

Democratic People's Republic of Korea  
**POPULATION PROJECTION**  
**(2014–2050)**

October 2016



# FOREWORD

After the Population Census 2008, the Democratic People's Republic of Korea (DPRK) conducted the Socio-economic, Demographic and Health Survey (SDHS) 2014 to measure the progress in socio-economic spheres and also to facilitate evidence-based planning. The National Report on the result of the SDHS 2014 was published and disseminated in December, 2015.

In 2016, the project of writing various thematic reports based on SDHS 2014 report was decided, as part of the SDHS/Pre-Census Project. Accordingly, the 2016 work plan was agreed between the DPRK Government and UNFPA. The report on the population projections in DPRK is one among the others. The present report describes the findings of population projection for the period (2014-2050) and is based on the results of population census 1993, population census 2008 and SDHS 2014.

The Central Bureau of Statistics (CBS) took the lead in writing this report except for Chapter 2, which was explained and inserted by Mr. Frans Willekens, the UNFPA consultant. He also provided the technical assistance to write the report and checked the overall content.

The profound and detailed results of the population projections, as described in the report will be used effectively for humanitarian and socio-economic development planning. In addition, the results become the baseline information for UN and international organizations including UNFPA, UNICEF, WHO, WFP, and etc., to plan and implement the cooperation with the Government.

The CBS expresses gratitude to UNFPA DPRK for its unstinted support in preparing this report. We would like to thank particularly Mr. Frans Willekens for his continuous engagement in the project and providing technical support.

Central Bureau of Statistics

# ACRONYMS

ADLs	Activities of Daily Living
CBS	Central Bureau of Statistics
DPRK	Democratic People's Republic of Korea
IMR	Infant Mortality Rate
LE	Life Expectancy
RHS	Reproductive Health Survey
SDHS	Socio-economic, Demographic and Health Survey
TFR	Total Fertility Rate
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WFP	World Food Programme
WHO	World Health Organization

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# CHAPTER 1. INTRODUCTION

## 1.1. Purpose of the report

The population projections are important for the strategic management of the population and the country and form the basis for a scientific approach to perspective planning. This is because;

**First, the target of the State administration is the human group, i.e., the population.**

There are many targets of the state administration including people, state machinery, the State and social assets, natural resources, environment, etc., but the major one is the people. It's because the people consists the State, creates the properties, develops the economy and protects the environment. Understanding the future changes of the population who are not only the target but also the master of the state administration makes it possible to set up the right strategy and implement without any challenges.

**Next, the purpose of socio-economic development is to provide the people with rich material and cultural living conditions.**

Provisions of rich material and cultural living conditions to the people cannot be realized within one or two years but is a long-term strategy. The population dynamics; past, current and future should be correctly understood to facilitate evidence-based socio-economic and humanitarian planning so as to improve the national economy and provide the people with rich material and cultural living conditions.

**Next, the driving force of the socio-economic development is the population.**

The driving forces are scientists, technicians, officials and workers who contribute to the development of the society and economy. An understanding of the composition of the labour force along with future changes in the size, age and sex composition will enable appropriate planning of sectoral labour forces to ensure rapid growth..

**Lastly, the population projection is a high-priority task for planning and implementation of the national population policy.**

In population policy-making several issues related to the size and composition of the national population is examined. It deals with questions such as to what levels the fertility and mortality (and life expectancy) would be in the future; how the in-country distribution of the population would be and what kinds of measures and interventions would be needed to address the needs of the future population in the context of the futuristic goals set by the government.

To answer these questions, it is important to understand the demographic trends of the country through the population projections. Thus, the population projections are preconditions of decision making and planning of socio-economic development to manage the population and the State administration in a strategic manner and develop the society and economy under a long-range program.

Given the importance of the population projections as stated above, this report aims to;

1. provide population data for population policy making of DPRK by generating the population projections for the period 2015-2050; and
2. provide the Government with the estimated population data required for designing the socio-economic development plan for 2016-2020.

## **1.2. Range of projection**

Projections will be produced of the national population by age and sex as well as urban/rural and province.

## **1.3. Projecting period**

The population will be projected for the period of 35 years until 2050, with 2014 data as the baseline. Within this period, the projection results of 2016-2020 will be used for planning the 5-year strategy for national economic development of the Government and the long term projections of 2015-2050 for Government's policy making and strategic planning for socio-economic development.

## **1.4. Population data of the baseline year**

The population data to be used as the baseline must be confirmed and assured with accuracy, as those data become the basic information for projection. In this report, the baseline year is 2014 and its population size will be estimated from the data of 2008 population census and 2014 SDHS.

## **1.5. Projection method; cohort-component method (components-birth, death and migration)**

The projection will be generated by using cohort-component method which is internationally recognized and used by several countries. This method can provide the projection of age-sex-structure population based on total fertility rate, fertility rate by reproductive age, life expectancy by sex, mortality rate by age, and migration by age and sex. Most countries use the cohort-component method as the standard projection method when they have necessary baseline data. DPRK has the data needed to apply this method of population projections from two population censuses in 1993 and 2008.

## **1.6. Projection program-Spectrum**

There are several programs supporting the projections. Spectrum is one of them. Spectrum was developed to facilitate sectoral planning including estimation of the future needs for reproductive health. It contains 11 components including demographic projection, adolescence, family planning, condom use, etc. The projection component of Spectrum is known as DemProj (Stover and Kirmeyer, 2008). This program makes it easy to estimate projections by age and to compute demographic indicators of fertility and mortality that depend on the age composition of the population.

# CHAPTER 2. METHOD

## 2.1 Introduction

As stated earlier, the cohort-component method is used to project the population. In the cohort-component method, the base population (population of DPRK in October 2014) is stratified by birth cohort and each birth cohort is projected separately. By distinguishing birth cohorts, cohort differences in fertility and mortality (and net migration) can be taken into account. A population may be stratified into by other variables than birth cohort. A subpopulation consists of people with a same characteristic, e.g. sex, marital status, health status or place of residence.

Subpopulations are usually considered when fertility and mortality are significantly different between subpopulations and/or projections are demanded for subpopulations. A population is usually disaggregated by sex because males and females differ significantly in fertility and mortality, and population projections are usually demanded for males and females. If the population characteristics that are considered are fixed at birth and do not change during the life course, the dynamics of a subpopulation depends entirely on fertility and mortality (and net migration) of that subpopulation. In that case, the cohort-component method can be simply adjusted to project the population by these characteristics. If a characteristic may change during the life course, cohort members transfer to other subpopulations and these transitions need to be considered.

Examples of characteristics that may change in the life course are marital status, education, labour force participation, health status, and place of residence (urban, rural). The traditional cohort-component method cannot handle such transitions. The multistate 17

cohort-component method was developed to project subpopulations that change as a result of (a) subpopulation-specific fertility and mortality and (b) transitions between subpopulations. The multistate method needs data on transitions cohort members experience during the life course. For instance, multistate marital status



projections require data on marriages, divorces and transitions to widowhood, by age (and sex). Multistate projections by place of residence (urban, rural) need data on migration by age (and sex). Multistate projections by health status need data on transitions between health status by age (and sex). When transition data are not available, the common approach is to project the population by age (and sex) and to disaggregate the projected population using the relative size of a subpopulation (proportion of subpopulation in the population). The relative size is usually available from the census.

The analysis and projection of a population by age is sensitive to the measurement of age. The age of a person is counted differently in different cultures. In East Asian countries, newborns start at the age of one year and remains one year during the first calendar year of life. A newborn reaches two years on New Year's Day. In this report, as in other official reports, a chronological age system is used akin to that in Western countries. A person is aged 0 during the first year of life and turns age 1 at midnight (00:01 hour) of the first birthday.

The structure of the Chapter is as follows. In Section 2.2, the cohort-component method is presented without considering migration. The model is derived from demographic accounting equations. The Lexis diagram is used to graphically illustrate the projection methodology. The cohort-component method presented in Section 2.2 differs from the cohort-component method usually presented in demographic texts and implemented in software such as DemProj, the projection module of the Spectrum software package. The main reason for the difference is the type of age-specific data used. The method presented in this chapter accounts for data types, whereas traditional methods do not distinguish data types. In Section 2.3, the cohort-component method with migration (urban, rural) is presented. The method accounts for migration between rural and urban areas. Traditional cohort-component methods may consider net migration but disregard migration flows. The method presented in this chapter follows the United Nations manual for sub-national population projections, which states that "When projections for all the regions of a country are desired and the appropriate data are available, a multiregional approach should be considered." (United Nations, 1992, p. 1). A widely used software package

for population projection is DemProj (Spectrum). Section 2.4 describes the projection method implemented in the DemProj software and compares that method with the method presented in this chapter. Since the documentation of the method used by DemProj is limited, the comparison is also limited. However, the main differences, e.g. the role of data types, are clear.

## 2.2 The cohort-component method without migration

In demographic analysis, and in this Chapter, a distinction is made between exact age and age in completed years. Age in completed years refers to an age interval. Similarly, a distinction is made between exact time or point in time and time period. A Lexis diagram is used to describe these distinctions.

Let  $P(x,t)$  denote the number of people aged  $x$  at time  $t$ . Time  $t$  is a point in time, e.g. midnight 15th October 2014. Age  $x$  is age in completed years, e.g. age between  $x$  and  $x+1$ . Age  $x$  therefore denotes an age interval of one year. Age  $x$  may also denote an age interval of  $n$  years from exact  $x$  to exact age  $x+n$ . In the cohort-component model, the length of the age interval is determined by the projection interval. Since projections are produced for each calendar year, the population is disaggregated by single years of age. Data on the components of demographic change (fertility, mortality and migration) may not be available by single years of age, but may be available for  $n$ -year age groups, where usually  $n$  is 5. In that case, the age groups considered in the data differ from the age groups considered in the projection and demographic methods are used to convert  $n$ -year age intervals into 1-year age intervals. In the model description, age groups of one year are considered.

People aged  $x$  at time  $t$  are born between exact time  $t-x-1$  and  $t-x$ . For example, persons aged 30 on 15th October 2014 were born between 16th October 1983 and 15th October 1984. On 15th October 2015 survivors are 31 and survivors on 15th October 2049 are 65. The total population on 15th October 2049 depends on (a) the survival of members of the base population, (b) the number of children born between 15th October 2014 and 14th October 2049, (c) the survival of children born during this period until 15th October 2049, and (d) migration. In the presentation of the cohort-component model, the survival of members of the base population is considered first. Births and survival of newborns are considered next.

## a. Survival

In the absence of migration, the number of persons aged  $x$  at  $t$  surviving from  $t$  to  $t+1$  is:

$$P(x+1, t+1) = P(x, t) - D(x, t) \quad (1)$$

where  $D(x,t)$  is the number of persons aged  $x$  to  $x+1$  at exact time  $t$  who die during the time period from  $t$  and  $t+1$ . It is the number of deaths in year  $(t, t+1)$  among members of the birth cohort. The age interval and time period that is being considered in the accounting equation (1) is visualised in a Lexis diagram. Figure 1 shows a Lexis diagram with two lifelines, representing two persons, a and b. Person a dies in 2014, aged 52.6 years. Person b also dies in 2014, but at age 53.4. Consider persons aged 52 on 1st January 2014.  $P(52,2014)$  is the number of lifelines crossing segment AB in the Lexis diagram. The survivors are 53 on 1st January 2015 [ $P(53,2015)$ ]. It is the number of lifelines crossing segment CD in the diagram.  $D(x,t)$  is the number of lifelines that end in the parallelogram ABDC. The segment ABDC represents an observation window, which is an intersection of birth cohort and calendar year. The window is known as the period-cohort observation window.

The number of deaths may be replaced by the product of the death rate and the person years of exposure to the risk of dying between  $t$  and  $t+1$  by persons aged  $x$  at time  $t$ :

$$P(x+1, t+1) = P(x, t) - M(x, t)L(x, t) \quad (2)$$

where  $M(x,t)$  is the age-specific death rate between  $t$  and  $t+1$  for persons aged between  $x$  and  $x+1$  at time  $t$  (and born between  $t-x-1$  and  $t-x$ ) and  $L(x,t)$  represents the person-years lived between  $t$  and  $t+1$  by persons aged  $x$  to  $x+1$  at time  $t$ .

The exposure time  $L(x,t)$  is not known. It has to be approximated. If we assume that the deaths are uniformly distributed during the period  $(t, t+1)$ , then the exposure time can be approximated by the product of the mid-period population and the length of the period, which is one year:

$$L(x, t) = \frac{1}{2} [P(x, t) + P(x+1, t+1)] \quad (3)$$

The mid-period population can be visualised by the lifelines that cross the dashed line in parallelogram ABDC.

Equation (1) becomes

$$P(x+1, t+1) = P(x, t) - \frac{1}{2}M(x, t) [P(x, t) + P(x+1, t+1)] \quad (4)$$

or

$$P(x+1, t+1) = P(x, t) - \frac{1}{2}M(x, t)P(x, t) - M(x, t)P(x+1, t+1)$$

$$P(x+1, t+1) = \frac{1 - \frac{1}{2}M(x, t)}{1 + \frac{1}{2}M(x, t)} P(x, t) = S(x, t)P(x, t) \quad (5)$$

with  $S(x,t)$  the probability that a person aged  $x$  at time  $t$  (and born during the period  $(t-x-1, t-x)$ ), is alive at time  $t+1$ . The probability is known as a period-cohort survival probability.  $M(x,t)$  is a period-cohort death rate. It is the rate of death in a given year for persons born in a given year (and of a given age at the beginning of that year). The period-cohort survival probability is also known as the survival rate (see e.g. 2014 SDHS p. 97) and survival ratio (see e.g. Preston et al., 2001, p. 121). Equation (5) is one equation of the cohort-component projection model.

The period-cohort death rate may be expressed in terms of the period-cohort survival probability:

$$M(x, t) = 2 \frac{1 - S(x, t)}{1 + S(x, t)} \quad (6)$$

This relation will be used later in this chapter.

The age-specific death rate  $M(x,t)$  is estimated from data. The method is described in the 2014 SHDS report (p. 98), in the presentation of the life table. The number of deaths is from the civil registration system. The population is the population at the reference date of the 2014 SDHS. The fieldwork for the 2014 SDHS started on

1st October 2014 and ended on 31st October 2014. The reference date is taken to be 15th October 2015. The death rates are shown in Table 7 of the 2014 SDHS report (for males, females and both sexes combined). The precise estimation method is not given in the report. It can therefore not be determined whether the death rates are period-cohort death rates, required for equation (5). The death rate may be an age-period death rate, which is more common than period-cohort death rates. Age-period data relate to the observation window ABCE. It includes person a but not person b. The mid-period population is different too.

If the observed age-specific death rate is not a period-cohort death rate but an age-period rate, then the period-cohort survival probability is not given by equation (5). Consider the period observation window ABCE. The number of deaths in that observation window is the number of persons who die in 2014 and are 52 at time of death. These people are either 51 or 52 at the beginning of 2014; they are born in 1962 or 1961. To derive the projection model, the number of deaths  $D(x,t)$  in equation (1) must be approximated. Recall that  $D(x,t)$  is the number of deaths in the period-cohort observation window (in the Lexis diagram represented by ABDC). The common approach is to first compute the period-cohort survival probability from a life table, derived from mortality rates in a given year  $t$ :

$${}_{pc}S(x, t) = \frac{{}_pL(x+1, t)}{{}_pL(x, t)} \quad (7)$$

where the subscript  $p$  denotes period observation window and  $pc$  period-cohort observation window.  ${}_pL(x, t)$  represents person-years lived, obtained as part of a period life table. The estimation of  ${}_pL(x, t)$  introduces the assumption that the age-specific death rates do not vary in time. If also annual numbers of births remain constant, then the population is stationary. Hence, equation (7) is valid for a stationary population. Expression (7) is used in the life-table presented in the 2014 SDHS report.

Equation (7) is used in most population projection models (see Preston et al., 2001, p. 121), with  ${}_pL(x, t)$  being derived from a period life table. The approach is appropriate if the observed death rate is an age-period death rate. Using equation (7) and life-table methodology,  ${}_{pc}S(x, t)$  can be expressed in terms of age-period

death rates. The subscript t is omitted. The period-cohort survival probability is:

$${}_{pc}S(x) = \frac{{}_pL(x+1)}{{}_pL(x)} = \frac{[l(x+1) + (x+2)]/2}{[l(x) + l(x+1)]/2} = \frac{[1 + p(x+1)]p(x)}{1 + p(x)} \quad (7a)$$

$${}_{pc}S(x) = \frac{\left[ 1 + \frac{1 - \frac{1}{2} m(x+1)}{1 + \frac{1}{2} m(x+1)} \right] \left[ \frac{1 - \frac{1}{2} m(x)}{1 + \frac{1}{2} m(x)} \right]}{\left[ 1 + \frac{1 - \frac{1}{2} m(x)}{1 + \frac{1}{2} m(x)} \right]} \quad (7b)$$

$${}_{pc}S(x) = \frac{1 - \frac{1}{2} m(x)}{1 + \frac{1}{2} m(x+1)} \quad (7c)$$

Using equation (6), the period-cohort death rate  ${}_{pc}M(x, t)$  may be obtained from  ${}_{pc}S(x, t)$ . Combining (6) and (7),  ${}_{pc}M(x, t)$  may also be obtained from  ${}_pL(x, t)$  and  ${}_pL(x+1, t)$ :

$${}_{pc}M(x, t) = \frac{{}_pL(x) - {}_pL(x+1)}{{}_pL(x) + {}_pL(x+1)} \quad (8)$$

As part of the 2014 SDHS, death rates by age and sex have been computed for the life table, which is included in the 2014 SDHS report. The death rate is obtained by dividing the number of deaths together with the weighted total population by age and sex from the 2014 SDHS. The weighted population accounts for the fact that the sample data is self-weighted (CBS and UNFPA 2015). These death rates could be used in the projection. In that case, a first step is to interpolate the death rates to death rates by single years of age.

The highest age group is open-ended and needs to be considered differently in population projections. Let z denote the lowest age of the open-ended age group. In the 2014 SDSH-based life table, z=80. The population aged z or older (z+) at t+1

consists of (a) survivors of persons who are  $z^+$  at  $t$  (and are at least  $z+1$  at time  $t+1$ ), and (b) survivors of persons who are aged  $z-1$  at  $t$ . Figure 2 shows four lifelines. Lifeline 'a' represents a person who is 79 on 1st January 2014 and dies in 2014 at age 80. The person contributes exposure time to 79-year olds and 80-year olds. Lifeline b represents a person who is alive at the end of 2014. Since that person is born in near the end of 1935, he contributes considerably more exposure time to 79-year olds than to 80-year olds. Lifelines c and d denote persons aged 80 on 1st January 2014. Their age is already part of the open-ended age group. They contribute to the exposure time in the highest age group.

For the open-ended age group at time  $t+1$ , the accounting equation is:

$$P(z^+, t+1) = P(z-1, t) - D(z-1, t) + P(z^+, t) - D(z^+, t) \quad (9)$$

Assuming a uniform distribution of deaths during the interval  $(t, t+1)$ , the person-years lived between  $t$  and  $t+1$  by persons aged  $z-1$  at  $t$  is

$$L(z-1, t) = \frac{1}{2} [P(z-1, t) + P(z, t+1)]$$

and the person-years lived by persons of age  $z^+$  at  $t$  is:

$$L(z^+, t) = \frac{1}{2} [P(z^+, t) + P(z+1^+, t+1)]$$

where  $P(z+1^+, t+1)$  represents the number of people aged  $z+1$  or older at time  $t+1$ . In Figure 2, the mid-period population is represented by lifelines crossing the dotted line.

Equation (9) may be written as

$$P(z^+, t+1) = P(z-1, t) - M(z-1, t) + P(z^+, t) - M(z^+, t) L(z^+, t) \quad (10)$$

which yields

$$P(z^+, t+1) = \frac{1 - \frac{1}{2} M(z-1, t)}{1 + \frac{1}{2} M(z-1, t)} P(z-1, t) + \frac{1 - \frac{1}{2} M(z^+, t)}{1 + \frac{1}{2} M(z^+, t)} P(z^+, t)$$

$$P(z^+, t+1) = S(z-1, t) P(z-1, t) + S(z^+, t) P(z^+, t) \quad (11)$$

Equation (11) is part of the projection model. Note that M is a period-cohort death rate.

## b. Fertility

The number of children aged 0 at time t+1 depends on the number of births during the period (t,t+1) and the survival of the newborns. Figure 3 shows two lifelines. Lifeline a represents a child born in 2014 that dies in 2014 and lifeline b represents a child that survives beyond 2017. The number of births in 2014 can be denoted by lifelines starting on the segment AB. The lifelines that reach 2015 denote the survivors on 1st January 2015.

The number of births between t and t+1 depends on (a) the person-years lived in 2014 by women of reproductive age and (b) age-specific fertility rates:

$$B(t) = \sum_0^Z B(x, t) = \sum_0^Z F(x, t) {}_fL(x, t) \quad (12)$$

where B(t) denotes the number of births between t and t+1, B(x,t) the number of children born between t and t+1 to women aged x in completed years at time t,  ${}_fL(x, t)$  the person-years lived in the interval (t,t+1) by women aged x at time t, and F(x,t) the fertility rate during the period (t,t+1) of women aged x at t. The latter measure is approximated by the product of the mid-period female population and the length of the period:

$${}_fL(x, t) = \frac{1}{2} [ {}_fP(x, t) + {}_fP(x+1, t+1) ] \quad (13)$$



The number of births, expressed in terms of age-specific fertility rates, is:

$$B(x, t) = \frac{1}{2}F(x, t) [{}_fP(x, t) + {}_fP(x+1, t+1)] \quad (14)$$

Equations (12) and (14) are part of the projection model. Since  $B(x,t)$  depends on  ${}_fP(x+1, t+1)$ , the projection of survivors at  $t+1$  should be made before the projection of births.

$B(t)$  is the total number of births. That total needs to be disaggregated by sex using the sex ratio at birth. Let  $SRB$  denote the sex ratio at birth, i.e. the ratio of male births to female births. The proportion of girls is  $1/(1+SRB)$  and the proportion of boys is  $SRB/(1+SRB)$ .

The probability that a baby born between  $t$  and  $t+1$  is alive at  $t+1$  is derived from the accounting equation:

$$P(0, t+1) = B(t) - D(00, t) \quad (15)$$

where  $D(00,t)$  denotes the number of deaths in the period  $(t,t+1)$  among children born in period  $(t,t+1)$ .  $00$  refers to children born in the interval  $(t,t+1)$ ; survivors are age 0 at  $t+1$ . Equation (15) may be rewritten as

$$P(0, t+1) = B(t) - M(00, t)L(00, t) \quad (16)$$

with  $M(00,t)$  the death rate of children born in the interval  $(t,t+1)$  and  $L(00,t)$  the person-years lived between  $t$  and  $t+1$  by children born during that interval. To determine  $L(00,t)$  we need assumptions about the distribution of births and deaths during the interval. Assume that the births are uniformly distributed during the interval from  $t$  to  $t+1$ . In other words, seasonal effects are assumed to be absent. The assumption is equivalent to the assumption that children are born in the middle of the interval. Children that are alive at  $t+1$  contribute 0.5 years to the exposure time during the interval. If deaths are assumed to be uniformly distributed, then children that die before  $t+1$  contribute 0.25 years to the exposure time. Hence

$$L(00) = 0.5P + 0.25[B(t) - P(00, t+1)] = 0.25[B(t) + P(0, t+1)] \quad (17)$$

If all children survive, then  $P(0,t+1)=B(t)$  and  $L(00,t)=0.5B(t)$ .

Combining (16) and (17) gives

$$P(0, t+1) = B(t) - 0.25M(00, t) [B(t) + P(0, t+1)] \quad (18)$$

which yields

$$P(0, t+1) = \frac{1 - 0.25M(00, t)}{1 + 0.25M(00, t)} B(t) \quad (19)$$

### **2.3 Comparison with the cohort-component method implemented in DemProj of Spectrum**

DemProj is one of the most widely used software models for making population projections. The model is the main building block of the Spectrum suite of computer models, originally developed by Futures Group in Washington D.C. to utilize demographic projections as a basis for generating family planning and reproductive health projections. DemProj uses the cohort-component method. The inputs are the population by age and sex in the base year and, for all years in the projection, the total fertility rate, the age distribution of fertility, the sex ratio at birth, the life expectancy at birth, the age pattern of mortality and the number and distribution by age and sex of international migrants. The most recent description of the DemProj model is Stover and Kirmeyer (2008). The description of the methodology is very limited.

DemProj assumes that the base population is a mid-year population. If the population is given by 5-year age groups, it is disaggregated into single years of age. This is accomplished by applying the Beers procedure (Beers, 1945). This procedure uses a series of polynomial equations to divide the population in 5-year age groups into single year age groups while maintaining the population total and providing a smooth transition from one age to the next.

Mortality is specified as life expectancy at birth and a model life table. The standard tables are the four Coale–Demeny tables (north, south, east and west) and the five United National tables (General, Latin America, Chile, South Asia and East Asia). The model life table provides period-cohort probabilities of surviving (survival rates or survivorship ratio), associated with a given life expectancy. The life-table survival rate, i.e. the survival rate in a stationary population, is given by equation (7), where  ${}_pL(x, t)$  represents the number of people by age in the stationary population. It is computed as part of the life table, which is a description of a stationary population. In a stationary population, the number of people in a given age group  $x$  to  $x+1$  is equal to the person-years lived between  $x$  and  $x+1$ .

Model life tables usually consider age groups of 5 years. Therefore values of  ${}_pL(x, t)$  need to be disaggregated into single years of age. DemProj uses the Beers procedure to accomplish that task. The number of deaths from mid-year to mid-year is calculated as follows (Stover and Kirmeyer, 2008, p. 75):

$$D(x+1, t) = P(x, t) \left[ 1 - \frac{S(x, t) + S(x, t+1)}{2} \right] \quad (20)$$

where  $S(x, t) = {}_pL(x+1, t) / {}_pL(x, t)$ . The number of deaths during calendar year  $t+1$  is  $[D(x, t) + D(x, t+1)] / 2$ .

The population by age (and sex) is projected using the balance equation

$$P(x+1, t+1) = P(x, t) - D(x+1, t) \quad (21)$$

The number of births from mid-year to mid-year is

$$B(t) = \sum_{15}^{49} \frac{P(x, t) - P(x, t+1)}{2} \frac{TFR(t) + TFR(t+1)}{2} \frac{F(x, t) + F(x, t+1)}{2} \quad (22)$$

where  $TFR(t)$  is the Total Fertility Rate in the year from  $t$  to  $t+1$ . The number of births during a calendar year is  $[B(x, t) + B(x, t+1)] / 2$ .

The population of age 0 at  $t+1$  is

$$P(0, t+1) = \frac{B(t) - B(t+1)}{2} S(00, t) \quad (23)$$

with  $S(00,t)$  equal to  $L(00,t)$  divided by the size of the birth cohort (in the model life-table population).

