Population Projections for Korea (2017~2067)

1. Total population and population growth rate

○ According to the medium growth scenario*, the total population is projected to rise from 51.36 million persons in 2017 to 51.64 million persons in 2028. Afterwards, the total population is projected to record 39.29 million persons in 2067.

* Assuming medium growth of demographic variations (fertility rate, life expectancy at birth and net international migration)

○ According to the high growth scenario* (assuming a high total fertility rate, a high life expectancy at birth and a high-level net international migration), the total population is projected to drop to 45.47 million persons in 2067 after recording a peak of 53.75 million persons in 2036.

* Assuming high growth of demographic variations (fertility rate, life expectancy at birth and net international migration)

○ According to the low growth scenario* (assuming a low total fertility rate, a low life expectancy at birth and a low-level net international migration), the total population is projected to drop to 33.65 million persons in 2067 after recording a peak of 51.65 million persons in 2019.

* Assuming low growth of demographic variations (fertility rate, life expectancy at birth and net international migration)

[Table] Total population (1960-2067)

Indicator	Scenario	1960	1970	1980	1990	2000	2017	2020	2030	2040	2050	2060	2067
Total population (10 thousand persons)	Medium growth	2,501	3,224	3,812	4,287	4,701	5,136	5,178	5,193	5,086	4,774	4,284	3,929
	High growth						5,136	5,194	5,341	5,355	5,161	4,808	4,547
	Low growth						5,136	5,164	5,065	4,831	4,401	3,801	3,365

[Table] Population growth rate (1961-2067)

Indicator	Scenario	1961	1970	1980	1990	2000	2017	2020	2030	2040	2050	2060	2067
Population growth rate (%)	Medium growth	2.97	2.18	1.56	0.99	0.84	0.28	0.14	-0.03	-0.38	-0.86	-1.20	-1.26
	High growth						0.28	0.31	0.22	-0.14	-0.56	-0.77	-0.83
	Low growth						0.28	-0.02	-0.27	-0.66	-1.17	-1.66	-1.79

<Scenarios for population projections>

○ A total of 30 scenarios are made by combining assumptions of birth, death and international migration to reflect uncertainty in the future.

○ Three scenarios are presented by combining three level of assumptions (medium growth, high growth and low growth of birth, life expectancy at birth and net international migration.

○ The following table shows demographic variations according to three scenarios (medium growth, high growth and low growth).

Demographic variations		2017	2021			2067		
			High growth	Medium growth	Low growth	High growth	Medium growth	Low growth
Total fertility rate		1.05 births	1.09 births	0.86 births	0.78 births	1.45 births	1.27 births	1.10 births
Life expectancy at birth	Total	82.7 years	83.9 years	83.4 years	82.8 years	91.1 years	90.1 years	88.9 years
	Males	79.7 years	81.0 years	80.5 years	80.0 years	89.3 years	88.5 years	87.4 years
	Females	85.7 years	86.8 years	86.3 years	85.6 years	92.8 years	91.7 years	90.4 years
Net international migration		191 thousand persons	109 thousand persons	68 thousand persons	28 thousand persons	96 thousand persons	35 thousand persons	-23 thousand persons

2. Demographic variations (Birth, death and international migration)

○ Under the medium growth scenario, the number of births would drop from 350 thousand persons in 2017 to 290 thousand persons in 2021 and 210 thousand persons in 2067.

- Under the high growth scenario, the number of births would record 290 thousand persons in 2067.
- Under the low growth scenario, the number of births would record 140 thousand persons in 2067.

○ Under the medium growth scenario, the number of deaths would rise from 290 thousand persons in 2017 to over 400 thousand persons in 2028 and 740 thousand persons in 2067. The figure for 2067 is 2.5 times higher compared to 2017.

- Under the high growth scenario, the number of deaths would mark 770 thousand persons in 2067.
- Under the low growth scenario, the number of deaths would mark 720 thousand persons in 2067.

○ Under the medium growth scenario, the natural increase (Birth - Death) would record a minus from 2019*.

* Period between July 1st 2019 and June 30th 2020

- Under the high growth assumption, the natural increase is projected to be minus from 2032.
- Under the low growth assumption, the natural increase is projected to be minus from 2019.

○ Under the medium growth scenario, the net international migration would decrease from 190 thousand persons in 2017 to 40 thousand persons after 2028.

- Under the high growth scenario, the net international migration would record between 80 thousand persons and 130 thousand persons during the 2018~2067 period.
- Under the low growth scenario, the net international migration would remain between - 20 thousand persons and 40 thousand persons during the 2018~2067 period.

