Future Institutional Care Needs of the Elderly in Japan

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INAHSIM (Integrated Analytical Model for Household Simulation) is a dynamic micro simulation model, which was first developed in 1984-85 in Japan by using an actual initial population derived from a national household survey. Since the 1994 Simulation, the initial population for the model was formed by using the INAHSIM model itself. This is especially important in Japan where it is particularly difficult to use micro data of household surveys to obtain the initial population.

The 2004 Simulation improved the process of creating the Initial Population and added the dependency of the elderly in the model. Since the 2009 Simulation, the dependency level of the elderly aged 65 or over was based on the data from the Long-term Care Insurance (LCI) implemented since April 2000, and institution was among options of living arrangement for the elderly.

INAHSIM 2014 Simulation

Observing the basic framework of the 2009 Simulation, we conducted a household projection in Japan for the period of 2012-2060. Due to rapid aging of the population, the distribution of the elderly (65 years old or older) by living arrangement and dependency level has a profound impact on the future society in Japan. The choice of the elderly among a) living independently, b) co-resident with child households, and c) moving to institutions are crucial indicators. Especially, we focus on the percentage of the elderly living in institutions.

The Initial Population obtained consisted of 467.7 thousand individuals in 192.3 thousand households. The Initial Population reflected actual situation in 2012 fairly well, but there was still a certain discrepancy in the living situation of the elderly between the Initial Population and the result from the Population Census and the Basic Household Survey.

The death rate is given by age (single year of age) and sex for those who are less than 65 years old, but it is determined by dependency transition which is given by age (5 year age group) and sex for those who are 65 years old or over. The dependency of the elderly aged 65 or over is classified into 4 levels as follows:

Level 0: No disability and completely independent;

Level 1: Some disability but basically independent;

Level 2: Slightly or moderately dependent; and

Level 3: Heavily dependent.

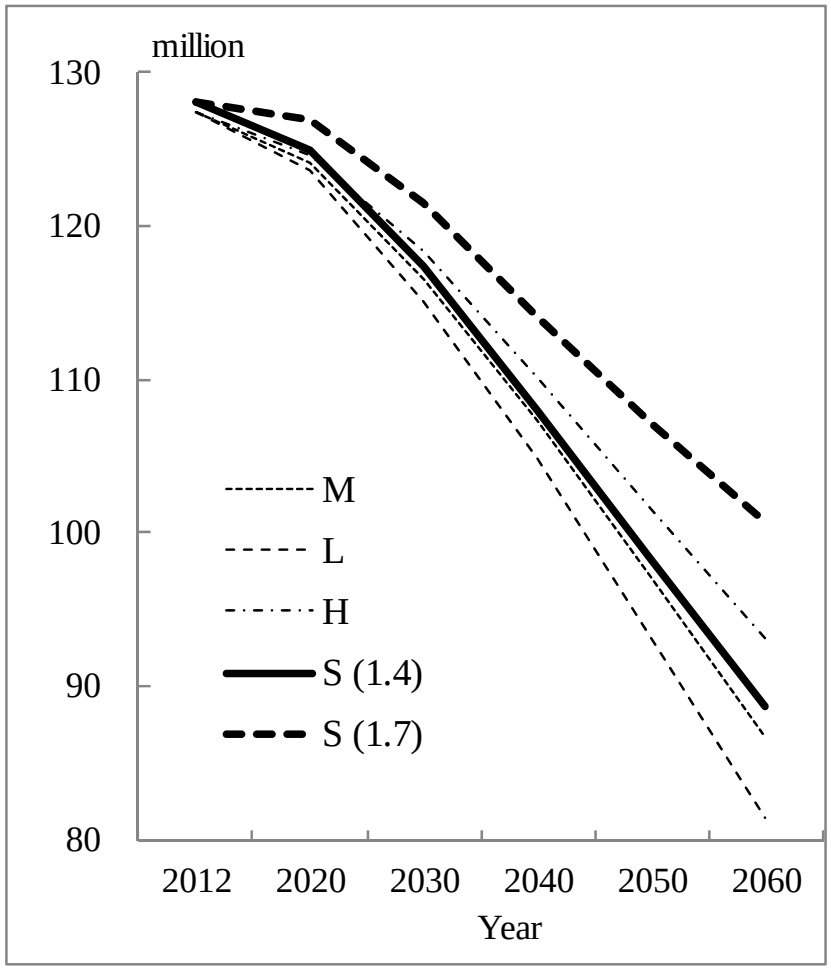
Levels 2 and 3 correspond to persons eligible for the LCI, and Level 3 corresponds to care need assessments 4 and 5 of the LCI in particular.

Concerning the possibility of the elderly to move into institutions, we assumed two cases: Standard case (S) and Independent case (I). Whether an elderly person moves to an institution or not depends on living arrangement, marital status, and dependency level.

