Table 1. Sensitivity analysis: Association of IADL disability with community- and individual-level variables determined by multilevel logistic regression ^a.

Variables		Model 1		Model 2		Model 3	
variables	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	
Community-level independent variable							
Social cohesion (ref. < -0.540)							
-0.540-0.115	1.29	(1.09-1.54)	1.05	(0.87-1.26)	1.04	(0.86-1.25)	
0.116-0.6022	1.48	(1.24-1.76)	1.12	(0.93-1.35)	1.10	(0.91-1.33)	
≥0.6023	1.55	(1.30-1.85)	1.10	(0.90-1.33)	1.07	(0.88-1.31)	
Civic participation (ref. < -0.526)							
-0.526-0.012	0.81	(0.72-0.91)	0.86	(0.76-0.97)	0.86	(0.76-0.98)	
0.0121-0.564	0.77	(0.68-0.87)	0.87	(0.76-0.99)	0.87	(0.76-0.99)	
≥0.565	0.56	(0.48-0.64)	0.73	(0.61-0.87)	0.74	(0.62-0.88)	
Reciprocity (ref. <-0.418)							
-0.418-0.190	1.20	(1.03-1.41)	1.13	(0.96-1.31)	1.11	(0.95-1.30)	
0.191-0.559	1.18	(1.01-1.38)	1.05	(0.89-1.23)	1.04	(0.89-1.22)	
≥0.560	1.20	(1.02-1.42)	1.12	(0.95-1.32)	1.12	(0.94-1.32)	
Community-level covariates							
Average annual household income (1000	yen)		1.18	(1.01–1.37)	1.21	(1.05–1.41)	
Population density (people/km ² of inhabi	table area) (ref≥1	0,123)					
<2040			1.84	(1.45-2.35)	1.78	(1.40-2.27)	
2040–6852			1.55	(1.25–1.91)	1.50	(1.22–1.85)	
6853–10,122			1.05	(0.84-1.30)	1.04	(0.83-1.29)	
Area (km²) (ref ≥5.135)							
<1.256			1.09	(0.85-1.39)	1.07	(0.83-1.36)	
1.256-2.2563			1.02	(0.83-1.24)	1.01	(0.83-1.23)	
2.2564-5.134			1.09	(0.96-1.24)	1.10	(0.97-1.24)	
Individual-level independent variable (re	ef. no)						
Social cohesion	,		0.87	(0.76–0.99)	0.94	(0.83-1.08)	
Civic participation			0.63	(0.58–0.69)	0.68	(0.63–0.74)	
Reciprocity			1.08	(0.74–1.58)	1.19	(0.81–1.73)	
Individual-level covariates				,		, ,	
Sex (ref. women)							
Men			2.45	(2.24-2.68)	2.55	(2.31-2.82)	
Age (ref. 65–69)				,		,	
70–74			1.24	(1.12-1.38)	1.22	(1.10-1.36)	

75–79		1.71	(1.53-1.91)	1.64	(1.46-1.84)
80-84		3.00	(2.62-3.43)	2.83	(2.46-3.24)
≥85		5.52	(4.46-6.82)	5.22	(4.21-6.47)
Marital status (ref divorced)					
Married		2.60	(1.84-3.67)	2.73	(1.94-3.86)
Widowed		2.32	(1.63-3.30)	2.36	(1.65-3.37)
Never married		1.36	(0.82-2.25)	1.36	(0.83-2.26)
Educational attainment (ref. 10–12 years)					
<10		1.41	(1.29-1.55)	1.39	(1.27-1.53)
≥13		0.92	(0.82-1.03)	0.92	(0.82-1.04)
Annual household income (yen) (ref. ≥4,000,000)					
<2,000,000		1.09	(0.94-1.26)	1.04	(0.90-1.20)
2,000,000–3,999,999		1.01	(0.87-1.16)	1.00	(0.86-1.15)
Presence of illnesses (ref. no)					
Yes				1.13	(1.02-1.24)
Depression symptoms (ref. no depression) (GDS-5)					
Depression symptom (GDS >5)				1.25	(1.13-1.38)
Body mass index (ref. 18.5–24.9)					
<18.5				1.12	(0.94-1.33)
≥25.0				1.15	(1.04-1.26)
Smoking habit (ref. no)					
Yes				1.19	(1.06-1.35)
Alcohol consumption (ref. no)					
Yes				0.91	(0.83-1.00)
Daily walking time (ref. ≥30 min/day)					
<30				1.33	(1.22-1.45)
Frequency of going outside (ref. 1 time or more per week	k)				
Less than 1 time per week				1.61	(1.36-1.92)
Random-effects					
parameters					
Community-level variance (standard error) 0.117	0.039	0.058	0.067	0.043	0.091
CI . C (: 1 : . 1		1	NIII II () OC (O OOF) NA	. 1.11 F

