

体上の独立性を分析に用いることで、要介護高齢者主導の要因と供給者主導の要因を識別した点である。しかしながら、本研究の限界としていくつかの点が挙げられる。

まず、要介護高齢者の特性や家族状況といった介護サービスの利用に影響を与える要因の補正を十分に行えていないため、通所介護併設が通所介護利用そのものに与える影響については因果の逆転に対応できてない可能性がある。

2点目の限界として、通所介護以外の介護サービスに与える影響について十分に検証できていない点が挙げられる。居宅サービス単位数は介護報酬改定後に増加していることは示したが、介護報酬改定後の個々のサービス利用の変化や、通所介護サービス利用の変化が他の介護サービス（代替サービス・補完サービス）に与える影響は明らかになっていないため、居宅介護支援事業所が併設している他のサービスを考慮にいたした検証を行う必要がある。

最後に要介護高齢者の健康に与える影響を検証していない点である。ただ、本研究は介護報酬改定後1年までしか追跡していない点や、介護給付費実態調査では要介護高齢者の重症度を示す指標が介護度のみであることから、要介護高齢者の健康に与える影響を明らかにするためには、追加的な研究が必要となると考えられる。

政策的意義

本研究は介護報酬の改定が通所介護の利用に与える影響が、居宅介護支援事業所と通所介護事業所の経営主体上の独立性により異なることを明らかにした。このことから、情報の非対称性が小さいと考えられている介護サービスであっても供給者主導の需要があることが示され、併設サービスについてはケアプランが適切に作成されているかを評価する必要があると考えられる。

居宅介護支援の介護報酬では、居宅介護支援を公正中立に機能させるために、特定の事業所に集中して訪問介護や通所介護、福祉用具貸与サービスを利用すると居宅介護支援費

が減算されている¹⁹。しかし、本研究の結果からは、供給者主導の需要は抑制的に働く可能性があること、また、通所介護の介護報酬の切り下げが他の介護サービスの需要を誘発する可能性があることが示され、訪問介護や通所介護を特定の事業所に集中させることを防ぐだけでは居宅介護支援の公正中立を保つことができない可能性が示唆された。