DemProj projects the urban and rural population. The method follows the United Nations method of growth rate difference (Stover and Kirmeyer, 2008, p. 78). Let  $P_u(t)$  denote the urban population at time  $t$  and  $P_r(t)$  the rural population. The total population is  $P(t)$ . The urban population at  $t+1$  is

$$P_u(t+1) = P_u(t) \frac{P(t+1) - URGD P_r(t)}{P(t)} \quad (24)$$

where URGD is the urban-rural growth rate difference. It is estimated from recent data on urban and rural population growth. The equation is a logistic function, which implies that the urbanization rate slows after the proportion urban exceeds 50 percent.

The growth rate of the urban population by age is derived from the change in the percent of the population that is urban. DemProj uses the logit of the percent urban:

$$0.5 \frac{\ln(\text{percent urban})}{\ln(1 - \text{percent urban})}$$

The logit of the percent urban in each age group is assumed to increase as the logit of the total percent urban, which is

$$IUL = \text{logit}(\% \text{urban} at + 1) - \text{logit}(\% \text{urban} at t)$$

where IUL is the increase in the logit of percent urban. The logit of the percent of the population aged  $x$  in completed years that is urban at time  $t+1$ , is

$$\text{logit}(\% \text{urban at } t+1)(x) = \text{logit}(\% \text{urban at } t) + IUL$$

The percent of the population aged x that is urban is

$$\% \text{urban}(x, t+1) = \frac{\exp[2\text{logit}(\text{urban}_t\%(x))]}{1 + \exp[2\text{logit}(\text{urban}_t\%(x))]} \quad (25)$$

The urban population aged x at time t+1 is the total population aged x times the percent urban. The total of the urban population computed this way will differ from  $P_u(t+1)$  computed in (24). Therefore all age groups are normalized to sum to  $P_u(t+1)$ .

Figure 1. Observation windows for population projection

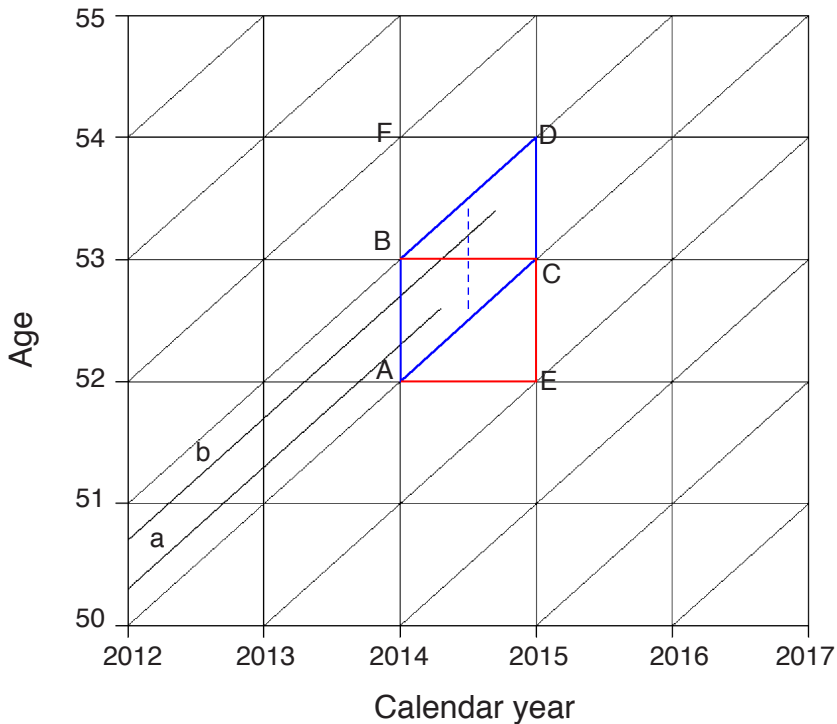


Figure 2. Observation windows for population projection. Open-ended age group.

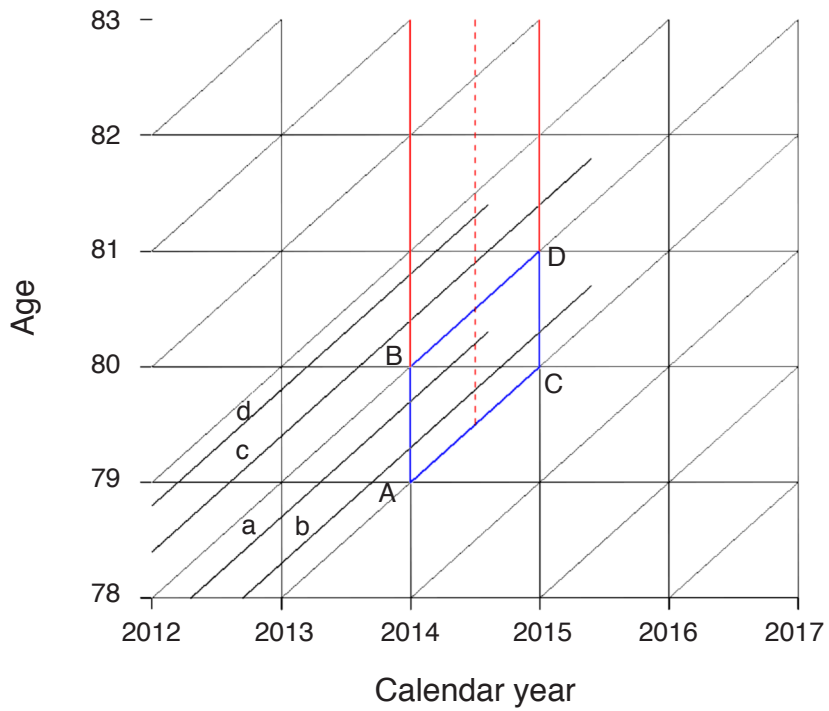
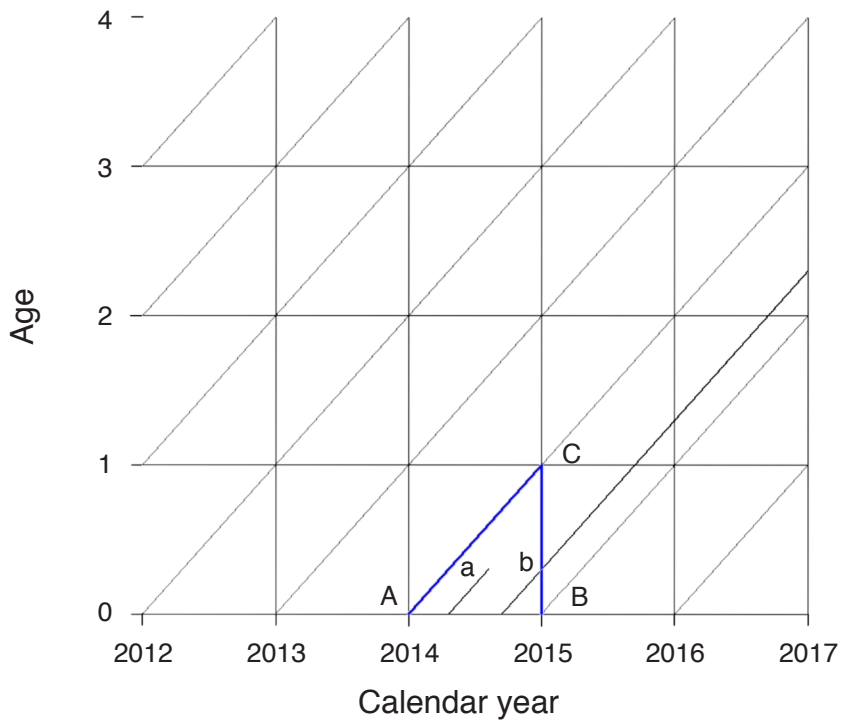


Figure 3. Observation windows for population projection. First age group.



# CHAPTER 3. NATIONAL POPULATION PROJECTION

This chapter describes the population projection at the national level. The topics covered include preparing and checking the quality of the population data at the base year for the projection, analyzing and assuming various scenarios of the fertility and mortality which are the main factors affecting the projection, and the detailed results of the projection.

## **3.1 Population by age and sex of the base year and description of data quality**

In the population projection, the accuracy and the quality of the base year population data affect the whole projection. It is of course because if the base year data is incorrect, the quality of the following years data become from bad to worse. In this report, the base year for projection is 2014 and its population data are the results of 2014 Socio-economic, Demographic and Health Survey (SDHS). 2014 SDHS report which was published in December 2015 assessed the quality of the age data (2014 SDHS report, page 30). The report calculated Whipple's index and Myer's blended index which are the indices assessing the quality of age data, and concluded that its quality was high.

**In preparing 2014 population data for projection, the following issues were considered:**

First, international migration was not taken into account in projecting the national population.

In DPRK, persons who are temporarily out of the country as students, health and construction workers were recorded as household members in the survey, not as migrants. Temporary absence may be for a short duration or a long duration. Foreign persons who came to live in DPRK are not considered as immigrants.

Next, 2014 SDHS did not cover the army, meaning its population is not included in 2014 total population.

The population considered in the projection is the civilian population. However, there are servicemen enlisted in and discharged from the army every year, and their turnover impacts on the population size by sex and age, like migration. To avoid this influence, the army servicemen were included in the total population.

In 2008 population census, the number of servicemen was collected by sex and age. In the census, a distinction is made between the civilian population and the total population. The latter includes servicemen. Assuming that the number of servicemen in 2014 is the same as the number recorded in the 2008 census, then the base year population can be estimated as 2014 population (excluding servicemen) plus the number of servicemen in 2008. This estimated total population is used in the projection.

Since international migration is absent in the projections, the national population projection depends only on fertility and mortality.

The total DPRK population as of October 1, 2014, including 2014 population (excluding servicemen) and the number of servicemen from 2008 census, is shown in Table 3.1:

Table 3-1. Population size by sex and age group, 2014

<b>Age group</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	<b>Sex ratio</b>
0-4	1692967	865438	827529	104.6
5-9	1672279	857789	814490	105.3
10-14	1791946	924154	867792	106.5
15-19	1968009	1005310	962699	104.4
20-24	2014440	1044626	969814	107.7
25-29	1817963	923970	893993	103.4
30-34	1770266	887955	882311	100.6
35-39	1722394	873804	848590	103.0
40-44	2226940	1117666	1109274	100.8
45-49	2006703	992827	1013876	97.9
50-54	1543774	745702	798072	93.4
55-59	1301898	631948	669950	94.3
60-64	885039	418378	466662	89.7
65-69	969223	420814	548409	76.7
70-74	762471	279410	483061	57.8
75-79	490079	140038	350042	40.0
80+	279474	46516	232958	20.0
<b>Total</b>	<b>24915866</b>	<b>12176343</b>	<b>12739522</b>	<b>95.6</b>

(※ includes servicemen)



## **3.2 Analysis and assumption of fertility and mortality**

To ensure the accuracy of population projection, fertility and mortality trends and socio-economic factors affecting fertility and mortality should be analysed and forms the basis for fertility and mortality assumptions about future changes.

### **3.2.1 Analysis and assumption of fertility**

The fertility rate is the important variant affecting the population size and composition.

#### **- Dynamics and assumption of the fertility rate**

In DPRK, the total fertility rate (TFR) has decreased slowly. Between the 1993 Census and the 2008 Census, the fertility rate declined from 2.2 to 2.0 in 15 years. In 2014, 6 years later, the TFR was 1.9. Hence, the TFR decreased by 0.3 points during 21 years from 1993 to 2014.

Two main reasons can be given for the slight decline. The first reason is the increased educational level of women and their increased participation in the labour force. The proportion of women with secondary school education and above increased from 91.0 percent in 2008 to 98.5 percent in 2014. There is a tendency among urban women to have only one child as they participate in social, political and economic activities, so the TFR in urban areas is low. The second reason is that the desired number of children by women in DPRK has not changed. That is why the TFR is sustained as 1.9 in 2014 unlike in most of the other countries in East Asia where the TFR has declined to about 1.5. The sharp decrease of TFR from about 2.0 to 1.5 in East Asian countries is related to the tendency among women willing to have fewer children with the development of the society and the improvement of economic and cultural life.

There is little change in the tendency among women in DPRK to have a son and a daughter or at least 2 children regardless of sex. There are, of course, some women wanting only one child because of their type of occupation or physical reasons of weakness or disease. On the other hand, most women in rural areas gave birth to at least 2 children, so the TFR is maintained at 2, though there was slight decrease from 2.2 in 2008 to 2.0 in 2014.

Fertility assumptions can be made based on the number of children women consider ideal. The information for this may be derived from 2014 SDHS, the most recent survey. In this survey, the question of the ideal number of children was asked to women of reproductive age and the total fertility rate was calculated. The result is shown in the table below (2014 SDHS report, pages 51 and 58):

Table 3-2. The relationship between the ideal number of children wanted by women of reproductive age and the total fertility rate (person)

<b>Region</b>	<b>Ideal number of children</b>	<b>Total fertility rate</b>	<b>Gap</b>
Urban	1.82	1.84	+0.02
Rural	1.99	1.97	-0.02
Total	1.89	1.89	0.00
Difference	-0.17	-0.13	

Source: 2014 SDHS

The survey results show that the wanted number of children and the reality (total fertility rate) are nearly the same although there is a small difference between them. It is to be noted that in urban areas the fertility rate is a bit higher than the number considered by women to be ideal, while in rural areas, it is a bit lower. In the meantime, by region, the ideal number of children in urban areas is 0.17 lower than in rural areas and the TFR in urban areas is 0.13 lower than in rural areas.

Based on this analysis, the assumption of fertility was formulated in 3 scenarios as follows;

The national fertility rate was estimated by applying the weights to the regional figures, considering the population rates of urban (60%) and rural (40%).

The 3 scenarios are:

- High scenario assumes that the current fertility rate continues until 2015 and be sustained thereafter.
- Medium scenario assumes that the past decrease of fertility rate continue during the next decade, towards 1.8 in urban and 1.9 in rural until 2025 and be sustained thereafter.

- Low scenario assumes that the TFR will be reduced to 1.7 in urban and 1.8 in rural until 2025 and be sustained thereafter.

Table 3-3. TFR in 3 fertility scenarios

Year	High scenario			Medium scenario			Low scenario		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2014	1.84	1.97	1.89	1.84	1.97	1.89	1.84	1.97	1.89
2020	1.84	1.97	1.89	1.82	1.94	1.87	1.80	1.90	1.84
2025	1.84	1.97	1.89	1.80	1.90	1.84	1.70	1.80	1.74
2030	1.84	1.97	1.89	1.80	1.90	1.84	1.70	1.80	1.74
2035	1.84	1.97	1.89	1.80	1.90	1.84	1.70	1.80	1.74
2040	1.84	1.97	1.89	1.80	1.90	1.84	1.70	1.80	1.74
2045	1.84	1.97	1.89	1.80	1.90	1.84	1.70	1.80	1.74
2050	1.84	1.97	1.89	1.80	1.90	1.84	1.70	1.80	1.74

Table 3-4. Age composition of the total fertility rates in 2008 and 2014

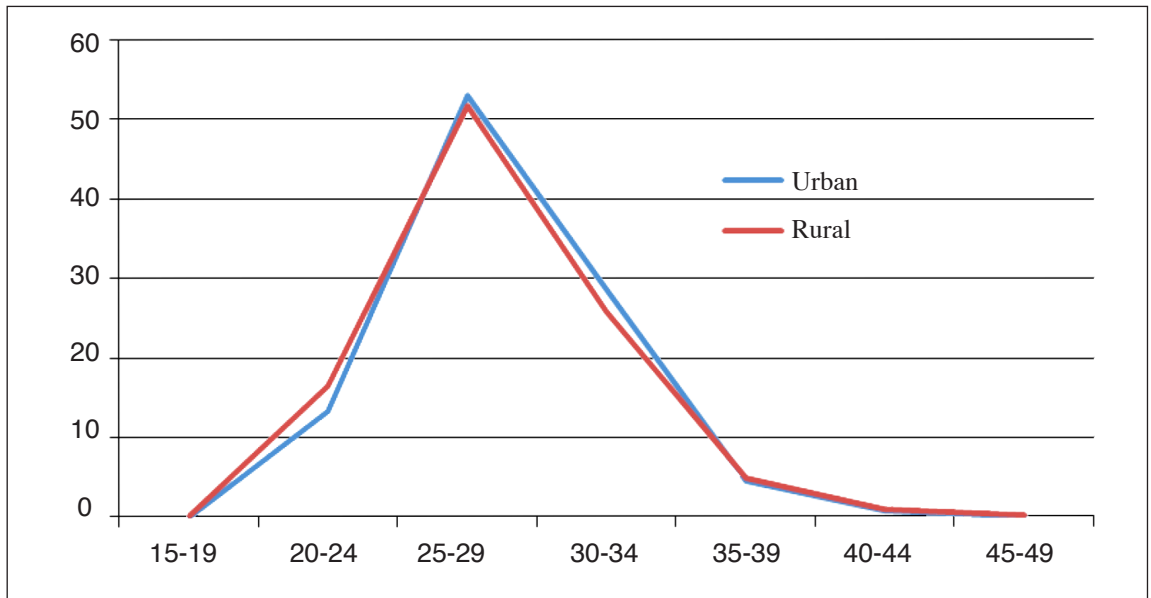
Age group	2008			2014			Difference		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
15–19	0.00	0.23	0.25	0.00	0.00	0.00	0.00	-0.23	-0.25
20–24	13.23	16.44	14.68	9.23	11.68	10.30	-4.00	-4.76	-4.38
25–29	52.91	51.60	52.24	52.78	51.52	52.19	-0.13	-0.08	-0.05
30–34	28.57	25.80	27.36	35.55	32.99	34.34	6.98	7.20	6.97
35–39	4.50	4.79	4.73	2.17	3.55	2.91	-2.33	-1.24	-1.82
40–44	0.79	0.91	0.75	0.27	0.25	0.26	-0.52	-0.66	-0.48
45–49	0.00	0.23	0.00	0.00	0.00	0.00	0.00	-0.23	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	0.00	0.00	0.00
TFR	1.89	2.19	2.01	1.84	1.97	1.89			

### - Dynamics and assumption of the fertility by age

In 2008, the difference of the TFR between urban and rural areas was 0.3. Table 3-4 and Figure 3-1 show the age distribution of fertility. In Spectrum (DemProj),

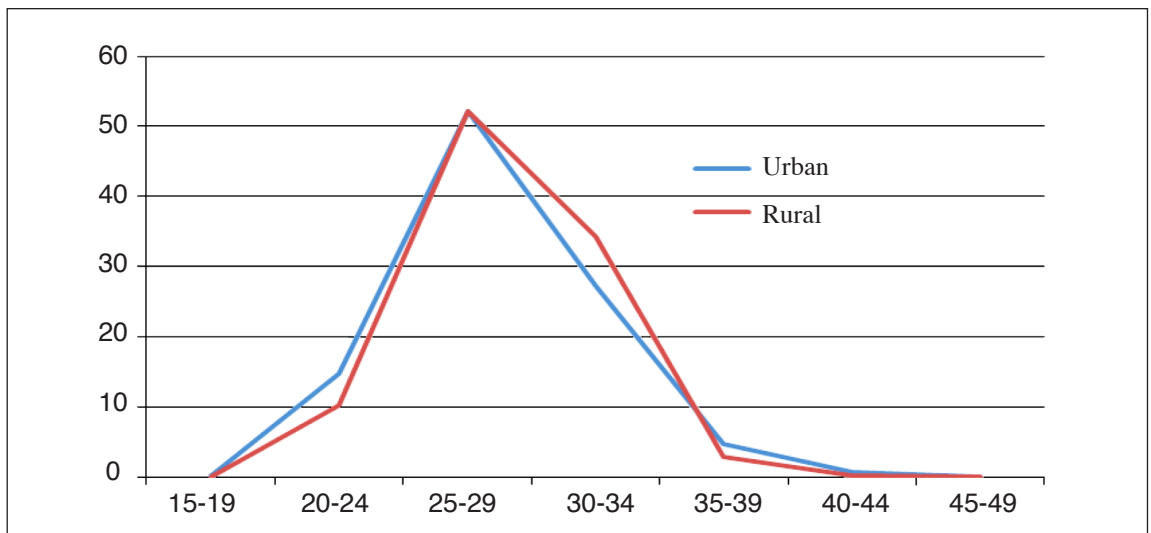
the age distribution of fertility is entered as the percentage of lifetime fertility that occurs in five-year age groups.

Figure 3-1. Age distribution of fertility in urban and rural areas, 2008  
(as percentage of TFR)



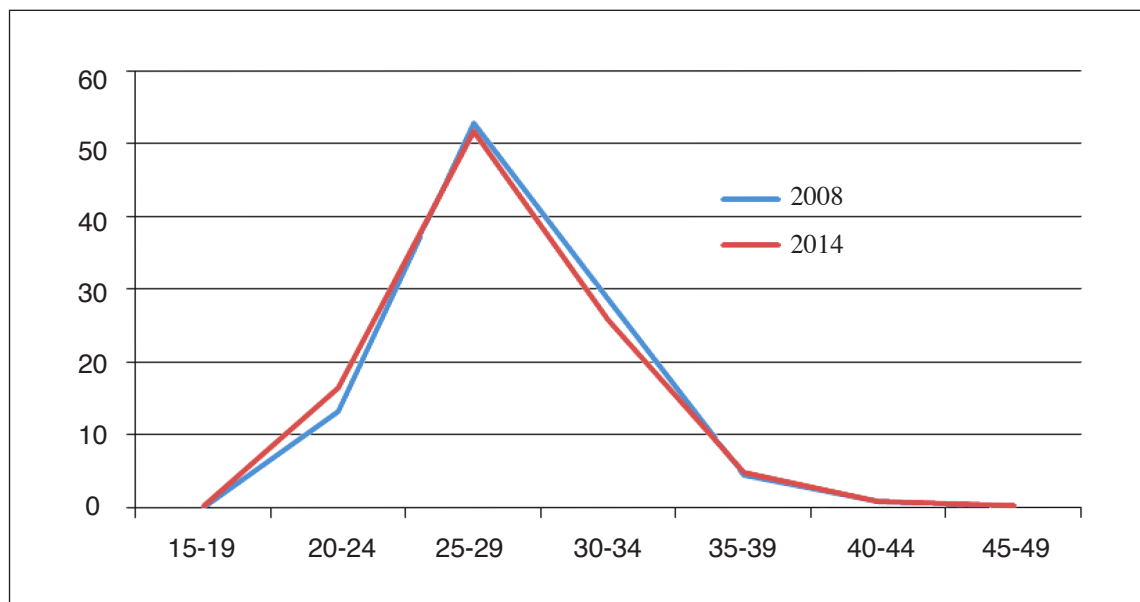
In 2014, the difference of the fertility rates between urban and rural has been reduced to 0.13. Table 3-4 and Figure 3-2 show fertility by age.

Figure 3-2. Age distribution of fertility in urban and rural areas, 2014 (as percentage of TFR)



A comparison of the fertility by age in 2008 and 2014 (Table 3-4 and Figure 3-3) reveals a shift of fertility from early ages (below 25) to higher age (30-34).

Figure 3-3. Age distribution of fertility, 2008 and 2014 (%)



The reason is the increase in age at first marriage. The mean age at first marriage of women increased marginally from 24.8 years in 2008 to 24.9 years in 2014. The SDHS indicates that the mean age at first marriage is increasing. The older cohort (aged 45-49 in 2014) married at age 25.0 on average, while the younger cohort (aged 30-34 in 2014) married at age 25.4. The mean age at first marriage is not considered for younger cohorts because women not married yet at the time of the survey are likely to marry later. The increase in the age at first marriage and the slight decline in fertility rate imply that pregnancy and delivery are concentrated in the age range from 25 to 34. Sex ratio at birth is approximately 105 as referred to 104.6 in 2014.

### 3.2.2 Analysis and assumption of mortality

The life expectancy and the age-specific mortality rates determine population size and composition by age, sex and urban and rural areas. Therefore, an in-depth analysis of data on life expectancy and age-specific mortality rates and their determinants improve the quality of the population projection.

## - Dynamics and assumption of the mortality

There was a remarkable change in mortality rates during nearly 20 years from 1993 to 2014.

After 1993 population census, DPRK was affected by continuous natural disasters and sanctions from UN and some western countries, which resulted in serious challenges for economic development leading to severe impacts on people's livelihood and public health. The infant mortality rate (IMR) increased from 13.9‰ in 1993 to 19.3‰ in 2008. The life expectancy at birth (LE) decreased from 73.2 years in 1993 to 69.3 years in 2008 (Table 3-5).

Table 3-5. Infant mortality rate (‰) and life expectancy (years), 1993, 2008 and 2014

Indicator	1993	2008	2014	Difference 2008–2014	Average annual rate of differences 2008–2014
IMR	13.9	19.3	13.7	–5.6	–0.93
LE total	73.2	69.3	72.1	2.8	0.47
Male	68.4	65.6	68.2	2.6	0.43
Female	76.8	72.7	75.6	2.9	0.48

Since then, thanks to great efforts of the Government, the national economy has recovered and developed gradually and there has been a significant improvement in public health as well. Therefore, IMR decreased during 2008-2014, while the LE increased 2.8 years between 2008 and 2014, with an average annual rate of 0.47 years (0.48 for females and 0.43 for males).

DPRK is now making huge investments in building stronger national economy. The Government has set up the 5-year national economic development strategy and has been increasing its expenditure for the economy as well as the education and health. Therefore, it is expected that the national economy will keep developing thanks to the firm resolution of the Government to achieve self-reliant economic

development. This will certainly lead to the development of the health sector and the improvement of people’s life, which in turn will increase LE in the future. Considering the prospects of economic development in DPRK and the increase in the life expectancy at the global level as presented by the United Nations life tables, the assumption of LE is made as shown in Table 3-6. No mortality scenarios are considered.

Table 3-6. Assumption of LE by sex (years)

Period	LE increase		Year	LE	
	Male	Female		Male	Male
			2014	68.2	75.6
2014–2020	2.0	2.0	2020	70.2	77.6
2020–2025	1.5	1.5	2025	71.7	79.1
2025–2030	1.0	1.0	2030	72.7	80.1
2030–2035	1.0	1.0	2035	73.7	81.1
2035–2040	1.0	0.5	2040	74.7	81.6
2040–2045	0.5	0.5	2045	75.2	82.1
2045–2050	0.5	0.5	2050	75.7	82.6

The United Nations East Asia model life table was used in projection. For males, the model life table with a life expectancy at birth of 68 years was used. For females, the life table with a life expectancy at birth of 75 years was used. The IMR in the East Asia model life table is slightly higher than the IMR estimated in the 2014 SDHS.

### 3.2.3 Assumption of international migration

National projection has been generated without any assumption of international migration because there was no immigration in or emigration from DPRK, as mentioned above.

### 3.3 The results of population projections

#### 3.3.1 Prospects of population growth by total and age group

Table 3-7 and Figure 3-4 show the main results of the population projection. The three scenarios are the fertility scenarios. Since fertility remains below replacement level (TFR of 2.1) in the three scenarios, the total population is expected to decrease gradually when the impact of the current age composition of the female population is limited. The population will start to reduce in 2043 according to high scenario (i.e., if the current rate is sustained), but in 2040 according to medium scenario and in 2037 according to low scenario, both 3 years earlier than the former scenario.

In the medium scenario, the population will reach a maximum of 26.57 million in 2040, a 6.6% (i.e., 1.65 million) increase compared to 24.92 million in 2014. The population size will decline afterwards.

