

表 1. 47 都道府県における 35 歳未満 ART 助成利用率(1 万人あたり)および各要因の分布

Table 1. Demographics, income inequality and social capital indicators of prefectures (N=47).

	Mean (SD) or n (%)	Median (range)
Population (10,000 persons)	270.1 (274)	163 (57–1362.4)
Area (Km ²)	8040 (11700)	6096 (1876–83,456)
Number of women at the age 15-34 (10,000 persons)	20.4 (24.7)	11.8 (3.6–13.4)
Mean income per capita (10,000 yen)	617 (56.6)	612 (470–769)
Mean age at first marriage	29.1 (0.38)	29.1 (28.6–30.5)
Number of doctors	6797 (7583)	4081 (1805–44,136)
Number of IVF clinics	13.1 (16.4)	7 (2–100)
Number of women receiving ART reimbursement	663 (721)	400 (128–3241)
Number of cycles receiving ART reimbursement	1031 (1119)	620 (210–5118)
Number of women < 35 years who receive ART reimbursement per 10,000 women	35.2 (6.1)	33.4 (22.0–58.8)
Gini coefficient	0.35 (0.015)	0.35 (0.32–0.38)
Voting rate in the lower house election (%)	54.9 (4.0)	55.2 (46.5–64.1)
Volunteer rate (%)	27.9 (3.5)	27.8 (20.6–33.9)
Move-in ratio (%)	1.5 (0.39)	1.5 (0.91–3.0)
Additional grant for ART at prefecture (%)	36 (76.6)	—
Shifting age limitation for reimbursement (%)	2 (4.3)	—
Increase the number of reimbursement (%)	11 (23.4)	—
Increase amount of reimbursement (%)	20 (42.6)	—
Shifting income limitation for reimbursement (%)	6 (12.8)	—
Additional grant for non-ART treatment or infertility testing (%)	23 (48.9)	—
Others (%)	10 (21.3)	—

表 2. 35 歳未満 ART 助成利用率(1 万人あたり)と各要因との関連

Table 2. Association of income inequality and social capital with proportion of women receiving ART reimbursement less than 35 years.

	Bivariate analysis		Multivariate analysis	
	Coefficient (95% CI)	p value	Coefficient (95% CI)	p value
Log(population (10,000 persons))	-3.5 (-6.9 to -0.22)	0.037	—	
Log(area (Km ²))	-2.9 (-6.9 to 1.14)	0.15	-6.5 (-10.4 to -2.5)	0.002
Mean income per capita (10,000 yen)	0.061 (0.016 to 0.11)	0.008	0.047 (0.007 to 0.088)	0.02
Mean age at first marriage	-6.7 (-13.7 to 0.22)	0.06	0.017 (-9.4 to 9.5)	0.997
Log(number of doctors)	-3.5 (-7.0 to -0.0013)	0.05	—	
Log(number of IVF clinics)	-1.7 (-4.8 to 1.43)	0.28	1.45 (-1.86 to 4.8)	0.38
Gini coefficient	-157.8 (-330.8 to 15.1)	0.073	77.0 (-59.6 to 213)	0.26
Voting rate in the lower house election (%)	0.20 (-0.48 to 0.88)	0.55	-0.32 (-0.95 to 0.30)	0.3
Volunteer rate (%)	1.33 (0.67 to 1.99)	<0.001	1.50 (0.70 to 2.30)	0.001
Move-in ratio (%)	-7.1 (-13.8 to -0.43)	0.038	-15.0 (-25.8 to -4.1)	0.008
Additional grant for ART at prefecture (%)	5.76 (-0.36 to 11.9)	0.065	5.42 (-1.26 to 12.1)	0.11
Shifting age limitation for reimbursement (%)	-2.5 (-15.8 to 10.9)	0.71	0.03 (-11.9 to 11.9)	0.996
Increase the number of reimbursement (%)	4.5 (-1.7 to 10.7)	0.15	1.46 (-3.2 to 6.1)	0.53
Increase amount of reimbursement (%)	-0.25 (-5.7 to 5.2)	0.93	-1.53 (-5.87 to 2.81)	0.48
Shifting income limitation for reimbursement (%)	6.1 (-1.7 to 14.0)	0.12	3.64 (-2.70 to 9.9)	0.25
Additional grant for non-ART treatment or infertility testing (%)	1.0 (-4.4 to 6.4)	0.71	1.1 (-4.0 to 6.1)	0.67
Others (%)	4.58 (-1.86 to 11.0)	0.16	-2.82 (-7.66 to 2.01)	0.24

*Bold values signiice p<0.05.

表 3. 夫婦合算所得 5 分位別の申請者背景情報 (埼玉県)

Table 3. Baseline characteristics of sample population stratified by Quintile of total household income (n=3442).

	Q1 (n=689)	Q2 (n=688)	Q3 (n=689)	Q4 (n=688)	Q5 (n=688)	P value
Age (year)	35.3 (4.6)	35.6 (4.2)	35.6 (4.1)	35.8 (4.0)	36.2 (4.0)	0.003
Treatment type						
A (Fresh ET)	238 (34.5)	219 (31.8)	242 (35.1)	226 (32.9)	245 (35.6)	
B (Freeze-all)	321 (46.6)	343 (49.9)	332 (48.2)	340 (49.4)	334 (48.6)	
D	35 (5.1)	41 (6.0)	26 (3.8)	39 (5.7)	34 (4.9)	0.55
E	88 (12.8)	74 (10.8)	83 (12.1)	80 (11.6)	69 (10.0)	
F	7 (1.0)	11 (1.6)	6 (0.87)	3 (0.44)	6 (0.87)	
Fertilization method						
IVF+ICSI	62 (9.0)	57 (8.3)	68 (9.9)	42 (6.1)	63 (9.2)	
IVF only	276 (40.1)	274 (39.8)	257 (37.3)	254 (36.9)	262 (38.1)	0.27
ICSI only	254 (36.9)	256 (37.2)	276 (40.1)	294 (42.7)	278 (40.4)	
missing	97 (14.1)	101 (14.7)	88 (12.8)	98 (14.2)	85 (12.4)	
Housewife	367 (53.3)	309 (44.9)	238 (34.5)	191 (27.8)	148 (21.5)	<0.001
Working both	289 (41.9)	376 (54.7)	447 (64.9)	72.1 (496)	540 (78.5)	<0.001
Total no of subsidies	1344	1339	1339	1390	1351	
Pregnancy	368 (53.4)	389 (56.5)	380 (55.2)	299 (58.0)	412 (59.9)	0.14
Total income (yen)	2,309,845 (714,313)	3,641,006 (258,052)	4,490,715 (232,096)	5,391,876 (290,653)	6,530,196 (389,483)	<0.001
Husband (yen)	1,968,726 (871,299)	3,117,612 (784,780)	375,409 (970,633)	4,077,207 (1,166,937)	4,632,334 (1,333,527)	<0.001
Wife (yen)	341,119 (592,168)	523,393 (763,325)	915,306 (973,083)	1,314,669 (1,171,315)	1,897,862 (1,360,162)	<0.001
Total payment (yen)	732,828 (438,280)	747,666 (440,888)	715,872 (384,791)	758,954 (406,250)	763,062 (446,056)	0.21
Total subsidies (yen)	375,342 (141,385)	382,012 (146,117)	379,054 (135,044)	389,627 (75,000)	386,316 (155,702)	0.38

表 4. 解析対象群と除外群における申請時情報の分布 (n = 1807)

Table 4 ART cycle characteristics based on application information for eligible samples stratified by included and excluded status (*n* = 1807).^a

	Analyzed sample (<i>n</i> = 1072)	Excluded sample (<i>n</i> = 735)	<i>p</i> value ^b
Age (year)	35.6 (4.4)	36.0 (4.1)	0.09
Treatment type ^c			
A (Cycle with fresh ET)	440 (41.0)	171 (23.3)	
B (Cycle with freeze-all)	445 (41.5)	383 (52.1)	
C (Frozen ET cycles)	20 (1.9)	24 (3.3)	<0.001
D (Cancellation due to patients' health problem)	33 (3.1)	56 (7.6)	
E (Cancellation due to unfertilized egg/ embryo development)	116 (10.8)	94 (12.8)	
F (Cancellation due to non-oocyte collected)	18 (1.7)	7 (0.95)	
Fertilization method			
IVF+ICSI	92 (8.6)	53 (7.2)	
IVF only	413(38.5)	260 (35.4)	0.59
ICSI only	416 (38.8)	284 (38.6)	
missing	151 (14.1)	138 (19.8)	
Housewife	419 (39.1)	273 (37.1)	0.40
Total no of subsidies	2.34 (1.28)	2.55 (1.44)	0.002
Annual household income (JPY)	4,321,475 (1,539,174)	4,509,354 (1,478,917)	0.01

^a Data are presented as the mean (\pm SD) for continuous variables and *n* (%) for dichotomous variables.