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Figure 1 対象者選択の流れ

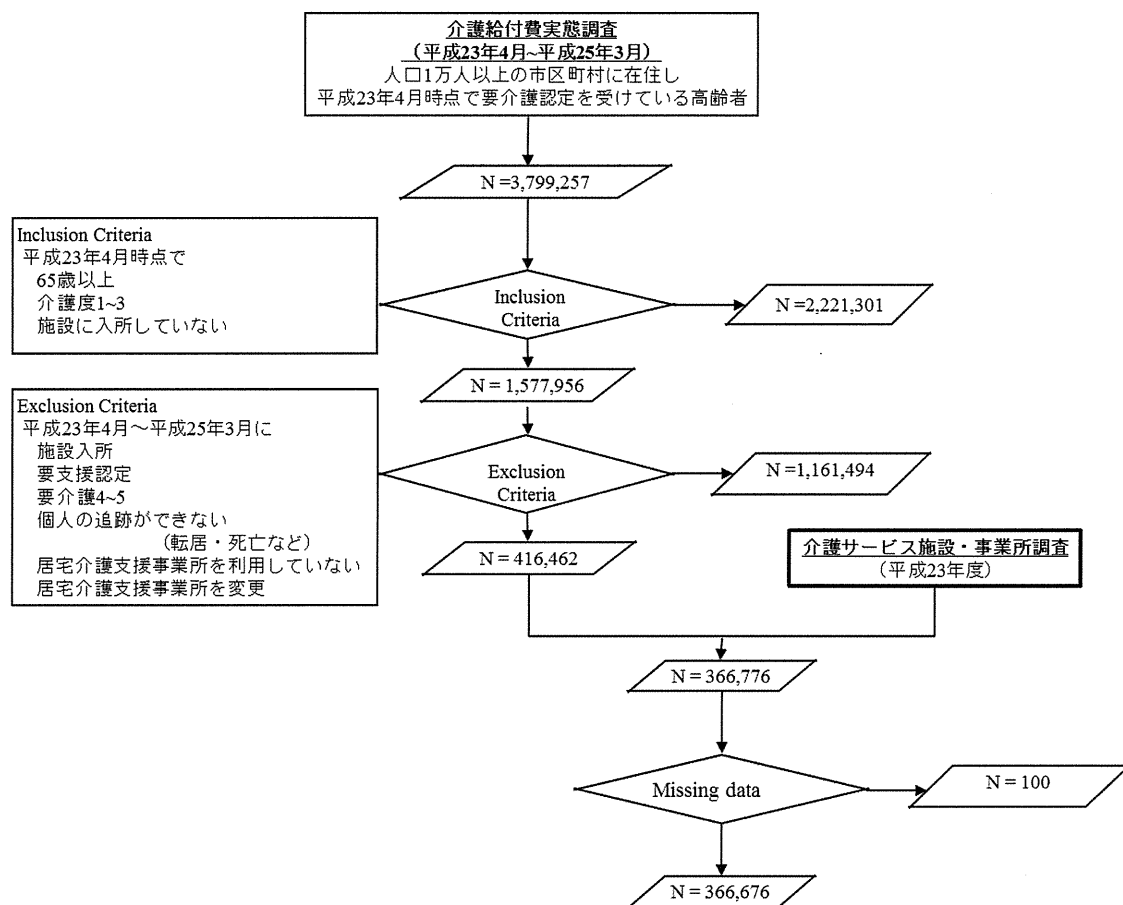


Fig. 2 通所介護利用割合の経時変化

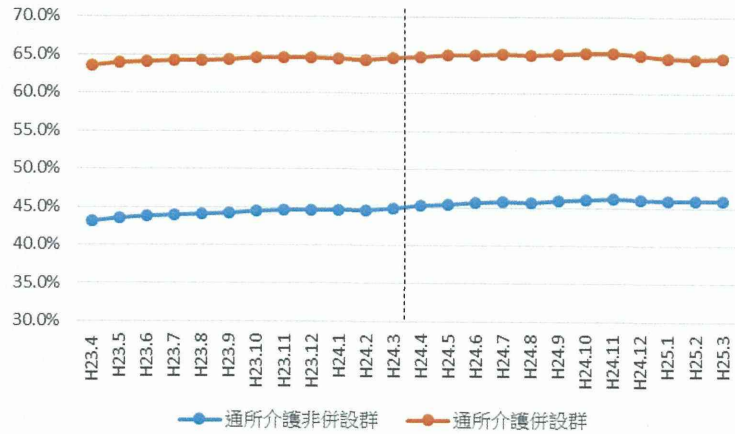


Fig. 4 1日当たり通所介護単位数（基本サービス部分）

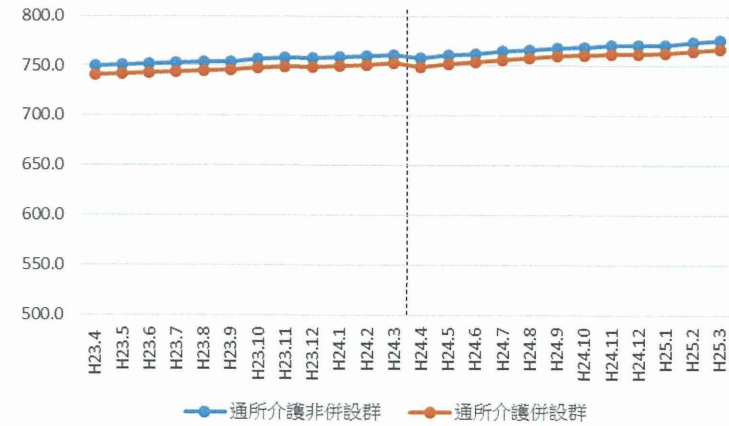


Fig. 3 1か月当たりの通所介護利用日数

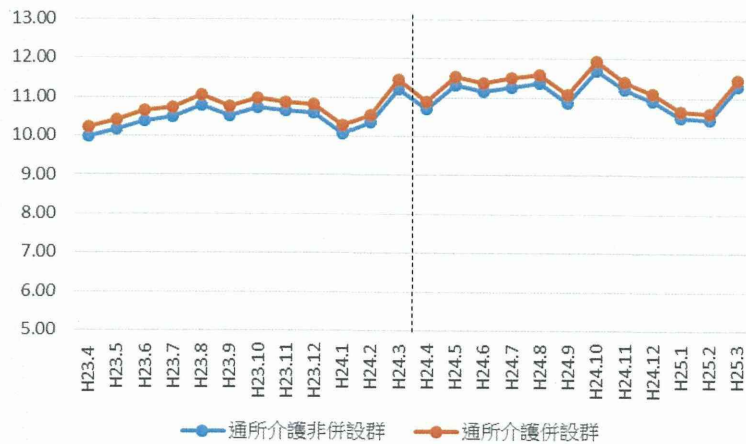


Fig. 5 1日当たり通所介護単位数（加算部分）

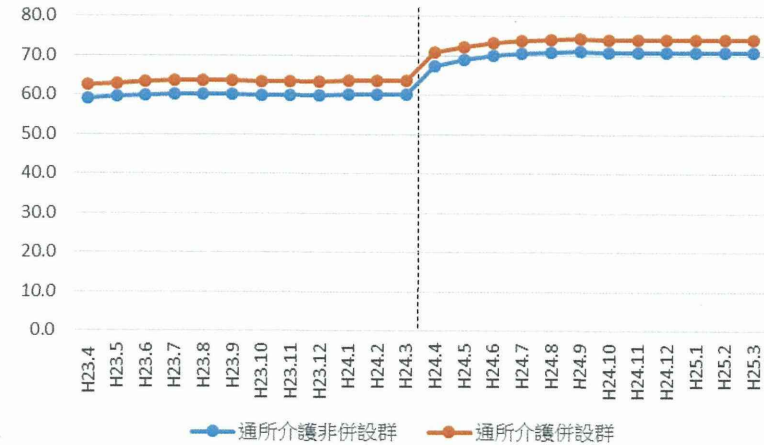


Table 1 対象者の記述統計（平成 23 年 4 月時点）

	通所介護非併設群 N=133,395	通所介護併設群 N=233,281	P value
年齢 (mean±SD, years)	81.7±7.4	82.5±7.3	P < 0.01
性別, 女性	68.9%	66.4%	P < 0.01
介護度			
要介護 1	41.4%	44.3%	P < 0.01
要介護 2	40.4%	39.2%	
要介護 3	18.3%	16.5%	
通所介護利用, あり	43.1%	63.6%	P < 0.01
すべての居宅サービス単位数 (mean±SD, units/month)	7507±5878	8066±5830	P < 0.01
経営主体			
public non-profit provider	7.7%	11.4%	P < 0.01
