Household Projections for Korea (2020~2050)

> **The number of households is projected to mark 20.73 million households in 2020, starting to decrease after recording a peak of 23.87 million households in 2039.**

○ **(Projected number of households)**
The number of households in Korea is projected to increase from 20.73 million in 2020 to 23.87 million in 2039. Afterwards, this figure is projected to decline to stand at 22.85 million in 2050.
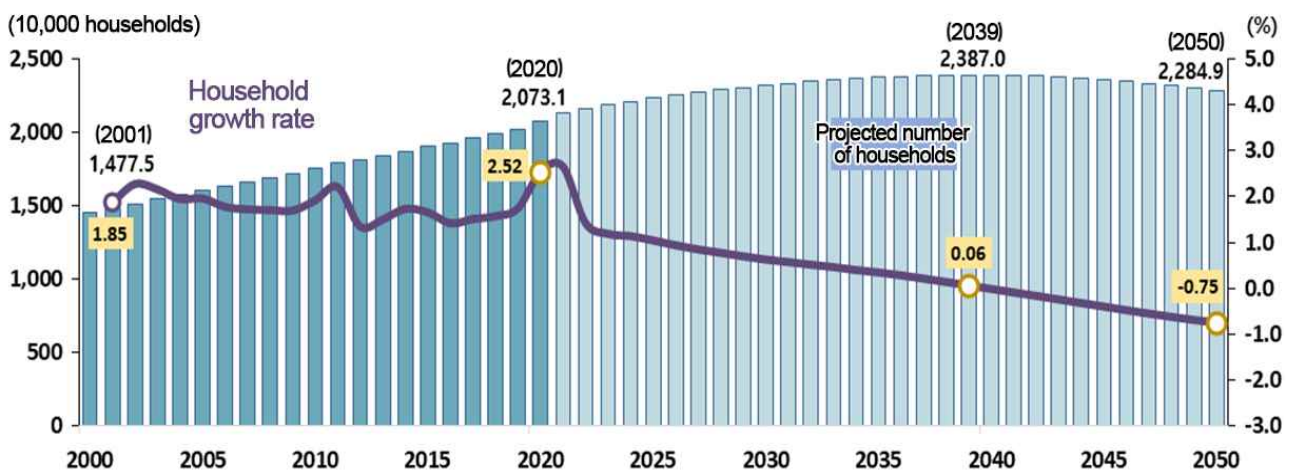
○ **(Household growth rate)**
The annual household growth rate is projected to gradually decline from 2.52% in 2020 to ⁻0.75% in 2050, with a negative growth starting in 2040.

○ **(Average household size)**
The average household size is projected to gradually fall from 2.37 persons in 2020 to 1.91 persons in 2050.

< Projected number of households and household growth rate, (2000-2050) >

> **Until the year 2050, one-person households and couple-only households are projected to increase. Whereas, the households of couples with children are projected to decline.**

○ **(Household type)**
In 2020, one-person households are projected to occupy the largest share at 31.2%, followed by the households of couples with children (29.3%) and couple-only households (16.8%). In 2050, one-person households are projected to occupy the largest share at 39.6%, followed by couple-only households (23.3%) and households of couples with children (17.1%).

○ **(Household size)**

As for the share of households by household size, one-person households are projected to occupy the largest share at 31.2%, followed by two-person households (28.0%), three-person households (20.3%) and four-person households (15.8%) in 2020. In 2050, the shares of one-person households (39.6%) and two-person households (36.2%) are projected to record an increase. Whereas, the share of four-person households is projected to drop to 6.2%.