According to three scenarios, the population size is projected to increase 1.66 million, 1.38 million and 0.85 million respectively in 2050 more than in 2014.

In 2050, the difference between high and medium scenarios is 0.28 million, which is 1.1% of the population size projected by medium scenario, while the difference

Table 3-7. Population projections according to 3 scenarios and difference between scenario results (10,000)

Year	High	Medium	Low	Difference (high and medium)	Difference (medium and low)
2014	2492	2492	2492	0	0
2015	2502	2502	2502	0	0
2016	2513	2513	2513	0	0
2017	2524	2524	2523	0	1
2018	2535	2534	2533	1	1
2019	2546	2545	2544	1	1
2020	2557	2555	2553	2	2
2021	2567	2566	2563	1	3
2022	2578	2576	2572	2	4
2023	2588	2585	2580	3	5
2024	2598	2595	2588	3	7

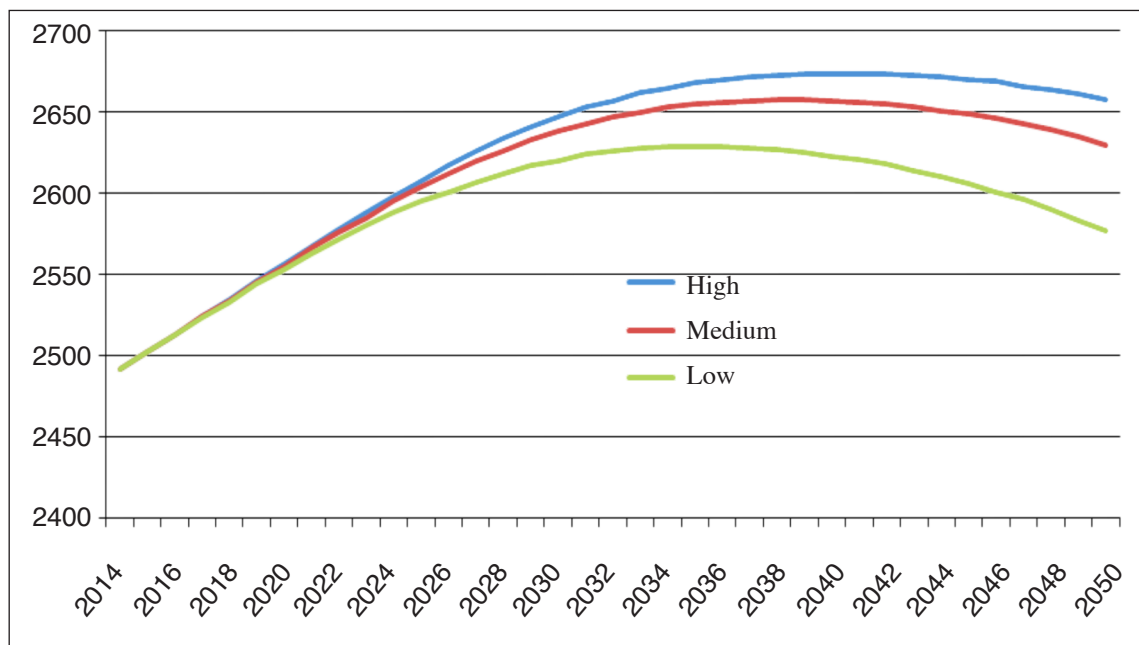


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<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>Difference (high and medium)</b>	<b>Difference (medium and low)</b>
2025	2608	2604	2595	4	9
2026	2617	2612	2601	5	11
2027	2626	2620	2607	6	13
2028	2634	2626	2612	8	14
2029	2641	2633	2617	8	16
2030	2647	2638	2620	9	18
2031	2653	2643	2624	10	19
2032	2657	2647	2626	10	21
2033	2662	2650	2628	12	22
2034	2665	2653	2629	12	24
2035	2668	2655	2629	13	26
2036	2670	2656	2629	14	27
2037	2672	2657	2628	15	29
2038	2673	2658	2627	15	31
2039	2674	2658	2625	16	33
2040	2674	2657	2623	17	34
2041	2674	2656	2621	18	35
2042	2674	2655	2618	19	37
2043	2673	2653	2614	20	39
2044	2672	2651	2610	21	41
2045	2670	2649	2606	21	43
2046	2669	2646	2601	23	45
2047	2666	2643	2596	23	47
2048	2664	2639	2590	25	49
2049	2661	2635	2583	26	52
2050	2658	2630	2577	28	53
Increase in 2050 com- pared to 2014	166	138	85		

between medium and low is 0.53 million, which is 2% of medium scenario projection. The difference between the two cases can be explained in terms of fertility rates, i.e., the difference of 0.05 between high fertility (TFR 1.89) and medium fertility (TFR 1.84), and 0.1 between medium (TFR 1.84) and low (TFR 1.74).

Figure 3-4. Population of DPRK according to 3 fertility scenarios, 2014-2050



In the medium scenario, the female population is 0.53 million more than the male population and the sex ratio is within the range of 96%, at average (see Table 3-8 and Figure 3-5).

In the remainder of this section, the projection results are shown by three major age groups (0-14, 15-59 and 60+). The second age group is the working age.

The number of children aged 0-14 decreases in all 3 scenarios according to the fertility assumptions (Table 3-9).

In 2050, the population of 0-14 age group is expected to have decreased by 10.5%, 13.2% and 18.6% of 2014 population, respectively.

Table 3-8. Population by sex, according to medium scenario (10,000), and sex ratio (x100)

Year	2015	2020	2025	2030	2035	2040	2045	2050	Average
Male	1223	1252	1277	1294	1301	1301	1296	1288	1279
Female	1279	1303	1326	1344	1354	1357	1353	1343	1332
Difference	56	51	49	50	53	56	57	55	53
Sex ratio	95.6	96.1	96.3	96.3	96.1	95.9	95.8	95.9	96.0

Figure 3-5. Population by sex, according to medium scenario (10,000)

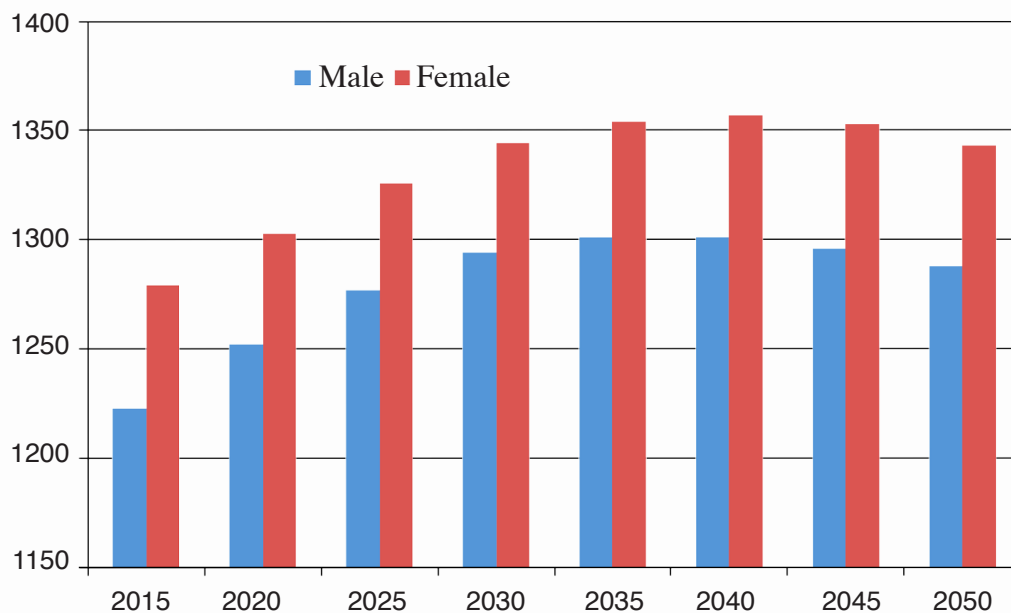


Table 3-9. Population of 0-14 age group according to 3 scenarios and difference between scenarios (10,000)

Year	High	Medium	Low	Difference (high and medium)	Difference (medium and low)
2014	516	516	516	0	0
2015	512	512	511	0	1
2016	509	508	508	1	0
2017	507	506	506	1	0
2018	506	505	504	1	1
2019	506	505	504	1	1
2020	507	505	504	2	1
2021	508	506	504	2	2
2022	510	508	504	2	4
2023	512	509	504	3	5

continue

<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>Difference (high and medium)</b>	<b>Difference (medium and low)</b>
2024	514	510	504	4	6
2025	516	512	503	4	9
2026	518	512	502	6	10
2027	519	512	500	7	12
2028	518	511	496	7	15
2029	516	508	492	8	16
2030	516	506	489	10	17
2031	514	504	485	10	19
2032	512	501	481	11	20
2033	509	498	476	11	22
2034	505	494	471	11	23
2035	501	489	465	12	24
2036	496	484	459	12	25
2037	492	479	453	13	26
2038	487	474	448	13	26
2039	482	469	443	13	26
2040	477	465	439	12	26
2041	473	461	435	12	26
2042	470	457	432	13	25
2043	467	454	429	13	25
2044	464	452	427	12	25
2045	463	450	425	13	25
2046	462	449	423	13	26
2047	461	448	422	13	26
2048	461	448	421	13	27
2049	462	448	420	14	28
2050	462	448	420	14	28
Decrease in 2050 compared to 2014	- 54 (- 10.5%)	- 68 (- 13.2%)	- 96 (- 18.6%)		

In the high and medium scenarios, the population aged 0-14 increases slightly especially during the 2nd half of 2020s (2025-2030). The increase can be attributed to the increase of women of reproductive age, which is an echo effect of the age group 15-24 in 2014 (Figure 3-6).

The population of 15-59 age group is projected to increase during eight years until 2022 but declines sharply thereafter (Table 3-10). In 2050, the working age population will be 5.9% compared to 8.3% in 2014, assuming that the upper age of the working age population does not change.

Figure 3-6. Population of DPRK aged 0-14 according to 3 fertility scenarios

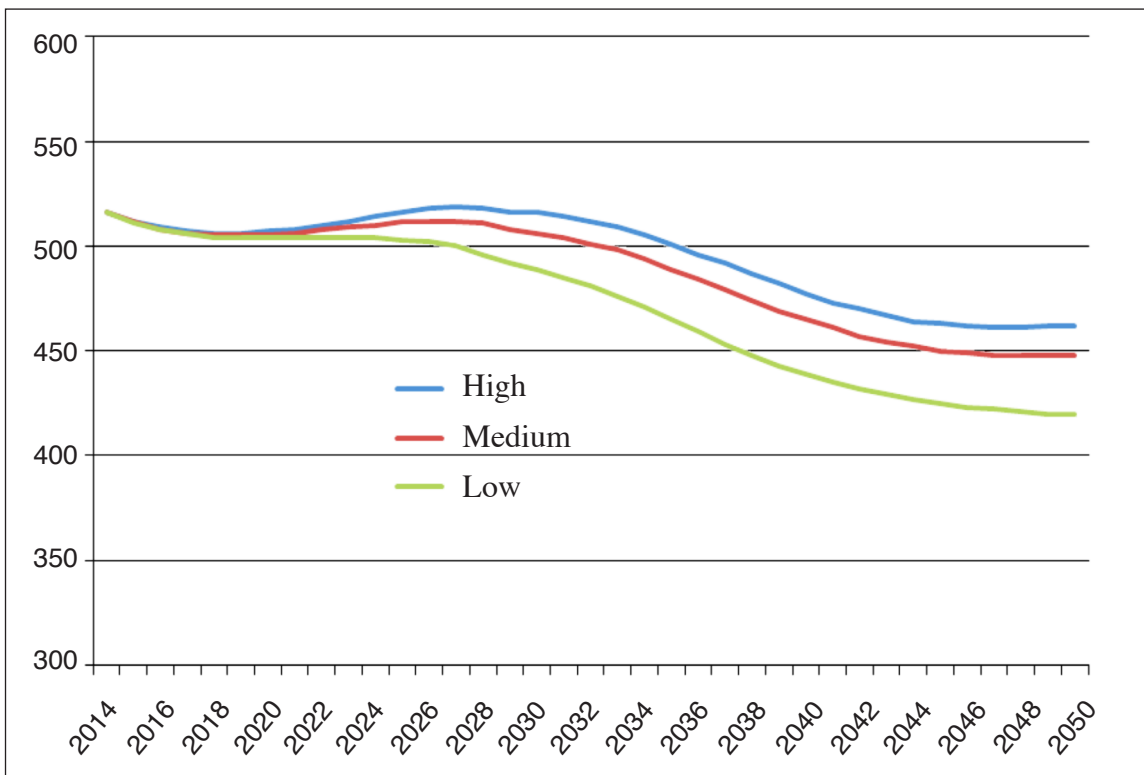


Table 3-10. Population of 15-59 age group according to 3 scenarios and difference between scenario (10,000)

<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>Difference (high and medium)</b>	<b>Difference (medium and low)</b>
2014	1637	1637	1637	0	0
2015	1646	1646	1646	0	0
2016	1652	1652	1652	0	0
2017	1656	1656	1656	0	0
2018	1659	1659	1659	0	0
2019	1661	1661	1661	0	0
2020	1662	1662	1662	0	0
2021	1663	1663	1663	0	0
2022	1663	1663	1663	0	0
2023	1662	1662	1662	0	0
2024	1658	1658	1658	0	0
2025	1653	1653	1653	0	0
2026	1646	1646	1646	0	0
2027	1638	1638	1638	0	0
2028	1630	1630	1630	0	0
2029	1622	1622	1622	0	0
2030	1610	1610	1610	0	0
2031	1599	1598	1598	1	0
2032	1587	1587	1587	0	0
2033	1578	1578	1577	0	1
2034	1572	1571	1570	1	1
2035	1569	1568	1566	1	2
2036	1569	1568	1565	1	3
2037	1571	1569	1565	2	4
2038	1574	1571	1566	3	5
2039	1576	1572	1565	4	7
2040	1576	1571	1563	5	8
2041	1576	1570	1560	6	10
2042	1574	1568	1555	6	13
2043	1572	1565	1551	7	14

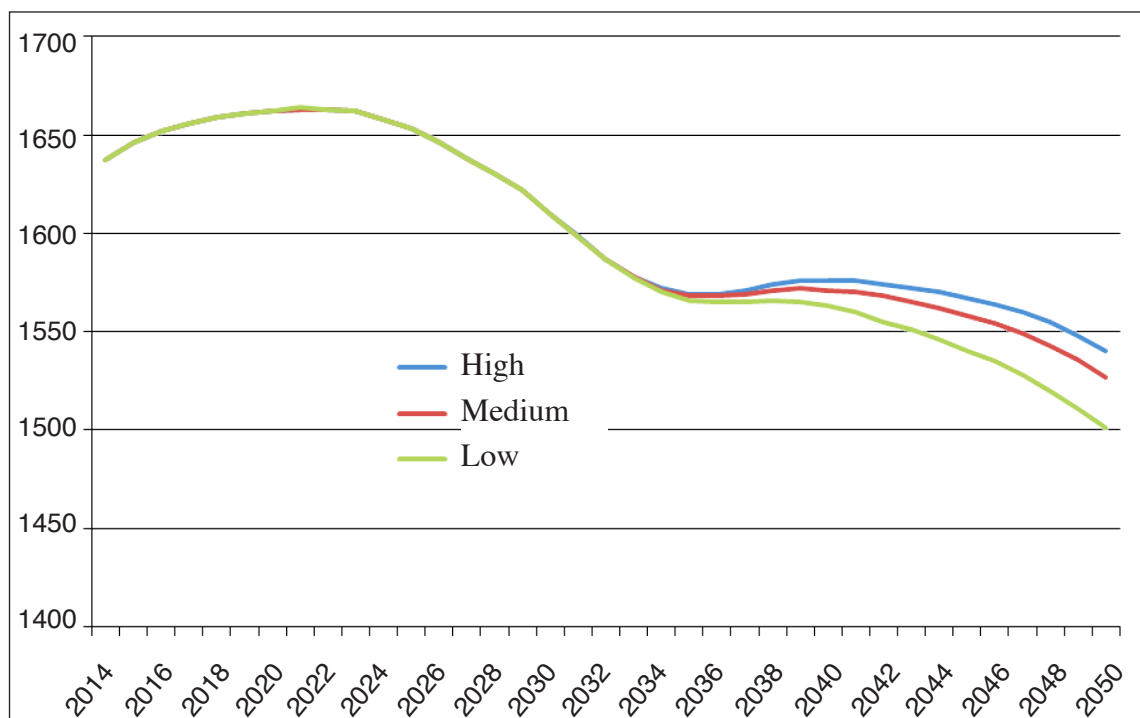
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Year	High	Medium	Low	Difference (high and medium)	Difference (medium and low)
2044	1570	1562	1546	8	16
2045	1567	1558	1540	9	18
2046	1564	1554	1535	10	19
2047	1560	1549	1528	11	21
2048	1555	1543	1520	12	23
2049	1548	1536	1511	12	25
2050	1540	1527	1501	13	26
Decrease in 2050 compared to 2014	-97 (-5.9%)	-110 (-6.7%)	-136 (-8.3%)		

The 0-14 age group, is expected to increase slightly during the 2nd half of 2030s and 1<sup>st</sup> half of 2040s but expected to decrease afterwards (Figure 3-7).

The assumptions have no impact on the elderly population of 60+ years old. It means that the elderly population is similar for all 3 scenarios (Table 3-11 and Figure 3-8).

Figure 3-7. Population of DPRK aged 15-59 according to 3 fertility scenarios



Elderly population is expected to increase fast during 20 years (2014-2034) but dully after then. Therefore, the elderly population of 3.39 million in 2014 will in3.3.2  
 Composition of population by sex and age (population pyramid)

Table 3-11. Population of DPRK, aged 60+ according to 3 scenarios (10,000)

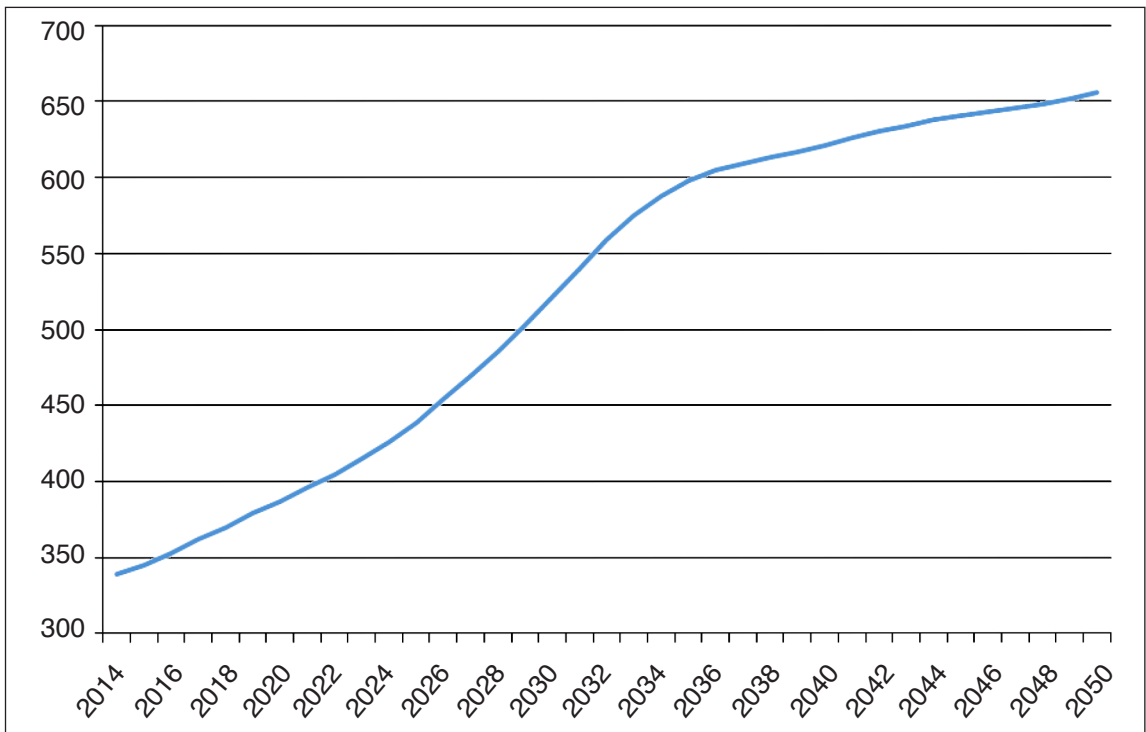
<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
2014	339	339	339
2015	345	345	345
2016	353	353	353
2017	362	362	362
2018	370	370	370
2019	379	379	379
2020	387	387	387
2021	396	396	396
2022	405	405	405
2023	415	415	415
2024	426	426	426
2025	439	439	439
2026	454	454	454
2027	469	469	469
2028	486	486	486
2029	503	503	503
2030	521	521	521
2031	540	540	540
2032	559	559	559
2033	575	575	575
2034	588	588	588
2035	598	598	598
2036	605	605	605
2037	609	609	609
2038	613	613	613
2039	617	617	617
2040	621	621	621
2041	626	626	626
2042	630	630	630



continue

Year	High	Medium	Low
2043	634	634	634
2044	638	638	638
2045	641	641	641
2046	643	643	643
2047	646	646	646
2048	648	648	648
2049	652	652	652
2050	656	656	656
Increase in 2050 compared to 2014	317 (93.5%)	317 (93.5%)	317 (93.5%)

Figure 3-8. Population of DPRK, aged 60+



### 3.3.2 Composition of population by sex and age (population pyramid)

Figure 3-9 shows the composition of population by age and sex in 2014. The age pyramid clearly shows the impact of political, economic and military events that affected the population growth during the last 70 years. Due to the calamities of the Korean War in early 1950s, the number of births was very few during this war period, so population of 60-64 age group that has been severely impacted is distorted. However, the pro-natalistic policy of the government after the war helped in increasing the population. The population has continued to increase until the end of 1960s and observations of age cohorts of 55-59 to 40-44 age groups in the pyramid clearly indicates the change.

Due to the Government plan to protect the health of children and women and encourage the participation of women in public life, fertility started declining from the 1970s and is visible when age cohorts of 35-39 and lower are examined. Despite declining fertility, the population has been growing due to the past momentum it gained during the implementation of the pro-natalistic policy.

Figure 3-9. Population of DPRK by age and sex, 2014

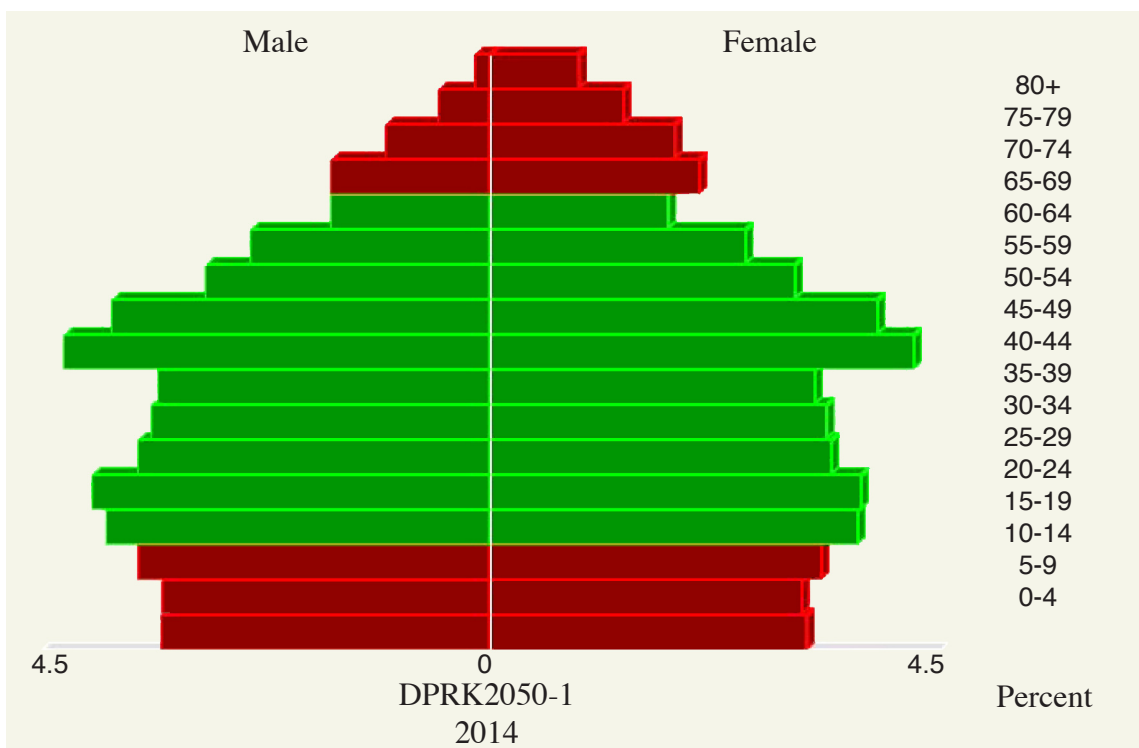
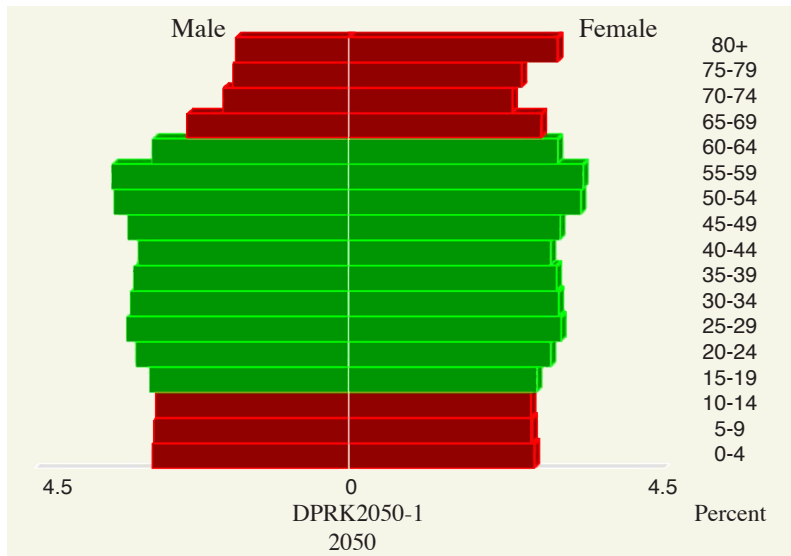


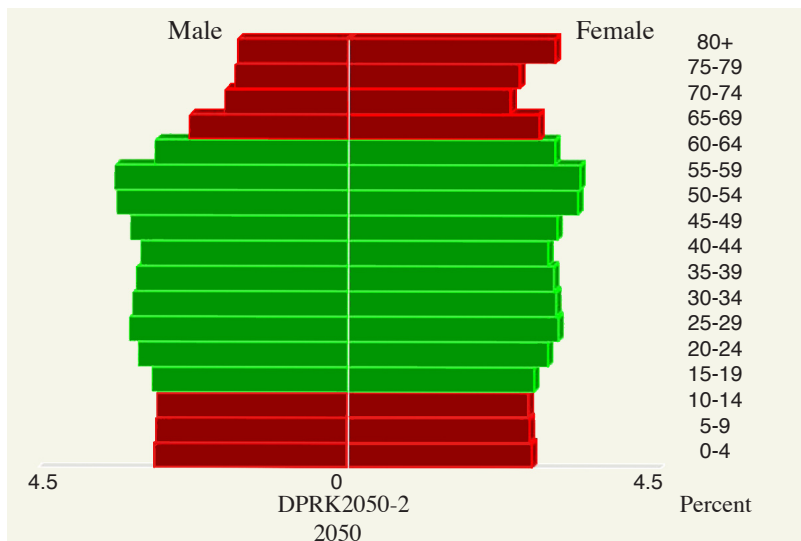
Figure 3-10 shows the composition of the population by sex and age according to the 3 fertility scenarios. The age pyramid of the 2050 population shows considerable ageing of the population with more females than males. The difference between the age structures in the 3 fertility scenarios is not very different because of marginal differences in the fertility assumptions.