^b Assessed using χ^2 or Student's *t* test.

^c Treatment type for first application.

ET, embryo transfer; ICSI, intracytoplasmic sperm injection; IVF, in vitro fertilization; JPY, Japanese Yen.

表 5. 解析対象群における年齢別背景情報 (n = 1807)

Table 5 Baseline characteristics for the analyzed sample stratified by age (*n* = 1072).^a

	< 35 (<i>n</i> = 413)	35-39 (<i>n</i> = 438)	40-42 (<i>n</i> = 221)	<i>p</i> value
Age (year)	31.0 (2.6)	37.1 (1.4)	41.2 (1.3)	<0.001^b
Treatment type ^c				
A (Cycle with fresh ET)	167 (40.4)	177 (40.4)	96 (43.4)	
B (Cycle with freeze-all)	187 (45.3)	190 (43.4)	68 (30.8)	
C (Frozen ET cycles)	5 (1.2)	8 (1.8)	7 (3.2)	<0.001^c
D (Cancellation due to patients' health problem)	20 (4.8)	8 (1.8)	5 (2.3)	
E (Cancellation due to unfertilized egg/ embryo development)	31 (7.5)	47 (10.7)	38 (17.2)	
F (Cancellation due to non-oocyte collected)	3 (0.73)	8 (1.8)	7 (3.2)	
Housewife	151 (36.6)	173 (39.5)	95 (43.0)	<0.001^d
Annual household income (JPY)	4,258,525 (1506548)	4,370,113 (1535059)	4,342,615 (1609110)	0.80 ^b
Quartile of annual household income				
Q1 (3,232,000 JPY)	105 (25.4)	107 (24.4)	56 (25.3)	
Q2 (3,246,714–4,389,754 JPY)	108 (26.2)	107 (24.4)	53 (24.0)	0.95 ^d
Q3 (4,396,909–5,466,400 JPY)	105 (25.4)	108 (24.7)	55 (24.9)	
Q4 (5,473,600–7,292,085 JPY)	95 (23.0)	116 (26.5)	57 (25.8)	
Mean total no of subsidies	2.2 (1.2)	2.5 (1.5)	2.2 (0.79)	<0.001^b
Infertility diagnosis				
Tubal factor	74 (17.9)	52 (11.9)	21 (9.5)	0.005^d
Endometriosis	21 (5.1)	22 (5.0)	9 (4.1)	0.83 ^d
Anti-sperm antibody	2 (0.48)	0 (0)	0 (0)	0.19 ^c

Male factor	79 (19.1)	93 (21.2)	29 (13.1)	0.04 ^d
Unexplained	238 (57.6)	260 (59.4)	147 (66.5)	0.08 ^d
Others	48 (11.6)	56 (12.8)	46 (20.8)	0.004 ^d

^a Data are presented as mean (\pm SD) for continuous variables and n (%) for dichotomous variables.

^b Assessed using one-way analysis of variance.

^c Assessed using Fisher's exact test.

^d Assessed using χ^2 test.

^e Treatment type for first application.

ET, embryo transfer; ICSI, intracytoplasmic sperm injection; IVF, in vitro fertilization.

表 6. 初回申請における年齢別新鮮周期情報 (n = 980)

Table 6. Treatment information for fresh cycles at first application stratified by age at the first application for ART subsidy (n = 980).^a

	< 35 (n=379)	35–39 (n=398)	40–42 (n=203)	p value
Ovarian stimulation protocols				
Natural	53 (14.0)	57 (14.3)	29 (14.3)	
CC	31 (8.2)	67 (16.8)	44 (21.7)	
CC + Gn	63 (16.6)	61 (15.3)	34 (16.8)	
Gn only	9 (2.4)	4 (1.0)	4 (2.0)	0.01 ^d
GnRH agonist	79 (20.8)	82 (20.6)	34 (16.8)	
GnRH antagonist	110 (29.0)	98 (24.6)	39 (19.2)	
Others	27 (7.1)	22 (5.5)	15 (7.4)	
Missing	7 (1.9)	7 (1.8)	4 (2.0)	
Cancellation cycles	0 (0)	0 (0)	2 (0.99)	0.04 ^c
Number of oocytes collected	8.0 (7.2)	6.1 (5.5)	4.2 (5.2)	<0.001 ^b
Women with no oocyte collected	3 (0.79)	6 (1.5)	6 (3.0)	0.13 ^c
	n=376	n=392	n=195	
Fertilization methods ^c				
IVF	162 (43.1)	153 (39.0)	78 (40.0)	
ICSI	133 (35.4)	163 (41.6)	82 (42.1)	0.55 ^c
IVF+ICSI	79 (21.0)	75 (19.1)	35 (18.0)	
Others	2 (0.53)	1 (0.26)	0 (0)	
Cycles with fresh ET ^c	166 (44.1)	176 (44.9)	94 (48.2)	0.64 ^d
Single ET rate ^d	164 (98.8)	159 (90.3)	75 (80.0)	<0.001 ^d

Cycle with freeze-all ^c	176 (46.8)	164 (41.8)	61 (31.3)	0.002 ^d
Number of frozen embryo ^c	2.5 (3.1)	1.8 (2.5)	1.0 (1.7)	<0.001 ^b

^a Data are presented as mean (SD) for continuous variables and n (%) for dichotomous variables.

^b Assessed using one-way analysis of variance.

^c Assessed using Fisher's exact test.

^d Assessed using χ^2 test.

^c Women with cancelled cycles and no oocytes collected were excluded.

^d The denominator was cycles with fresh ET.

CC, clomiphene citrate; ET, embryo transfer; Gn, gonadotropin; ICSI, intracytoplasmic sperm injection; IVF, in vitro fertilization.

表 7. 生産に対する患者背景要因のリスク比 (n = 1072)

Table 7. Relative risks (RRs) and 95% confidence intervals (CIs) for having a live birth (n = 1072).

	Crude RR (95% CI)	Adjusted RR (95% CI) ^a
Age		
<35	Reference	Reference
35–39	0.85 (0.75 to 0.96)	0.84 (0.74 to 0.96)
40–42	0.29 (0.22 to 0.40)	0.30 (0.22 to 0.40)
Infertility diagnosis		
Tubal factor	0.97 (0.80 to 1.17)	0.87 (0.69 to 1.10)
Endometriosis	1.04 (0.78 to 1.39)	0.99 (0.72 to 1.34)
Anti-sperm antibody	1.08 (0.27 to 4.34)	0.82 (0.20 to 3.36)
Male factor	1.17 (1.003 to 1.36)	1.03 (0.83 to 1.27)
Unexplained	0.93 (0.82 to 1.06)	0.91 (0.73 to 1.14)
Others	0.86 (0.70 to 1.06)	0.94 (0.76 to 1.16)
Quartile of annual household income		
Q1	Reference	Reference
Q2	1.12 (0.92 to 1.36)	1.11 (0.92 to 1.33)
Q3	1.22 (1.01 to 1.47)	1.16 (0.97 to 1.39)
Q4	1.16 (0.96 to 1.41)	1.15 (0.96 to 1.38)
Housewife	0.88 (0.77 to 1.01)	0.95 (0.83 to 1.08)

^a Adjusted for all variables listed.