< Share of households by household type (2020-2050) >

■ One-person households   ■ Couple-only households
■ Households of couples   ■ Households of single   ■ Others
with children   parent with children

Year	One-person	Couple-only	Couples with children	Single parent	Others
2020	31.2	16.8	29.3	9.8	12.9
2030	35.6	20.0	23.6	9.1	11.7
2040	37.9	22.2	19.7	8.7	11.4
2050	39.6	23.3	17.1	8.6	11.3

(%)

< Share of households by household size (2020-2050) >

■ One-person households   ■ Two-person households
■ Three-person households ■ Four-person households
■ Five-person and over households

Year	One-person	Two-person	Three-person	Four-person	Five+
2020	31.2	28.0	20.3	15.8	4.7
2030	35.6	31.8	18.7	11.0	2.8
2040	37.9	34.5	17.5	8.2	1.9
2050	39.6	36.2	16.6	6.2	1.3

(%)

One-person households are projected to increase from 6.48 million households in 2020 to 9.05 million households in 2050.

○ **(Share of households)**

The share of one-person households is projected to increase by 8.4%p (2.58 million households) from 31.2% (6.48 million households) in 2020 to 39.6% (9.05 million households) in 2050.

○ **(Age of household heads)**

In 2020, one-person households with a head aged 39 and under are projected to occupy the highest share at 36.7% (2.38 million households). In 2050, one-person households with a head aged 70 and over are projected to occupy the highest share at 42.9% (3.88 million households).

< Projections of one-person households by age (2020-2050) >

(10,000 households)

Age group	2020	2050
70 years and over	117.9	388.0
60-69 years	100.3	144.6
50-59 years	102.6	120.7
40-49 years	89.3	80.8
39 years and under	237.6	171.2
Total	647.7	905.4

< Share of one-person households by age (2020-2050) >

(%) —2020 —2030 —2040 ····2050

Age	Values
19 years and under	0.6 / 1.1
20-29 years	18.8
30-39 years	16.8
40-49 years	13.8
50-59 years	15.8
60-69 years	16.0
70-79 years	18.4
80-89 years	18.0
90 years and over	6.5 / 0.7

Additional labels: 6.9, 11.5, 8.9, 13.3, 15.5, 11.1, 6.4

Senior households are projected to increase by 2.5 times, and female-headed households are projected to increase by 1.4 times over the 30-year projection period.

○ **(Senior households)**
Households with heads aged 65 and over are projected to increase by 2.5 times from 4.64 million (22.4%) in 2020 to 11.38 million (49.8%) in 2050.

○ **(Female-headed households)**
Households with a female head are projected to increase by 1.4 times from 6.72 million (32.4%) in 2020 to 9.38 million (41.0%) in 2050.

○ **(Age of household heads)**
In 2020, household heads aged 40-59 are projected to occupy the largest share at 43.7%. In 2050, household heads aged 70 and over are projected to occupy the largest share at 40.2%.

< Household projections by sex and age (2020, 2050) >
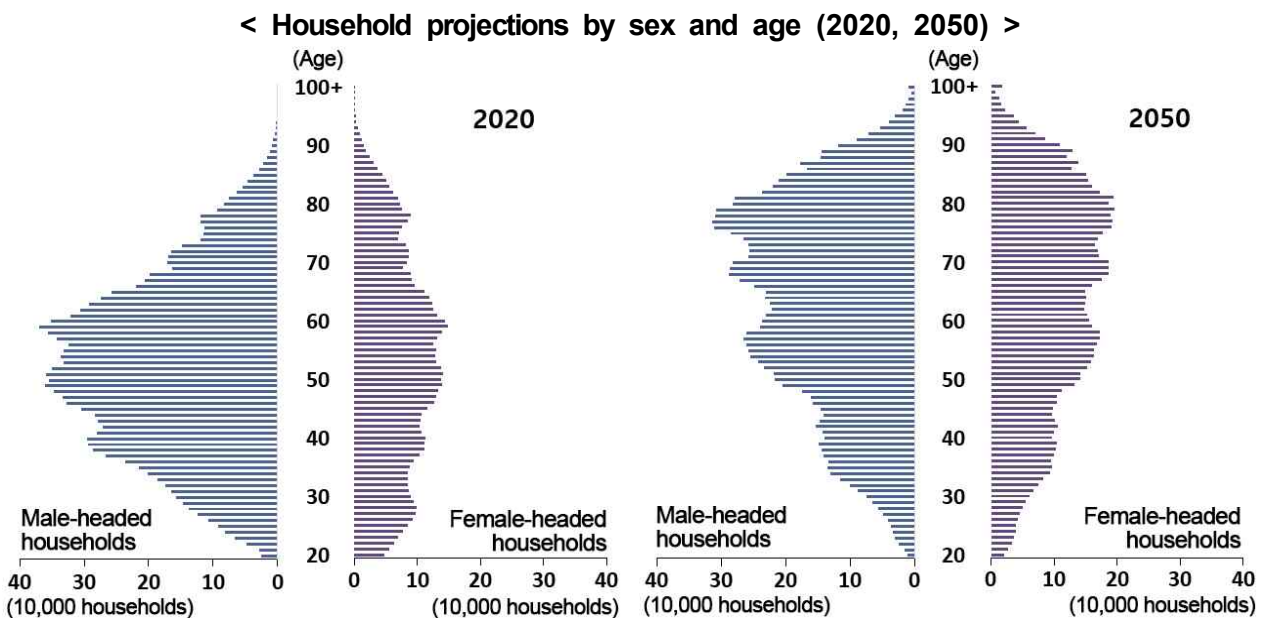
Ⅰ. Note