Figure 3-10. Projected population of DPRK in 2015, according to 3 fertility scenarios

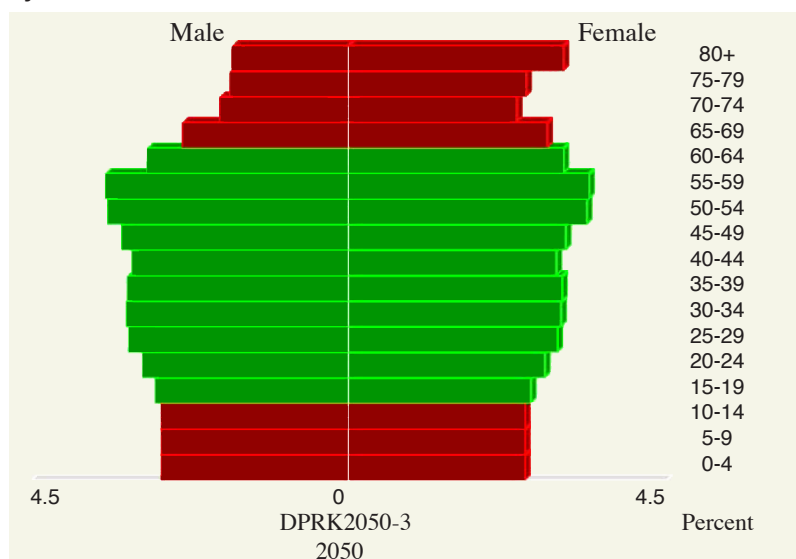
A. High fertility scenario



B. Medium fertility scenario



### C. Low fertility scenario



#### 3.3.3 Age distribution of population by sex and age

In this section, three broad age categories are considered: 0-14, 15-59 and 60+. Two indicators of an ageing population are presented. The first is the proportion of the population in each of these age categories. The second is the dependency ratio.

Changes in the percentages of the population aged 0-14, 15-59 and 60+ are shown in Table 3-12 and Figure 3-11. The main observations are:

- The proportion in the 0-14 age group decreases by 3.7 percentage points from 20.7% in 2014 to 17.0% in 2050.
- The proportion in the 15-59 age group decreases by 7.6 percentage points from 65.7% in 2014 to 58.1% in 2050.
- In contrast, the proportion in the 60+ age group increases by 11.3 percentage points from 13.6% in 2014 to 24.9% in 2050. At that time, one out of 4 persons will be 60 or more years old.

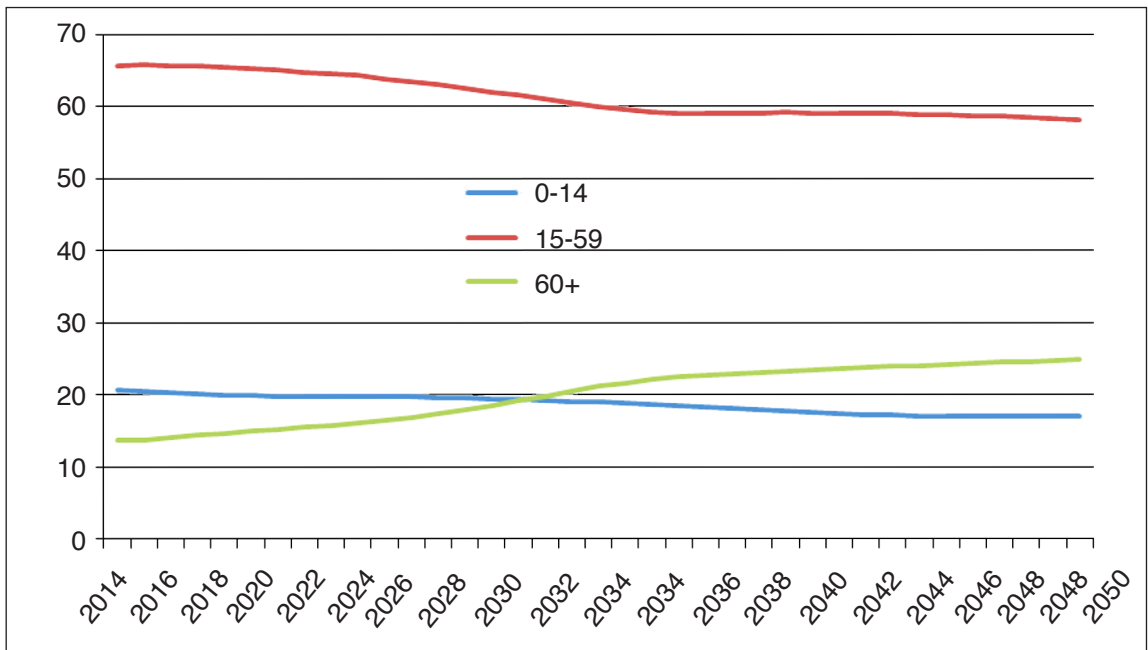
Table 3-12. Changing population composition in DPRK, according to medium scenario (%). Broad age categories.

Year	0-14	15-59	60+
2014	20.7	65.7	13.6
2015	20.5	65.8	13.7
2016	20.2	65.7	14.0
2017	20.0	65.6	14.3
2018	19.9	65.5	14.6

continue

<b>Year</b>	<b>0-14</b>	<b>15-59</b>	<b>60+</b>
2019	19.8	65.3	14.9
2020	19.8	65.0	15.2
2021	19.7	64.8	15.5
2022	19.7	64.6	15.7
2023	19.7	64.3	16.0
2024	19.7	63.9	16.5
2025	19.7	63.5	16.9
2026	19.6	63.0	17.4
2027	19.5	62.5	17.9
2028	19.5	62.1	18.5
2029	19.3	61.6	19.1
2030	19.2	61.0	19.8
2031	19.1	60.5	20.5
2032	18.9	60.0	21.1
2033	18.8	59.5	21.7
2034	18.6	59.2	22.2
2035	18.4	59.1	22.5
2036	18.2	59.0	22.7
2037	18.0	59.1	22.9
2038	17.8	59.1	23.1
2039	17.6	59.1	23.2
2040	17.5	59.1	23.4
2041	17.4	59.1	23.5
2042	17.2	59.1	23.7
2043	17.1	59.0	23.9
2044	17.1	58.9	24.0
2045	17.0	58.8	24.2
2046	17.0	58.7	24.3
2047	17.0	58.6	24.4
2048	17.0	58.5	24.6
2049	17.0	58.3	24.7
2050	17.0	58.1	24.9
Increase/decrease in 2050 compared to 2014	-3.7	-7.6	11.3

Figure 3-11. Changing population composition in DPRK, according to medium scenario, 2014- 2050 (%). Broad age categories.



The total dependency ratio is the ratio of the number of people aged 0-14 and 60+ years to the number of people of working ages (15-59 years). The old-age dependency ratio is the ratio of the population 60+ and the population of working age. The young age or child dependency ratio is the ratio of the number of persons below 15 to the size of the working age population (15-59). The trend in dependency ratios during the period 2014-2050 (Table 3-13 and Figure 3-12):

- As the number of birth is reduced, the young age dependency ratio decreases slowly by 2.2 percentage points from 31.5% in 2014 to 29.3% in 2050.
- On the contrary, the old age dependency ratio doubles from 20.7% in 2014 to 42.9% in 2050.
- Finally, the total dependency ratio increases sharply from 52.2% in 2014 to 68.8% in 2034 and then slowly to 72.2% in 2050.

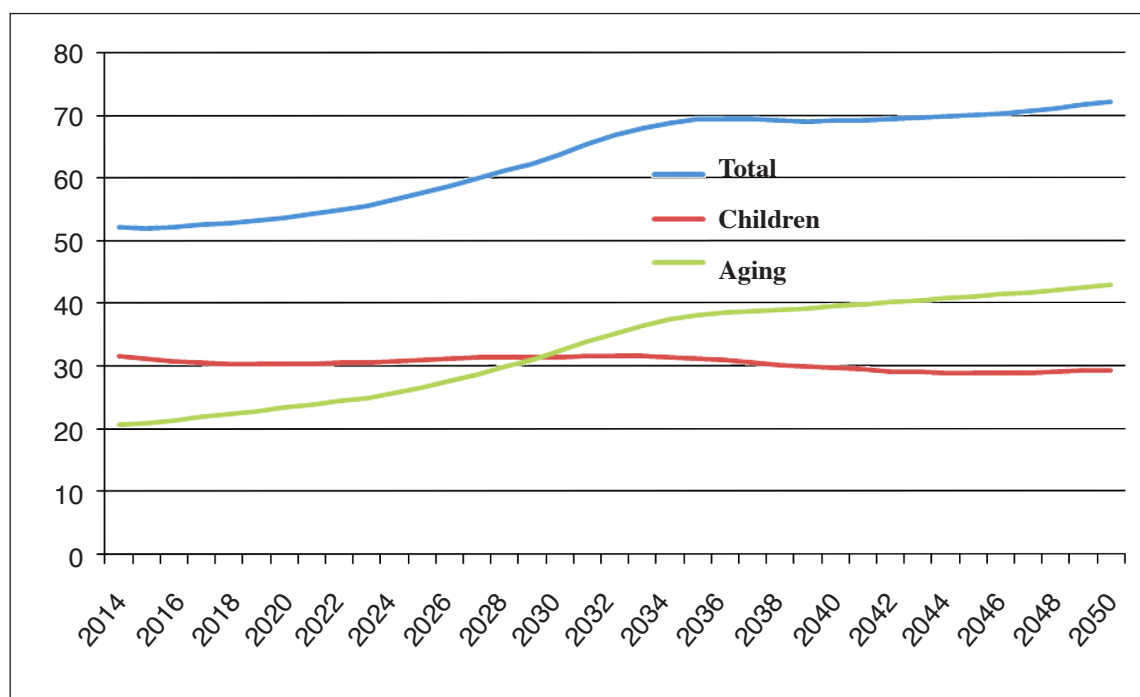
Table 3-13. Dependency ratio in DPRK, according to medium fertility scenario (%)

<b>Year</b>	<b>Children</b>	<b>Ageing</b>	<b>Total</b>
2014	31.5	20.7	52.2
2015	31.1	20.9	52.0
2016	30.8	21.4	52.2
2017	30.6	21.9	52.5
2018	30.4	22.3	52.7
2019	30.4	22.8	53.2
2020	30.4	23.3	53.7
2021	30.4	23.9	54.3
2022	30.5	24.4	54.9
2023	30.6	24.9	55.5
2024	30.8	25.8	56.6
2025	31.0	26.6	57.6
2026	31.1	27.6	58.7
2027	31.3	28.7	60.0
2028	31.3	29.8	61.1
2029	31.3	31.0	62.3
2030	31.4	32.4	63.8
2031	31.5	33.9	65.4
2032	31.6	35.2	66.8
2033	31.6	36.4	68.0
2034	31.4	37.4	68.8
2035	31.2	38.1	69.3
2036	30.9	38.5	69.4
2037	30.5	38.8	69.3
2038	30.2	39.0	69.2
2039	29.8	39.2	69.0
2040	29.6	39.5	69.1
2041	29.4	39.8	69.2
2042	29.1	40.2	69.3
2043	29.0	40.5	69.5
2044	28.9	40.8	69.7
2045	28.9	41.1	70.0

continue

Year	Children	Ageing	Total
2046	28.9	41.4	70.3
2047	28.9	41.7	70.6
2048	29.0	42.0	71.0
2049	29.2	42.4	71.6
2050	29.3	42.9	72.2
Increase/decrease in 2050 compared to 2014	-2.2	22.2	20.0

Figure 3-12. Dependency ratio in DPRK, according to medium fertility scenario, 2014- 2050 (%)





# CHAPTER 4. URBAN AND RURAL POPULATION PROJECTION

This chapter describes urban and rural population projections based on the national population projection. For this projection, the process and the affected factors of urban and rural population growth in the past were analysed. And it explains the appropriate assumptions and projected results of scenarios for further urbanization projection. An area is defined urban on the basis of population density and economic activity (see 2008 Census report).

## 4.1 The process and analysis of urban and rural population growth in the past

Urban and rural population growth between 1993 census, 2008 census and 2014 SDHS is shown in the below table (Table 4-1).

Table 4-1. Urban and rural population growth, 1993-2014

Indicator	Population			TFR		
	Urban (person)	Rural (person)	The rate of urban (%)	Urban	Rural	Difference
1993	12 501 217	8 021 134	60.9	1.96	2.57	0.61
2008	14 155 393	9 194 466	60.6	1.89	2.19	0.30
2014	14 809 396	9 404 114	61.2	1.84	1.97	0.13
Average annual growth rate, 1993-2008 (%)	0.83	0.91				
Average annual growth rate, 2008-2014 (%)	0.76	0.38				

Average annual growth rate of urban population during 15 years from 1993 to 2008 was 0.83%, about 0.1% lower than rural rate of 0.91%. It was because the rural TFR was higher than the urban TFR, resulting in higher average number of births per reproductive age woman.

As a result, between 1993 and 2008 the proportion of urban population was reduced by 0.3 percentage points from 60.9% to 60.6%. On the contrary, during 6 years between 2008 and 2014, the proportion of urban population increased by 0.6 percentage points from 60.6% to 61.2%. It is partially due to changes of administrative units. The administrative changes are a result of two developments. First, the government constructed satellite towns around Pyongyang and other municipalities because the Government did not, like some other countries, encourage the movement from rural to urban. Second, due to the economic development, some coal and mineral mining rural communities (administrative name is Ri) were classified into urban (administrative name is Up, Ku or Dong). For example, in 2013, 13 RIs administratively were changed into Dongs in Rason city, the international economic development area (Special Economic Zone).

Therefore, although the rural TFR was still higher than the urban, average annual growth rate of rural population (0.38%) was the half of urban (0.76%).

During the last 20 years, the difference of TFR between urban and rural has gradually reduced. It was 0.61 in 1993 but reduced by half to 0.3 in 2008. In 2014, it has further reduced by more than half of 2008 to 0.13 implying that rural fertility declined more rapidly than urban fertility. The more rapid decline in rural areas is likely due to the increase in modern contraceptive methods. The SDHS 2014 reveals that the difference in contraceptive prevalence rate between urban and rural areas reduced significantly since 2010. The Reproductive Health Survey (RHS-2010) indicated a difference in contraceptive prevalence (any method) as 7.5 percentage points (73.6 percent in urban areas and 66.1 percent in rural areas) while in 2014, the difference is less than one percent (78.4 percent in urban areas and 77.8 percent in rural areas). This has been mainly possible thanks to focused efforts on rural development.

## **4.2 Assumption of further urbanization and projection of urban and rural population**

There are several approaches to project urban and rural population. Generally, as mentioned in Chapter 2, the method of difference in growth rates of urban and rural is often used. However, that method is not appropriate in DPRK for urban and rural population projection.

As mentioned above, the growth rates of urban and rural between 1993 and 2008 could not be used in the current projection because the fertility at that time was higher than what it is now. Next, the growth rates of urban and rural areas between 2008 and 2014 were lower than those between 1993 and 2008 because of differences in fertility, but those rates do not reflect the reality due to the administrative changes in some regions. Therefore, the growth rates of urban and rural between 2008 and 2014 and the difference in growth rate could not be used in the projection either. These challenges lead to the conclusion that a DPRK-specific method should be applied in urban and rural population projection.

As mentioned above, the proportion of urban population sustained at about 61% during 20 years (1993-2014) in DPRK. Since the proportion urban remained stable while the difference in fertility rates gradually narrowed and the difference in growth rates reduced accordingly, it is reasonable and appropriate to apply the proportion urban in population projections. The migration from rural to urban, one of the main components in projection is too small to be considered.

The issue in applying this method is how to assume changes in proportion of urban population between 2014 and 2050.

In this report 3 scenarios are considered: low, high and medium.

- Low scenario – assuming that the proportion of urban population is sustained at the current level of 61.2%;
- High scenario – assuming that the current proportion of urban population (61.2%) gradually increases to 65% between 2014 and 2050;

The high scenario is in line with the goals set by the Government for the national economic development and its plan for creation of economic development zones and area-specific economic sectors considering the physiographical characteristics of the region. It is therefore expected that some communities (Ris) in rural areas will be changed as urban areas (Up, Ku or Dong) and the proportion of urban pop-

ulation will increase accordingly.

Considering the increase of the urban population during 6 years (2008-2014) by 0.6 percentage points, it can reasonably be assumed that the increase will continue and reach at least 3.6 percentage points during the coming period of 36 years (2014-2050). The proportion urban population in 2014 was 61.2%, and therefore an increase by 3.6 percentage points' results in a proportion urban of 64.8% in 2050, which is close to 65%.

- **Medium scenario** – assuming that the proportion of urban population will gradually increase to 63.0%, which represents the average of the low and the high scenarios.

Table 4-2 shows the assumed proportion urban population for each year between 2014 and 2050, according the three urbanization scenarios. It should be noted that the increase of urban population is not an outcome of the movement of the rural population to urban areas but of urban expansion resulting from economic development, as mentioned above.

Table 4-2. Assumed proportion of urban population, 2014-2050 (%)

<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
2014	61.20	61.20	61.20
2015	61.30	61.25	61.20
2016	61.40	61.30	61.20
2017	61.50	61.35	61.20
2018	61.60	61.40	61.20
2019	61.70	61.45	61.20
2020	61.80	61.50	61.20
2021	61.90	61.55	61.20
2022	62.00	61.60	61.20
2023	62.10	61.65	61.20
2024	62.20	61.70	61.20
2025	62.30	61.75	61.20
2026	62.40	61.80	61.20
2027	62.50	61.85	61.20
2028	62.60	61.90	61.20
2029	62.70	61.95	61.20
2030	62.80	62.00	61.20
2031	62.90	62.05	61.20

continue

<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
2032	63.00	62.10	61.20
2033	63.10	62.15	61.20
2034	63.20	62.20	61.20
2035	63.30	62.25	61.20
2036	63.40	62.30	61.20
2037	63.50	62.35	61.20
2038	63.60	62.40	61.20
2039	63.70	62.45	61.20
2040	63.80	62.50	61.20
2041	63.90	62.55	61.20
2042	64.00	62.60	61.20
2043	64.10	62.65	61.20
2044	64.20	62.70	61.20
2045	64.30	62.75	61.20
2046	64.40	62.80	61.20
2047	64.50	62.85	61.20
2048	64.60	62.90	61.20
2049	64.70	62.95	61.20
2050	64.80	63.00	61.20

Table 4-3 shows urban and rural population projections according to the 3 scenarios of the proportions of urban population and the medium fertility scenario.

Table 4-3. Urban and rural population projections according to 3 urbanization scenarios and medium fertility scenario (10,000)

<b>Year</b>	<b>High</b>		<b>Medium</b>		<b>Low</b>	
	<b>Urban</b>	<b>Rural</b>	<b>Urban</b>	<b>Rural</b>	<b>Urban</b>	<b>Rural</b>
2014	1525	967	1525	967	1525	967
2015	1534	968	1532	970	1531	971
2016	1543	970	1540	973	1538	975
2017	1552	972	1548	976	1545	979
2018	1561	973	1556	978	1551	983
2019	1570	975	1564	981	1558	987
2020	1579	976	1571	984	1564	991
2021	1588	978	1579	987	1570	996
2022	1597	979	1587	989	1577	999

continue

Year	High		Medium		Low	
	Urban	Rural	Urban	Rural	Urban	Rural
2023	1605	980	1594	991	1582	1003
2024	1614	981	1601	994	1588	1007
2025	1622	982	1608	996	1594	1010
2026	1630	982	1614	998	1599	1013
2027	1638	982	1620	1000	1603	1017
2028	1644	982	1625	1001	1607	1019
2029	1651	982	1631	1002	1611	1022
2030	1657	981	1636	1002	1614	1024
2031	1662	981	1640	1003	1618	1025
2032	1668	979	1644	1003	1620	1027
2033	1672	978	1647	1003	1622	1028
2034	1677	976	1650	1003	1624	1029
2035	1681	974	1653	1002	1625	1030
2036	1684	972	1655	1001	1625	1031
2037	1687	970	1657	1000	1626	1031
2038	1690	968	1659	999	1627	1031
2039	1693	965	1660	998	1627	1031
2040	1695	962	1661	996	1626	1031
2041	1697	959	1661	995	1625	1031
2042	1699	956	1662	993	1625	1030
2043	1701	952	1662	991	1624	1029
2045	1703	946	1662	987	1621	1028
2046	1704	942	1662	984	1619	1027
2047	1705	938	1661	982	1618	1025
2048	1705	934	1660	979	1615	1024
2049	1705	930	1659	976	1613	1022
2050	1704	926	1657	973	1610	1020
Increase/decrease in 2050 compared to 2014	179 (11.7%)	-41 (-4.2%)	132 (8.7%)	6 (0.6%)	85 (5.6%)	53 (5.5%)

Because of economic development and the change of some rural areas into urban, urban population in the high scenario will be 1.79 million (11.7%) larger than in 2014. In contrast, rural population will decrease by 410 thousand (4.2%) due to administrative changes in some regions.

If the proportion of urban population remains at the current level, urban and rural population will increase by 850,000 and 530,000 respectively, between 2014 and 2050 (Low scenario). In that scenario, the rates of increase are similar: 5.6% and 5.5%.

All the 3 scenarios assume that the urban population will continue to increase (Figure 4-1).

In the low scenario, the urban population it will increase until 2039 and decrease thereafter which is in line with the medium fertility scenario of the national population projection that indicates the onset of negative population growth.

Figure 4-1. Urban population growth according to 3 urbanization scenarios and medium fertility scenario, 2014-2050 (10,000)

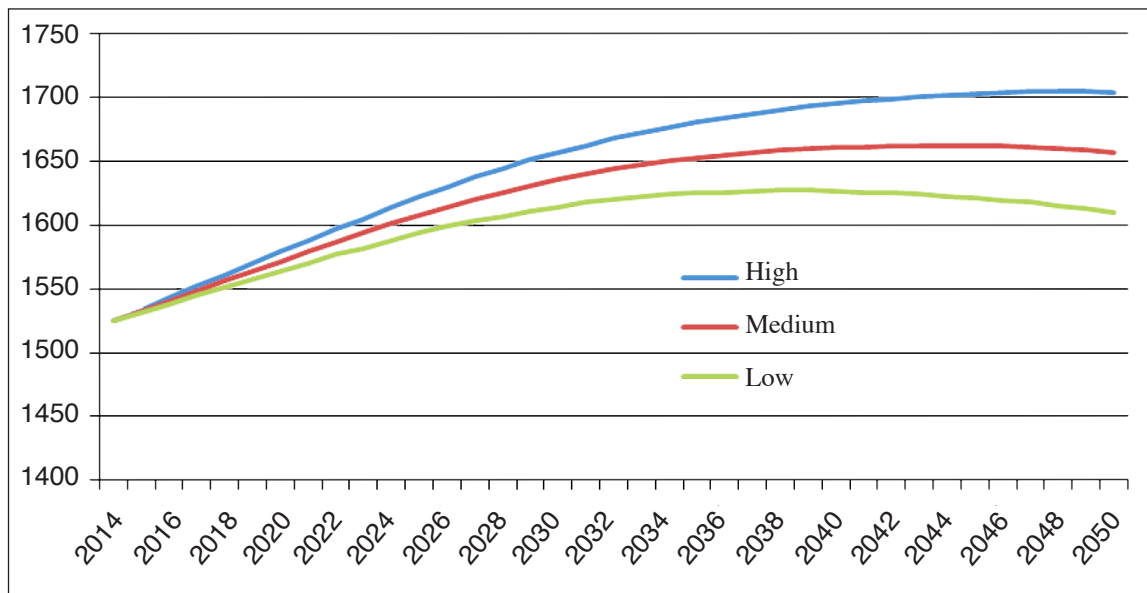


Figure 4-2 shows the projection change of the rural population according to the 3 scenarios. The higher increase of urban population assumed in the high scenario implies a more rapid decrease of the rural population. Specifically, according to the low scenario (no change in the current proportion of urban population) the rural population is expected to increase until 2039 and decrease afterwards. This is the

same trend as the national population. According to high scenario (the current proportion of urban population will be 64.8% in 2050) the rural population will increase until 2029 and decrease afterwards.

Figure 4-3 shows the trend of urban and rural population according to the medium urbanization scenario and the medium fertility scenario. In this scenario, the national population will increase until 2039 and decrease afterwards. The urban population increases continuously but starts to decrease from 2047, 8 years later than national population. The rural population will decrease from 2035, 11 years earlier than the urban population.