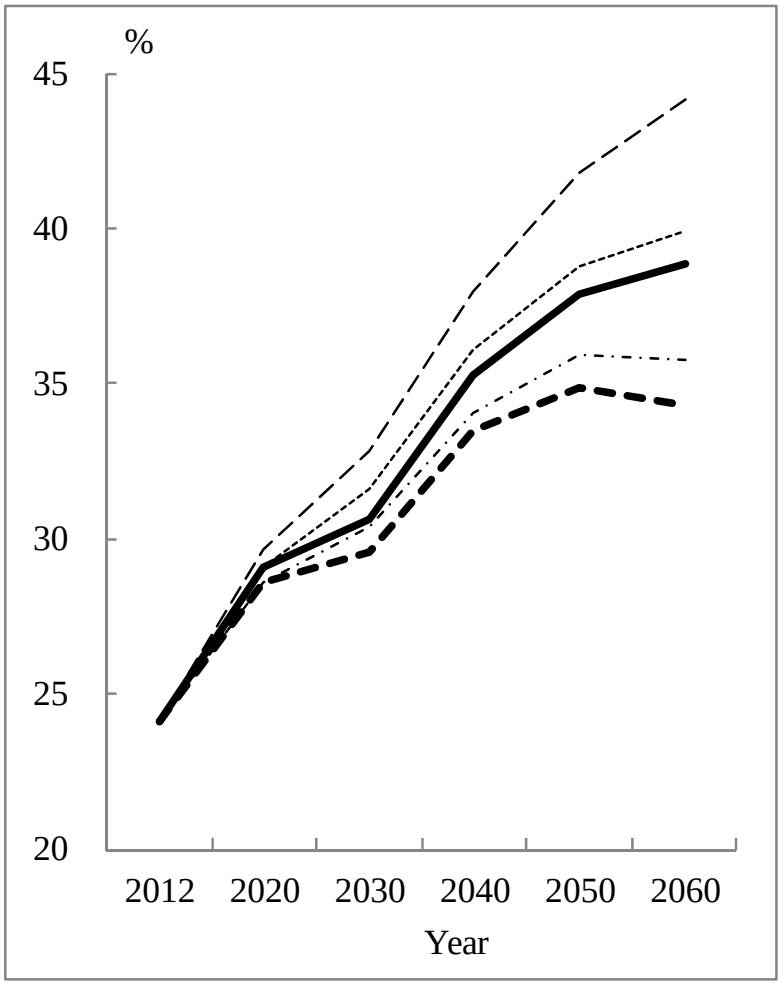
The total fertility rate was assumed to remain the same throughout the simulation period, and we assumed two levels (TFR=1.4 and 1.7). On the other hand, the death rate was assumed to decline gradually, and life expectancy at birth would be 84.5 years for males and 90.2 years for females in 2060. Concerning the possibility of the elderly to move to institution, we assumed two cases, Standard case (S) and Independent case (I), as mentioned above.

Fig. Total population and aging rate

(a) Total population



(b) Aging rate



Note: Middle, Low, High mean middle, low, and high scenarios of the Population Projection by the IPSS as of January 2012 respectively.

Table 2 Future population and households

(in million, %)

Year	Population							Number of Households	
				Age Structure					
	Total	Elderly (65+)	Elderly (75+)	0-14	15-64	65+	(Re) 75+	Total	With 65+
2000	126.9	22.0	9.0	14.6	68.1	17.4	7.1	46.8	15.6
2010	128.1	29.2	14.1	13.1	63.8	23.0	11.0	51.8	20.7
2012	127.5	30.8	15.2	13.0	62.9	24.2	11.9		
2020	124.9	36.4	18.4	12.1	58.8	29.1	14.8	52.5	24.2
2030	117.3	35.9	22.4	11.2	58.2	30.6	19.1	50.6	24.8
2040	107.9	38.1	20.7	10.9	53.8	35.3	19.2	47.4	26.2
2050	98.2	37.2	23.2	10.6	51.5	37.9	23.6	43.5	25.7
2060	88.7	34.5	23.1	10.1	51.0	38.9	26.0	39.4	23.5

Note: Figures for 2000 and 2010 are based on the Population Census.