[Table] Natural increase and net international migration (1970-2067)

(Unit: 10 thousand persons)

Classification	Scenario	1970	1980	1990	2000	2010	2017	2020	2030	2040	2050	2060	2067
Population growth (=A+B)	Medium growth	70	59	42	40	29	24	4	-3	-22	-43	-51	-50
	High growth						24	16	10	-10	-31	-37	-38
	Low growth						24	-5	-16	-34	-54	-64	-60
Natural increase (A)	Medium growth	75	59	41	39	21	5	-3	-6	-25	-47	-55	-53
	High growth						5	5	2	-18	-40	-46	-47
	Low growth						5	-8	-15	-33	-52	-62	-58
Birth	Medium growth	101	86	65	63	47	35	29	36	29	24	21	21
	High growth						35	36	42	34	30	31	29
	Low growth						35	26	30	24	19	14	14
Death	Medium growth	26	28	24	25	26	29	32	42	55	71	76	74
	High growth						29	31	40	53	69	77	77
	Low growth						29	34	45	57	72	75	72
International migration (B)	Medium growth	-	-	-	1	8	19	7	4	4	4	4	3
	High growth						19	11	8	8	9	9	10
	Low growth						19	3	-1	-1	-2	-2	-2

Note) Figures refer to data between July of the reference year and June of the following year.

3. Population by age group

○ As of 2017, the working age population aged 15 to 64 occupies 73.2% (37.57 million persons) of the total population. The elderly population aged 65 or more occupies 13.8% (7.07 million persons) of the total population. The child population aged 0 to 14 occupies 13.1% (6.72 million persons) of the total population.

- In 2067, the working age population, the elderly population and the child population are projected to occupy 45.4%, 46.5% and 8.1%, respectively.

○ The working age population is projected to decrease from 37.57 million persons in 2017 to 17.84 million persons (45.4% of the total population) in 2067.

- Under the high growth scenario, the working age population is projected to fall from 34.44 million persons in 2017 to 21.10 million persons (46.4% of the total population) in 2067.
- Under the low growth scenario, the working age population is projected to drop from 33.48 million persons in 2017 to 14.84 million persons (44.1% of the total population) in 2067.

○ Under the medium growth scenario, the elderly population is projected to exceed the child population from 2017. In 2067, the elderly population is projected to be 5.7 times higher than the child population.

- Under the high growth scenario, the elderly population is projected to be 4.4 times higher than the child population.
- Under the low growth scenario, the elderly population is projected to be 7.9 times higher than the child population.

○ Compared to 7.07 million persons (12.8% of the total population) in 2017, the elderly population is projected to rise by 2 times in 2033 and by 2.6 times to 18.27 million persons (46.5% of the total population) in 2067.

- Under the high growth scenario, the elderly population is projected to record 19.83 million persons and occupy 43.6% of the total population in 2067.
- Under the low growth scenario, the elderly population is projected to record 16.69 million persons and occupy 49.6% of the total population in 2067.

○ The child population is projected to decrease to 6.72 million persons (13.1% of the total population) in 2017. This figure would decrease to 3.18 million persons in 2067, recording 47% of the 2017 figure.

- Under the high growth scenario, the child population is projected to decrease from 5.79 million persons (10.8% of the total population) in 2030 to 4.54 million persons (10.0% of the total population) in 2067. Under the low growth scenario, the child population is projected to decrease from 4.43 million persons (8.7% of the total population) in 2030 to 2.13 million persons (6.3% of the total population) in 2067.
- The share of the child population is projected to fall from 13.1% in 2017 to 8.1% under the medium growth scenario, 10.0% under the high growth scenario and 6.3% under the low growth scenario in 2067.

○ From 2020 when the baby-boom generation shifts from the working age population to the elderly population, the distribution of the population is projected to show a high fluctuation among age groups. In particular, the working age population is projected to show a sharp decrease, while the elderly population is projected to show a sharp increase.

[Table] Population by age group (2017~2067)

(Unit: 10 thousand persons, %)

Scenario	Classification	Age group	2017	2020	2030	2040	2050	2060	2067
Medium growth	Population	Total	5,136	5,178	5,193	5,086	4,774	4,284	3,929
		0-14	672	630	500	498	425	345	318
		15-64	3,757	3,736	3,395	2,865	2,449	2,058	1,784
		65+	707	813	1,298	1,722	1,901	1,881	1,827
	Composition	0-14	13.1	12.2	9.6	9.8	8.9	8.0	8.1
		15-64	73.2	72.1	65.4	56.3	51.3	48.0	45.4
		65+	13.8	15.7	25.0	33.9	39.8	43.9	46.5
High growth	Population	Total	5,136	5,194	5,341	5,355	5,161	4,808	4,547
		0-14	672	636	579	589	501	454	454
		15-64	3,757	3,744	3,444	2,988	2,662	2,341	2,110
		65+	707	814	1,319	1,778	1,998	2,013	1,983
	Composition	0-14	13.1	12.2	10.8	11.0	9.7	9.4	10.0
		15-64	73.2	72.1	64.5	55.8	51.6	48.7	46.4
		65+	13.8	15.7	24.7	33.2	38.7	41.9	43.6
Low growth	Population	Total	5,136	5,164	5,065	4,831	4,401	3,801	3,365
		0-14	672	625	443	416	347	258	213
		15-64	3,757	3,728	3,348	2,754	2,256	1,794	1,484
		65+	707	811	1,274	1,661	1,798	1,749	1,669
	Composition	0-14	13.1	12.1	8.7	8.6	7.9	6.8	6.3
		15-64	73.2	72.2	66.1	57.0	51.2	47.2	44.1
		65+	13.8	15.7	25.2	34.4	40.9	46.0	49.6