Figure 4-2. Rural population growth according to 3 urbanization scenarios and medium fertility scenario, 2014-2050 (10,000)

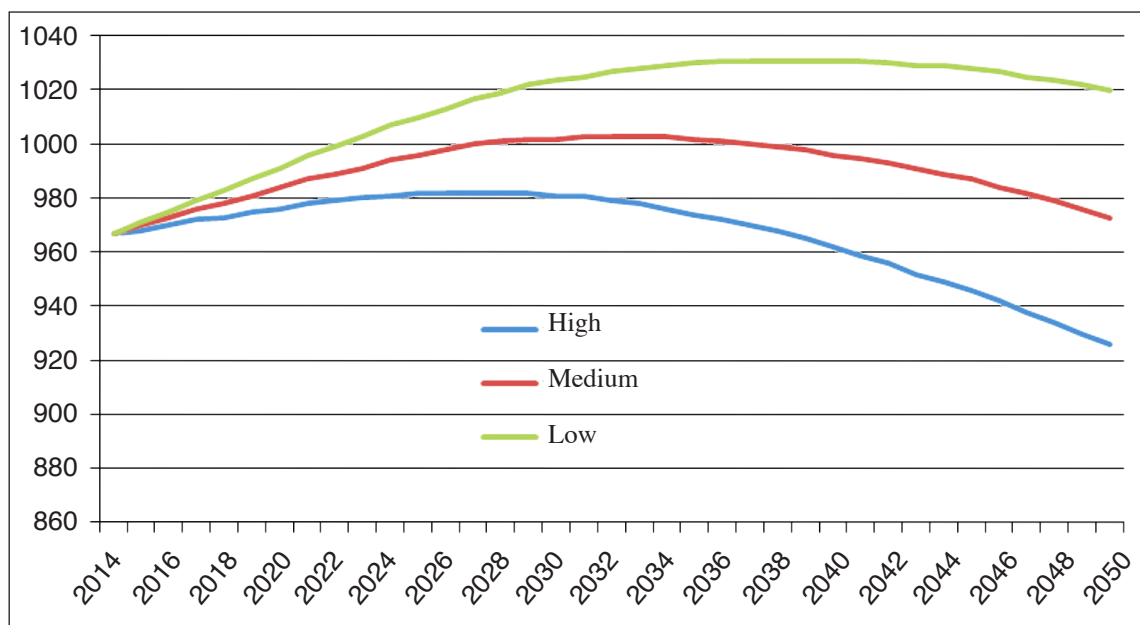
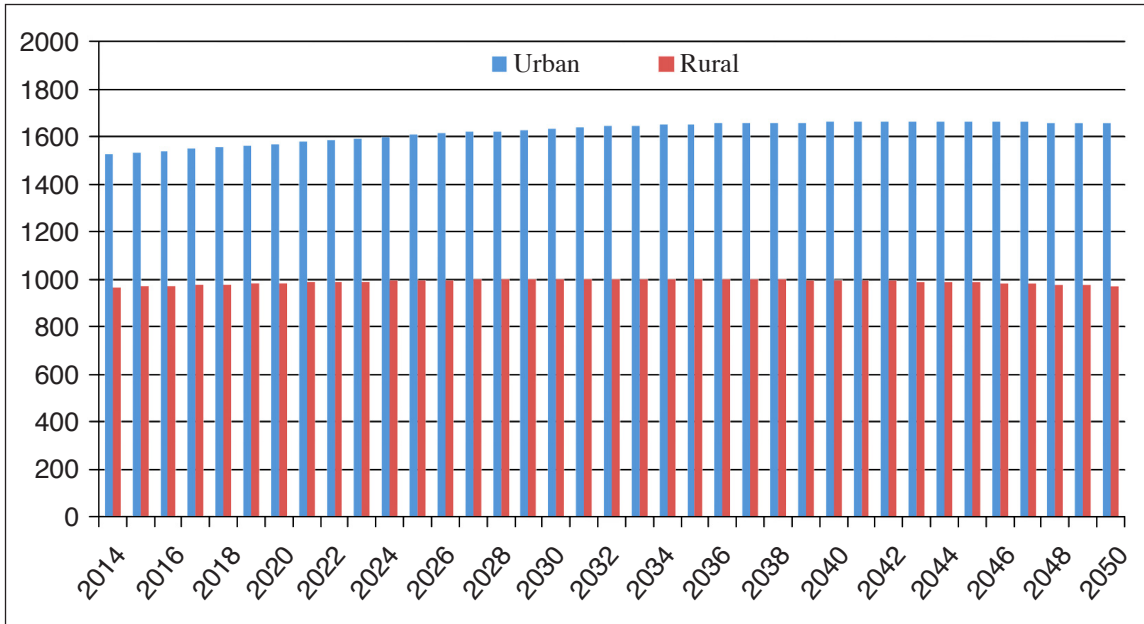




Figure 4-3. The urban and rural population according to medium urbanization scenario and medium fertility scenario, 2014-2050 (10,000)



# CHAPTER 5. FUNCTIONAL POPULATION PROJECTIONS

This chapter describes the results of three functional population projections. The first projection is of the enrolment in primary and secondary education. The results are intended to be used in national planning of education. The projection is based on school enrolment rates. The second functional projection is the labour force projection. The third functional projection is the projection of the elderly (60+) population by elderly persons requiring assistance in daily living and those having difficulties in mobility based on 2014 SDHS data.

## **5.1 Projection of enrolment in primary and secondary education**

In DPRK, the state law was proclaimed to enforce universal compulsory 12-year education from 2012 for primary and secondary education. According to the law, 4-year primary education was extended to 5-year education and the secondary education was divided into junior and senior middle school.

The 2008 Population Census and the 2014 SDHS showed that the enrolment rate of primary and secondary education has been 99.9% because in DPRK all children attend school except the few that are disabled or very sick. It means that the number of targeted children is nearly the same as the number of students in the schools. Therefore, the enrolment projection in primary, junior and senior middle school is based on the number of children at these ages.

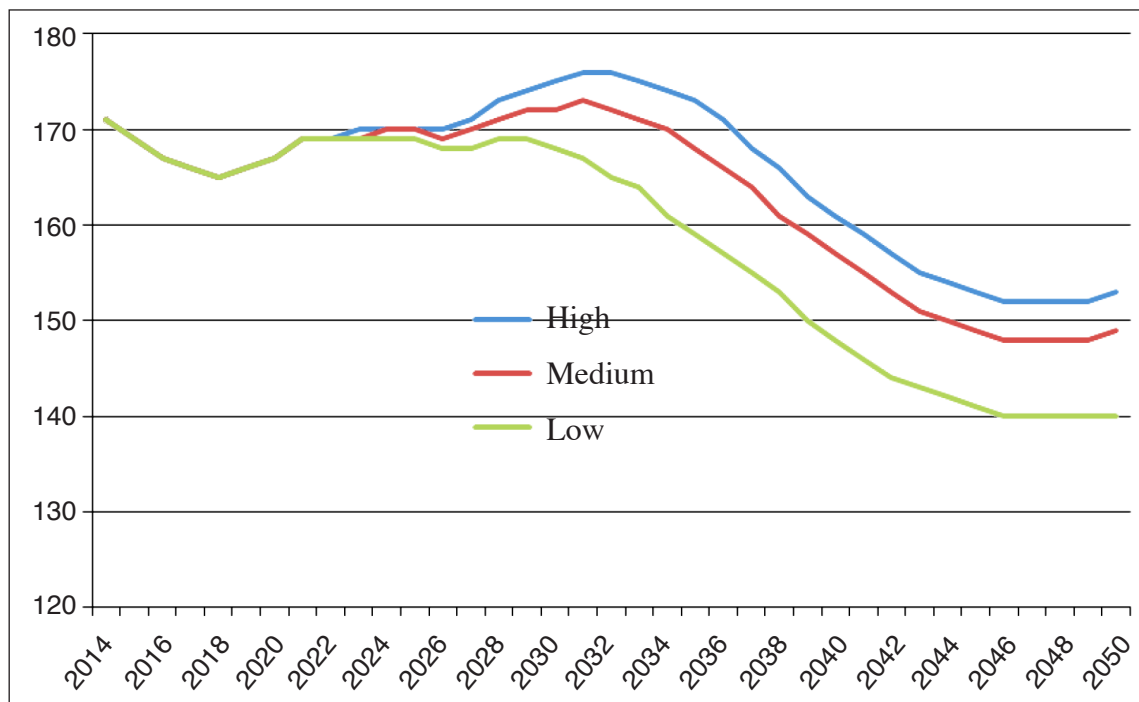
### **5.1.1 Enrolment projection in primary school**

The primary school age is from 7 to 11. The number of pupils in primary school is estimated from the 3 fertility scenarios are shown in Table 5-1 and Figure 5-1.

Table 5-1. Projection of pupils of primary school age according to 3 fertility scenarios, 2014-2050 (10,000)

<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
2014	171	171	171
2015	169	169	169
2016	167	167	167
2017	166	166	166
2018	165	165	165
2019	166	166	166
2020	167	167	167
2021	169	169	169
2022	169	169	169
2023	170	169	169
2024	170	170	169
2025	170	170	169
2026	170	169	168
2027	171	170	168
2028	173	171	169
2029	174	172	169
2030	175	172	168
2031	176	173	167
2032	176	172	165
2033	175	171	164
2034	174	170	161
2035	173	168	159
2036	171	166	157
2037	168	164	155
2038	166	161	153
2039	163	159	150
2040	161	157	148
2041	159	155	146
2042	157	153	144
2043	155	151	143
2044	154	150	142
2045	153	149	141
2046	152	148	140
2047	152	148	140
2048	152	148	140
2049	152	148	140
2050	153	149	140
Decrease in 2050 compared to 2014	- 18(- 10.5%)	- 22(- 12.9%)	- 31(- 18.1%)

Figure 5-1. Enrolment in primary education according to 3 fertility scenarios, 2014- 2050 (10,000)



The number of pupils of primary school age varies over time mainly because of the varying numbers of births in the recent past and the projected numbers in the future.

During the 20 years from 2014 to 2034, this number of pupils in primary schools remains at about 1.7 million but starts to decrease in 2034 due to the gradual reduction of fertility according to all the 3 fertility scenarios. In 2050, the number of pupils in primary schools is expected to be have decreased by 10.5%, 12.9% and 18.1% compared to 2014, according to respective scenarios.

However, the high and medium scenarios results in an increase in the enrolment from the 2nd half of 2020s to the 1st half of 2030s. The increase is a consequence of the demographic momentum and the resultant fertility assumptions.

### 5.1.2 Enrolment in junior middle school

The junior middle school age is from 12 to 14. The number of pupils in junior middle school is estimated for the 3 fertility scenarios. The results are shown in Table 5-2 and Figure 5-2.

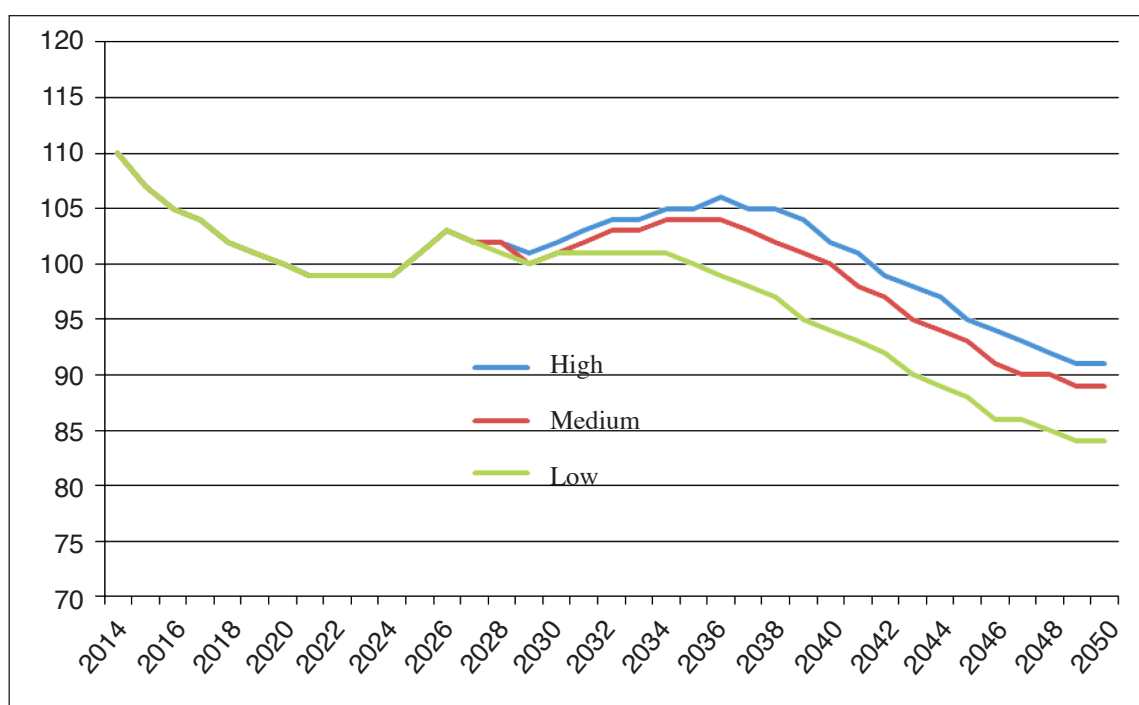
Table 5-2. Enrolment in junior middle school according to 3 fertility scenarios, 2014-2050 (10,000)

<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
2014	110	110	110
2015	107	107	107
2016	105	105	105
2017	104	104	104
2018	102	102	102
2019	101	101	101
2020	100	100	100
2021	99	99	99
2022	99	99	99
2023	99	99	99
2024	99	99	99
2025	101	101	101
2026	103	103	103
2027	102	102	102
2028	102	102	101
2029	101	100	100
2030	102	101	101
2031	103	102	101
2032	104	103	101
2033	104	103	101
2034	105	104	101
2035	105	104	100
2036	106	104	99
2037	105	103	98
2038	105	102	97
2039	104	101	95
2040	102	100	94
2041	101	98	93
2042	99	97	92
2043	98	95	90
2044	97	94	89
2045	95	93	88
2046	94	91	86
2047	93	90	86
2048	92	90	85
2049	91	89	84
2050	91	89	84
Decrease in 2050 compared to 2014	-19(-17.3%)	-21(-19.1%)	-26(-23.6%)

The enrolment in junior middle schools is expected to fluctuate because of changes in past and projected numbers of births and to decrease in all the 3 scenarios from the 2030s onwards. In 2050, the enrolment in junior middle schools is expected to be 17.3%, 19.1% 82

and 23.6% lower than the enrolment in 2014, according to respective scenario. Even the medium scenario shows a decrease of 210 thousand, one-fifth of the enrolment in 2014.

Figure 5-2. Enrolment in junior middle school according to 3 fertility scenarios, 2014-2050 (10,000)



### 5.1.3 Enrolment in senior middle school

The senior middle school age is from 15 to 17. The enrolment in senior middle schools is estimated for 3 fertility scenarios. The results are shown in Table 5-3 and Figure 5-3.

The growth of this population has the similar tendency as the junior middle students. In other words, the enrolment in senior middle schools is expected to increase a little at the latter half of 2030s and decrease in general in all the 3 scenarios. In 2050, the enrolment in senior middle schools is expected to be 19.8%, 22.4% and 25.9% lower than the enrolment in 2014, according to respective scenario.

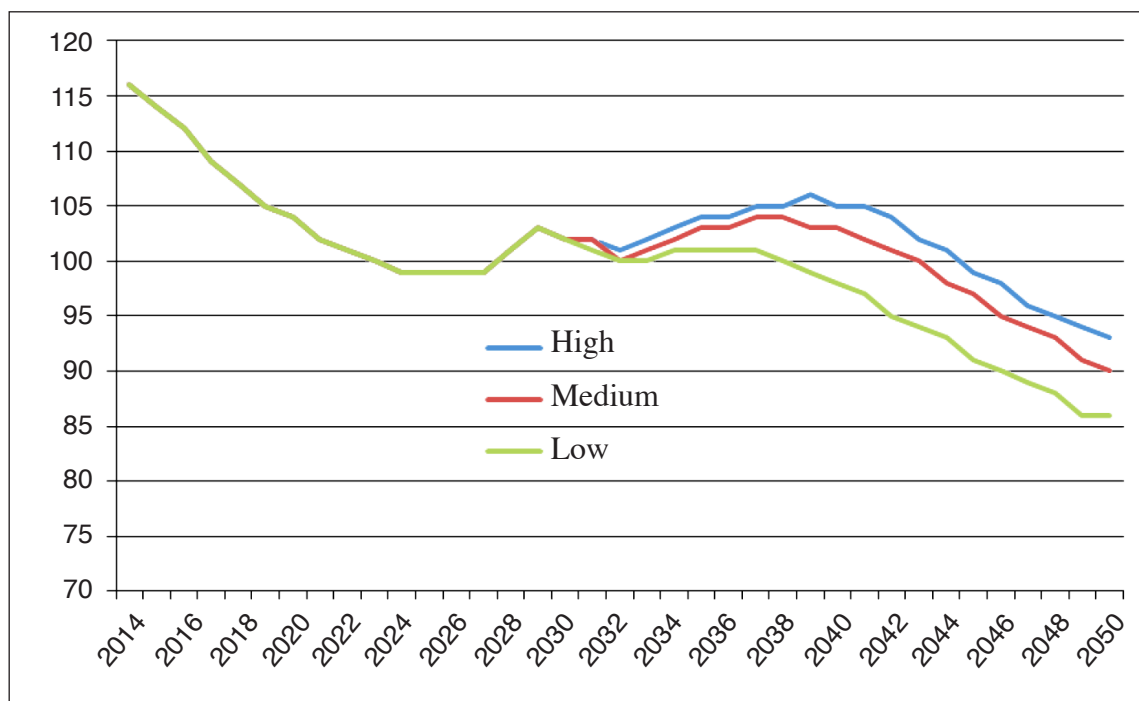
Table 5-3. Enrolment in senior middle school according to 3 fertility scenarios, 2014-2050 (10,000)

<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
2014	110	110	110
2015	107	107	107
2016	105	105	105
2017	104	104	104
2018	102	102	102
2019	101	101	101
2020	100	100	100
2021	99	99	99
2022	99	99	99
2023	99	99	99
2024	99	99	99
2025	101	101	101
2026	103	103	103
2027	102	102	102
2028	102	102	101
2029	101	100	100
2030	102	101	101
2031	103	102	101
2032	104	103	101
2033	104	103	101
2034	105	104	101
2035	105	104	100
2036	106	104	99
2037	105	103	98
2038	105	102	97
2039	104	101	95
2040	102	100	94
2041	101	98	93
2042	99	97	92
2043	98	95	90
2044	97	94	89
2045	95	93	88
2046	94	91	86
2047	93	90	86
2048	92	90	85
2049	91	89	84
2050	91	89	84
Decrease in 2050 compared to 2014	-19(-17.3%)	-21(-19.1%)	-26(-23.6%)

Because of the more rapid fertility decline in the period 1997 and 2008 than in the period following 2008, the rate of decrease in the enrolment in junior middle school is higher than that in primary school and the rate is higher for the enrolment in senior middle school than in junior middle school. For example, in the medium scenario, the decrease rate of primary school is 12.9% (220 thousand) but the rate of junior middle students is 19.1% (210 thousand) and that of senior middle students is 22.4% (260 thousand), meaning 6.2% and 9.5% higher than primary students, respectively.

In education planning, the estimated decreases of students by education categories should be considered when designing plans and implementing such plans as school modernization, teacher training, the state investment, material and technical provisions, etc will have to be factored in.

Figure 5-3. Enrolment in senior middle school according to 3 fertility scenarios, 2014-2050 (10,000)





## 5.2 Labour force projection

Labour force projections are obtained by applying labour force participation rates to the projected population. In this section, two variants of labour force projections are presented. The first uses average labour force participation rates in a population aged 16 and over. They are not disaggregated further by age and sex. The second variant applies age and sex-specific labour force participation rates. The rates are from the 2008 Census and the 2014 SDHS.

### 5.2.1 Projection of working population aged 16 years or older

In 2008 census, the information on individual normal activity during 6 months prior to enumeration was collected and analysed to get the data on economic activity status of population aged 16 or more years (Table 5-4). At the time of census, 70.2% of the population (excluding army) said “yes, now working”, meaning 7 out of ten 10 persons were currently working, 8 out of ten male and 6 out of 10 females.

Table 5-4. Economic activity status of population aged 16 years or older, 2008 (%)

Usual activity	Total	Male	Female
Total	100	100.0	100.0
Working	70.2	79.5	62.2
Studying	5.4	6.6	4.2
Incapacitated	0.9	1.2	0.7
Retired	18.1	12.5	23
Doing housework	5.3	0.1	9.8
Others	0.1	0.1	0.1

Source: 2008 population census

In the 2014 SDHS, data were collected from persons aged 16 years and above on usual activities during the last week prior to the survey. Although the reference period used in the census and survey differed greatly, the results showed a little difference. In the 2014 SDHS 78.3% of male and 61.6% of female were working with the total labour force participation rate of 69.3%, which was about 1% lower than the census.

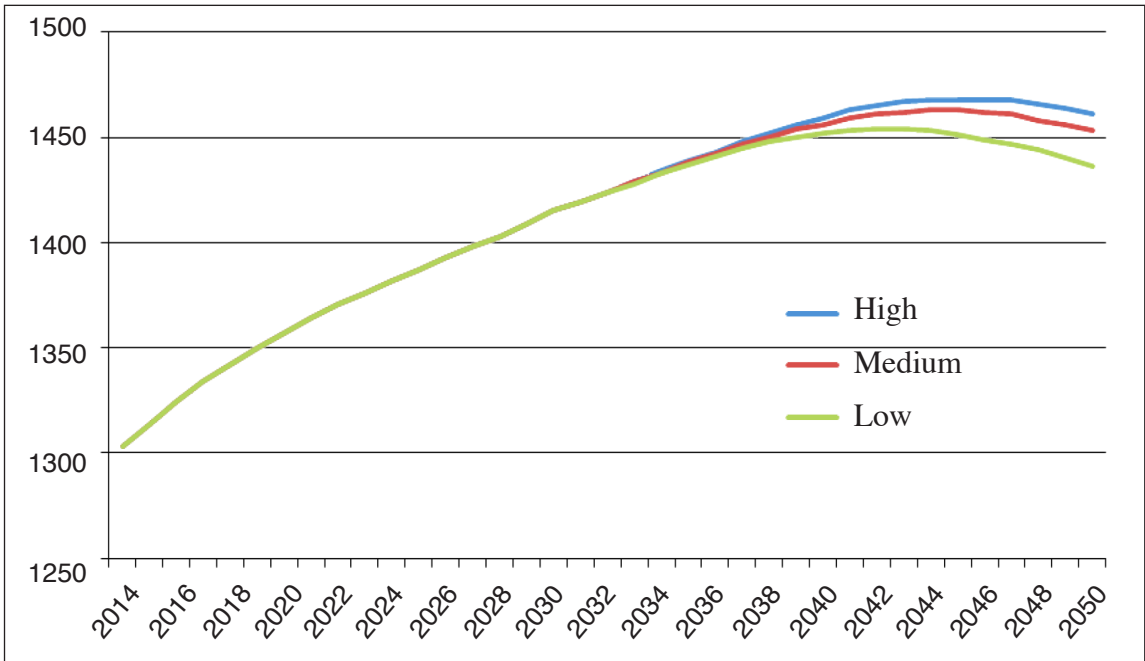
For the projection of the labour force or working population, the average labour force participation rate of the census and the survey results was used. The projections are for the civilian population (total population excluding army). The three fertility scenarios presented earlier in this report are considered.

Table 5-5. Projection of working population 16 years or older according to 3 fertility scenarios (10,000)

<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
2014	1303	1303	1303
2015	1314	1314	1314
2016	1324	1324	1324
2017	1334	1334	1334
2018	1342	1342	1342
2019	1350	1350	1350
2020	1357	1357	1357
2021	1364	1364	1364
2022	1371	1371	1371
2023	1376	1376	1376
2024	1382	1382	1382
2025	1387	1387	1387
2026	1393	1393	1393
2027	1398	1398	1398
2028	1403	1403	1403
2029	1409	1409	1409
2030	1415	1415	1415
2031	1419	1419	1419
2032	1424	1424	1424
2033	1429	1429	1428
2034	1434	1433	1433
2035	1439	1438	1437
2036	1443	1442	1441
2037	1448	1447	1445
2038	1452	1450	1448
2039	1456	1454	1450
2040	1459	1456	1452
2041	1463	1459	1453

Year	High	Medium	Low
2042	1465	1461	1454
2043	1467	1462	1454
2044	1468	1463	1453
2045	1468	1463	1451
2046	1468	1462	1449
2047	1468	1461	1447
2048	1466	1458	1444
2049	1464	1456	1440
2050	1461	1453	1436
Increase in 2050 comparing with 2014	158(12.1%)	150(11.5%)	133(10.2%)

Figure 5-4. Projection of working population 16 years or older according to 3 fertility scenarios, 2014- 2050 (10,000)



The labour force is expected to increase by 1.3 and 1.6 million persons between 2014 and 2050.

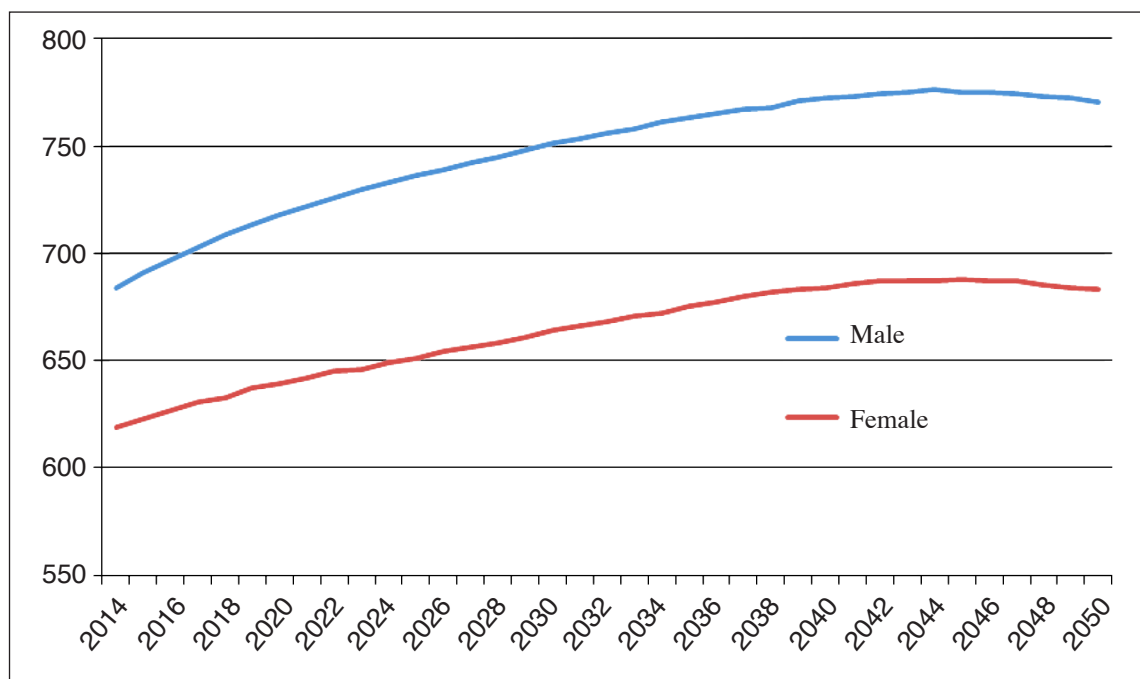
The working population by sex according to the medium fertility scenario is shown in Table 5-6 and Figure 5-5.

Table 5-6. Projection of working population 16 years or older by sex according to the medium fertility scenario (10,000)

<b>Year</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	<b>Difference</b>
2014	1303	684	619	65
2015	1314	691	623	68
2016	1324	697	627	70
2017	1334	703	631	72
2018	1342	709	633	76
2019	1350	713	637	76
2020	1357	718	639	79
2021	1364	722	642	80
2022	1371	726	645	81
2023	1376	730	646	84
2024	1382	733	649	84
2025	1387	736	651	85
2026	1393	739	654	85
2027	1398	742	656	86
2028	1403	745	658	87
2029	1409	748	661	87
2030	1415	751	664	87
2031	1419	753	666	87
2032	1424	756	668	88
2033	1429	758	671	87
2034	1433	761	672	89
2035	1438	763	675	88
2036	1442	765	677	88
2037	1447	767	680	87
2038	1450	768	682	86
2039	1454	771	683	88
2040	1456	772	684	88
2041	1459	773	686	87
2042	1461	774	687	87
2043	1462	775	687	88
2044	1463	776	687	89
2045	1463	775	688	87
2046	1462	775	687	88
2047	1461	774	687	87
2048	1458	773	685	88
2049	1456	772	684	88
2050	1453	770	683	87
Increase in 2050 compared to 2014	150(11.5%)	86(12.6%)	64(10.3%)	

In 2014, the number of working men was 650 thousand higher than that of women. The gap increases and reaches 870 thousand in 2050.