private non-profit provider	54.8%	65.9%	
for-profit provider	37.5%	22.8%	
通所リハビリテーション併設, あり	37.0%	18.2%	P < 0.01
訪問介護併設事業所, あり	49.3%	72.6%	P < 0.01
通所介護利用高齢者	(N=57,473)	(N=148,248)	
通所介護利用日数 (mean±SD, days/month)	9.5±5.2	9.8±5.3	P < 0.01
通所介護単位数・基本サービス部分 (mean±SD, units/day)	747.9±132.8	740.2±121.9	P < 0.01
通所介護単位数・加算部分 (mean±SD, units/day)	58.6±27.1	62.2±26.4	P < 0.01

*群間差の検定にはカテゴリー変数の場合は χ^2 検定を、連続変数にはt検定を用いた。

*public non-profit provider: 地方公共団体、社会福祉協議会

private non-profit provider: 社会福祉法人、医療法人、社団・財団法人（公益・一般）、
農協、生協、NPO

Table 2 居宅介護支援事業所の記述統計

	通所介護非併設 N=12,748	通所介護併設 N=14,957	P value
経営主体			
public non-profit provider	5.7%	9.1%	P < 0.01
private non-profit provider	44.1%	57.2%	
for-profit provider	50.3%	33.8%	
通所リハビリテーション併設あり	24.5%	13.5%	P < 0.01
訪問介護併設あり	45.9%	64.4%	P < 0.01