4. Median age

○ The median age* is predicted to mark 42.0 years in 2017, exceeding 50 years in 2031. This figure is predicted to rise to 62.1 years in 2063. This increasing speed would slow down to 62.2 years in 2067.

* Median age is the age that divides a population into two numerically equal groups.

- In 2017, 50% of the total population is predicted to be over 42. Whereas, in 2067, 50% of the total population is over 62.
- Years reaching the median ages: 20 in 1976, 30 in 1997, 40 in 2014, 50 in 2031

○ According to both high and low assumptions, the median age is predicted to rise. Under the high assumption, the median age is expected to exceed 50 years in 2032, reaching 59.5 years in 2067.

- Under the low assumption, the median age is expected to exceed 50 years in 2031, reaching 64.7 years in 2067.

[Table] Median age (1960-2067)

(Unit: year)

Classification	Sex	1960	1970	1980	1990	2000	2010	2017	2020	2030	2040	2050	2060	2067
Medium growth	Total	19.0	18.5	21.8	27.0	31.8	37.9	42.0	43.7	49.5	54.4	57.9	61.3	62.2
	Males	18.2	17.9	21.2	26.3	30.8	36.9	40.7	42.3	48.2	52.9	56.9	60.6	61.4
	Females	19.8	19.2	22.4	27.7	32.7	39.0	43.3	45.2	50.8	56.0	59.1	62.2	63.0
High growth	Total							42.0	43.7	49.0	53.5	56.9	59.7	59.5
	Males							40.7	42.3	47.8	52.0	56.0	59.1	58.9
	Females							43.3	45.1	50.3	55.0	58.0	60.4	60.1
Low growth	Total							42.0	43.8	49.8	55.1	58.8	62.8	64.7
	Males							40.7	42.4	48.5	53.5	57.6	61.8	63.6
	Females							43.3	45.2	51.2	56.8	60.4	63.8	65.8

5. Dependency ratio and aging index

○ The total dependency ratio is projected to increase from 36.7 persons per 100 working age population in 2017, exceeding 70 persons in 2038. This figure is projected to exceed 100 persons in 2056.

- Under the high growth scenario, the total dependency ratio is projected to rise to 115.5 persons in 2067. Under the low growth scenario, the total dependency ratio is projected to rise to 126.8 persons in 2067.

○ The child dependency ratio is projected to be 17.9 persons in 2017 and 17.8 persons in 2067 owing to the drop in both the child population and the working age population.

○ The aged dependency ratio is projected to rise from 18.8 persons in 2017, exceeding 50 persons in 2036. This figure will record 102.4 persons in 2067, which is 5.5 times higher than that for 2017.

○ The ageing index (per 100 child population) is projected to steadily rise from 105.1 persons in 2017, 206 persons in 2026 and 502.2 persons in 2056. From 2056, the elderly population is projected to 5 times larger than the child population.

[Table] Dependency ratio and ageing index (1960-2067)

