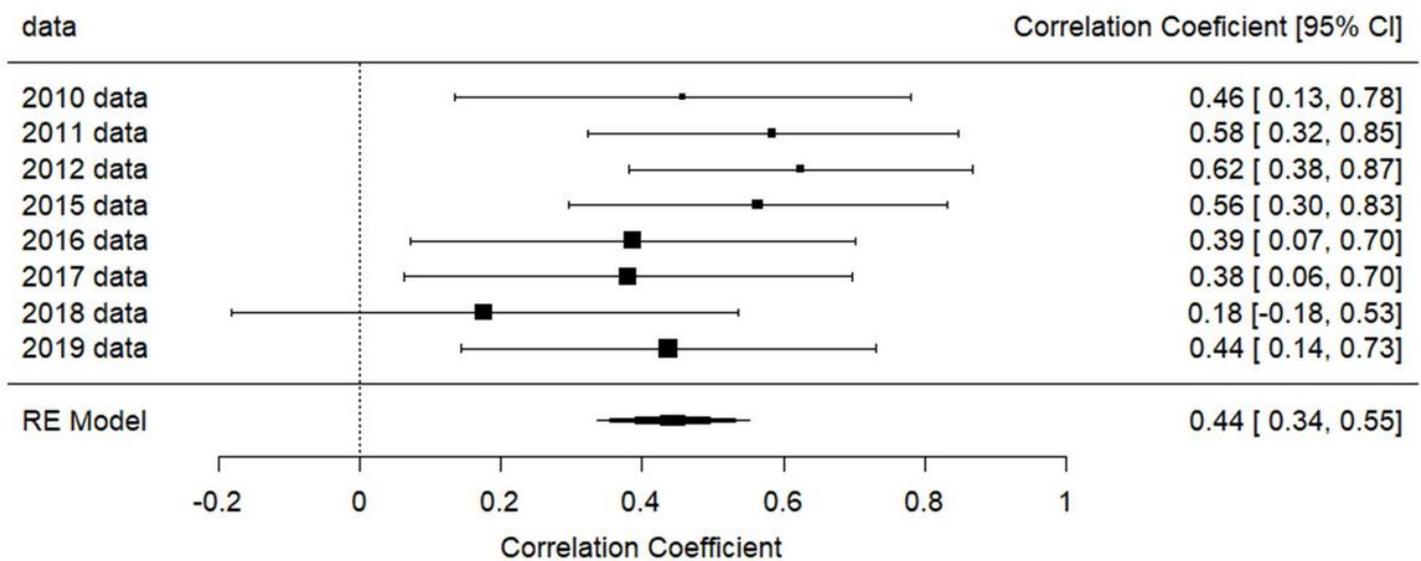


Figure 4

Forest plot of the combined correlation of the unemployment rate and the expression of hikikomori.