OR: Odds ratios; CI: Confidence interval; ref.: reference. a Random-effects of estimate (standard error) of Null model was 0.26 (0.035). Model 1: Each community-level social capital variable was incorporated into the model without adjustment. Model 2: Model 1 + community-level average annual household income, population density, area, individual-level social capital, sex, age, marital status, educational attainment, and annual household income. Model 2: Model 2 + presence of illnesses, depression symptoms, body mass index, smoking habit, alcohol consumption, daily walking time, and frequency of going outside.

Table 2. Subgroup analysis: Association between community- and individual-level variables and IADL disability by sex and age.

	Men ^a (n = 13,919)		V	Women ^a (n = 16,668)		Age 65–74 ^b (n = 22,180)		Age $\geq 75^{\text{ b}}$ (n = 8407)	
Variables			(n						
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	
Community-level independent variable	?								
Social cohesion	1.05	(0.96–1.15)	0.92	(0.81–1.05)	1.01	(0.92–1.11)	1.01	(0.90-1.14)	
Civic participation	0.93	(0.86-1.01)	0.83	(0.74-0.93)	0.90	(0.83-0.98)	0.90	(0.81-1.00)	
Reciprocity	1.03	(0.93-1.15)	1.11	(0.96-1.28)	1.08	(0.97-1.20)	1.05	(0.93-1.19)	
Community-level covariates									
Average annual household income (1000yen)	1.11	(0.93–1.34)	1.40	(1.09–1.80)	1.26	(1.04–1.54)	1.09	(0.87–1.37)	
Population density (people/km² of inha	abitable area)	(ref. ≥10,123)							
<2040	1.54	(1.16–2.05)	2.54	(1.63-3.95)	1.46	(1.07-2.00)	1.98	(1.37-2.85)	
2040-6852	1.24	(0.97–1.58)	2.32	(1.57–3.43)	1.24	(0.95–1.63)	1.62	(1.18–2.22)	
6853–10,122	1.09	(0.85–1.40)	0.82	(0.52–1.30)	0.90	(0.68–1.21)	1.17	(0.84-1.64)	
Area (km²) (ref. ≥5.135)		,		,		,		,	
≤1.256	1.16	(0.87-1.54)	0.85	(0.54-1.33)	1.04	(0.77-1.42)	0.94	(0.65-1.37)	
1.256-2.2563	1.06	(0.84-1.33)	0.94	(0.67-1.32)	1.12	(0.88-1.41)	0.84	(0.61-1.14)	
2.2564-5.134	1.19	(1.02-1.37)	0.99	(0.81-1.21)	1.07	(0.92-1.24)	1.14	(0.94-1.38)	
Individual-level independent variable ((ref. no)								
Social cohesion	0.89	(0.75-1.06)	1.01	(0.81-1.26)	0.91	(0.77-1.07)	1.00	(0.79-1.26)	
Civic participation	0.80	(0.72-0.89)	0.54	(0.47-0.63)	0.74	(0.66-0.83)	0.59	(0.51-0.68)	
Reciprocity	0.81	(0.52-1.25)	1.71	(0.75-3.87)	0.97	(0.60-1.55)	1.49	(0.79-2.79)	
Individual-level covariates									
Sex (ref. women)									
Men					3.94	(3.45-4.49)	1.55	(1.33-1.81)	
Age (ref. 65–69)									
70–74	1.08	(0.95-1.22)	1.63	(1.35-1.98)					
75–79	1.21	(1.05-1.40)	3.01	(2.46-3.68)					
80-84	1.75	(1.46-2.09)	6.85	(5.45-8.62)					
≥85	2.40	(1.77-3.25)	16.06	(11.63–22.16)					
Marital status (ref. divorced)									
Married	4.46	(2.61-7.62)	1.74	(1.10-2.75)	3.07	(2.01-4.69)	2.63	(1.44-4.81)	
Widowed	1.86	(1.05-3.31)	1.81	(1.14-2.88)	2.05	(1.30-3.23)	2.73	(1.49-5.00)	
Never married	1.51	(0.71-3.31)	1.07	(0.54-2.13)	1.45	(0.79-2.69)	1.14	(0.47-2.75)	
Educational attainment (ref. 10-12 year	rs)								