* public non-profit provider: 地方公共団体、社会福祉協議会

* private non-profit provider: 社会福祉法人、医療法人、社団・財団法人（公益・一般）、
農協、生協、NPO

Table 3 通所介護利用の有無に与える影響; First-part (linear model)

	pooling model		random effect model		fixed effect model	
	coef.	P value	coef.	P value	coef.	P value
性別 (1=女性)	0.048	P<0.01	0.057	P<0.01	omitted	
年齢	0.007	P<0.01	0.005	P<0.01	0.000	0.67
介護度						
要介護 1						
要介護 2	-0.032	P<0.01	0.003	P<0.01	0.003	P<0.01
要介護 3	-0.017	P<0.01	-0.002	P<0.01	-0.002	P<0.01
通所介護併設ダミー	0.194	P<0.01	0.196	P<0.01	omitted	
介護報酬改定ダミー	0.010	P<0.01	0.011	P<0.01	0.016	P<0.01
通所介護併設ダミー *介護報酬改定ダミー	-0.010	P<0.01	-0.010	P<0.01	-0.010	P<0.01
月次ダミー						
1月						
2月	-0.001	0.07	-0.001	P<0.01	-0.001	P<0.01
3月	0.000	0.93	0.000	0.56	0.001	P<0.01
4月	-0.002	P<0.01	-0.003	P<0.01	-0.006	P<0.01
5月	0.000	0.77	0.000	0.20	-0.004	P<0.01
6月	0.001	0.06	0.001	P<0.01	-0.002	P<0.01
7月	0.002	P<0.01	0.002	P<0.01	-0.001	P<0.01
8月	0.001	0.06	0.001	P<0.01	-0.001	P<0.01
9月	0.003	P<0.01	0.002	P<0.01	0.001	0.03
10月	0.004	P<0.01	0.004	P<0.01	0.003	P<0.01
11月	0.005	P<0.01	0.004	P<0.01	0.003	P<0.01
12月	0.003	P<0.01	0.003	P<0.01	0.002	P<0.01
cons	-0.135	P<0.01	-0.135	P<0.01	0.575	P<0.01
N. of observations	8800224		8800224		8800224	

* Breusch and Pagan 検定: P value<0.01

* Hausman 検定: $\chi^2(16)=1758.91$: P value<0.01

Table 4 1 か月当たりの通所介護利用日数に与える影響; Second-part (linear model)

	pooling model		random effect model		fixed effect model	
	coef.	P value	coef.	P value	coef.	P value
性別 (1=女性)	0.656	P<0.01	0.640	P<0.01	omitted	
年齢	0.027	P<0.01	0.021	P<0.01	-0.006	0.07
介護度						
要介護 1						
要介護 2	0.627	P<0.01	0.454	P<0.01	0.441	P<0.01
要介護 3	1.901	P<0.01	0.936	P<0.01	0.891	P<0.01
通所介護併設ダミー	0.245	P<0.01	0.229	P<0.01	omitted	
介護報酬改定ダミー	0.435	P<0.01	0.490	P<0.01	0.519	P<0.01
通所介護併設ダミー *介護報酬改定ダミー	-0.043	P<0.01	-0.040	P<0.01	-0.039	P<0.01
月次ダミー						
1月						
2月	0.106	P<0.01	0.111	P<0.01	0.115	P<0.01
3月	0.967	P<0.01	0.978	P<0.01	0.984	P<0.01
4月	0.187	P<0.01	0.147	P<0.01	0.125	P<0.01
5月	0.584	P<0.01	0.548	P<0.01	0.528	P<0.01
6月	0.610	P<0.01	0.579	P<0.01	0.561	P<0.01
7月	0.715	P<0.01	0.687	P<0.01	0.671	P<0.01
8月	0.892	P<0.01	0.869	P<0.01	0.855	P<0.01
9月	0.483	P<0.01	0.465	P<0.01	0.454	P<0.01
10月	1.006	P<0.01	0.992	P<0.01	0.984	P<0.01
11月	0.694	P<0.01	0.685	P<0.01	0.678	P<0.01
12月	0.511	P<0.01	0.506	P<0.01	0.503	P<0.01
cons	6.626	P<0.01	7.387	P<0.01	10.334	P<0.01
N. of observations	4253928		4253928		4253928	

