Table S1. Differences of cumulative cost in LTCI services by OLS with MI, and GLM

	n	GLM [a,b)] Marginal effect (95%CI)	OLS with MI [b,c)] Coef. (95%CI)
Hobby activities group			
Never	2833		*ref.*
A few times a year	259	- 1.9 (-11.0 to 7.2)	- 3.1† (-6.6 to 0.3)
Once or twice a month	524	- 3.3 (-8.7 to 2.2)	- 2.9† (-5.8 to 0.1)
Once a week +	972	- 3.5† (-7.3 to 0.3)	- 3.7* (-6.0 to -1.3)
Sports group or club			
Never	3716		*ref.*
A few times a year	91	10.9 (-14.3 to 36.1)	2.7 (-4.6 to 10.0)
Once or twice a month	125	- 5.0 (-17.8 to 7.9)	- 3.5 (-7.8 to 0.7)
Once a week +	572	- 7.0** (-11.2 to -2.9)	- 4.9*** (-6.9 to -2.9)
Volunteer group			
Never	3899		*ref.*
A few times a year	194	- 9.4*** (-14.1 to -4.6)	- 4.3** (-7.3 to -1.2)
Once or twice a month	193	2.3 (-8.9 to 13.6)	1.9 (-2.9 to 6.8)
Once a week +	122	- 2.8 (-11.1 to 5.6)	- 0.5 (-4.4 to 3.3)

*** p<.001 ** p<.01 * p<.05 † p<.10 Unit: 1000 USD

GLM: Generalized linear model, OLS: Ordinal least squares, MI: Multiple imputation, CI: Confidential interval

a) Missing values in control variables were included as a dummy variable.

b) Each model was controlled by sex, age, disease and/or impairment, years of education, equivalent income, marital status, living situation, self rated health at baseline.

c) Multiple imputation by chained equations was performed using sex, age, disease and/or impairment, years of education, equivalent income, marital status, living situation, self rated health at baseline (m=20).

Table S2. C statistics by multinominal regression model

	Hobby activities group	Sports group or club	Volunteer group
A few times a year vs Never	0.664	0.757	0.637
Once or twice a month vs Never	0.665	0.695	0.681
Once a week + vs Never	0.662	0.645	0.713

C statistics by multinominal regression model in order to calculate generalized propensity scores were not high: hobby activities group=.662 to .665, sports group or club=.645 to .757, volunteer group=.637 to 713. However, it is not necessarily to mean undesirable model, because the goal of a propensity score model is to efficiently control confounding, not to predict treatment or exposure.[28]

Table S3. Differences of lifetime cost in LTCI services by social participation among deceased person

	n	Mean	OLS [a,b]	GLM [a,b]	After Multiple Imputation [c]	
					OLS [b]	IPW [d]
			Coef. (95%CI)	Marginal effect (95%CI)	Coef. (95%CI)	Coef. (95%CI)
Hobby activities group						
Never	861	19.2	*ref.*		*ref.*	*ref.*
A few times a year	72	9.7	- 6.0* (-11.9 to - 0.1)	- 5.6 (-14.9 to 3.8)	- 5.6† (-11.6 to 0.3)	- 4.7 (-13.7 to 4.4)
Once or twice a month	113	15.8	- 2.0 (-9.1 to 5.1)	- 0.9 (-9.3 to 7.6)	- 2.1 (-9.2 to 4.9)	- 2.4 (-9.8 to 4.9)
Once a week +	188	12.2	- 5.3* (-10.1 to -0.4)	- 3.9 (-7.3 to 0.3)	- 5.4* (-10.2 to -0.5)	- 5.7† (-11.6 to 0.3)
Sports group or club						
Never	1066	19.1	*ref.*		*ref.*	*ref.*
A few times a year	17	4.3	- 8.9*** (-13.7 to -4.1)	- 17.8*** (-22.8 to -12.8)	- 8.6** (-14.1 to -3.0)	- 9.4 (-27.3 to 8.4)
Once or twice a month	20	4.0	- 8.6** (-14.8 to -2.4)	- 18.5*** (-24.0 to -13.0)	- 9.1** (-15.3 to -2.8)	- 10.1 (-26.6 to 6.4)
Once a week +	105	5.4	- 9.7*** (-13.8 to -5.7)	- 11.4** (-17.8 to -4.9)	- 9.4*** (-13.4 to -5.4)	- 11.1** (-18.6 to -3.5)
Volunteer group						
Never	1091	16.9	*ref.*		*ref.*	*ref.*
A few times a year	40	11.2	- 1.8 (-12.4 to 8.8)	- 5.9 (-18.8 to 7.0)	- 1.7 (-12.6 to 9.2)	- 2.0 (-13.7 to 9.8)
Once or twice a month	24	20.6	6.2 (-14.9 to 27.2)	10.2 (-22.5 to 42.9)	7.1 (-13.9 to 28.0)	7.6 (-7.4 to 22.7)
Once a week +	14	9.3	- 4.6 (-16.8 to 7.7)	- 12.5** (-20.4 to -4.7)	- 5.1 (-18.1 to 7.8)	- 3.4 (-23.0 to 16.2)

*** p<.001 ** p<.01 * p<.05 † p<.10 Unit: 1000USD

OLS: Ordinal least squares, GLM: Generalized linear model, IPW: Inverse probability weighting, CI: Confidential interval

a) Missing values in control variables were included as a dummy variable.

b) Each model was controlled by sex, age, disease and/or impairment, years of education, equivalent income, marital status, living situation, self rated health at baseline.

c) Multiple imputation by chained equations was performed using sex, age, disease and/or impairment, years of education, equivalent income, marital status, living situation, self rated health at baseline (m=20).

d) The generalized propensity scores were calculated using multinominal regression analysis using all previously listed potential confounders: sex, age, disease and/or impairment, years of education, equivalent income, marital status, living situation, self rated health. C statistics were as follows: hobby activities group=.640 to .665, sports group or club=.645 to 757, volunteer group=.637 to 713.