Significantly increased or reduced relative risks are indicated by boldface.

RR, relative risk.

表 8. 年齢別の申請回数ごとの申請者数および生産数 (n= 1072)

Table 8. Number of applicants and live births according to the number of governmental subsidies stratified by age.

Number of governmental subsidies	Number of applicants	Number of live births	Cumulative number of live births	CLBR (%)
Age <35				
1	413	92	92	22.3
2	264	80	172	41.6
3	139	34	206	49.9
4	69	24	230	55.7
5	25	8	238	57.6
6	6	3	241	58.4
Age 35–39				
1	438	84	84	19.2
2	287	45	129	29.5
3	198	43	172	39.3
4	109	26	198	45.2
5	51	14	212	48.4
6	18	4	216	49.3
Age 40–42				
1	221	19	19	8.6
2	168	8	27	12.2
3	88	11	38	17.2

CLBR, cumulative live birth rate.

図 1. 35 歳未満 ART 助成利用率(1 万人あたり)の都道府県別分布

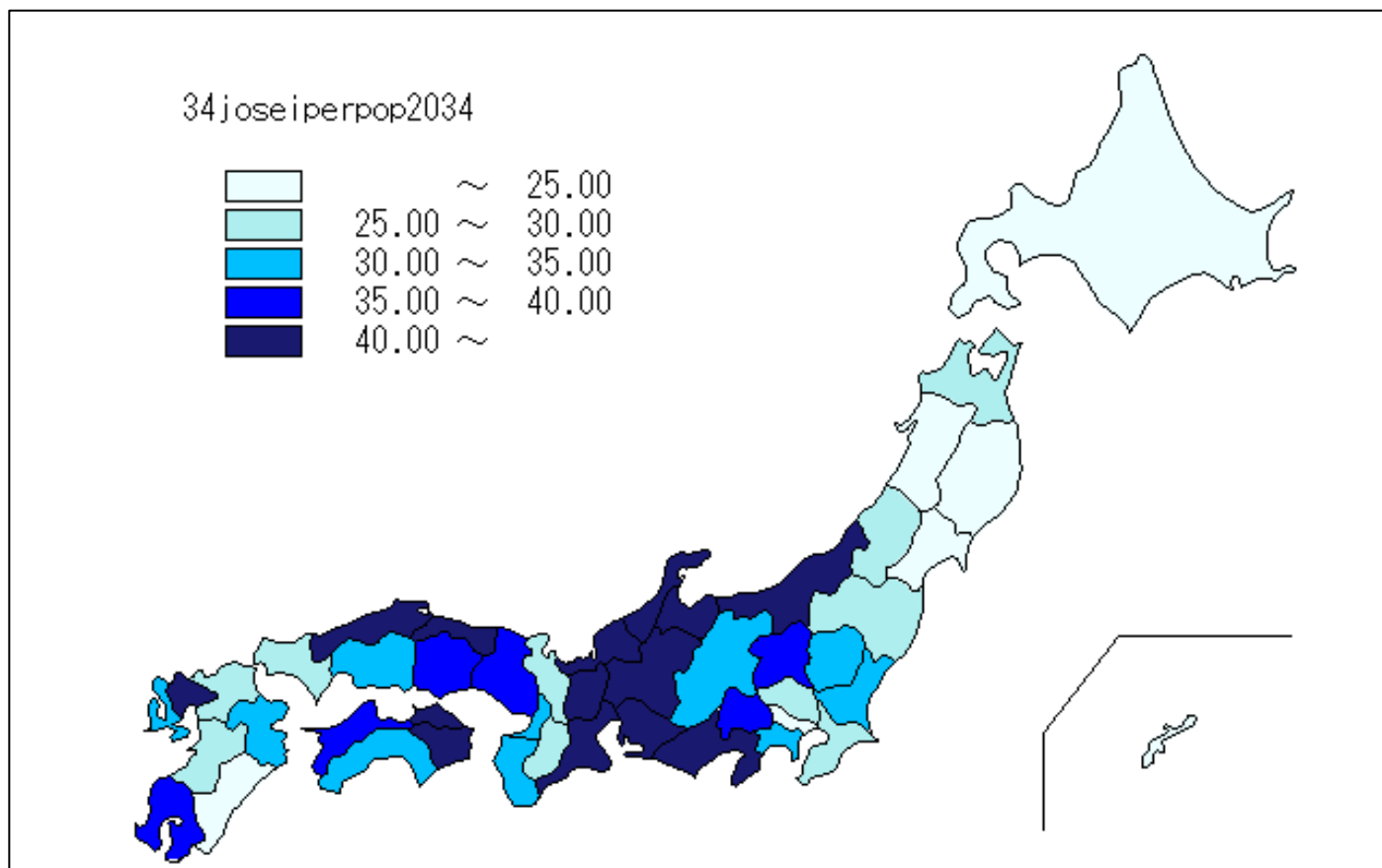


図 2. 二人以上世帯における平均収入と 35 歳未満 ART 助成利用率との相関 (N=47)

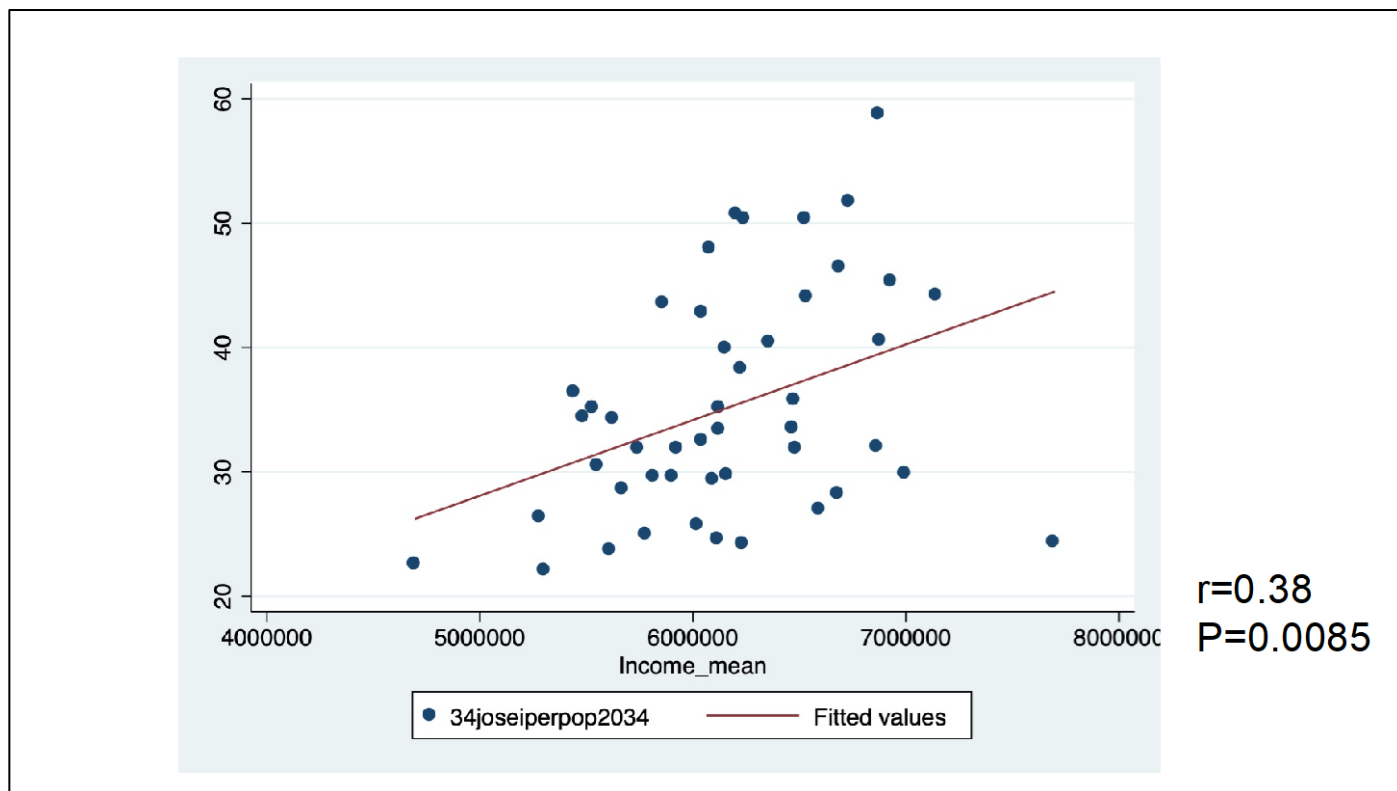


図 3. 都道府県別ボランティア参加率と 35 歳未満 ART 助成利用率との相関 (N=47)