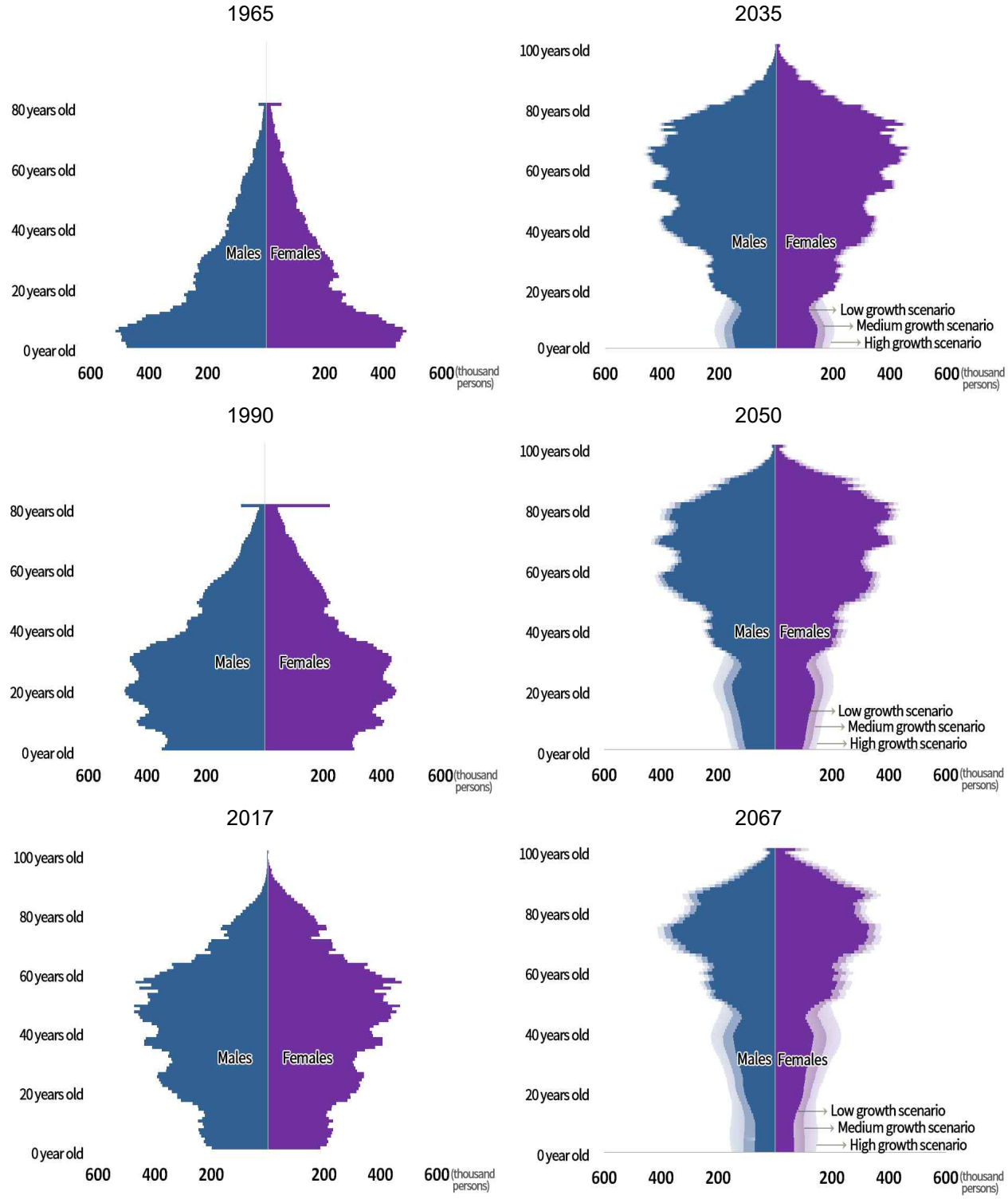
(Unit: per 100 working age population, per 100 child population)

Scenario	Classification	1960	1970	1980	1990	2000	2010	2017	2020	2030	2040	2050	2060	2067
Medium growth	Total dependency ratio	82.6	83.8	60.7	44.3	39.5	36.9	36.7	38.6	53.0	77.5	95.0	108.2	120.2
	Child dependency ratio	77.3	78.2	54.6	36.9	29.4	22.0	17.9	16.9	14.7	17.4	17.4	16.7	17.8
	Aged	5.3	5.7	6.1	7.4	10.1	14.8	18.8	21.7	38.2	60.1	77.6	91.4	102.4
	Ageing index	6.9	7.2	11.2	20.0	34.3	67.2	105.1	129.0	259.6	345.7	447.2	546.1	574.5
High growth	Total dependency ratio							36.7	38.7	55.1	79.2	93.9	105.3	115.5
	Child dependency ratio							17.9	17.0	16.8	19.7	18.8	19.4	21.5
	Aged							18.8	21.7	38.3	59.5	75.1	86.0	94.0
	Ageing index							105.1	128.0	227.9	301.8	398.7	443.3	436.4
Low growth	Total dependency ratio							36.7	38.5	51.3	75.4	95.1	111.9	126.8
	Child dependency ratio							17.9	16.8	13.2	15.1	15.4	14.4	14.3
	Aged							18.8	21.8	38.1	60.3	79.7	97.5	112.5
	Ageing index							105.1	129.7	287.8	399.7	518.2	676.9	785.4

6. Population pyramid

○ As of 2017, the population pyramid is pot shaped due to a large share of people aged 30~59. However, the population pyramid would become inverted triangle shaped due to a large share of people aged 60 or more.

[Figure] Population pyramid (1965-2067)



Projection method and assumption

1. Cohort component method

□ 『Population Projections for Korea (2017~2067)』 are based on the results of the 2017 Population Census, which is a register-based census. Statistics of births, deaths and international migration for the years until 2018 are used for population projections. According to the Cohort component method, the population size and the population structure by sex and age are projected from 2017 to 2067.

□ According to the Cohort component method (birth, death and international migration), the population is projected by applying the demographic balancing equation. Births and net international migrations are added to the base population, while deaths are subtracted for population projections.

2. Base population (2017)

□ The base population, which is a starting point for population projections, refers to the population as of July 1st, 2017.