Figure 5-5. Projection of working population 16 years or older according to medium fertility scenario, by sex, 2014-2050 (10,000)



### 5.2.2 Projection of working population aged 16 years or older by sex and age

In this section, the labour force is projected by age and sex based on the age- and sex-specific proportions of working population in 2008 and 2014. The mean value of the labour force participation rates by age and sex in 2008 and 2014 was used in the projection. For the population aged 65 years or older, 2008 census data were used. The labour force participation rates (%) by age and sex are shown in Table 5-7. The labour force in 2014 by age and sex is obtained by multiplying the 2014 population by the mean values shown in Table 5-7.

Table 5-7. Percent distribution of working population 16 years or older by sex and age group (%)

Age group	2008 census		2014 SDHS		Mean	
	Male	Female	Male	Female	Male	Female
16–19	49.4	55.4	42.0	56.4	45.7	55.9
20–24	84.0	91.6	77.7	91.0	80.9	91.3
25–29	87.8	87.1	86.3	89.2	87.1	88.2
30–34	96.0	84.3	95.3	82.1	95.7	83.2
35–39	98.3	84.2	96.8	81.2	97.6	82.7
40–44	98.6	84.4	98.1	85.3	98.4	84.9
45–49	98.5	84.4	97.5	85.1	98.0	84.8
50–54	98.0	84.2	97.7	82.3	97.9	83.3
55–59	96.8	19.0	96.7	23.5	96.8	21.3
60–64	28.9	5.1	32.2	4.0	30.6	4.6
65–69	9.2	2.1	—	—	9.2	2.1
70+	3.4	0.6	—	—	3.4	0.6

As the results of the projection according to the medium fertility scenario by each year are too much to show in one table, table 5-8 shows the results of selected number of years, i.e., 2020, 2030, 2040 and 2050. The labour force of 13.03 million in 2014 increases to 13.28 million (0.25 million) in 2020, followed by a gradual decline to 12.87 million (by 0.41 million) in 2030, 12.63 million (by 0.24 million) in 2040 and 12.27 million (by 0.36 million) in 2050. It means that about one million of the labour force will be reduced between 2020 and 2050.

As described in Chapter 3, the number of people of working age is projected to increase during 8 years until 2022 and decline rapidly afterwards. Similarly, the labour force will increase towards 2022 and decline later (Table 5-8). The total labour force is 13.28 million in 2020 and decreases gradually to 12.87 million (by 0.41 million) in 2030, 12.63 million (by 0.24 million) in 2040 and 12.27 million (by 0.36 million) in 2050. Therefore, the size of the labour force is expected to reduce by 1 million persons between 2020 and 2050.

Table 5-8. Projection of working population 16 years or older according to medium fertility scenario, by sex and age group (selected years and numbers in ten thousands)

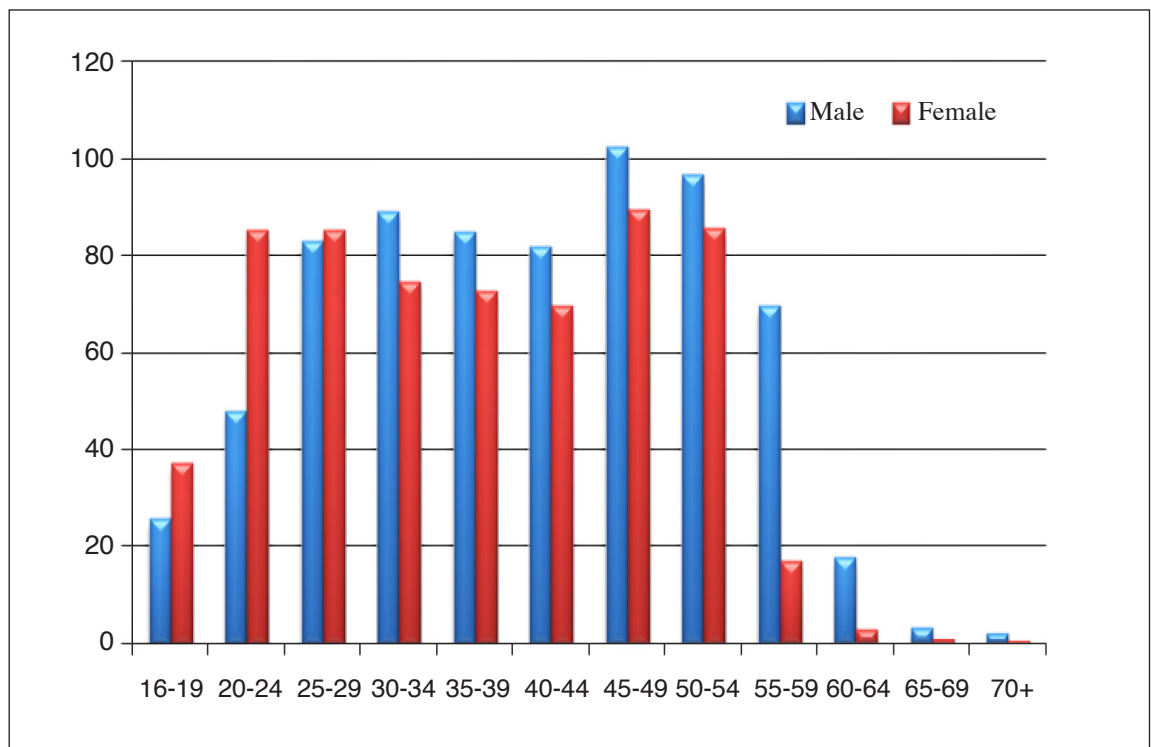
Age group	2020			2030		
	Total	Male	Female	Total	Male	Female
Total	1327.9	705.4	622.5	1286.9	701.0	85.9
16–19	63.1	25.8	37.3	60.1	23.9	36.2
20–24	133.5	48.1	85.4	109.4	36.8	72.6
25–29	168.4	83.0	85.4	145.6	70.8	74.8
30–34	164.1	89.2	74.9	171.2	93.0	78.2
35–39	157.9	85.1	72.8	179.9	99.7	80.2
40–44	151.7	82.1	69.6	165.5	90.0	75.5
45–49	192.4	102.6	89.8	157.7	84.0	73.7
50–54	182.5	96.8	85.7	143.8	77.2	66.6
55–59	86.6	69.6	17.0	113.4	91.9	21.5
60–64	20.7	17.7	3.0	30.0	25.7	4.3
65–69	4.2	3.3	0.9	6.7	5.2	1.5
70+	2.8	2.1	0.7	3.6	2.8	0.8
Age group	2040			2050		
	Total	Male	Female	Total	Male	Female
Total	1263.3	683.3	580.0	1227.0	671.0	556.0
16–19	61.1	24.9	36.2	53.4	21.2	32.2
20–24	113.6	39.2	74.4	108.5	36.8	71.7
25–29	140.4	67.3	73.1	143.1	69.1	74.0
30–34	147.0	79.6	67.4	150.6	81.6	69.0
35–39	156.4	86.1	70.3	150.0	82.2	67.8
40–44	173.6	93.9	79.7	149.0	81.1	67.9
45–49	179.1	97.7	81.4	155.3	85.0	70.3
50–54	159.3	86.0	73.3	166.5	89.9	76.6
55–59	94.2	76.4	17.8	109.7	89.9	19.8
60–64	24.5	21.1	3.4	27.3	23.5	3.8
65–69	8.9	7.0	1.9	7.5	5.9	1.6
70+	5.1	4.1	1.1	6.1	4.8	1.3

(\* excluding army)

The projection shows that at age 25-29, the number of working women exceeds the number of working men significantly (Figure 5-6). The difference is related to the fact that men at this age serve in the army. From age 30, most soldiers are discharged from the army and some women leave the labour force after marriage and delivery to do housework. Therefore, from age 30 onwards, the male working population exceeds the female working population.

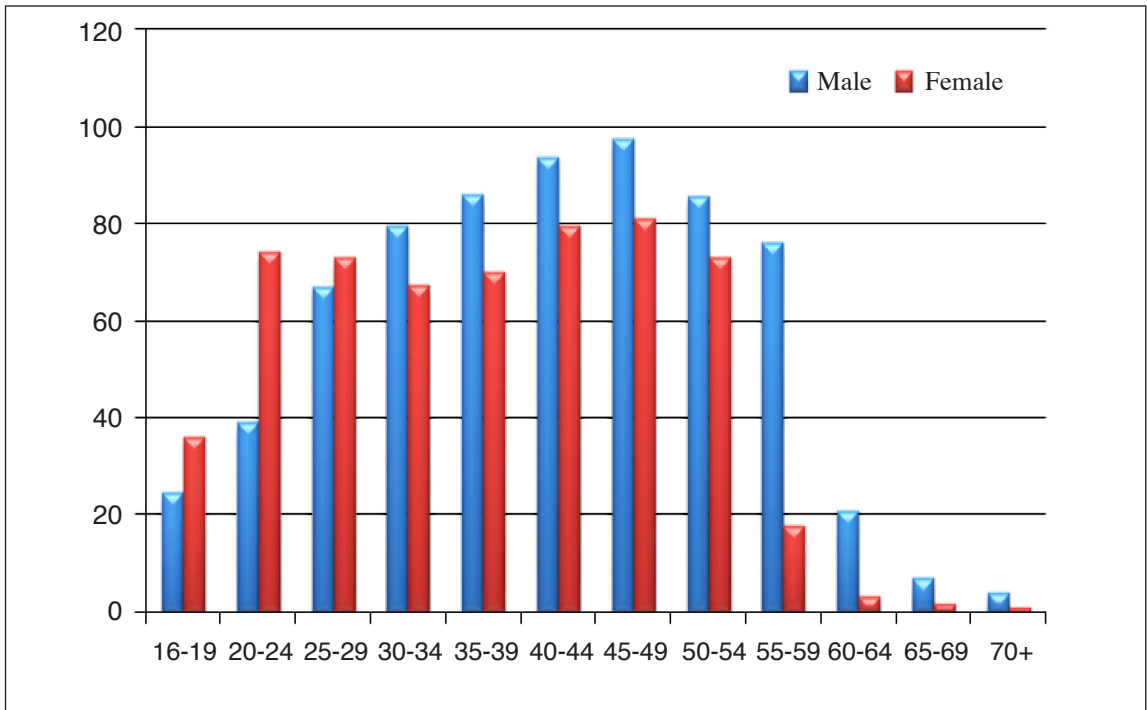
After age 55, the number of women working reduces widely because 55 is the official retirement age for women. The number of men working reduces after 60 years, the official retirement age for men. The number of working men aged 55-59 years is significantly higher in 2030 than in 2020, because the labour force of 45-49 years in 2020 was large due to the large cohorts born before 1975. The impact of changes in birth cohorts can be found in nearly all age groups. Compared to 2020, the labour force in 2050 will be smaller in all the age groups.

Figure 5-6. Projection of working population by age group and sex, 2020, 2030, 2040 and 2050 (10,000) 2020

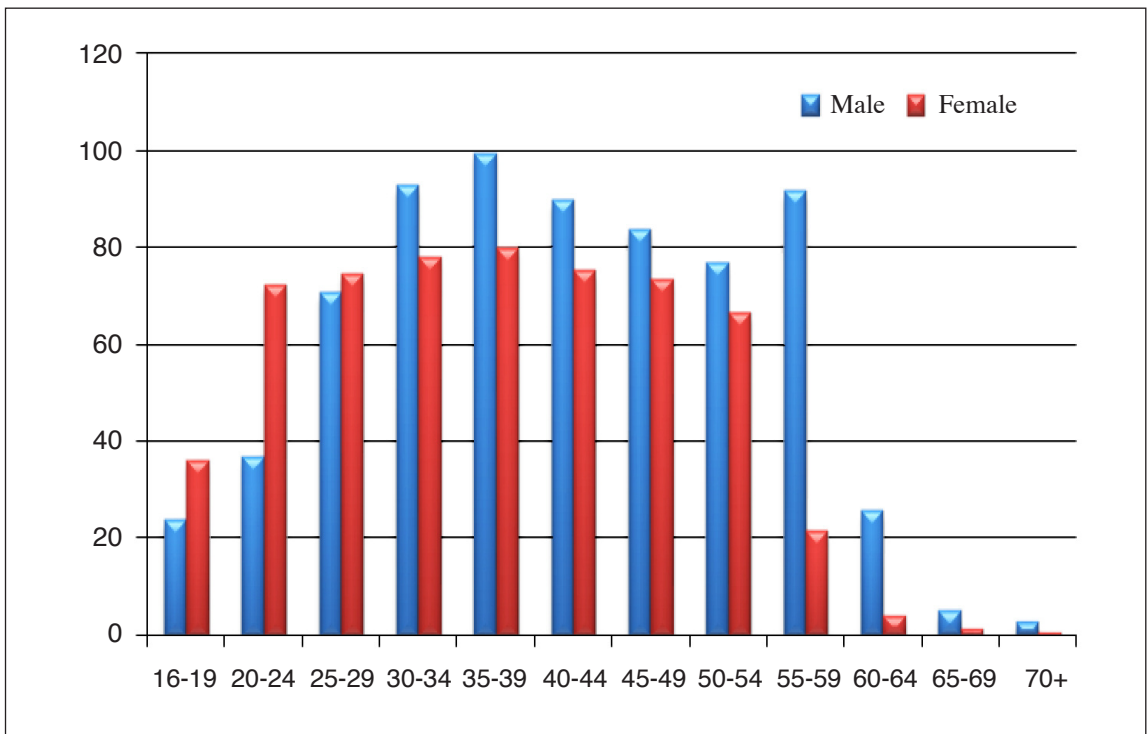




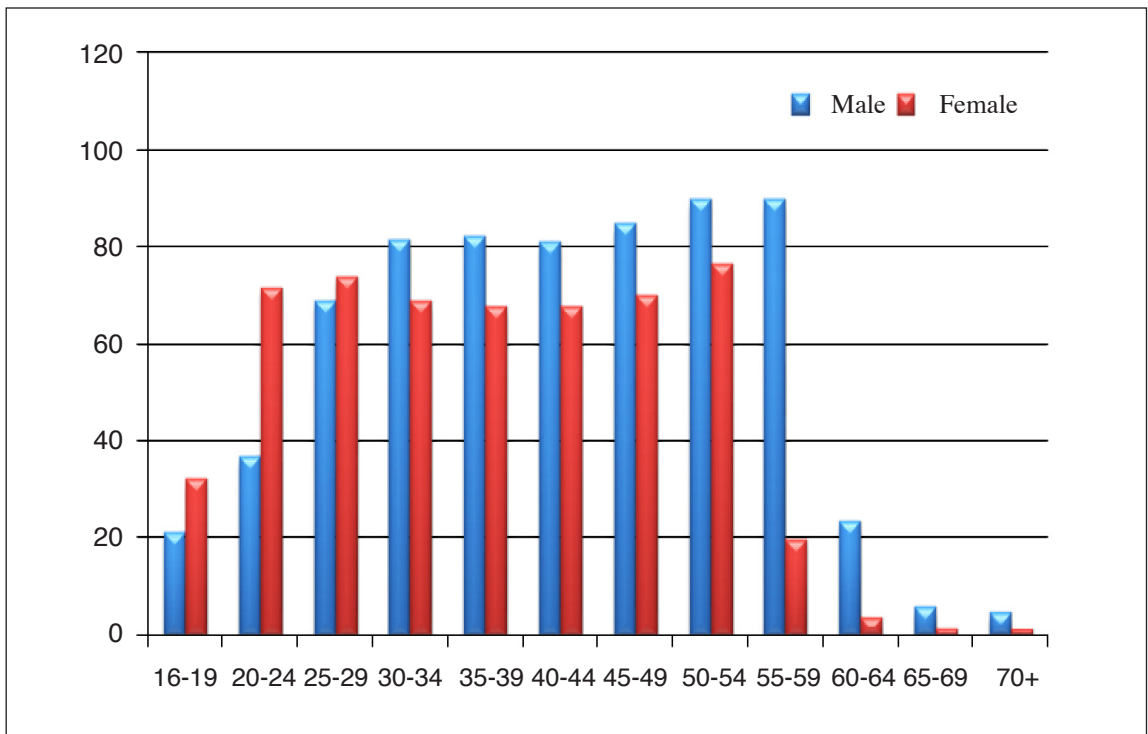
2030



2040



2050



In this Chapter, two different methods have been used to project the labour force. The projection that uses the total labour force participation rate reveals a constant increase of the working population.

The reason is that the same constant labour force participation rate is applied to the entire population 16 years or older. If age-specific labour force participation rates are used, a different picture emerges. As described in Chapter 3, the population aged 16 to 59 years, the majority of the working population 16 years or older, is projected to increase during 8 years until 2022 but decline rapidly from that point onwards.

The conclusion is clear. Using the total labour force participation rate to project the working population is incorrect and produces wrong projections. For an accurate projection of the labour force, age- and sex-specific labour force participation rate should be used.

The projection results recommend the Government to expect an increase in the

labour force until 2022 and a decrease later. Based on such favorable circumstances until 2022, the Government may 97

design and implement the rapid economic development strategy during 2014-2022.

As the economy develops and the living standards of the people improve, the life expectancy increased and the number of elderly aged 60 years or older increased. Therefore, if the legal retirement age is revised to 65 or 70 for males and 60 or 65 for females, the reduction in the labour force could be reversed. In addition, continuously improving the quality of the labour force through educational development and skill-set enhancement and use of modern technology the government may be able to cope with the challenges of reduction in the labour force.

### **5.3 Projection of the elderly population needing assistance and the elderly population with locomotor disability**

As mentioned above, population ageing is becoming faster. The number of elderly is expected to almost double from 3.39 million to 6.56 million (medium scenario) in the period 2014-2050. That figure reveals that the Government should make ageing a priority issue and plan and implement the national strategy of taking care of elderly to cope with socio-economic and health issues related with the further increase of older persons.

The 2014 SDHS provides information on the elderly. The survey covered self-reported health perceptions of elderly and included questions related to daily living and difficulties in performing activities. This section describes the projections of elderly needing assistance in various aspects of daily living and having any difficulties in performing activities.

The projections are based on the medium fertility scenario and the underlying assumption that the locomotor and other disabilities observed in the 2014 SDHS does not change in the projection period. The projections are shown in Table 5-9.

Table 5-9. Elderly population (60+) according to the medium fertility scenario, 2014-2050 (10,000)

<b>Year</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
2014	339	131	208
2015	345	134	211
2016	353	139	214
2017	362	144	218
2018	370	149	221
2019	379	153	226
2020	387	157	230
2021	396	162	234
2022	405	166	239
2023	415	171	244
2024	426	176	250
2025	439	182	257
2026	454	189	265
2027	469	197	272
2028	486	205	281
2029	503	213	290
2030	521	221	300
2031	540	230	310
2032	559	239	320
2033	575	246	329
2034	588	252	336
2035	598	256	342
2036	605	259	346
2037	609	261	348
2038	613	262	351
2039	617	264	353
2040	621	266	355
2041	626	267	359
2042	630	269	361
2043	634	271	363
2044	638	272	366
2045	641	273	368
2046	643	274	369
2047	646	275	371
2048	648	277	371
2049	652	279	373
2050	656	281	375
Increase in 2050 compared to 2014	317(93.5%)	150(114.5%)	167(80.3%)

### 5.3.1 Projection of elderly needing assistance in activities of daily living

Activities of Daily Living (ADLs) are defined as feeding, bathing, dressing, toilet, continence, etc. Normally, the older persons becoming older feel difficulties in ADLs and then require assistance from others, use mechanical tools or require both. The types and level of dependence of these assistances are very important in planning caretaking, living approaches and health care of elderly in either family or facilities taking care of them.

The 2014 SDHS distinguished three levels of dependence in ADLs like feeding, bathing, dressing, toilet and continence: “Do not require assistance”, “Require partial assistance” and “Require full assistance”. The proportions of older persons requiring partial or full assistance are shown in Table 5-10.

These figures and the medium fertility scenario are used to project the number of elderly people requiring assistance. Note that the projected elderly population is the same in the low, high and medium fertility scenarios. First, total projections by sex are considered. Projections by age and sex are considered next. The disability categories are considered one by one.

Table 5-10. Proportion of 60+ years old persons requiring partial or full assistance in ADLs by sex and age group (%)

ADL	Sex			Age group		
	Total	Male	female	60–69	70–79	80+
Bathing	7.2	7.0	7.4	4.4	8.6	20.0
Dressing	5.2	4.7	5.5	3.0	11.8	13.6
Toilet	3.6	3.5	3.7	2.2	8.4	11.9
Mobility	3.3	3.3	3.3	2.1	4.0	8.2
Incontinence	2.9	3.1	2.0	1.6	5.1	8.4
Feeding	1.8	1.9	1.8	1.0	2.3	5.1

Source: 2014 SDHS Report, p. 113.

## a. Bathing

A person who needs assistance in bathing has physical difficulties. The number of persons requiring partial or full assistance is expected to increase fast because the population is ageing rapidly. During the period 2014-2050, the male population requiring assistance will more than double (increase 114.1%) and the female population requiring assistance will increase by more than 80% (see Table 5-11 and Figure 5-7)b. Dressing

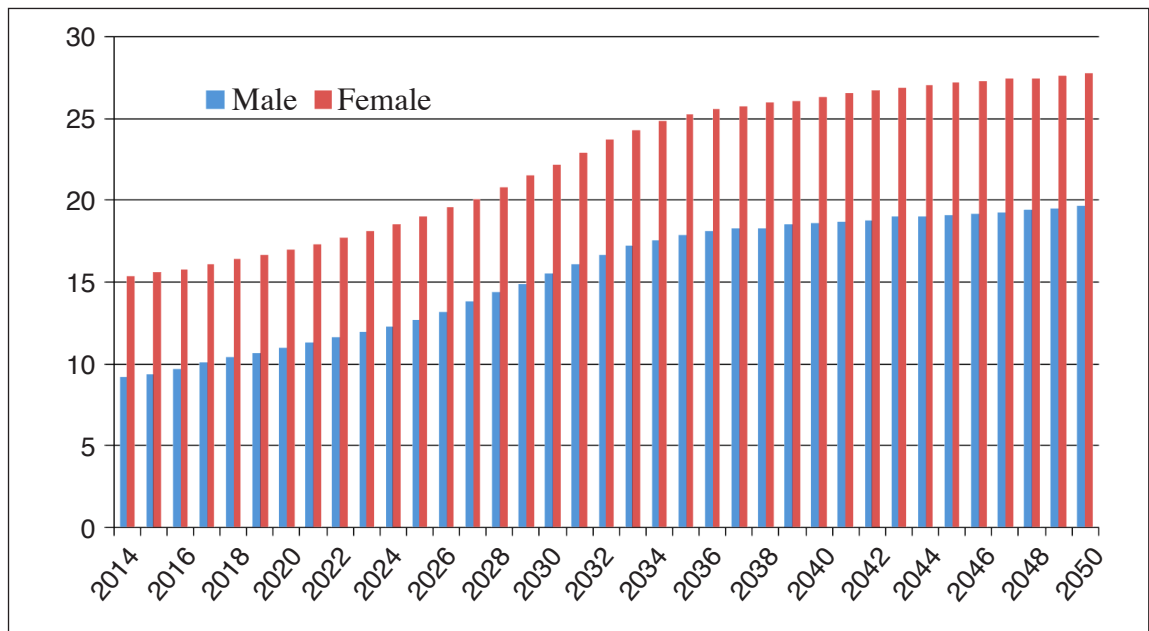
Table 5-11. The number of older persons requiring partial or full assistance in bathing, by sex (10,000)

<b>Year</b>	<b>Total</b>	<b>Male</b>	<b>female</b>
2014	24.6	9.2	15.4
2015	25.0	9.4	15.6
2016	25.5	9.7	15.8
2017	26.2	10.1	16.1
2018	26.8	10.4	16.4
2019	27.4	10.7	16.7
2020	28.0	11.0	17.0
2021	28.6	11.3	17.3
2022	29.3	11.6	17.7
2023	30.1	12.0	18.1
2024	30.8	12.3	18.5
2025	31.7	12.7	19.0
2026	32.8	13.2	19.6
2027	33.9	13.8	20.1
2028	35.2	14.4	20.8
2029	36.4	14.9	21.5
2030	37.7	15.5	22.2
2031	39.0	16.1	22.9
2032	40.4	16.7	23.7
2033	41.5	17.2	24.3
2034	42.5	17.6	24.9
2035	43.2	17.9	25.3

continue

Year	Total	Male	female
2036	43.7	18.1	25.6
2037	44.1	18.3	25.8
2038	44.3	18.3	26.0
2039	44.6	18.5	26.1
2040	44.9	18.6	26.3
2041	45.3	18.7	26.6
2042	45.5	18.8	26.7
2043	45.9	19.0	26.9
2044	46.1	19.0	27.1
2045	46.3	19.1	27.2
2046	46.5	19.2	27.3
2047	46.8	19.3	27.5
2048	46.9	19.4	27.5
2049	47.1	19.5	27.6
2050	47.5	19.7	27.8
Increase in 2050 compared to 2014	22.9(93.1%)	10.5(114.1%)	12.4(80.1%)

Figure 5-7. The number of older persons requiring partial or full assistance in bathing, by sex (10,000)



## b. Dressing

The 2014 SDHS revealed that 5.2% of elderly require partial or full assistance to put on and off the dress. That number of persons requiring assistance is expected to increase from about 180 thousand in 2014 to 340 thousand in 2050, i.e., by 92%. This number is smaller than the number of bathing but its rate of increase is similar.

The number of males requiring assistance will increase by 112.9% and the number of females by 80.7% (Table 5-12 and Figure 5-8).