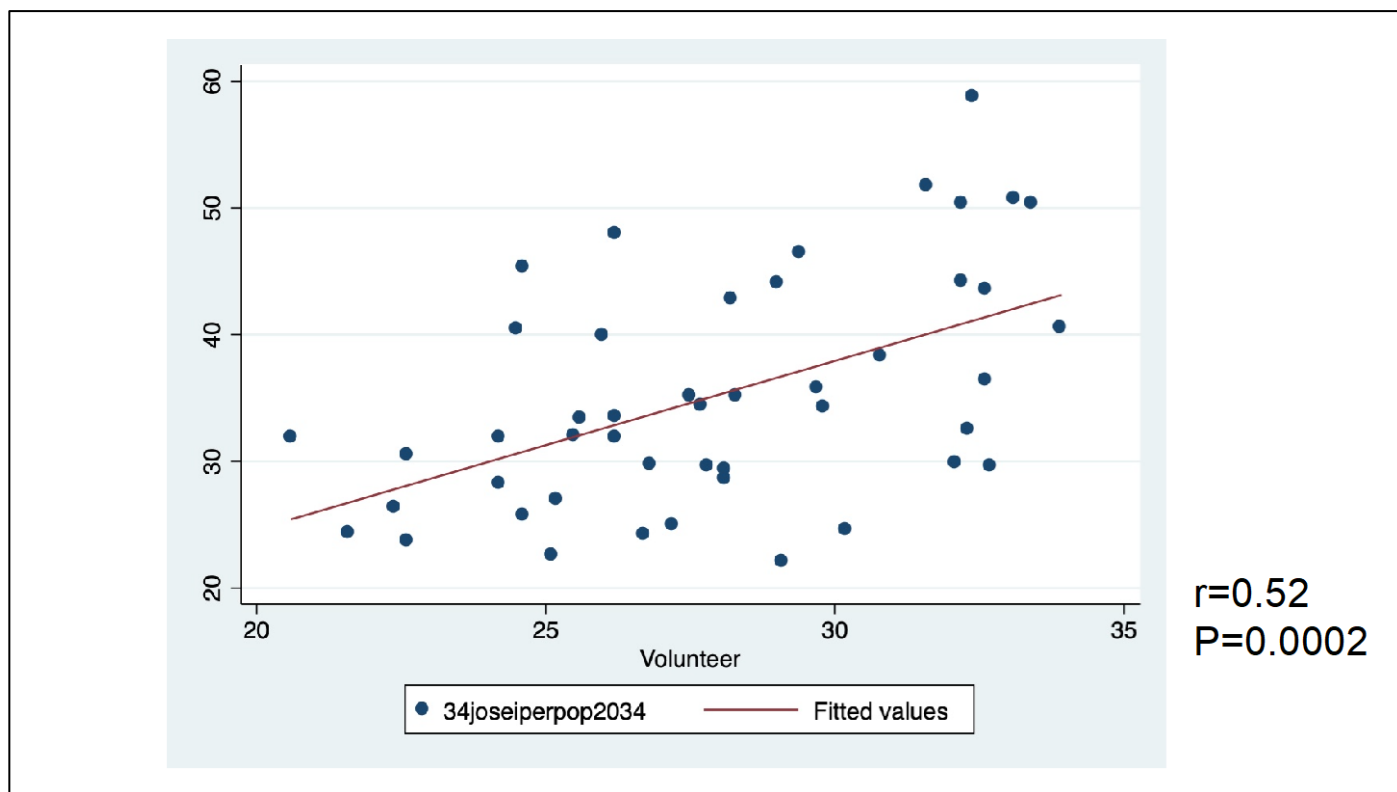


図4. 都道府県別転入率と35歳未満ART助成利用率との相関 (N=47)

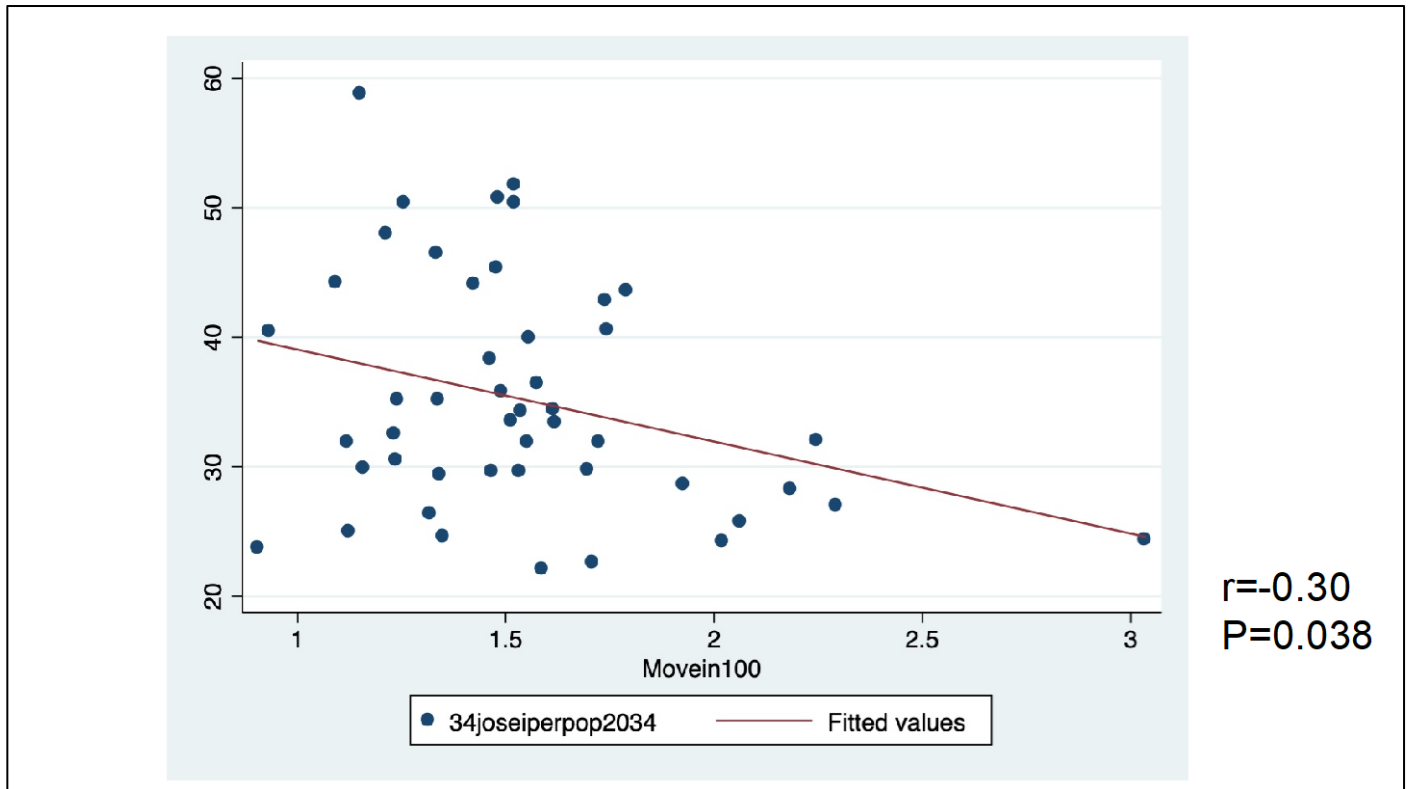


図5. 所得の分布 (埼玉県、夫婦合算)