□ The base population (as of July 1st, 2017) is obtained by reflecting the demographic variations between July and October, 2017, on the basis of the census population as of November 1st, 2017 in the Population Census (Register-based Census).

○ The base population as of July 1st, 2017 (51.36 million persons) was 60 thousand persons smaller than the census population as November 1st, 2017 (51.42 million persons).

[Table] Census population and base population (2017)

2017	Population (10 thousand persons)		
	Total	Males	Females
Census population (November 1st)	5,142	2,577	2,565
Base population (July 1st)	5,136	2,574	2,563

3. Retrospective population (2016)

○ The retrospective population is calculated by reflecting demographic variations during the July-October period in 2016 on the basis of the Population Census as of November 1st 2016.

4. Fertility projection method

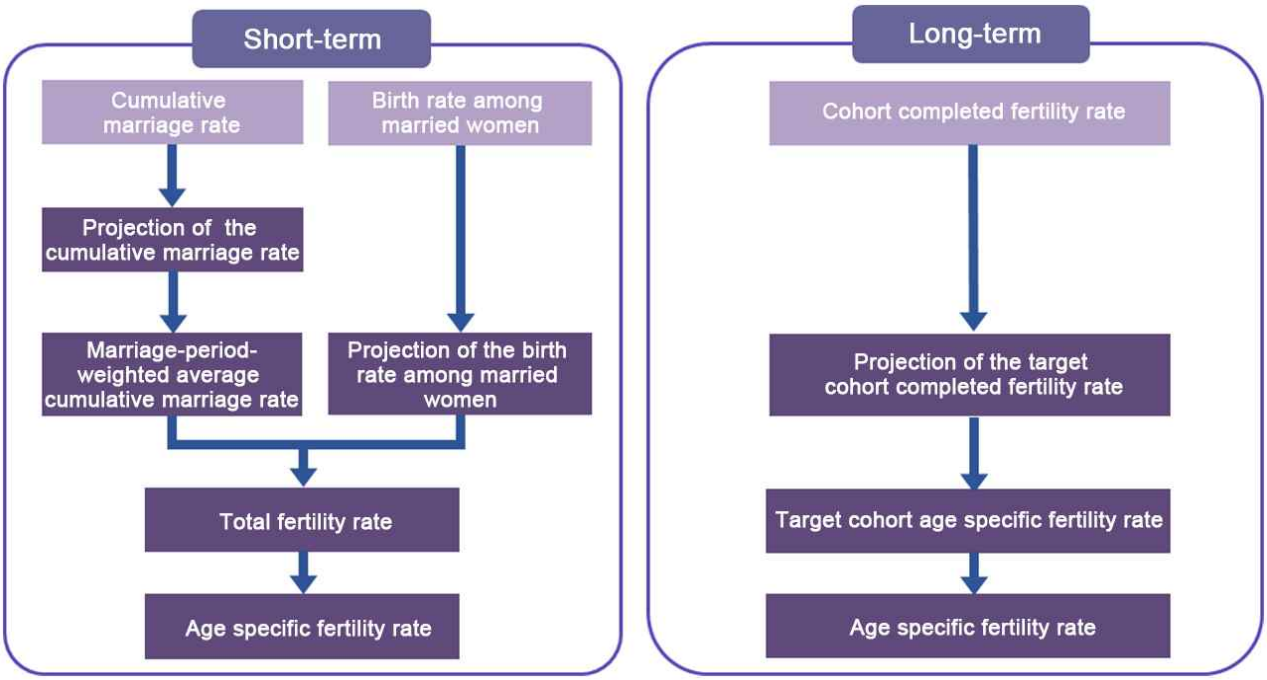
□ Fertility projection method

○ As for the short-term projection for the next 3 years*, the total fertility rate is projected by using the polynominal model of the marriage rate and birth rate among married women. As for the long-term projection for the next decade, the cohort completed fertility rate is projected by using the time-series model.

* High-growth assumption for 2 years and low-growth assumption for 4 years

- The total fertility rate for the next 4~9 years is a weighted average of short-term and long-term estimates.

[Figure] Short-term and long-term fertility projection methods



○ Details of short-term and long-term projection methods

1) In the short term, the total fertility rate is estimated with the marriage rates and the birth rate among married women for the recent years.

$$TFR_t = \sum_s M_{s,t} b_{s,t} + \epsilon_t$$

- TFR_t : Total fertility rate at time t
- $M_{s,t}$: Marriage-period-weighted average cumulative marriage rate* for birth order s (1, 2, 3+) at time t
- $b_{s,t}$: Birth rate by birth order s (1, 2, 3+) at time t per married woman

$$M_{s,t} = \sum_k m_k w_{s,k}$$

- m_k : Cumulative marriage rate until age 39 during time k of marriage period
- $w_{s,k}$: Weight of percentage of birth at time k of marriage period by birth order s (1, 2, 3+)