Table 5-12. The number of older persons requiring partial or full assistance in dressing, 2014-2050 (10,000)

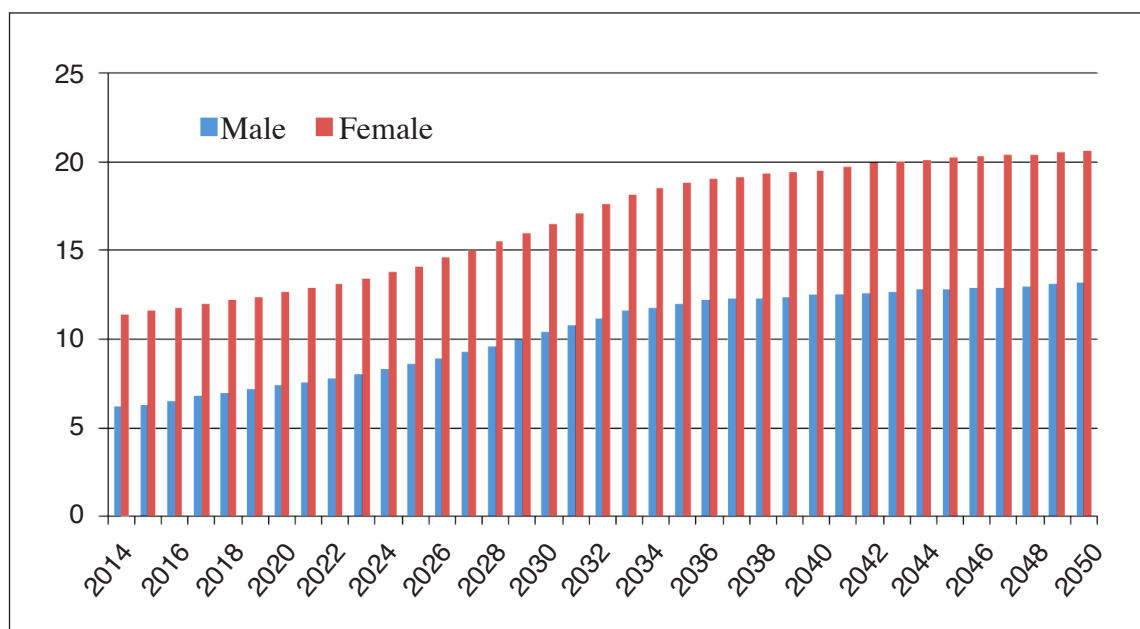
<b>Year</b>	<b>Total</b>	<b>Male</b>	<b>female</b>
2014	17.6	6.2	11.4
2015	17.9	6.3	11.6
2016	18.3	6.5	11.8
2017	18.8	6.8	12.0
2018	19.2	7.0	12.2
2019	19.6	7.2	12.4
2020	20.1	7.4	12.7
2021	20.5	7.6	12.9
2022	20.9	7.8	13.1
2023	21.4	8.0	13.4
2024	22.1	8.3	13.8
2025	22.7	8.6	14.1
2026	23.5	8.9	14.6
2027	24.3	9.3	15.0
2028	25.1	9.6	15.5
2029	26.0	10.0	16.0
2030	26.9	10.4	16.5
2031	27.9	10.8	17.1
2032	28.8	11.2	17.6
2033	29.7	11.6	18.1
2034	30.3	11.8	18.5
2035	30.8	12.0	18.8
2036	31.2	12.2	19.0



continue

Year	Total	Male	female
2037	31.4	12.3	19.1
2038	31.6	12.3	19.3
2039	31.8	12.4	19.4
2040	32.0	12.5	19.5
2041	32.2	12.5	19.7
2042	32.5	12.6	19.9
2043	32.7	12.7	20.0
2044	32.9	12.8	20.1
2045	33.0	12.8	20.2
2046	33.2	12.9	20.3
2047	33.3	12.9	20.4
2048	33.4	13.0	20.4
2049	33.6	13.1	20.5
2050	33.8	13.2	20.6
Increase in 2050 compared to 2014	16.2(92.0%)	7.0(112.9%)	9.2(80.7%)

Figure 5-8. Number of older persons requiring partial or full assistance in dressing, 2014-2050 (10,000)



### c. Toilet

In 3.5% of elderly males and 3.7% of elderly females required partial or full assistance in using toilet, about 50 thousand males and 80 thousand females. In 2050, 100 thousand males and 140 thousand females will require assistance if the current percentage does not change. The ratio of number of females requiring assistance over number of males will decline from 1.7 in 2014 to 1.4 in 2050 (Table 5-13 and Figure 5-9).

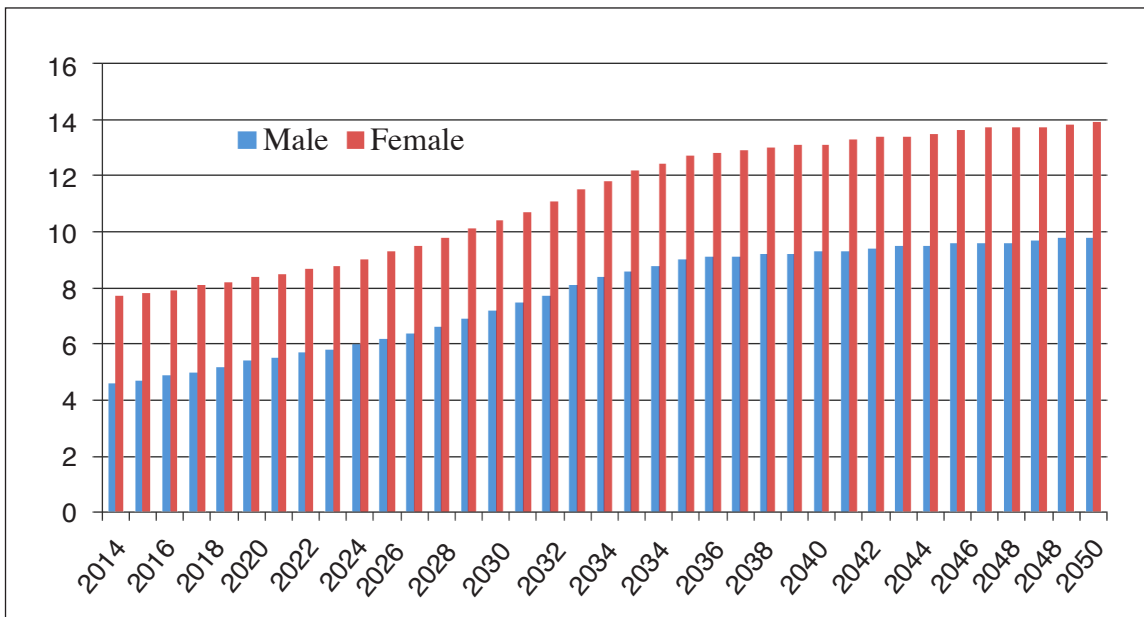
Table 5-13. Number of older persons requiring partial or full assistance in using toilet, 2014-2050(10,000)

<b>Year</b>	<b>Total</b>	<b>Male</b>	<b>female</b>
2014	12.3	4.6	7.7
2015	12.5	4.7	7.8
2016	12.8	4.9	7.9
2017	13.1	5.0	8.1
2018	13.4	5.2	8.2
2019	13.8	5.4	8.4
2020	14.0	5.5	8.5
2021	14.4	5.7	8.7
2022	14.6	5.8	8.8
2023	15.0	6.0	9.0
2024	15.5	6.2	9.3
2025	15.9	6.4	9.5
2026	16.4	6.6	9.8
2027	17.0	6.9	10.1
2028	17.6	7.2	10.4
2029	18.2	7.5	10.7
2030	18.8	7.7	11.1
2031	19.6	8.1	11.5
2032	20.2	8.4	11.8
2033	20.8	8.6	12.2
2034	21.2	8.8	12.4
2035	21.7	9.0	12.7
2036	21.9	9.1	12.8

continue

Year	Total	Male	female
2037	22.0	9.1	12.9
2038	22.2	9.2	13.0
2039	22.3	9.2	13.1
2040	22.4	9.3	13.1
2041	22.6	9.3	13.3
2042	22.8	9.4	13.4
2043	22.9	9.5	13.4
2044	23.0	9.5	13.5
2045	23.2	9.6	13.6
2046	23.3	9.6	13.7
2047	23.3	9.6	13.7
2048	23.4	9.7	13.7
2049	23.6	9.8	13.8
2050	23.7	9.8	13.9
Increase in 2050 compared to 2014	11.4 (92.7%)	5.2(113.0%)	6.2(80.5%)

Figure 5-9. Number of older persons requiring partial or full assistance in using toilet, 2014-2050(10,000)



#### d. Mobility

In 2014, 3.3%, of the population required partial or full assistance to walk, get in and out of bed, and get into and out of a chair. The percentage is the same in both sexes.

The number of elderly persons requiring assistance in mobility will increase from 112 thousand in 2014 to 217 thousand in 2050 (Table 5-14 and Figure 5-10).

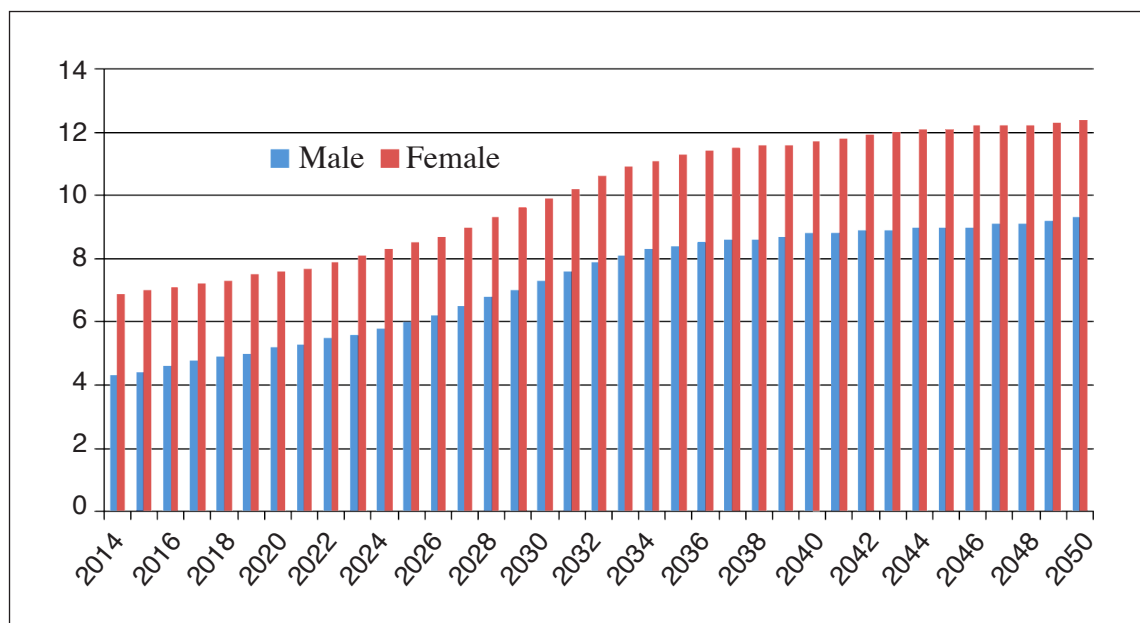
Table 5-14. Number of older persons requiring partial or full assistance in mobility, 2014-2050 (10,000)

<b>Year</b>	<b>Total</b>	<b>Male</b>	<b>female</b>
2014	11.2	4.3	6.9
2015	11.4	4.4	7.0
2016	11.7	4.6	7.1
2017	12.0	4.8	7.2
2018	12.2	4.9	7.3
2019	12.5	5.0	7.5
2020	12.8	5.2	7.6
2021	13.0	5.3	7.7
2022	13.4	5.5	7.9
2023	13.7	5.6	8.1
2024	14.1	5.8	8.3
2025	14.5	6.0	8.5
2026	14.9	6.2	8.7
2027	15.5	6.5	9.0
2028	16.1	6.8	9.3
2029	16.6	7.0	9.6
2030	17.2	7.3	9.9
2031	17.8	7.6	10.2
2032	18.5	7.9	10.6
2033	19.0	8.1	10.9
2034	19.4	8.3	11.1
2035	19.7	8.4	11.3
2036	19.9	8.5	11.4

continue

Year	Total	Male	female
2037	20.1	8.6	11.5
2038	20.2	8.6	11.6
2039	20.3	8.7	11.6
2040	20.5	8.8	11.7
2041	20.6	8.8	11.8
2042	20.8	8.9	11.9
2043	20.9	8.9	12.0
2044	21.1	9.0	12.1
2045	21.1	9.0	12.1
2046	21.2	9.0	12.2
2047	21.3	9.1	12.2
2048	21.3	9.1	12.2
2049	21.5	9.2	12.3
2050	21.7	9.3	12.4
Increase in 2050 compared to 2014	10.5(93.8%)	5.0(116.3%)	5.5(79.7%)

Figure 5-10. Number of older persons requiring partial or full assistance in mobility, 2014-2050 (10,000)



## e. Incontinence

In 2014, the number of older persons required full or partial assistance in incontinence was about 40 thousand males and the same number of females, a total of 80 thousand. The percentage needing assistance was 3.1 for males and 2.8 for females. In 2050 the number of males requiring assistance is expected to be around 90 thousand and the number of females is around 70 thousand. The number of males is expected to increase more rapid (1.2 times) than the number of females (Table 5-15 and Figure 5-11).

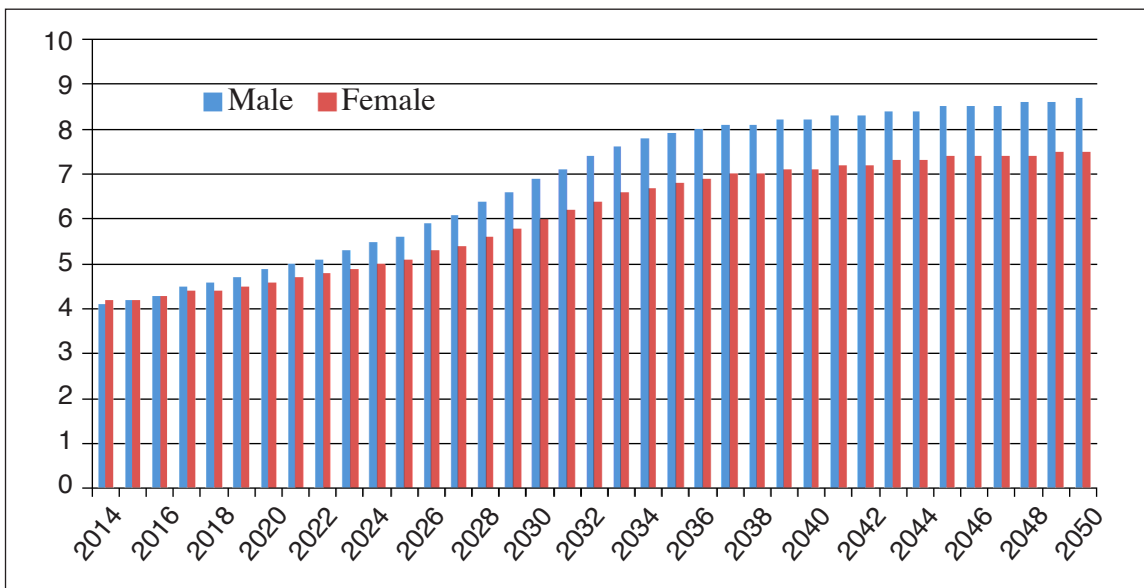
Table 5-15. Number of older persons requiring partial or full assistance in incontinence, 2014-2050 (10,000)

<b>Year</b>	<b>Total</b>	<b>Male</b>	<b>female</b>
2014	8.3	4.1	4.2
2015	8.4	4.2	4.2
2016	8.6	4.3	4.3
2017	8.9	4.5	4.4
2018	9.0	4.6	4.4
2019	9.2	4.7	4.5
2020	9.5	4.9	4.6
2021	9.7	5.0	4.7
2022	9.9	5.1	4.8
2023	10.2	5.3	4.9
2024	10.5	5.5	5.0
2025	10.7	5.6	5.1
2026	11.2	5.9	5.3
2027	11.5	6.1	5.4
2028	12.0	6.4	5.6
2029	12.4	6.6	5.8
2030	12.9	6.9	6.0
2031	13.3	7.1	6.2
2032	13.8	7.4	6.4
2033	14.2	7.6	6.6
2034	14.5	7.8	6.7
2035	14.7	7.9	6.8

continue

Year	Total	Male	female
2036	14.9	8.0	6.9
2037	15.1	8.1	7.0
2038	15.1	8.1	7.0
2039	15.3	8.2	7.1
2040	15.3	8.2	7.1
2041	15.5	8.3	7.2
2042	15.5	8.3	7.2
2043	15.7	8.4	7.3
2044	15.7	8.4	7.3
2045	15.9	8.5	7.4
2046	15.9	8.5	7.4
2047	15.9	8.5	7.4
2048	16.0	8.6	7.4
2049	16.1	8.6	7.5
2050	16.2	8.7	7.5
Increase in 2050 compared to 2014	7.9(95.2%)	4.6(112.2%)	3.3(78.6%)

Figure 5-11. Number of older persons requiring partial or full assistance in incontinence, 2014-2050 (10,000)



## f. Feeding

In 2014, the number of older persons who cannot take food and required full or partial assistance in feeding was about 60 thousand for both sexes. The number will increase and is projected to be twice as large in 2050 (Table 5-16 and Figure 5-12).

Table 5-16. Number of older persons requiring partial or full assistance in feeding, 2014-2050 (10,000)

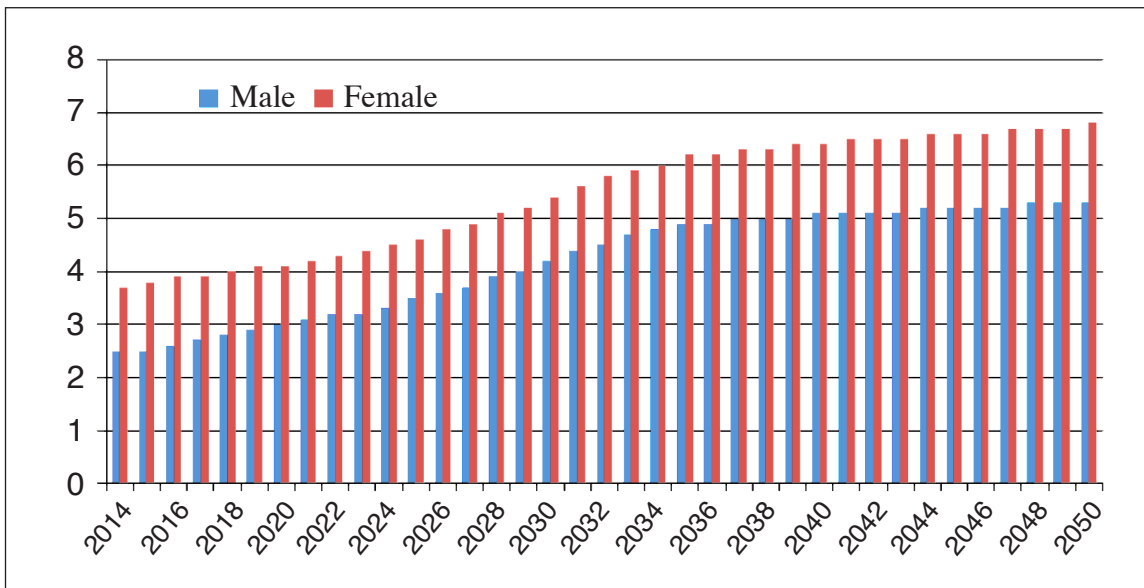
<b>Year</b>	<b>Total</b>	<b>Male</b>	<b>female</b>
2014	6.2	2.5	3.7
2015	6.3	2.5	3.8
2016	6.5	2.6	3.9
2017	6.6	2.7	3.9
2018	6.8	2.8	4.0
2019	7.0	2.9	4.1
2020	7.1	3.0	4.1
2021	7.3	3.1	4.2
2022	7.5	3.2	4.3
2023	7.6	3.2	4.4
2024	7.8	3.3	4.5
2025	8.1	3.5	4.6
2026	8.4	3.6	4.8
2027	8.6	3.7	4.9
2028	9.0	3.9	5.1
2029	9.2	4.0	5.2
2030	9.6	4.2	5.4
2031	10.0	4.4	5.6
2032	10.3	4.5	5.8
2033	10.6	4.7	5.9
2034	10.8	4.8	6.0
2035	11.1	4.9	6.2
2036	11.1	4.9	6.2
2037	11.3	5.0	6.3
2038	11.3	5.0	6.3



continue

Year	Total	Male	female
2039	11.4	5.0	6.4
2040	11.5	5.1	6.4
2041	11.6	5.1	6.5
2042	11.6	5.1	6.5
2043	11.6	5.1	6.5
2044	11.8	5.2	6.6
2045	11.8	5.2	6.6
2046	11.8	5.2	6.6
2047	11.9	5.2	6.7
2048	12.0	5.3	6.7
2049	12.0	5.3	6.7
2050	12.1	5.3	6.8
Increase in 2050 compared to 2014	5.9(95.2%)	2.8(112.0%)	3.1(83.8%)

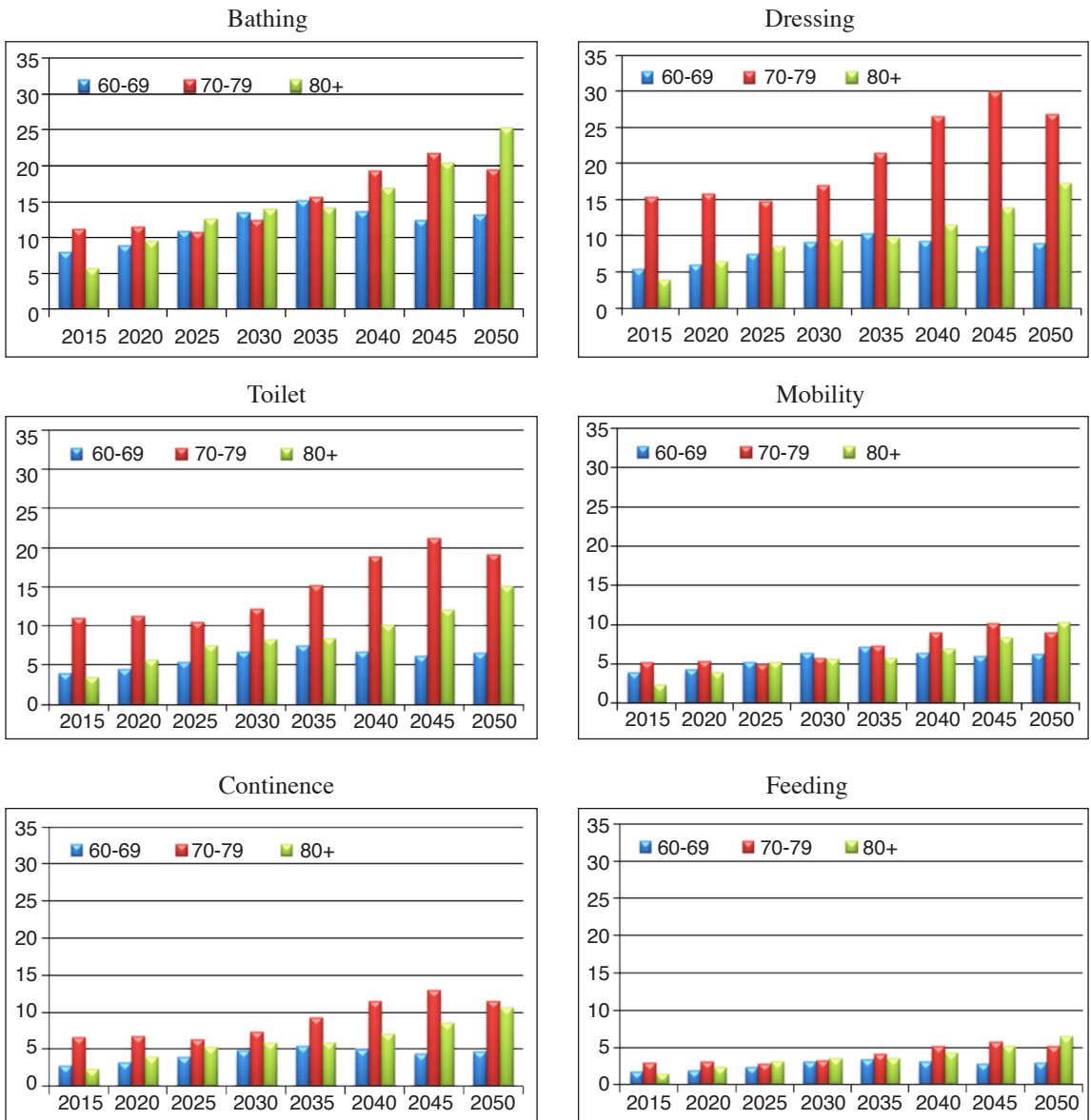
Figure 5-12. Number of older persons requiring partial or full assistance in feeding, 2014-2050 (10,000)



The number of elderly needing assistance in ADL differs significantly by age. In general, the number of elderly needing assistance increases with age. Figure 5-3 shows the projection of the number of elderly needing assistance by age based on the medium fertility scenario of elderly projections. Note that the projected elderly population is the same in the low, high and medium fertility scenarios.

The number of elderly needing assistance is much higher in age group 70-79 years

Figure 5-13. Number of elderly needing full/partial assistance in ADL by age, 2014-2050 (10,000)



than in other age groups. The reason is that as the number needing assistance depends on the number of persons surviving. Since in the projection the percentage of the elderly needing assistance does not change with age, the change in number requiring assistance depends only on the number of persons of a give age. An increase in the life expectancy increases the number of elderly requiring assistance at higher age.

The projection shows that the number of elderly requiring assistance; vary by the types of limitation in ADL. More people need assistance in bathing, dressing and toilet than in feeding, incontinence and mobility. These differences are informative in developing a strategy for elderly protection.

The projection results provide important baseline information for long and short term planning of elderly related interventions in the country.

### 5.3.2 Elderly with disability

The 2014 SDHS asked respondents whether they experience any difficulties in performing basic activities, such as seeing, hearing, walking or climbing stairs, remembering or concentrating, self-care (washing and dressing) and communicating. Four response categories were distinguished, from ‘no difficulty’ to ‘cannot do at all’. The percentages of elderly with full or partial disability, by age and sex, are shown in Table 5-17.

21% of the elderly population has difficulty in walking or climbing stairs and 10% has difficulty to concentrate or to remember something. The proportions of elderly having difficulty bathing or dressing and communicating were about 5%.

Table 5-17. Proportion of elderly 60 year or older by full/partial disability, by sex and age group (%)

Activity	Total	Male	female	60–69	70–79	80+
Seeing	9.4	7.1	10.7	2.1	5.6	28.4
Hearing	9.9	9.4	10.2	2.1	11.8	31.2
Walking/climbing stairs	20.7	18.4	22.1	5.0	18.4	62.5
Remembering/ concentrating	10.2	9.1	10.9	2.0	5.5	28.5
Bathing/dressing	4.7	4.8	4.7	0.7	5.1	15.0
Communicating	4.8	5.0	4.7	1.0	2.4	14.8

In 2014, 700,000 persons aged 60+ reported some or severe difficulty walking or climbing stairs. In 2050, that number is expected to double to 1.36 million if the average disability rate of persons aged 60+ remains constant (Table 5-18 and Figure 5-14).