Table 3 Living situation of the elderly (65+): S & TFR=1.4

(in %)

Year	Total							Male						Female					
	1P	Co	Co-resident with child				Insti-tution	1P	Co	Co-resident with child				1P	Co	Co-resident with child			
			a	b	c	d				a	b	c	d			a	b	c	d
2007	15.7	36.7	9.6	10.0	16.9	7.2		9.7	46.1	11.5	3.5	22.7	2.7	20.4	29.3	8.1	15.1	12.3	10.7
2010	16.9	37.2	8.4	9.1	17.4	7.4		10.9	46.4	10.0	3.1	23.0	2.8	21.5	30.0	7.1	13.8	13.1	10.9
2013	17.7	38.5	6.7	7.2	18.2	7.8		11.6	47.6	8.0	2.3	23.7	2.8	22.4	31.4	5.7	10.9	14.0	11.8
2020	21.8	33.8	5.4	8.8	13.3	6.5	5.4	20.1	39.1	6.1	4.9	16.2	3.6	23.1	29.4	4.9	12.0	11.0	8.9
2030	25.0	29.5	5.3	10.5	11.0	7.4	5.6	23.7	35.2	6.3	6.0	13.7	4.3	26.0	25.1	4.6	14.0	8.9	9.9
2040	27.6	28.2	4.8	9.7	10.5	6.7	5.5	26.3	33.4	5.6	5.4	13.2	3.8	28.7	24.1	4.2	13.2	8.3	9.1
2050	29.3	28.4	4.8	9.0	10.2	6.0	5.7	27.5	33.0	5.5	5.1	13.2	3.4	30.7	24.7	4.2	12.0	7.8	8.1
2060	30.0	25.9	4.9	9.0	10.0	5.8	7.1	28.0	30.1	5.8	5.2	13.4	3.5	31.5	22.6	4.3	12.0	7.5	7.6

(Note 1)1P: One-person, Co: Couple only

a, b: Co-resident with child (Couple) of elderly couple (a) or elderly without spouse (b)

c, d: Co-resident with child (without spouse) of elderly couple (c) or elderly without spouse (d).

(Note 2) Figures for 2007, 2010 and 2013 are from the Basic Households Survey, which excludes those who stay in institutions.

Table 4 Distribution of the elderly (65+) by dependency level: S & TFR=1.4

(in %)

Year	Total				Male				Female			
	Deendency level				Deendency level				Deendency level			
	0	1	2	3	0	1	2	3	0	1	2	3
2010	87.8		8.7	3.5	91.8		6.0	2.2	84.8		10.7	4.5
2012	75.5	13.3	7.9	3.3	72.7	17.5	7.3	2.5	77.9	9.7	8.4	3.9
2020	72.2	14.5	9.1	4.1	69.4	19.2	8.2	3.2	74.4	11.0	9.8	4.8
2030	67.2	15.6	11.4	5.8	64.5	20.9	10.3	4.2	69.4	11.4	12.2	7.0
2040	67.6	14.6	11.2	6.6	65.9	19.7	9.8	4.6	68.9	10.6	12.3	8.2
2050	65.3	16.0	11.8	6.9	62.2	21.8	11.0	5.0	67.7	11.4	12.5	8.4
2060	61.1	16.3	13.6	9.1	58.1	22.7	12.6	6.7	63.4	11.3	14.4	10.9

(Note 1) Dependency level

0: No disability and completely independent

1: With some disability but independent

2: Slightly or moderately dependent

3: Heavily dependent

(Note 2) Figures for 2010 are from the Basic Households Survey.

Table 5 Proportion of the elderly living alone or in institution：
TFR=1.4

(in：%)

Year	65+					85+				
	Population (million)	Standard case		Indipendent case		Population (million)	Standard case		Indipendent case	
		Alone	Instit.	Alone	Instit.		Alone	Instit.	Alone	Instit.
2012	30.9	16.4	5.7	16.4	5.7	3.6	8.3	10.6	8.3	10.6
2020	36.4	21.8	5.4	22.9	4.7	5.6	17.5	15.6	17.8	13.8
2030	35.9	25.0	5.6	26.0	4.5	7.8	19.8	15.7	20.2	13.8
2040	38.1	27.6	5.5	28.2	4.2	9.5	24.8	15.2	25.2	12.3
2050	37.2	29.3	5.7	30.1	4.4	8.5	26.6	15.6	26.4	13.0
2060	34.5	30.0	7.1	30.6	5.9	11.0	32.3	15.8	31.5	14.4

The percentage of the elderly living in institutions is rather theoretical, considering only demand side. Moreover, the logic employed here is rather simple, and there is a plenty of room to improve. Actual proportion of those elderly who stay in institutions is determined by the availability of places on long term care institutions.

From the INAHSIM model, we can obtain a population-household projection in a coherent manner as well as dynamic statistics which are difficult to obtain from static surveys or macro simulation. If we construct a pertinent initial population and improve the accuracy of transition probabilities, then we can extract useful information from the INAHSIM, which is only available from dynamic micro-simulation model.

Due to rapid aging of the population, the choice of the elderly among a) living independently, b) co-resident with child households, and c) moving to institutions have a profound impact on future LCI expenditures in Japan. These results may change according to assumptions, but simulation results are useful in considering ways how to reorganize the social security system under the circumstances of aging of the population and low fertility in Japan.