- k : Marriage period, $\begin{cases} [\,t-2\,,\ \ t\ \,] & (\text{if } s=1\ ) \\ [\,t-6\,,\,t-2\,] & (\text{if } s=2\ ) \\ [\,t-9\,,\,t-4\,] & (\text{if } s=3+) \end{cases}$

$w_{s,k} = p_{s,k} / \sum_k p_{s,k}$

· $p_{s,k}$: Percentage at time k of marriage period by birth order s (1, 2, 3+)

2) In the long term, the completed fertility rate of target cohort is predicted by using the time-series model.

$$CFR_t = \beta_0 + \beta_1 \ln(t) + \varepsilon_t \ \ (\varepsilon_t = \phi_1 \times \varepsilon_{t-1})^{1)}$$

- CFR_t : Cohort completed fertility rate at time t

1) $\widehat{y_t} = 3.6580 - 0.5873 \ln(t) + e_t \ \ (e_t = 0.4942 \times e_{t-1},\ e_t = \widehat{\varepsilon_t})$, Among various time-series prediction methods (regression of time-series, ARIMA, exponential smoothing), the final model is selected by considering the significance of model/parameters, fitness standard and residual test.

3) The distribution of the fertility rates by age is calculated by using the generalized log gamma model.

$$f(x)=\frac{C|\lambda|}{b\Gamma(1/\lambda^2)}(\frac{1}{\lambda^2})^{\lambda^{-2}}\exp[\frac{1}{\lambda}(\frac{x-u}{b})-\frac{1}{\lambda^2}\exp\lambda(\frac{x-u}{b})]$$

- C : Probability of childbirth by birth order
- u : Average age at childbirth
- b : Standard derivation of the average age at birth (u)
- λ : Distribution pattern

* The average age at childbirth for to the short-term model is estimated by using The recent trend in the average age at childbirth.
* The cohort average age at childbirth for the long-term model is estimated by the log regression model

$$\widehat{y_t}=292.12\ln(t)-2187.24;\ R^2(0.858)$$

4) The fertility rate the next 4-9 years is a weighted average of short-term and long-term estimates

$$TFR_t=\sum_{i=15}^{49}(1-w_t)ASFR_{s,i}+\sum_{i=15}^{49}w_tASFR_{l,i}$$

- $ASFR_{s,i}$: Age specific fertility rate at age i at time s
- s : Final year of the short-term projection: 2021 (Medium fertility). 2020 (High fertility), 2022 (Low fertility)
- l : Beginning year of the long-term projection (2028)

- $w_t=\frac{t-s}{l-s}$

□ Fertility projection results

○ By reflecting the uncertainty of fertility in the future, three fertility assumptions are formulated.

- Under the medium fertility scenario, the total fertility rate would drop to 0.86 persons in 2021. The figure would rise to 1.11 persons in 2028 and 1.27 persons in 2040.
- Under the high fertility scenario, the total fertility rate would rise from 2019 to record 1.09 persons in 2021 and 1.45 persons in 2037.
- Under the low fertility scenario, the total fertility rate would drop to 0.72 person in 2022. This figure would rise to 1.0 person in 2033 and 1.10 persons in 2041.

[Table] Total fertility rate (2017~2067)

(Unit: Number of births per woman aged 15 to 49)

	2017	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2067
Medium growth	1.05	0.90	1.00	1.14	1.22	1.27	1.27	1.27	1.27	1.27	1.27	1.27
High growth	1.05	1.06	1.23	1.38	1.44	1.45	1.45	1.45	1.45	1.45	1.45	1.45
Low growth	1.05	0.81	0.84	0.97	1.03	1.09	1.10	1.10	1.10	1.10	1.10	1.10

5. Mortality projection method

□ Mortality projection method

○ The death rate by sex and age is projected by the extended Li-Lee-Gerland model (2013).[2)]

- The high and low mortality scenarios apply the 99% confidence interval of the extended Li-Lee-Gerland (LLG) metod.

○ The extended Li-Lee-Gerland model (2013)

$$\log m_{x,t,i} = a_{x,i} + B_{x,t} K_t + b_{x,i} k_{t,i} + \epsilon_{x,t,i}$$

- $a_{x,i}$: age pattern of mortality for the individual group (males and females)
- $B_{x,t} K_t$: age pattern of mortality change and time varying index of the level of mortality at time t for total population
- $b_{x,i} k_{t,i}$: age pattern of mortality change and time varying index of the level of mortality at time t for the individual group (males and females)

□ Mortality projection results

○ Three scenarios of life expectancy at birth are established by considering the uncertainty of future mortality.

- Under the medium mortality scenario, in 2067, the life expectancy at birth of males and females would stand at 88.5 years and 91.7 years, respectively, in 2067.
- Under the high mortality scenario, in 2067, the life expectancy at birth of males and females would stand at 89.3 years and 92.8 years, respectively, in 2067.
- Under the low mortality scenario, in 2067, the life expectancy at birth of males and females would stand at 87.4 years and 90.4 years, respectively, in 2067.