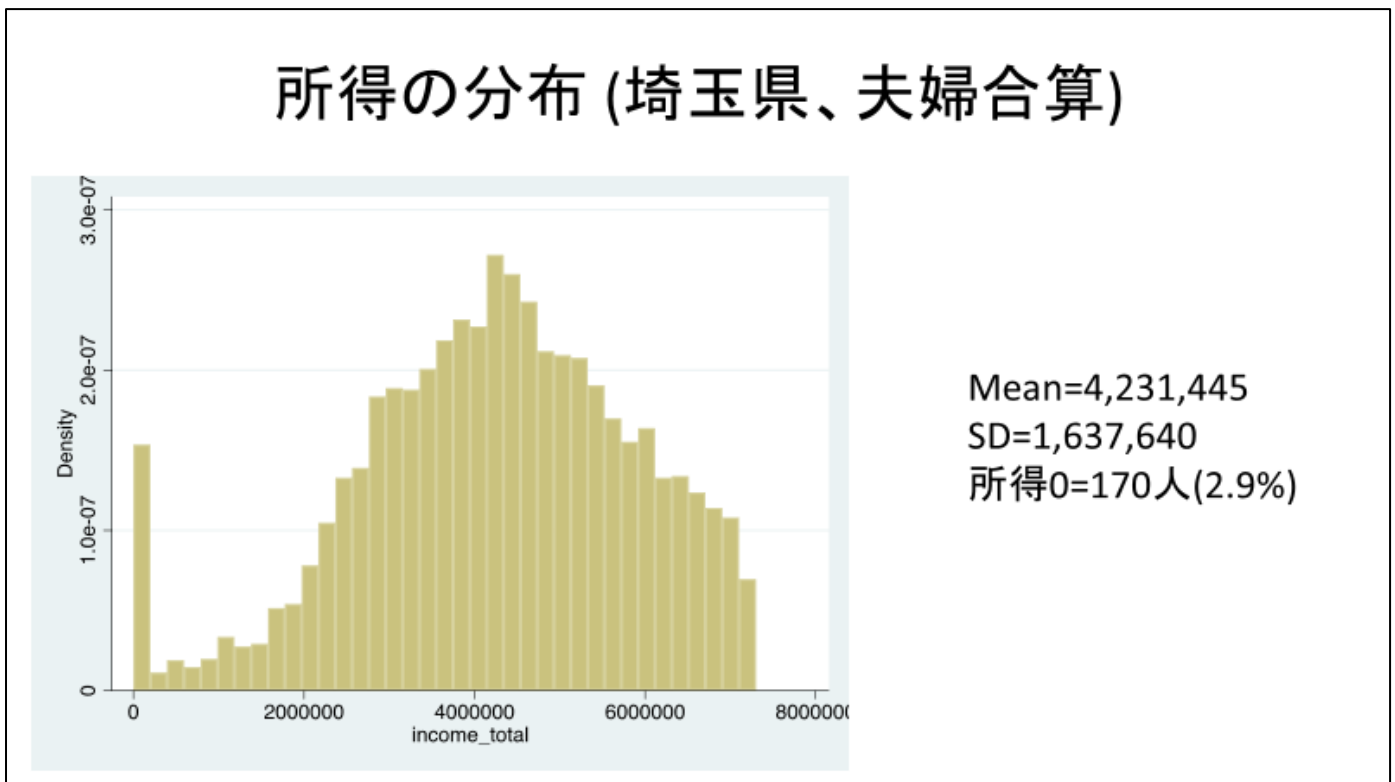


図 6. 所得の分布 (埼玉県、夫)

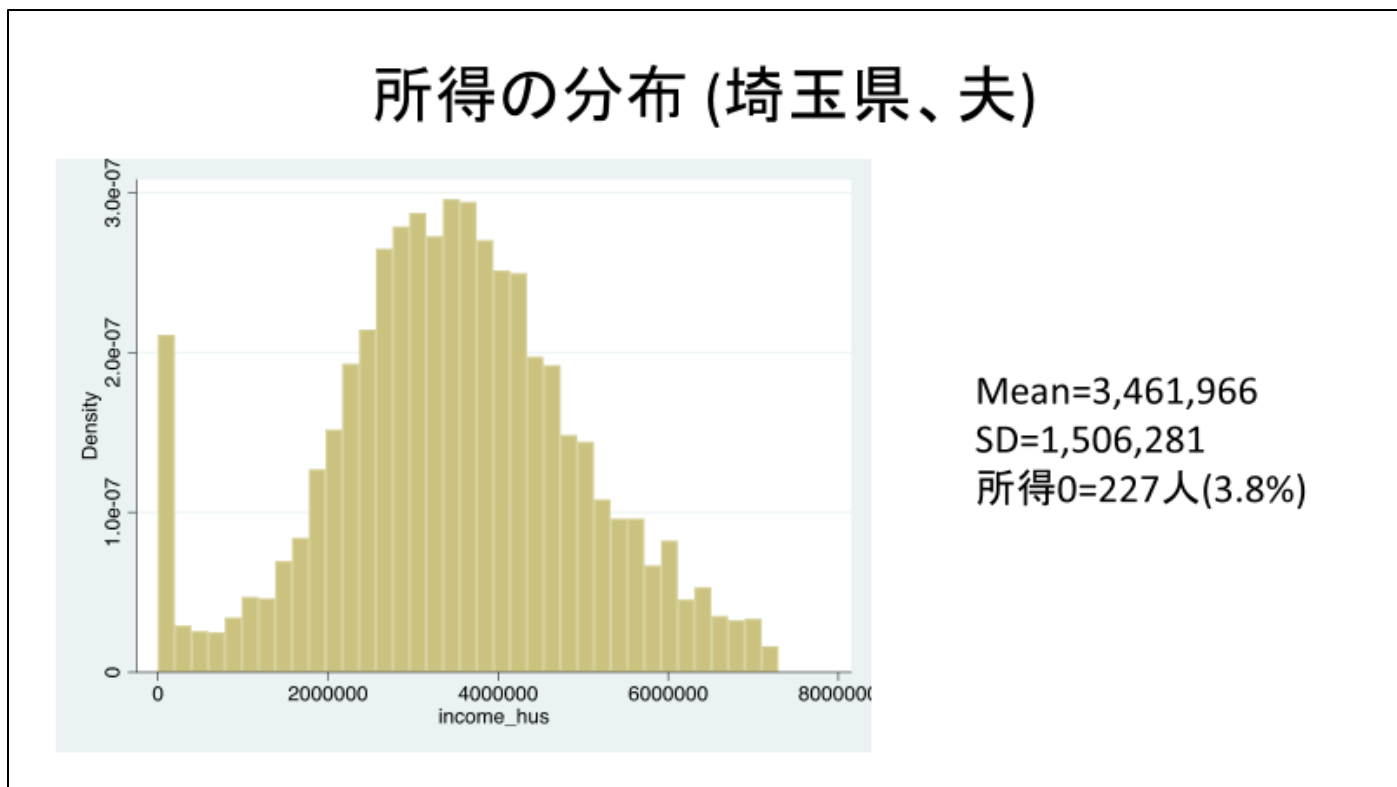


図 7. 所得の分布 (埼玉県、妻)