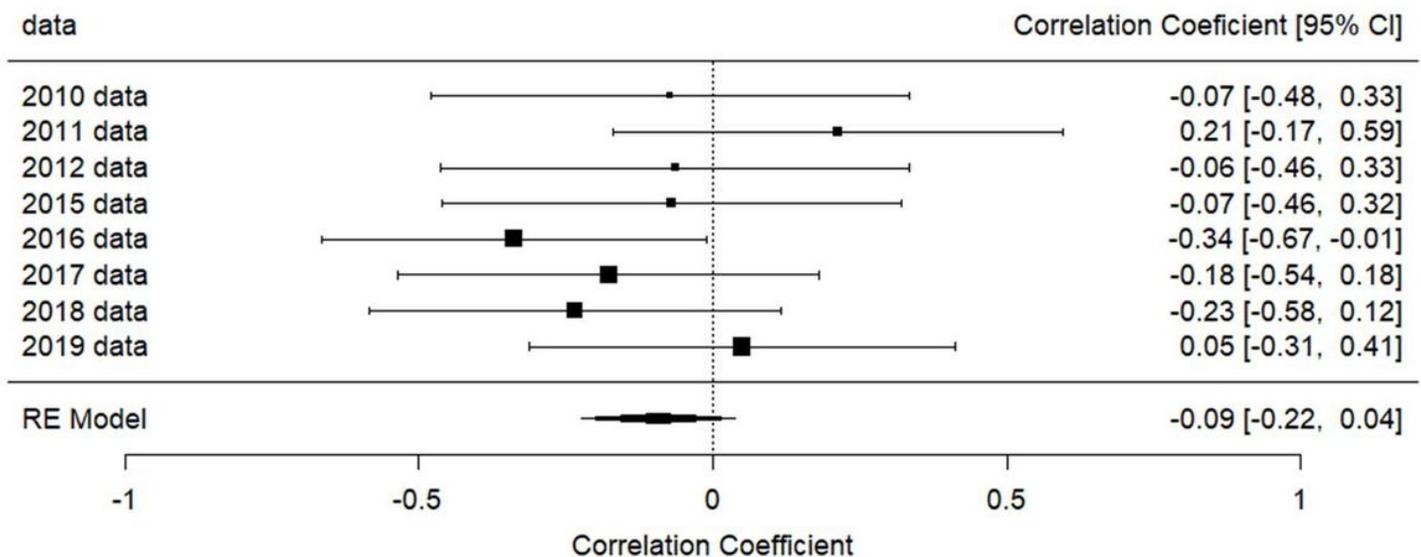


Figure 5

Forest plot of the combined correlation of the active job opening rate and the expression of hikikomori.

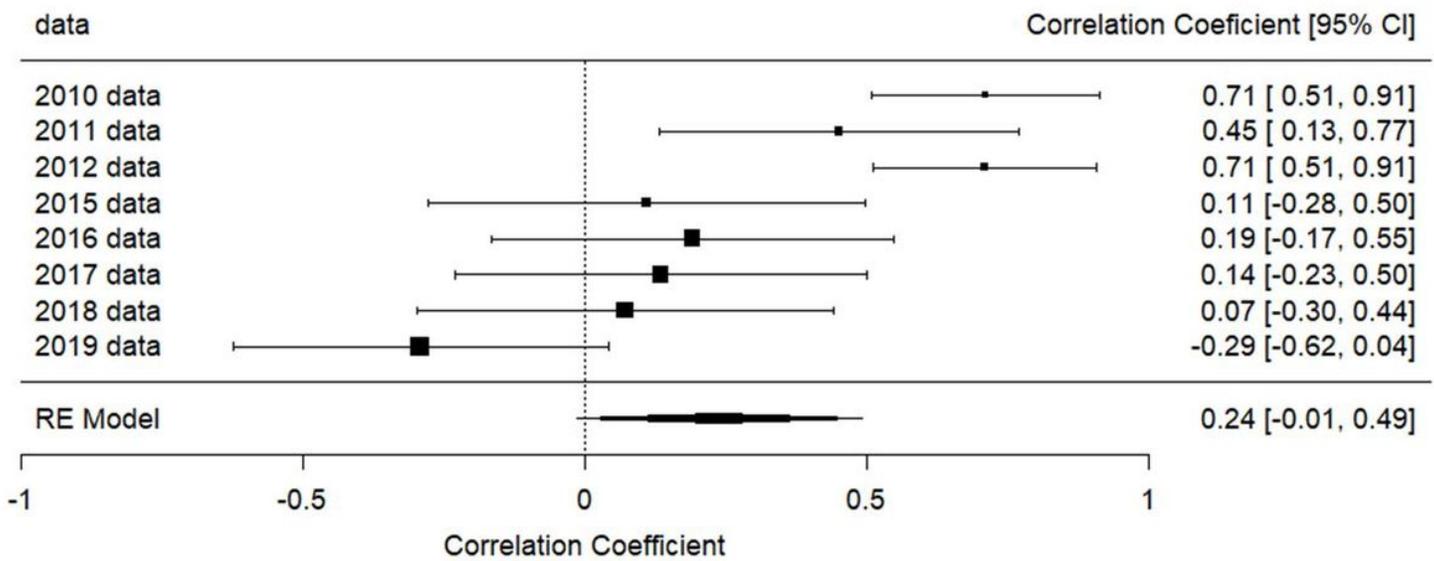


Figure 6

Forest plot of the combined correlation of the average household income and the expression of hikikomori.