○ Under the medium mortality scenario, the gender gap in the life expectancy at birth would drop from 6.0 years in 2017 to 3.2 years in 2067.

[Table] Life expectancy at birth (2017~067)

(Unit: year)

		2017	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2067
Medium mortality	Total	82.7	83.2	84.2	85.2	86.0	86.8	87.5	88.2	88.8	89.4	89.9	90.1
	Males	79.7	80.3	81.5	82.6	83.6	84.6	85.4	86.2	87.0	87.7	88.3	88.5
	Females	85.7	86.1	86.9	87.7	88.4	89.0	89.5	90.1	90.6	91.0	91.5	91.7
	Gender gap	6.0	5.8	5.4	5.1	4.8	4.4	4.1	3.9	3.6	3.4	3.2	3.2
High mortality	Total	82.7	83.6	84.9	85.9	86.9	87.8	88.5	89.2	89.8	90.4	90.9	91.1
	Males	79.7	80.7	82.1	83.3	84.4	85.5	86.4	87.3	87.9	88.5	89.1	89.3
	Females	85.7	86.5	87.7	88.6	89.4	90.0	90.6	91.2	91.7	92.2	92.6	92.8
	Gender gap	6.0	5.9	5.5	5.2	4.9	4.5	4.2	3.9	3.8	3.7	3.5	3.5
Low mortality	Total	82.7	82.7	83.3	84.2	85.0	85.7	86.4	87.1	87.7	88.2	88.7	88.9
	Males	79.7	79.8	80.7	81.6	82.6	83.5	84.4	85.2	86.0	86.5	87.2	87.4
	Females	85.7	85.5	86.0	86.7	87.3	87.9	88.5	89.0	89.4	89.9	90.2	90.4
	Gender gap	6.0	5.7	5.3	5.1	4.6	4.5	4.1	3.8	3.4	3.4	2.9	3.0

2) Extending the Li-Lee-Gerland(2013) model to the multiple population.
Li, N., Lee, R., and Gerland, P.(2013), “Extending the Lee-Carter method to model the rotation of age pattern of mortality decline for long-term projections”, *Demography,* 50(6), 2037-2051.

6. International migration projections

□ International migration projections

○ International migrations of Koreans and foreigners are separately projected to reflect their different characteristics.

○ By considering a stable net international migration rate of Koreans, the average net international migration rate by sex and age for the recent five years is applied.

○ As for international migration of foreigners, the net migration by year is assumed by considering the fact that international migration is highly influenced by foreigner policy that is managed in terms of size, such as the quota system by status of sojourn.

□ Results of international migration projections

○ Three scenarios are established by considering the uncertainty of net international migration in the future.

- Under the medium international migration scenario, the net international migration would fall from 191 thousand persons in 2017 to 37 thousand persons in 2030 and 35 thousand persons in 2067.
- Under the high international migration scenario, the net international migration would record 82 thousand in 2030 and 96 thousand persons in 2067.
- Under the low international migration scenario, the net international migration would fall to -9 thousand persons in 2030 and -23 thousand persons in 2067.

○ Under the medium international migration scenario of Koreans, the net international migration would fall from 27 thousand persons in 2017 to 4 thousand persons in 2067.

○ Under the medium international migration scenario of foreigners, the net international migration would fall from 164 thousand persons in 2017 to 31 thousand persons in 2067.

7. Population projection scenarios

○ The three assumptions of the high growth, medium growth and low growth scenarios are established by considering components of demographic variations (birth, death and international migration) to reflect future uncertainty into a total of 30 projection scenarios.

○ A combination of all the assumptions leads to 27 scenarios (3 assumptions of birth × 3 assumptions of death × 3 assumptions of international migration).

- As basic scenarios, the medium assumption is formulated by combining the medium assumptions of birth, death and international migration. The high assumption is formulated by combining the high assumptions of birth, death and international migration. The low assumption is formulated by combining the low assumptions of birth, death and international migration.

○ Three special scenarios are added by considering foreigner policy and childbirth policy.

- The zero international migration scenario is assumed to eliminate the effect of international migration which is easily affected by policy factors. (medium assumption of birth rate and life expectancy at birth)

- The scenario of the continuation of the current fertility rate in 2018 assumes that the fertility rate in 2018 will be maintained. (medium assumption of life expectancy at birth and international migration)
- The scenario of the OECD average fertility rate reflects the average recovery speed of fertility rates in OECD member countries. (medium assumption of life expectancy at birth and international migration)
  - · The scenario assumes that the total fertility rate would reach 1.30 in 2030 by increasing at the average rebound speed (lasting 12 years and a year-on-year increase of 0.32) of countries experiencing very low fertility rates (less than 1.3).
  - · The scenario assumes that the total fertility rate would reach 1.68 (the average level of OECD member countries in 2016) in 2051 by increasing at the average rebound speed (lasting 14.9 years and an increase of 0.31) of the total OECD member countries.