* Breusch and Pagan 検定: P value<0.01

* Hausman 検定: $\chi^2(16)=1261.46$: P value<0.01

Table 5 1日当たりの通所介護単位数(基本サービス部分)に与える影響;Third-part (linear model)

	pooling model		random effect model		fixed effect model	
	coef.	P value	coef.	P value	coef.	P value
性別 (1=女性)	13.949	P<0.01	14.415	P<0.01	omitted	
年齢	0.879	P<0.01	0.724	P<0.01	-0.080	0.22
介護度						
要介護 1						
要介護 2	112.021	P<0.01	112.096	P<0.01	112.048	P<0.01
要介護 3	237.746	P<0.01	232.764	P<0.01	232.485	P<0.01
通所介護併設ダミー	-4.226	P<0.01	-4.221	P<0.01	omitted	
介護報酬改定ダミー	-1.972	P<0.01	-1.583	P<0.01	-0.764	P<0.01
通所介護併設ダミー *介護報酬改定ダミー	-0.504	0.01	-0.492	P<0.01	-0.492	P<0.01
月次ダミー						
1月						
2月	0.462	0.03	0.505	P<0.01	0.606	P<0.01
3月	0.855	P<0.01	0.935	P<0.01	1.092	P<0.01
4月	-0.979	P<0.01	-1.260	P<0.01	-1.866	P<0.01
5月	0.074	0.73	-0.181	0.05	-0.736	P<0.01
6月	0.417	0.05	0.190	0.04	-0.308	P<0.01
7月	1.044	P<0.01	0.843	P<0.01	0.405	P<0.01
8月	1.144	P<0.01	0.975	P<0.01	0.601	P<0.01
9月	0.885	P<0.01	0.748	P<0.01	0.441	P<0.01
10月	1.357	P<0.01	1.253	P<0.01	1.013	P<0.01
11月	1.296	P<0.01	1.221	P<0.01	1.036	P<0.01
12月	0.403	0.06	0.367	P<0.01	0.284	P<0.01
cons	582.657	P<0.01	596.178	P<0.01	670.904	P<0.01
N. of observations	4253928		4253928		4253928	

* Breusch and Pagan 検定: P value<0.01

* Hausman 検定: $\chi^2(16)=321.97$: P value<0.01

Table 6 1日当たりの通所介護単位数（加算部分）に与える影響;Third-part (linear model)

	pooling model		random effect model		fixed effect model	
	coef.	P value	coef.	P value	coef.	P value
性別 (1=女性)	-2.682	P<0.01	-2.843	P<0.01	omitted	
年齢	0.056	P<0.01	0.053	P<0.01	0.007	0.79
介護度						
要介護1						
要介護2	3.641	P<0.01	1.057	P<0.01	0.857	P<0.01
要介護3	4.815	P<0.01	1.640	P<0.01	1.339	P<0.01
通所介護併設ダミー	3.601	P<0.01	3.522	P<0.01	omitted	
介護報酬改定ダミー	10.067	P<0.01	10.261	P<0.01	10.325	P<0.01
通所介護併設ダミー *介護報酬改定ダミー	-0.340	P<0.01	-0.323	P<0.01	-0.321	P<0.01
月次ダミー						
1月						
2月	0.070	0.36	0.087	0.02	0.095	0.02
3月	0.023	0.77	0.059	0.13	0.071	0.07
4月	-1.880	P<0.01	-2.033	P<0.01	-2.081	P<0.01
5月	-0.998	P<0.01	-1.133	P<0.01	-1.176	P<0.01
6月	-0.315	P<0.01	-0.433	P<0.01	-0.471	P<0.01
7月	0.147	0.06	0.044	0.26	0.010	0.81
8月	0.284	P<0.01	0.202	P<0.01	0.173	P<0.01
9月	0.314	P<0.01	0.249	P<0.01	0.226	P<0.01
10月	0.079	0.30	0.033	0.39	0.016	0.69
11月	-0.039	0.62	-0.068	0.08	-0.081	0.04
12月	-0.066	0.39	-0.081	0.04	-0.087	0.03
cons	55.098	P<0.01	55.098	P<0.01	61.635	P<0.01
N. of observations	4253928		4253928		4253928	