☐ **Overview of household projections**

○ **(Overview)** To predict the number, size and types of households in the future by reflecting the recent trends in household changes

○ **(Purpose)** To provide basic data for mid-term and long-term policy making of the government, local governments and enterprises, and demand prediction

○ **(Target households)** General households (relative households, non-relative households of 5 persons or less, one-person households)

  * Excluding: Group households (non-relative households of 6 persons or more, institutional households), foreigner households

○ **(Coverage)** The nation

○ **(Cycle)** Quinquennial

○ **(Projection period)** 2020~2050 (3 decades)

○ **(Projection method)** Headship rate method

○ **(Projections)**

  - Households by age of household head and household type

  - Households by age of household head and the number of household members

  - Households by sex, age and marital status of household head

☐ **Statistical terms**

○ Household: A unit of living of one person or two persons or more who share livelihood such as cooking and sleeping

❍ Household head: A person who effectively represents a household and is responsible for livelihood regardless of the household head according to resident registration. In case of households of 2 persons or more without relative relationship, one representative person becomes the head of a household.

❍ Generation: According to the relative relationship between a household head and family members only in general households, a household can be classified into a one-generation household, a two-generation household, etc.

※ In household types, 'Child(ren)' and 'Grandchild(ren)' represents 'Unmarried child(ren)' and 'Unmarried grandchild(ren)', respectively.

☐ Precaution

❍ Household projections are made from the assumption that the recent trend in household changes will continue for a certain period of time in the future.

- Therefore, there might be a difference between projected values and actual values depending on changes in the social and economic environment and social behavior patterns.

- Besides, as time goes by, the uncertainty of projection results increases.

❍ There is a difference between the number of households in 2020 according to household projections and the number of households according to the 2020 Population Census owing to their respective reference time point.

- The reference time point of household projections is July 1st, while that of the Population Census is November 1st.

❍ In some statistical tables, due to rounding, totals may not correspond with the sum of the separate figures.