[Table] Major scenarios for special population projections

Classification	Scenarios	Assumptions		
		Total fertility rate	Life expectancy at birth	International migration
Basic scenario	Medium growth	Medium growth	Medium growth	Medium growth
	High growth	High growth	High growth	High growth
	Low growth	Low growth	Low growth	Low growth
Combined scenario	High fertility rate	High growth	Medium growth	Medium growth
	Low fertility rate	Low growth	Medium growth	Medium growth
	High life expectancy at birth	Medium growth	High growth	Medium growth
	Low life expectancy at birth	Medium growth	Low growth	Medium growth
	Maximum net international migration	Medium growth	Medium growth	High growth
	Minimum net international migration	Medium growth	Medium growth	Low growth
Special scenario	Zero international migration	Medium growth	Medium growth	Zero migration
	Continuation of current fertility rate in 2018	Continuation of current fertility rate in 2018	Medium growth	Medium growth
	OECD average fertility rate	Average rebound speed of OECD countries	Medium growth	Medium growth

[Table] Population projection scenarios and projection results

Indicator		High growth	Medium growth	Low growth	Zero international migration Birth (medium) + Death (medium)	Continuation of the total fertility rate in 2018 (0.98 person)	Average fertility rate in OECD countries
Total fertility rate (person)	2017	1.05	1.05	1.05	1.05	1.05	1.05
	2051	1.45	1.27	1.10	1.27	0.98	1.68
Life expectancy at birth (year) (Males/ Females)	2017	79.7 / 85.7	79.7 / 85.7	79.7 / 85.7	79.7 / 85.7	79.7 / 85.7	79.7 / 85.7
	2067	89.3 / 92.8	88.5 / 91.7	87.4 / 90.4	88.5 / 91.7	88.5 / 91.7	88.5 / 91.7
Net international migration (thousand persons)	2017	191	191	191	191	191	191
	2067	96	35	-23	0	37	32
Total population (growth rate)	2017	51,362 (0.28)	51,362 (0.28)	51,362 (0.28)	51,362 (0.28)	51,362 (0.28)	51,362 (0.28)
	2067	45,469 (-0.83)	39,294 (-1.26)	33,653 (-1.79)	37,270 (-1.38)	36,891 (-1.55)	42,094 (-0.99)
	Population peak (year)	53,745 (2036)	51,942 (2028)	51,654 (2019)	51,627 (2019)	52,020 (2026)	52,433 (2031)
Population aged 15-64 (%)	2017	37,572 (73.2%)	37,572 (73.2%)	37,572 (73.2%)	37,572 (73.2%)	37,572 (73.2%)	37,572 (73.2%)
	2030	34,435 (64.5%)	33,947 (65.4%)	33,484 (66.1%)	33,303 (65.1%)	33,947 (65.5%)	33,947 (64.7%)
	2067	21,096 (46.4%)	17,842 (45.4%)	14,837 (44.1%)	17,046 (45.7%)	16,362 (44.4%)	19,276 (45.8%)
Population aged 65 or more (%)	2017	7,066 (13.8%)	7,066 (13.8%)	7,066 (13.8%)	7,066 (13.8%)	7,066 (13.8%)	7,066 (13.8%)
	2030	13,191 (24.7%)	12,980 (25.0%)	12,742 (25.2%)	12,880 (25.2%)	12,980 (25.0%)	12,980 (24.8%)
	2067	19,830 (43.6%)	18,271 (46.5%)	16,691 (49.6%)	17,170 (46.1%)	18,271 (49.5%)	18,271 (43.4%)
Population aged 0-14 (%)	2017	6,724 (13.1%)	6,724 (13.1%)	6,724 (13.1%)	6,724 (13.1%)	6,724 (13.1%)	6,724 (13.1%)
	2030	5,787 (10.8%)	5,000 (9.6%)	4,428 (8.7%)	4,990 (9.8%)	4,937 (9.5%)	5,504 (10.5%)
	2067	4,544 (10.0%)	3,181 (8.1%)	2,125 (6.3%)	3,053 (8.2%)	2,258 (6.1%)	4,546 (10.8%)
Total dependency ratio (Aged dependency ratio)	2017	36.7 (18.8)	36.7 (18.8)	36.7 (18.8)	36.7 (18.8)	36.7 (18.8)	36.7 (18.8)
	2030	55.1 (38.3)	53.0 (38.2)	51.3 (38.1)	53.7 (38.7)	52.8 (38.2)	54.4 (38.2)
	2067	115.5 (94.0)	120.2 (102.4)	126.8 (112.5)	118.6 (100.7)	125.5 (111.7)	118.4 (94.8)