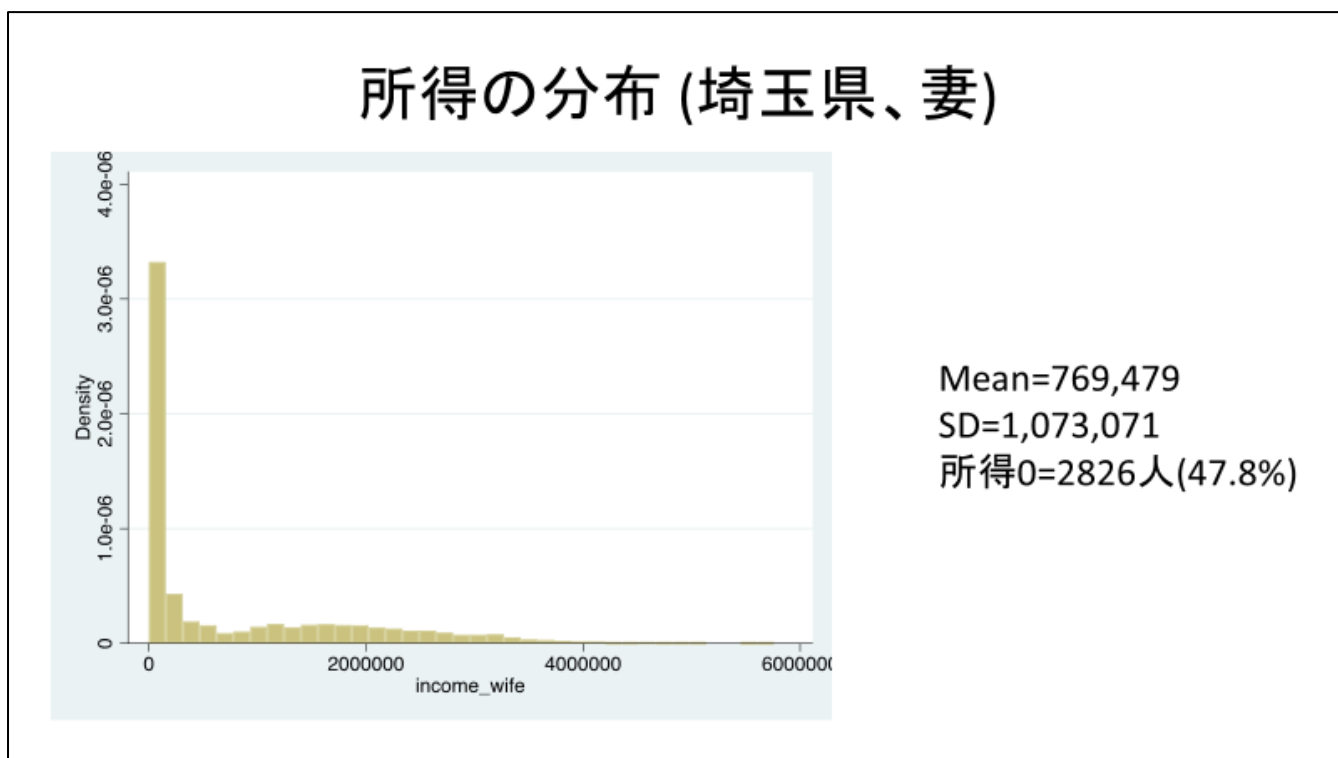


図 8. 共働き世帯別でみた所得分布（埼玉県、夫婦合算）

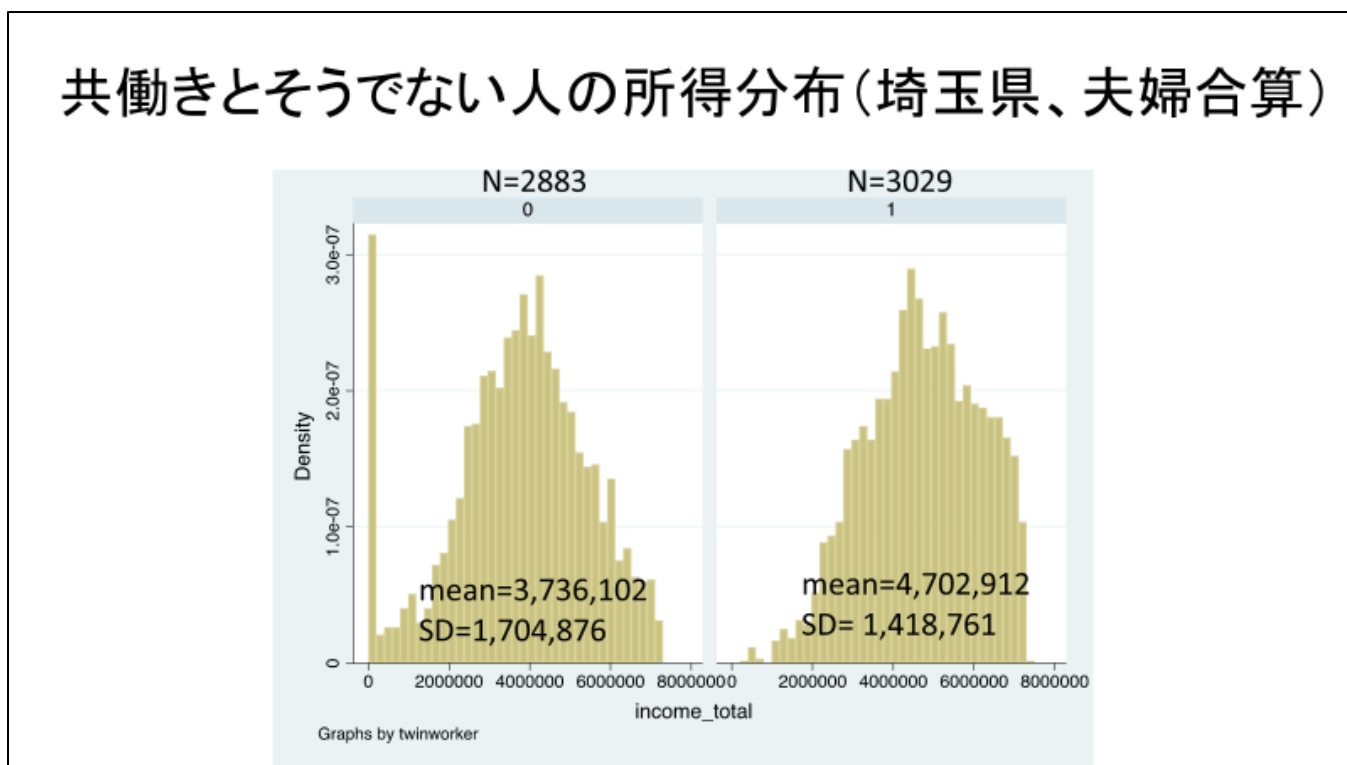


図 9. 申請回数と累積妊娠率（埼玉県、n=3442）

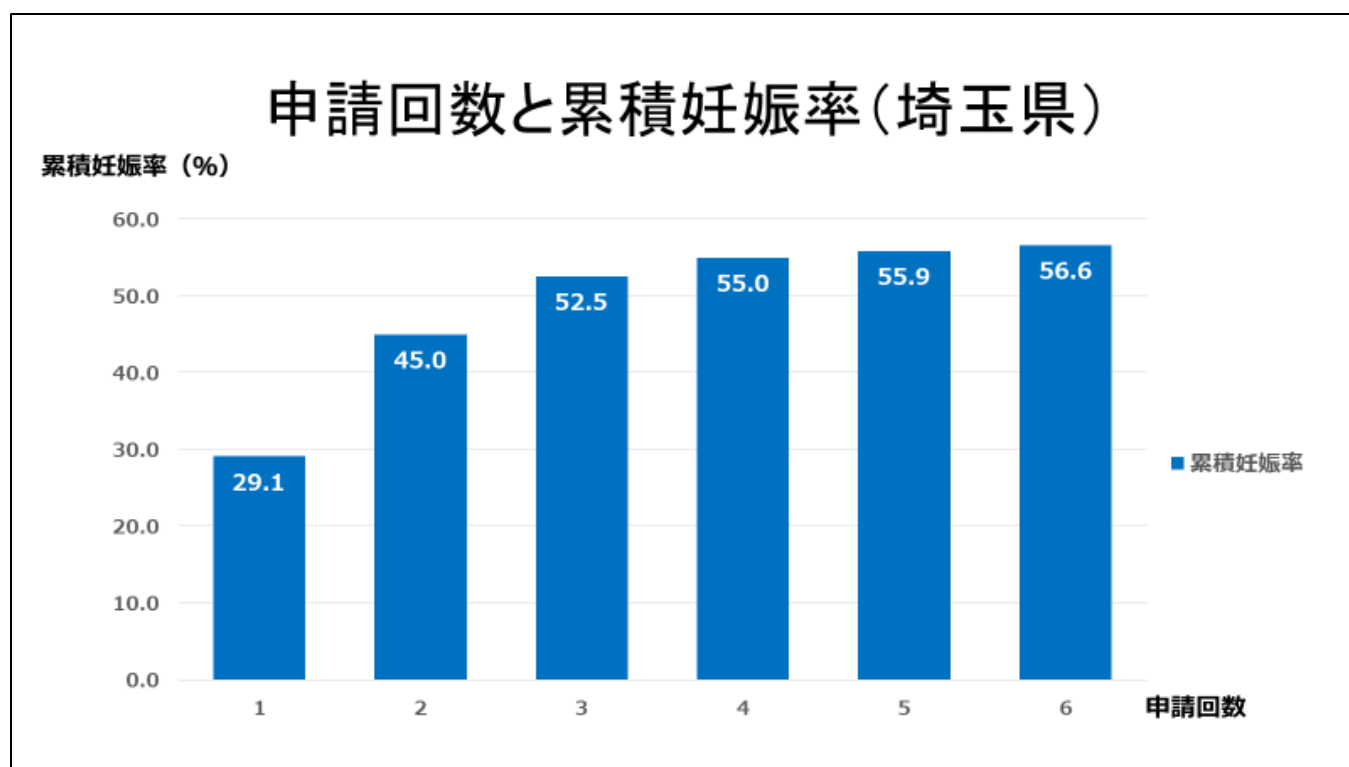