* Breusch and Pagan 検定: P value<0.01

* Hausman 検定: $\chi^2(16)=567.99$: P value<0.01

Table 7 1 か月当たりの居宅サービス単位数に与える影響

	pooling model		random effect model		fixed effect model	
	coef.	P value	coef.	P value	coef.	P value
性別 (1=女性)	353.5	P<0.01	330.1	P<0.01	omitted	
年齢	74.6	P<0.01	58.8	P<0.01	-2.4	0.3
介護度						
要介護1						
要介護2	2176.5	P<0.01	1767.1	P<0.01	1744.9	P<0.01
要介護3	6210.0	P<0.01	4196.8	P<0.01	4124.3	P<0.01
通所介護併設ダミー	688.1	P<0.01	665.5	P<0.01	omitted	
介護報酬改定ダミー	520.9	P<0.01	626.5	P<0.01	691.0	P<0.01
通所介護併設ダミー *介護報酬改定ダミー	124.9	P<0.01	136.0	P<0.01	136.4	P<0.01
月次ダミー						
1月						
2月	76.0	P<0.01	87.4	P<0.01	95.2	P<0.01
3月	763.0	P<0.01	785.6	P<0.01	798.0	P<0.01
4月	-53.7	P<0.01	-132.2	P<0.01	-179.9	P<0.01
5月	255.7	P<0.01	185.8	P<0.01	142.2	P<0.01
6月	324.0	P<0.01	262.2	P<0.01	223.1	P<0.01
7月	419.4	P<0.01	364.5	P<0.01	330.1	P<0.01
8月	602.5	P<0.01	556.7	P<0.01	527.4	P<0.01
9月	274.9	P<0.01	237.7	P<0.01	213.7	P<0.01
10月	702.9	P<0.01	675.1	P<0.01	656.3	P<0.01
11月	489.8	P<0.01	470.6	P<0.01	456.3	P<0.01
12月	358.2	P<0.01	348.7	P<0.01	342.3	P<0.01
cons	-825.6	P<0.01	1079.8	P<0.01	6827.2	P<0.01
N. of observations	4253928		4253928		4253928	

* Breusch and Pagan 検定: P value<0.01

* Hausman 検定: $\chi^2(16)=9684.77$ P value<0.01

参考資料 2

Socioeconomic within-gender gap in informal caregiving
among middle-aged women: an evidence from Japanese nationwide
survey

Socioeconomic within-gender gap in informal caregiving among middle-aged women: an evidence from Japanese nationwide survey

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1. Introduction

Care giving to older people with needs has been dominantly dependent on informal care provision by female caregivers. A recent meta-analysis of 229 studies reported that 69% of the informal caregivers were women, and that gender gap existed in hours and numbers of care taking [1]. Gender-biased burden of caregiving could be attributed to traditional norms about gender roles [2, 3], gender-specific skills for caring [4], or gender gap in wage in labor market [5].

In order to relieve and equalize the burden of care in the household [3, 6], some countries including Japan have introduced long-term care insurance (LTCI) system to provide formal care services with affordable copayment [2, 7] that at least partially succeeded in increasing labor market participation of women [8]. However, there remains a gap within gender; women in lower income household did not enjoy such benefit.

As we know of, a within-gender gap across socioeconomic status (SES) has been only poorly studied in informal care giving. Most previous studies focusing on gender disparity in informal care provision ignored a gap across caregivers' SES [9, 10, 11, 12, 13, 14, 15, 16, 17]. Gender and socioeconomic status as represented in income, occupation, and educational attainment are conceptually independent [18, 19, 20, 21], but are intertwined in social stratification of life chances

and risks [22]. Women have a larger risk of low income, low educational attainment, and limited opportunities to access resources such as healthcare [23, 24, 25, 26, 27, 28, 29, 30].