Ⅱ. Household projection method

1. Headship rate method

○ The headship rate method is used to project the number of households in the future by estimating future headship rates and applying population projections.
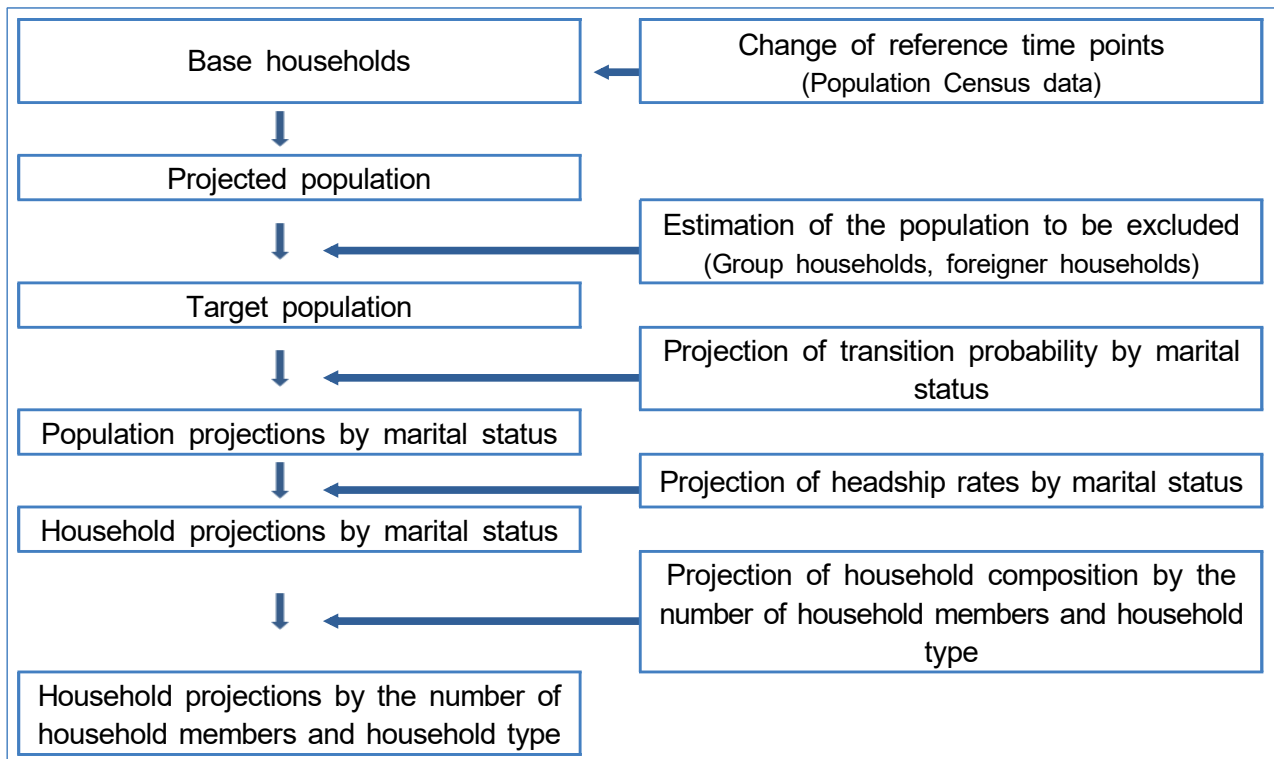
$$H^s(x,t) = \sum_m P^s(m,x,t) \times h^s(m,x,t)$$

Where $H^s(x,t)$ denotes the number of households of household head's sex s and age x in year t.

$P^s(m,x,t)$ denotes the population of sex s, marital status m, age x and in year t.

$h^s(m,x,t)$ denotes the headship rate of sex s, marital status m, age x and in year t.

[Figure] Process of household projections

2. Base households and retrospective households

○ Base households and retrospective households are calculated by changing reference time points (from November 1st to July 1st) after reflecting the share of sex, age and marital status of the sample survey of the Population Census.

3. Target population

○ Household projections include only general households. Therefore, the target population of household projections excludes the population in group households and foreigner households.

Target population of household projections
= Projected population - (Population in group households and foreigner households)

4. Population projection by marital status

1) Transition rates by marital status

❍ Based on the results of the Population Census and vital statistics, transition rates by marital status are calculated and adjusted.

- Transition rate by marital status $\left(_{n}m_{x}^{ij} \right) = \dfrac{\text{Changes by marital status}}{\text{Population by marital status}}$

- Gompertz model: $m_{x} = Be^{qx}$ · Logistic model: $m_{x} = \dfrac{Be^{\beta x}}{1 + Be^{\beta x}}$

2) Projection of transition rates by marital status in 2020~2050

❍ Transition rates by marital status are projected by using univariate time series modelling (Lee and Carter, 1992) on the basis of age-specific first marriage, remarriage, divorce and death transition rates.