<10	1.33	(1.18-1.50)	1.59	(1.36-1.85)	1.51	(1.34-1.70)	1.37	(1.18-1.60)	
≥13	0.94	(0.82-1.08)	0.78	(0.59-1.02)	0.92	(0.79-1.07)	0.97	(0.79-1.18)	
Annual household income (yen) (ref. ≥4,000,000)									
<2,000,000	1.10	(0.92-1.31)	0.98	(0.76-1.26)	1.24	(1.03-1.50)	0.80	(0.64-1.01)	
2,000,000-3,999,999	1.06	(0.89-1.26)	0.95	(0.73-1.22)	1.13	(0.94-1.36)	0.84	(0.67-1.05)	
Presence of illnesses (ref. no)									
Yes	1.10	(0.98-1.24)	1.16	(0.97-1.40)	1.14	(1.01-1.29)	1.13	(0.95-1.35)	
Depression symptoms (ref. no depression	on) (GDS-5)								
Depression symptom (GDS >5)	1.19	(1.04-1.35)	1.47	(1.25-1.73)	1.19	(1.04-1.36)	1.35	(1.15-1.57)	
Body mass index (ref. 18.5-24.9)									
<18.5	1.09	(0.85-1.39)	1.30	(1.01-1.68)	1.20	(0.94-1.54)	1.20	(0.94-1.53)	
≥25.0	0.96	(0.85-1.08)	1.55	(1.32-1.82)	1.12	(0.99-1.26)	1.12	(0.95-1.31)	
Smoking habit (ref. no)									
Yes	1.18	(1.04-1.34)	0.94	(0.59-1.50)	1.16	(1.00-1.33)	1.02	(0.81-1.30)	
Alcohol consumption (ref. no)									
Yes	0.90	(0.81-1.00)	0.87	(0.71-1.08)	0.86	(0.77-0.97)	0.92	(0.79-1.07)	
Daily walking time (ref. ≥30 min/day)									
<30	1.30	(1.17-1.45)	1.42	(1.23-1.63)	1.34	(1.19-1.50)	1.39	(1.22-1.58)	
Frequency of going outside (ref. 1									
time or more per week)									
Less than 1 time per week	1.52	(1.20-1.92)	1.63	(1.25-2.11)	1.51	(1.17-1.94)	1.68	(1.33-2.13)	
Random-effects parameters									
Community-level variance (standard error)	0.023	0.225	3.85×10^{-7}	0.191	3.16×10^{-10}	0.104	0.062	0.129	

OR: Odds ratios; CI: Confidence interval; ref.: reference. ^a Adjusted for each community-level social capital variable, community-level average annual household income, population density, area, individual-level social capital, age, marital status, educational attainment, annual household income, presence of illnesses, depression symptoms, body mass index, smoking habit, alcohol consumption, daily walking time, and frequency of going outside. ^b Adjusted for each community-level social capital variable, community-level average annual household income, population density, area, individual-level social capital, sex, marital status, educational attainment, annual household income, presence of illnesses, depression symptoms, body mass index, smoking habit, alcohol consumption, daily walking time, and frequency of going outside.