Under these backgrounds, women in low socioeconomic status (SES) may face a larger risk of biased care burden because they lack resources to buy formal care, have less social support, and/or have no choice but remain in household for informal care without labor force skills. Such intertwined impact of gender and SES on the distribution of informal care burden, if exists, deserves policy attention to design welfare program for fair contribution and compensation of informal care in the society. The focus on not only gender gap, but disparity within women is considered important, while we are not aware of any literature directly addressing socioeconomic within-gender gap in informal care giving among women.

The aim of this study was to reveal the association of SES of women with the chance of being a primary caregiver for older people in needs. We focused particularly on household income, marital status, work status, and educational background among women.

2. Subjects and methods

2.1. Data source

A public insurance system has been an exclusively dominant platform to provide a formal LTC in Japan since 2000 [2]. The eligibility of formal care service use is based solely on a functional assessment of the recipient through a standardized protocol, regardless of households' demographic and SES conditions, and copayment is reduced or exempted in case of low-income households. We believe the investigation of within-gender gap in informal care provision under public LTC provision in Japan would help us identify a gap attributable to women's status in the household regardless of household's affordability of LTC.

For this study, we utilized data from the Comprehensive Survey of Living Conditions of the People on Health and Welfare (CSLCP), a nationwide representative, population based cross-sectional survey of households that is conducted every three years by the Ministry of Health Labour and Welfare in Japan. We pooled data derived from 2010 and 2013 surveys to obtain a sufficient size for analysis. The 2010 survey used a probabilistic sampling of about 5500 sampling area units stratified by 47 prefectures in Japan, then asked all the households in the sampled unit to participate in the self-administered questionnaire survey on household sociodemographic conditions and health status, educational status, marital status and work status of household members. In 2500 randomly-selected area units from the original sample, an additional questionnaire was further distributed to all households having a member eligible for public LTC at the time of the survey to collect information regarding formal LTC service use, informal care giving, and functional conditions of care recipients.

2.2 Subjects and sampling

For our purpose, we have to define the “population at risk”, or those who could be an informal caregiver in the household and/or labor force in formal labor market. To focus on a within-gender gap, we excluded male subjects from our analysis. We further limited our sample to females aged between 40 and 60 because women in this range of age are the most likely to be involved in personal care mainly with their elderly parents, and at the same time, they can be still part of the labor force [11, 31, 32]. We exclude women older than 60, the age of public pension eligibility, because they were more likely retired, and to be involved in care giving of their old spouses/parents regardless of socioeconomic status.

In 2010, the original survey included 228,864 households and 609,018 subjects from 5,510 sampling units in 47 prefectures in Japan (household response rate=79.1%). 7192 households were eligible for LTC survey, of which 5912 households gave effective response. We limited our analysis to 2980 households where care recipients had cohabitation with primary caregivers within the same household. We did so because the survey collected detailed information of care givers only in the same household with the care recipient. We excluded 59 households where the caregiver took care of more than two care recipients at the same time. Consequently, 1103 households and their 1181 women aged 40-60 years of working age were available as target sample for further analysis. We conducted similar procedures for the 2013 data; we appended the datasets to obtain 2399 female subjects in 2236 households.

2.2 Measurement

2.2.1 Female family member characteristics

We considered female family members' characteristics, including age ($40 \leq \text{age} < 50$ or $50 \leq \text{age} < 60$), marital status (whether currently married) [29], health status (whether have a chronic disease under treatment). Job status (full-time job, part-time job, no-job) [33], and educational attainment (“junior or high school degree”, “community college or training graduates”, and “university or graduates or above”) were counted as an indicator of female's individual SES.

2.2.2. Care recipient characteristics

We included care recipients' characteristics such as age, gender, health status and care eligibility level in public LTCI as indicators of the amount of care required. More specifically, eligibility level higher than II indicated those without functional independence, and need assistance in meal, toileting, bathing, and clothing [2, 3]. We divided the level into severe (Level III, IV, and V) vs. mild (Level I and II, and less than Level I).

2.2.3. Household characteristics

The number of household members over 18 years aged living together was included in the analysis because it should reflect the household capacity for informal care provision and the need for formal care related to household structure. The existence of the household members under 18 years old was also included because it should reflect conflicting demand for care provision to dependent children in the household. Equivalent household income was obtained through imputation, of which details are available elsewhere [3].