図 10. 所得 5 分位別累積妊娠率（埼玉県、Q1 vs Q5）

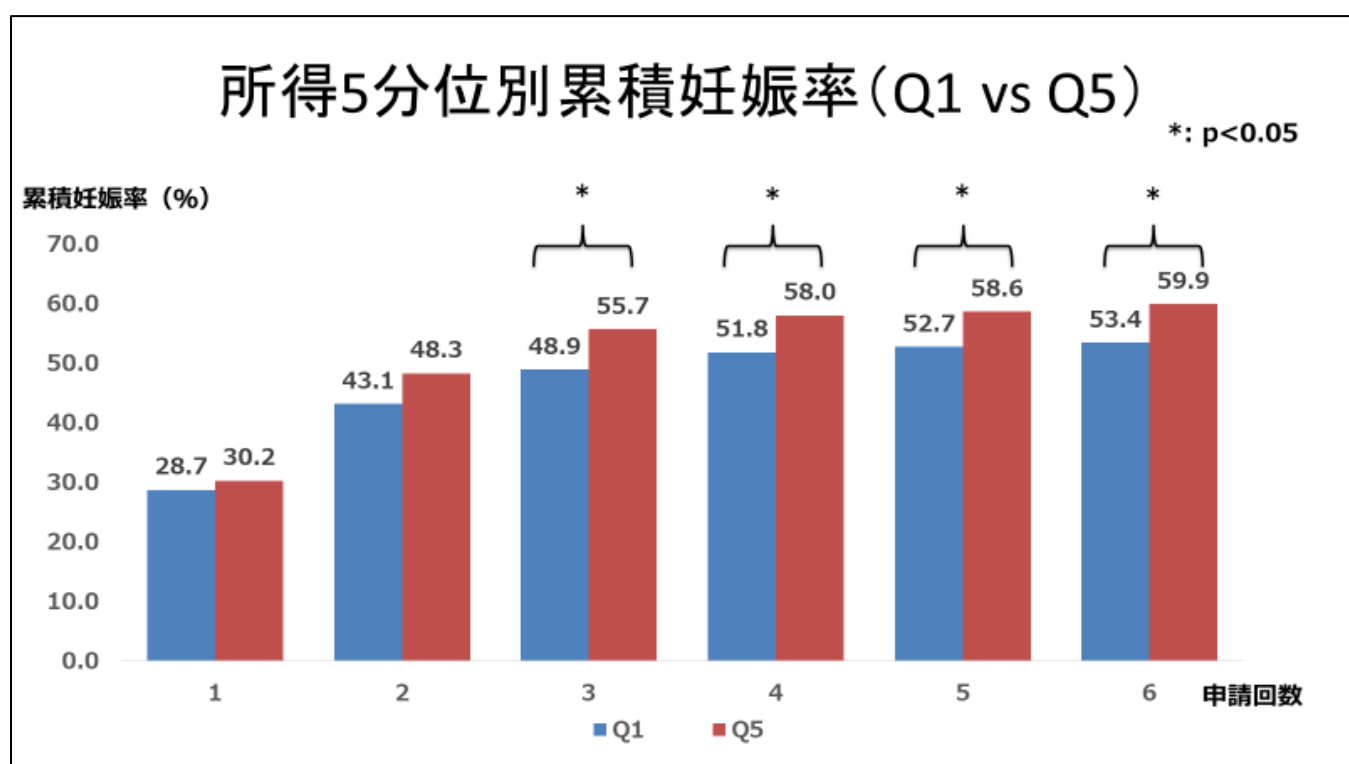


図 11. 所得 5 分位別申請中断者の割合（埼玉県、n=3442）

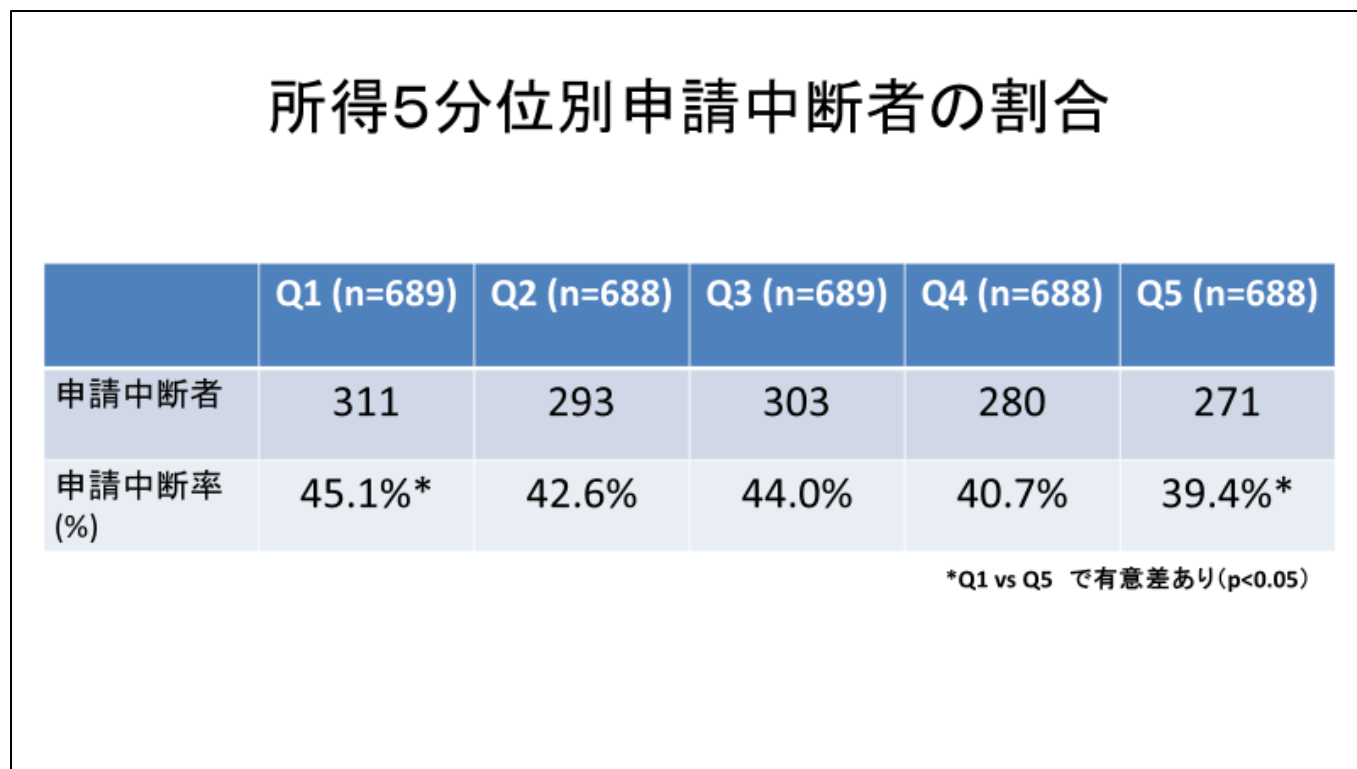