- Lee-Carter model : $\ln(m_{x,t}) = a_{x} + k_{t} \times b_{x} + e_{x,t}$
  - a_{x}: Average transition rate for each age, b_{x}: transition speed for each age, k_{t}: Time index of transition rate

3) Transformation to transition probability by marital status

❍ Transformation of transition rates by marital status into transition probability

- Transition probability by marital status $\left(_{n}\pi_{x,t}^{ij} = \dfrac{n \times _{n}m_{x,t}^{ij}}{1 + \dfrac{n}{2} \times \sum\limits_{i \neq j}^{k+1} \,_{n}m_{x,t}^{ij}} \right)$

4) Population projection by marital status in 2020~2050

❍ Population projection by marital status by applying transition probability to population by marital status

Unmarried population aged $x+1$ in $t+1$ year:	$P_{x+1,t+1}^{s} = P_{x,t}^{s} \cdot (1 - _{n}\pi_{x,t}^{sm} - _{n}\pi_{x,t}^{sd})$
Married population aged $x+1$ in $t+1$ year:	$P_{x+1,t+1}^{m} = P_{x,t}^{m} \cdot (1 - \pi_{x,t}^{mw} - \pi_{x,t}^{mv} - \pi_{x,t}^{md}) + P_{x,t}^{s} \cdot \pi_{x,t}^{sm} + P_{x,t}^{w} \cdot \pi_{x,t}^{wm} + P_{x,t}^{v} \cdot \pi_{x,t}^{vm}$
Widowed population aged $x+1$ in $t+1$ year:	$P_{x+1,t+1}^{w} = P_{x,t}^{w} \cdot (1 - \pi_{x,t}^{wm} - \pi_{x,t}^{wd}) + P_{x,t}^{m} \cdot \pi_{x,t}^{mw}$
Divorced population aged $x+1$ in $t+1$ year:	$P_{x+1,t+1}^{v} = P_{x,t}^{v} \cdot (1 - \pi_{x,t}^{vm} - \pi_{x,t}^{vd}) + P_{x,t}^{m} \cdot \pi_{x,t}^{mv}$

P_{x}^{s} : Unmarried population	P_{x}^{m} : Married population	P_{x}^{w} : Widowed population	P_{x}^{v} : Divorced population
π_{x}^{sm}: Probability of first marriage of the unmarried population	π_{x}^{mw}: Probability of bereavement of the married population	π_{x}^{wm}: Probability of remarriage of the widowed population	π_{x}^{vm}: Probability of remarriage of the divorced population
π_{x}^{sd}: Probability of death of the unmarried population	π_{x}^{mv}: Probability of divorce of the married population	π_{x}^{wd}:Probability of death of the widowed population	π_{x}^{vd}:Probability of death of the divorced population
	π_{x}^{md}: Probability of death of the married population		

5. Projection of headship rates

❍ Projection of headship rates by sex, age and marital status in 2020-2050 by applying modified exponential model, on the basis of trends in headship rates of the Population Census

> - Modified exponential model : $h_{m,x,t} = d + ab^{c_t}$
>   - $h_{m,x,t}$: marital status m, age x, headship rate in year t
>   - d : 1 when $h_{m,x,2020} > h_{m,x,2005}$, 0 when $h_{m,x,2020} < h_{m,x,2005}$
>   - a : $h_{m,x,2005} - d$
>   - b : $(h_{m,x,2020} - d) / (h_{m,x,2005} - d)$
>   - c_t : $(t - 2005) / (2020 - 2005)$

6. Household projection by household type and the number of household members

❍ Household projection by household type and the number of household members in 2020-2050 by applying modified exponential model, on the basis of trends in household distribution by household type and the number of household members of the Population Census

 - The composition by age, the number of household members and household type is projected with the lower classification of the composition by age and the number of household members.

 * Refer to '5. Projection of headship rates' to see the formular of the modified exponential model