2.3. Statistical analysis

We compared caregiver women and non-caregiver ones in their demographic, socioeconomic, and health statuses by using t-tests and chi-square tests as they fit. We also compared by the caregiving status of women the characteristics of cohabited care recipients and their households. Then, we conducted multiple logistic regressions of caregiving status as a target variable, regressed on women's socioeconomic status with adjustment for care recipient's and household characteristics (e.g., care level, gender, and chronic disease under treatment, household composition, and equivalent household income). Since the severity of care need may differentially affect the chance of being caregivers, we tested interaction terms between care eligibility level of the care recipient and caregiver's educational, job status, and marital status. As we found a significant interaction by education and marital status, analysis stratified by care eligibility level (mild and severe) was additionally conducted. Statistical significant was inferred at a p value of 0.05. The results from the multivariate analysis were expressed as odds ratio (OR) with 95% confidence intervals (CI).

4. Results

The characteristics of female members (non-caregivers, caregivers), care recipients, and households by caregiving status are presented in Table 1. All of the 982 non-caregiver women were cohabited with caregiver family members, majority of whom were women older than 60 or younger than 40 (not shown in the table). Caregiver women were on an average 3 years older than non-caregiver counterparts ($p < .0001$) and more likely to have chronic conditions ($p < 0.0001$). Caregiver women were more likely to have high-school education or less, and to be non-workers, as well. Finally, caregiver women were more likely to be cohabited with care recipients of older age, female gender, and mild care needs. Finally, a quarter of caregiver women belonged to the lowest quartile group of household income.

Table2 showed the results of multivariate logistic regression analysis for caregiving status as an outcome. Younger age, fulltime work status, and married status were significantly related to non-caregiving status, while education was not significantly related to the caregiving status (model 1). However, after including an interaction term between education and care recipient's care levels, the interaction was significant (loglikelihood ratio test $p=0.0003$), and high school education or less turned to be significantly related to the chance of being a caregiver ($p=0.0001$). Marital status also showed a significant interaction with the care eligibility levels (loglikelihood ratio test $p=0.0015$, not shown in the table).

Table3 shows the results of adhoc analysis stratified by care recipient's care eligibility level. the odds ratio of the possibility of primary caregiver by subgroup, the caregiver living with care recipient at mild level and at severe level, respectively. It is found that compared with the caregivers ($n=693$ of 1074) with care recipient at mild care level and those at severe level ($n=725$ of 1325) were significantly associated with the elder age-group (OR, 0.61; 95% CI, 0.43-0.86 vs. OR,0.41; 95%CI,0.29-0.56), full time job (OR,0.46; 95%CI,0.28-0.76 vs. OR,0.36; 95%CI,0.23-0.55) , married (OR,1.02; 95%CI,0.65-1.60 vs. OR,0.41 ;95%CI,0.27-0.64) and lower level education (OR,1.00; 95%CI, 0.67-1.49 vs. OR,1.94; 95%CI,1.37-2.74).

5. Discussion

LTCI was introduced in order to relieve the burden of the caregivers and equalize it in 2000. Nevertheless, much more women still remain informal caregiver than men. To the best of our knowledge, this study is the first to investigate that the inequality within women for primary caregiver might be caused not only by the gender gap, but by the socioeconomic gap, using the nationwide representative population based data.

Our results showed that there was no significant association between educational or marital status and caregiver living with care recipient after adjustment for equivalent household income, demographic variables of care recipient. But, in the subgroup analysis by care recipient's stratum of severity, the women with lower human resources were likely to be caregiver with care recipient at severe level: the women with lower educational background, non-marital status, older, and unemployed, while the women living with care recipient at mild level were not associated with educational status or marital status significantly.

For the cause of this observed linkage, there are two possible explanations. First, the severe care level accounts for a lot of demand for care provided. For care recipient with mild care level which caregiver may provide more casual help, even caregiver in full-time will be easy to care. But, for care recipient with severe care level who needs to be watched for almost all day, caregiver in