図 12. 所得の分布（越谷市、夫婦合算）

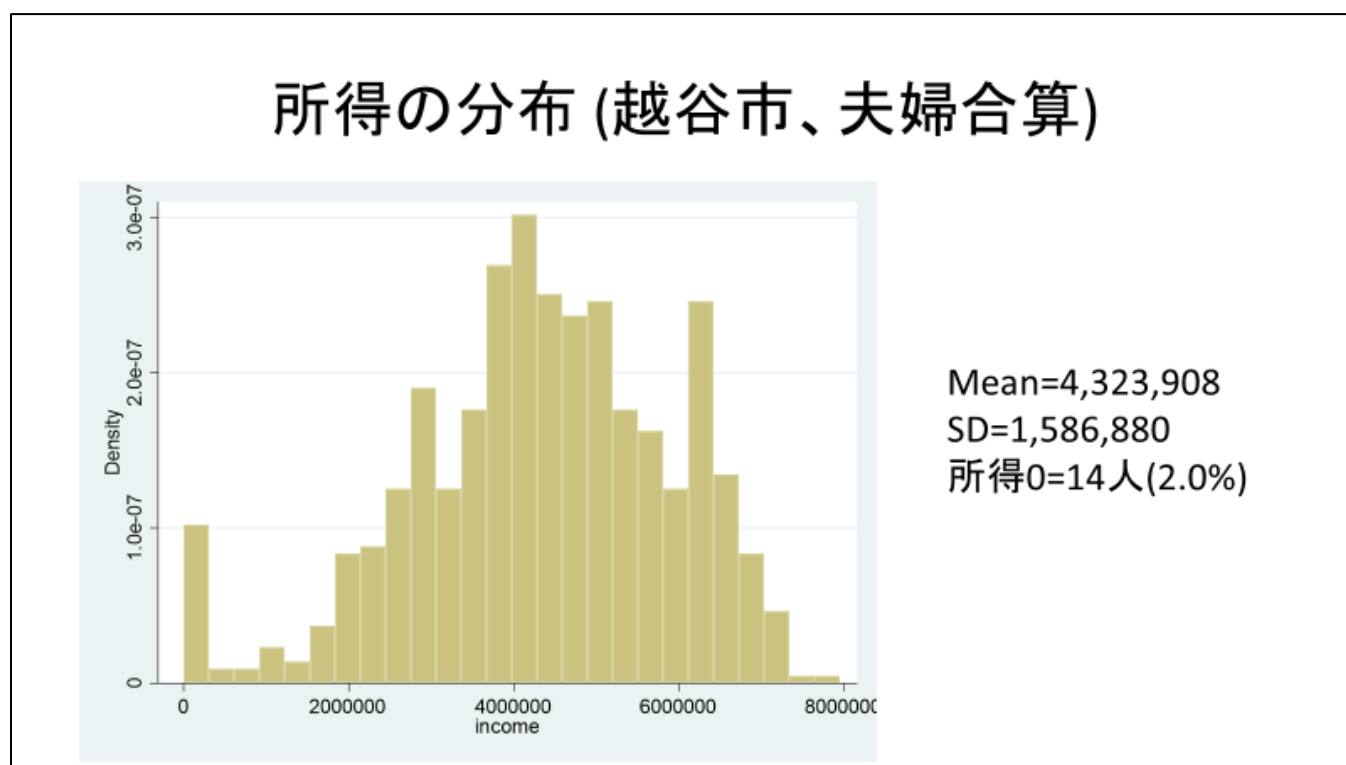


図 13. 解析対象者の選定方法

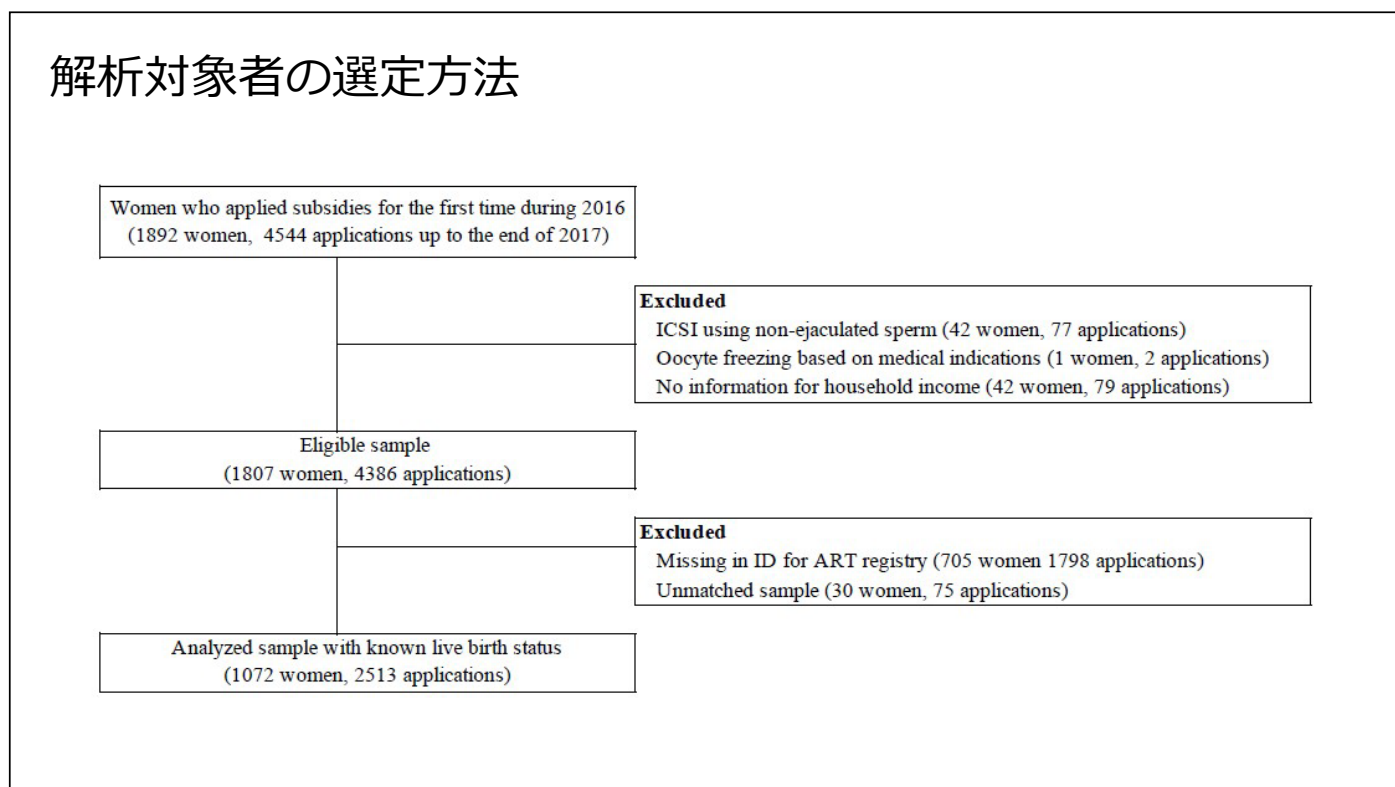


図 14. 年齢別申請回数ごとの累積生産率 (n = 1072)