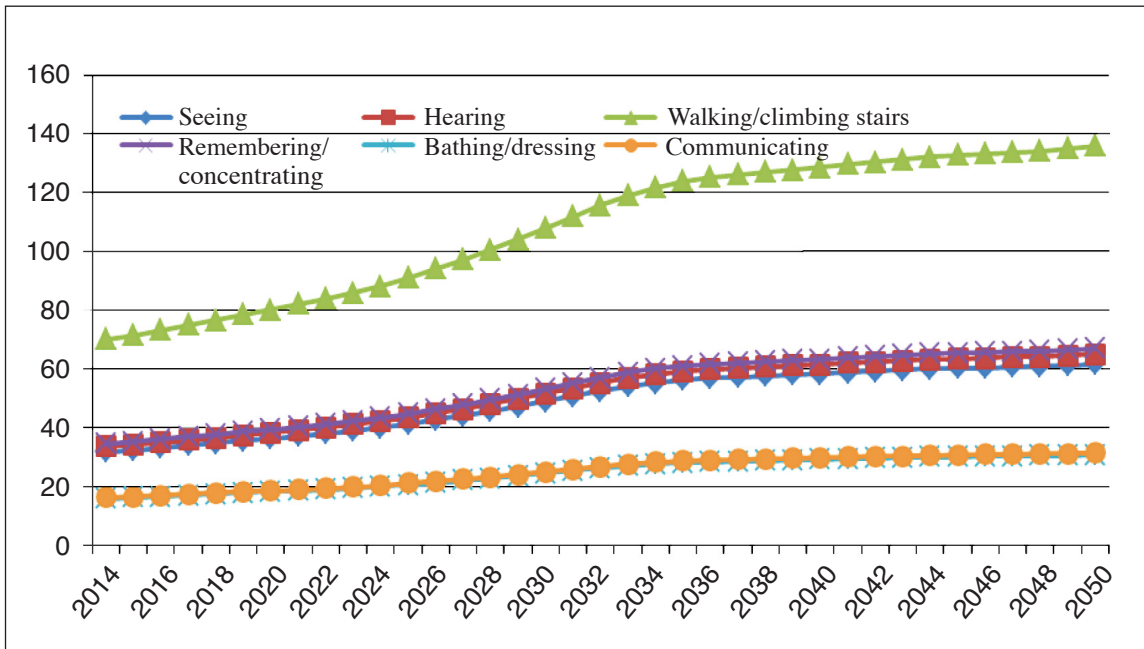
Table 5-18. Number of elderly of elderly having some or a lot difficulty by type of activity, 2014-2050 (10,000)

<b>Year</b>	<b>Seeing</b>	<b>Hearing</b>	<b>Walking/ climbing</b>	<b>Remembering/ concentrating</b>	<b>Bathing/ dressing</b>	<b>Communi- cating</b>
2014	31.9	33.6	70.2	34.6	15.9	16.3
2015	32.4	34.2	71.4	35.2	16.2	16.6
2016	33.2	34.9	73.1	36.0	16.6	16.9
2017	34.0	35.8	74.9	36.9	17.0	17.4
2018	34.8	36.6	76.6	37.7	17.4	17.8
2019	35.6	37.5	78.5	38.7	17.8	18.2
2020	36.4	38.3	80.1	39.5	18.2	18.6
2021	37.2	39.2	82.0	40.4	18.6	19.0
2022	38.1	40.1	83.8	41.3	19.0	19.4
2023	39.0	41.1	85.9	42.3	19.5	19.9
2024	40.0	42.2	88.2	43.5	20.0	20.4
2025	41.3	43.5	90.9	44.8	20.6	21.1
2026	42.7	44.9	94.0	46.3	21.3	21.8
2027	44.1	46.4	97.1	47.8	22.0	22.5
2028	45.7	48.1	100.6	49.6	22.8	23.3
2029	47.3	49.8	104.1	51.3	23.6	24.1
2030	49.0	51.6	107.8	53.1	24.5	25.0
2031	50.8	53.5	111.8	55.1	25.4	25.9
2032	52.5	55.3	115.7	57.0	26.3	26.8
2033	54.1	56.9	119.0	58.7	27.0	27.6
2034	55.3	58.2	121.7	60.0	27.6	28.2
2035	56.2	59.2	123.8	61.0	28.1	28.7
2036	56.9	59.9	125.2	61.7	28.4	29.0
2037	57.2	60.3	126.1	62.1	28.6	29.2
2038	57.6	60.7	126.9	62.5	28.8	29.4
2039	58.0	61.1	127.7	62.9	29.0	29.6
2040	58.4	61.5	128.5	63.3	29.2	29.8
2041	58.8	62.0	129.6	63.9	29.4	30.0

continue

Year	Seeing	Hearing	Walking/ climbing	Remembering/ concentrating	Bathing/ dressing	Communi- cating
2042	59.2	62.4	130.4	64.3	29.6	30.2
2043	59.6	62.8	131.2	64.7	29.8	30.4
2044	60.0	63.2	132.1	65.1	30.0	30.6
2045	60.3	63.5	132.7	65.4	30.1	30.8
2046	60.4	63.7	133.1	65.6	30.2	30.9
2047	60.7	64.0	133.7	65.9	30.4	31.0
2048	60.9	64.2	134.1	66.1	30.5	31.1
2049	61.3	64.5	135.0	66.5	30.6	31.3
2050	61.7	64.9	135.8	66.9	30.8	31.5
Increase in 2050 com- pared to 2014	29.8 (93.4%)	31.3 (93.2%)	65.6 (93.4%)	32.3 (93.4%)	14.9 (93.7%)	15.2 (93.4%)

Figure 5-14. Number of elderly having some or a lot difficulty by type of activity, 2014-2050 (10,000)



The projection of the number and age of elderly with a disability is very important in planning the scientific and practical national strategy and programme to address the health issues in an ageing population.

Table 5-19 and Figure 5-15 shows the projection of the elderly population with disability by age. The projections are based on the medium fertility scenario and the percentage of elderly by full/partial disability, by age and sex.

If the average disability rate of persons aged 60+ is replaced by age-specific disability rates, the number of the elderly population projection with disability is less. This shows the importance of using age-specific disability rates in disability projections, similar to using age-specific labour-force participation rates in labour force projections.

Note that the projected elderly population is the same in the low, high and medium fertility scenarios. Since the disability rates vary with age, the increase by age in the projected population with disability is due to the projected increase in the number of people at old-age and the increase in disability rate with age.

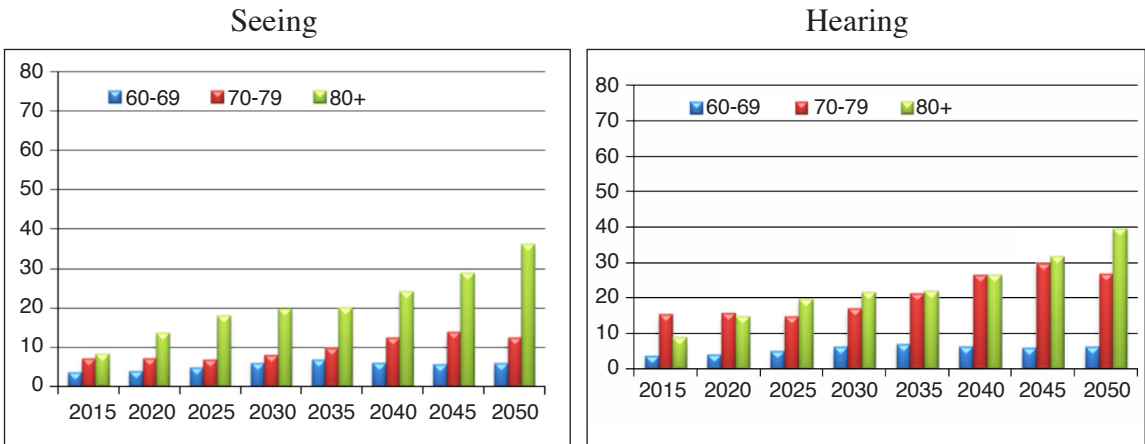
Table 5-19. Number of elderly by age group according to the type of disability, 2015-2050 (10,000)

Year	Seeing				Hearing			
	60–69	70–79	80+	Total	60–69	70–79	80+	Total
2015	3.9	7.3	8.2	19.4	3.9	15.5	9.0	28.4
2020	4.3	7.6	13.6	25.5	4.3	15.9	15.0	35.2
2025	5.3	7.0	17.9	30.2	5.3	14.8	19.7	39.8
2030	6.4	8.1	19.9	34.4	6.4	17.1	21.8	45.3
2035	7.2	10.2	20.2	37.6	7.2	21.5	22.2	50.9
2040	6.5	12.6	24.1	43.2	6.5	26.6	26.5	59.6
2050	6.0	14.2	29.0	49.2	6.0	30.0	31.8	67.8

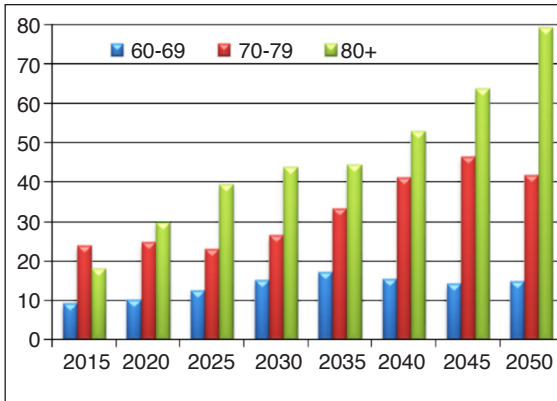
Year	Walking/climbing				Remembering/concentrating			
	60—69	70—79	80+	Total	60—69	70—79	80+	Total
2015	9.2	24.1	18.1	51.4	3.7	7.2	8.3	19.2
2020	10.2	24.8	30.0	65.0	4.1	7.4	13.7	25.2
2025	12.6	23.0	39.4	75.0	5.0	6.9	18.0	29.9
2030	15.3	26.7	43.8	85.8	6.1	8.0	20.0	34.1
2035	17.3	33.5	44.4	95.2	6.9	10.0	20.2	37.1
2040	15.6	41.4	53.1	110.1	6.2	12.4	24.2	42.8
2050	14.2	46.7	63.8	124.7	5.7	14.0	29.1	48.8

Year	Bathing/dressing				Communicating			
	60—69	70—79	80+	Total	60—69	70—79	80+	Total
2015	1.3	6.7	4.4	12.4	1.8	3.1	4.3	9.2
2020	1.4	6.9	7.2	15.5	2.0	3.2	7.1	12.3
2025	1.8	6.4	9.5	17.7	2.5	3.0	9.3	14.8
2030	2.1	7.4	10.5	20.0	3.1	3.5	10.4	17.0
2035	2.4	9.3	10.7	22.4	3.5	4.4	10.5	18.4
2040	2.2	11.5	12.8	26.5	3.1	5.4	12.6	21.1
2050	2.0	13.0	15.3	30.3	2.8	6.1	15.1	24.0

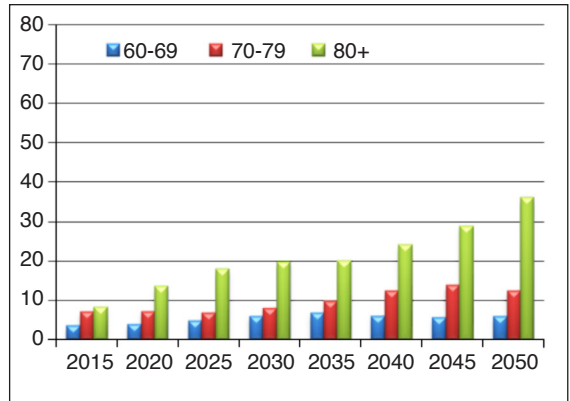
Figure 5-15. Number of elderly by age group according to the type of disability, 2014-2050 (10,000)



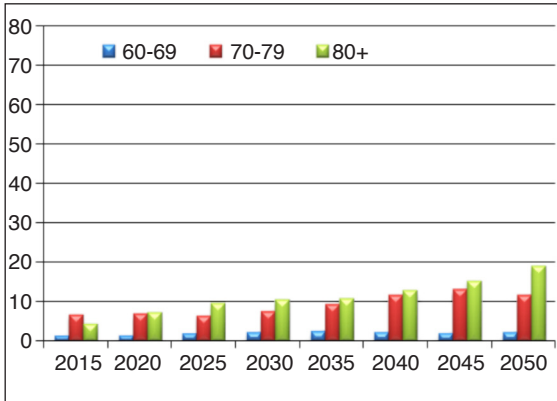
Walking/climbing stairs



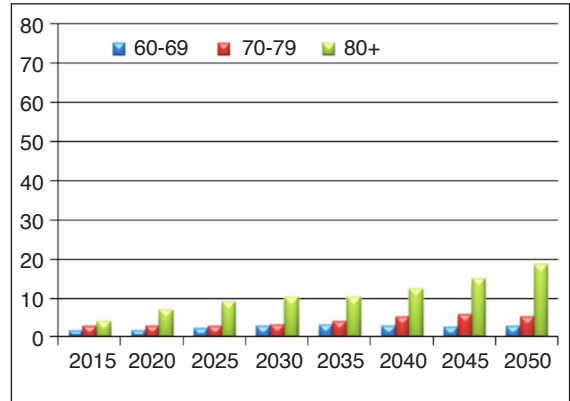
Remembering/concentrating



Bathing/dressing



Communicating



The projection shows that most elderly have difficulties walking/climbing stairs. The second most frequent prevalence of disability is seeing, hearing and remembering. Difficulties with communication are least prevalent. The projections are useful for elderly care and public health and provide a basis for a strategy of protection and care in scientific way in an ageing population.



# CHAPTER 6. PROJECTION OF PROVINCIAL POPULATION

Several methods for provincial (or regional) population projection exist. The selection of the most reasonable method is based on data availability, the analysis of past trends, and the understanding of the reasons for migration. In the 2008 census, data on migration were collecting by determining for all persons five years and older (except for persons living in military camps) where they were residing five years prior to the census. The census shows that migration is relatively small.

The method applied in this report to project the population by province does not use data on migration between provinces, but relies on changes in proportions of provinces in the national population. The method is known as the method of proportions or ratio method. The future population of a given province is obtained by applying a projected proportion of the national population living in that province to the projected national population. The projected proportion depends on observed proportions at times of a census of large survey and assumptions about future changes in proportions. Differences in fertility and mortality between provinces and inter-province migration are disregarded, usually because data are not available.

## **6.1 Dynamics and assumption of provincial population**

The proportion of provincial population in the total population of DPRK is shown in Table 6-1. The data are from the 1993 census, the 2008 census and the 2014 SDHS.

The share of each province in the national population is stable, except for Pyongyang which has increased its share. The population of Pyongyang increased by 0.033% per year, on average. The population of S. Hwanghae increased by 0.001% per year, on average. In contrast, the population of S. Phyongan, N. Phyongan, S. Hamgyong, N. Hamgyong and Kangwon decreased in the range of 0.005-0.014% respectively. Ryanggang, Jagang and N. Hwanghae maintained their share of the national population.

Despite differentials in fertility and mortality rates between provinces, and

Table 6-1. Provincial population as proportion of population of DPRK, 1993, 2008 and 2014 (%)

Province	1993	2008	2014	Average annual increase/decrease 1993 - 2014
Total	100.0	100.0	100.0	0.000
Ryongyang	3.1	3.1	3.1	0.000
N.Hamgyong/Rason	10.0	10.0	9.9	-0.005
S.Hamgyong	13.3	13.1	13.1	-0.010
Kangwon	6.4	6.3	6.3	-0.005
Jagang	5.6	5.6	5.6	0.000
N.Phyongan	11.9	11.7	11.7	-0.010
S.Phyongan/Nampho	17.5	17.4	17.2	-0.014
N.Hwanghae	9.0	9.0	9.0	0.000
S.Hwanghae	9.8	9.9	10.0	0.010
Pyongyang	13.4	13.9	14.1	0.033

some negligible movements between provinces, the total provincial population as a proportion of the population of DPRK has changed little.

In Pyongyang, the capital of the country, many scientists, technicians and skilled artists from other provinces study in different universities and, after graduation, some get positions in the central institutes of science, research, culture and arts. As a consequence, the population of Pyongyang increased slightly between 1993 and 2014. Hence, the increase of Pyongyang population is due to and external factor, i.e., the inflow of people (movement), rather than fertility and mortality in Pyongyang.

The trend in the rates of provincial population proves that the proportioning method can reasonably be used for provincial (or regional) population projection.

## 6.2 Scenarios for provincial projection

Considering that there is a slight variation only in the shares of provinces in the national population, except for Pyongyang, one scenario is formulated. The scenario is shown in Table 6-2 and Figure 6-1. It is assumed that the average annual variation (increase or decrease) in the shares of provinces in the national population during the last 20 year (1993-2014) remain constant in the future. These rates of change are use in the projection of the provincial population from 2014 to 2050.

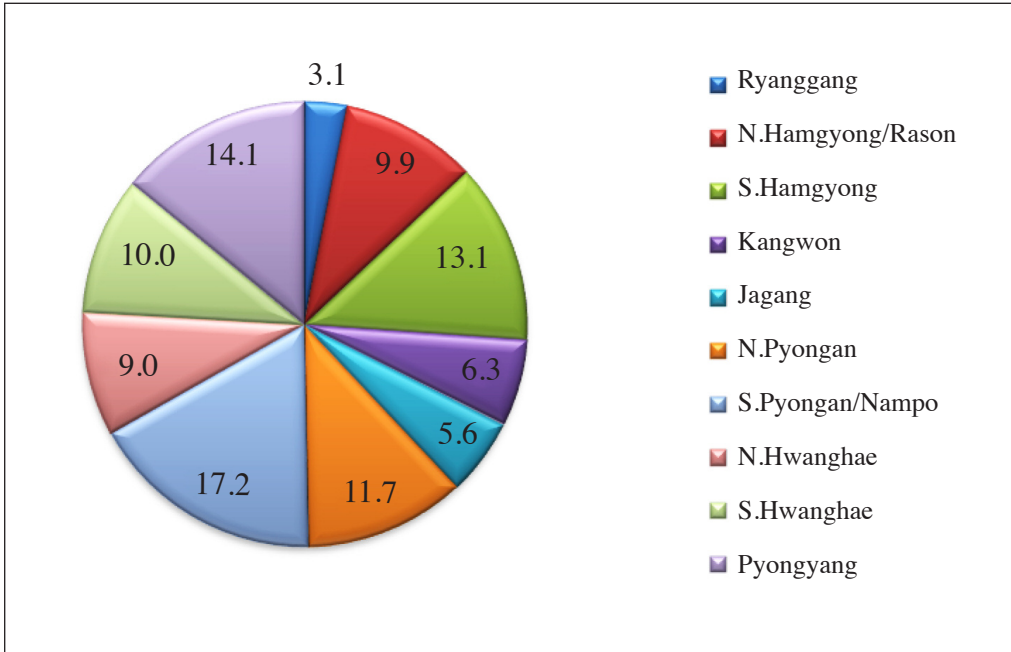
The projection of provincial population generated according to 3 fertility scenarios (high, medium and low) and one scenario for the distribution of the national population.

Table 6-2. Assumed proportion of national population living in each province, by 5-year interval (%)

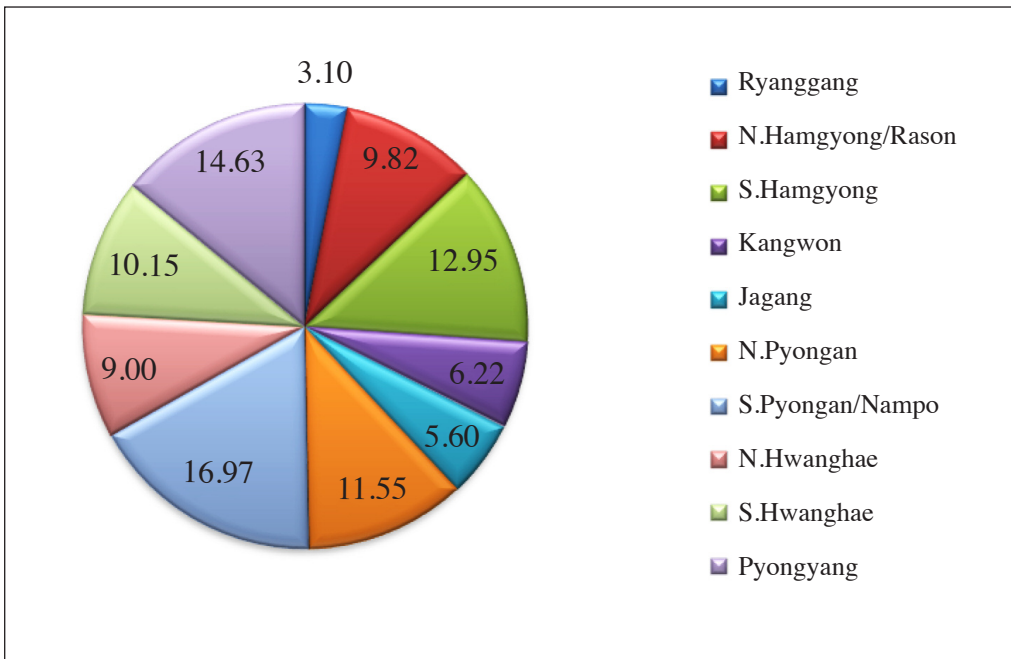
Province	2020	2025	2030	2035	2040	2045	2050
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Rygang	3.10	3.10	3.10	3.10	3.10	3.10	3.10
N.Hamgyong/ Rason	9.87	9.85	9.82	9.80	9.78	9.75	9.73
S.Hamgyong	13.04	13.00	12.95	12.90	12.85	12.80	12.76
Kangwon	6.27	6.25	6.22	6.20	6.18	6.15	6.13
Jagang	5.60	5.60	5.60	5.60	5.60	5.60	5.60
N.Phyongan	11.64	11.60	11.55	11.50	11.45	11.40	11.36
S.Phyongan/ Nampho	17.11	17.04	16.97	16.90	16.83	16.76	16.69
N.Hwnaghae	9.00	9.00	9.00	9.00	9.00	9.00	9.00
S.Hwanghae	10.06	10.10	10.15	10.20	10.25	10.30	10.34
Pyongyang	14.30	14.47	14.63	14.80	14.97	15.13	15.30

Figure 6-1. Percent distribution of provincial population, 2014, 2030 and 2050 (%)

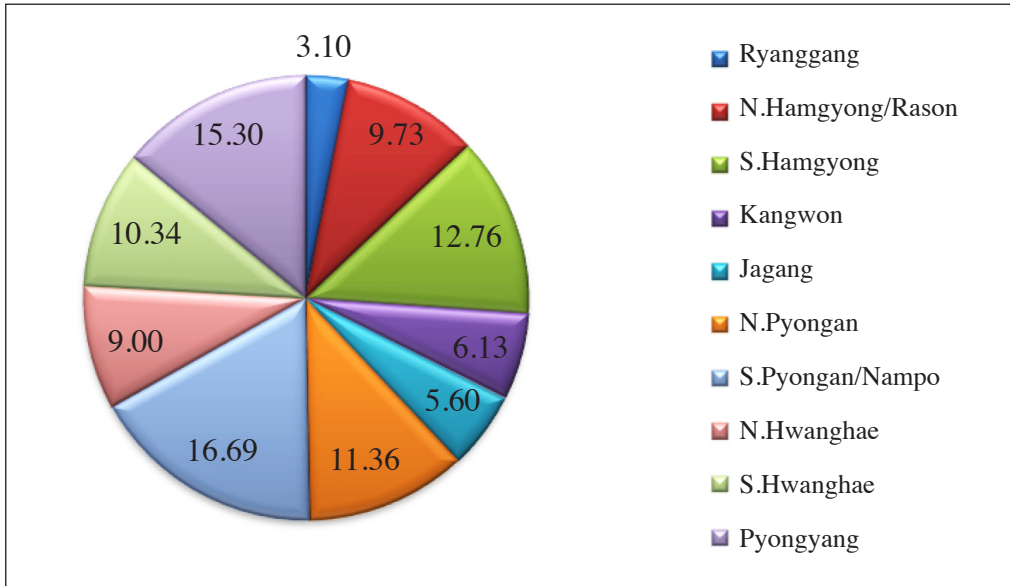
**2014 (%)**



**2030 (%)**



2050 (%)



Tables 6-3 to 6-5 and Figures 6-2 to 6-4 show the projected provincial populations for selected

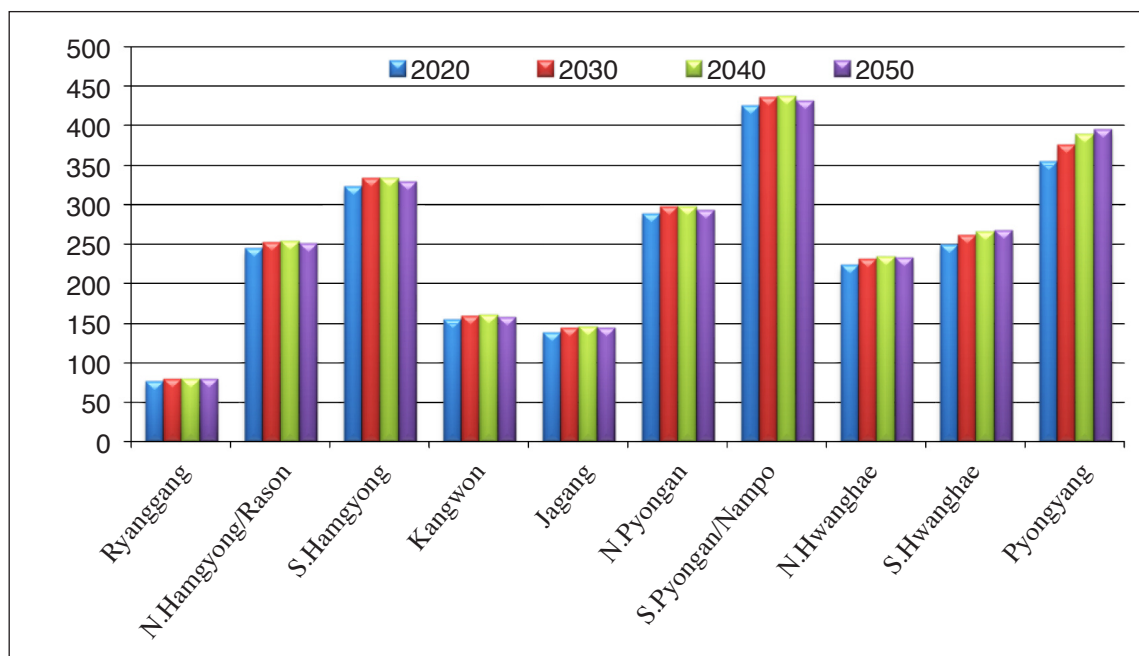
Table 6-3. Provincial projection by 5-year interval according to high scenario (10,000 persons)

Province	2020	2025	2030	2035	2040	2045	2050
Total	2487.0	2538.0	2577.0	2598.0	2604.0	2600.0	2588.0
Ryanggang	77.1	78.7	79.9	80.5	80.7	80.6	80.2
N.Hamgyong/Rason	245.5	249.9	253.2	254.6	254.6	253.6	251.8
S.Hamgyong	324.4	329.8	333.7	335.1	334.7	332.9	330.2
Kangwon	156.0	158.6	160.4	161.1	160.8	160.0	158.6
Jagang	139.3	142.1	144.3	145.5	145.8	145.6	144.9
N.Phyongan	289.6	294.3	297.6	298.8	298.2	296.5	293.9
S.Phyongan/Nampho	425.6	432.5	437.4	439.1	438.2	435.7	431.8
N.Hwanghae	223.8	228.4	231.9	233.8	234.4	234.0	232.9
S.Hwanghae	250.1	256.5	261.6	265.0	266.8	267.7	267.7
Pyongyang	355.6	367.2	377.0	384.5	389.8	393.4	396.0

\* excluding army

In most provinces, the population is similar to that of the national population (high scenario). It means that the provincial population increases until 2040 and decreases slightly afterwards. Only Pyongyang is expected to continue to grow after 2040 under this scenario. The population of S. Hwanghae increases until 2040 and remains stable in 2050.

Figure 6-2. Provincial population according to the high scenario, 2020, 2030, 2040 and 2050 (10 000 persons)



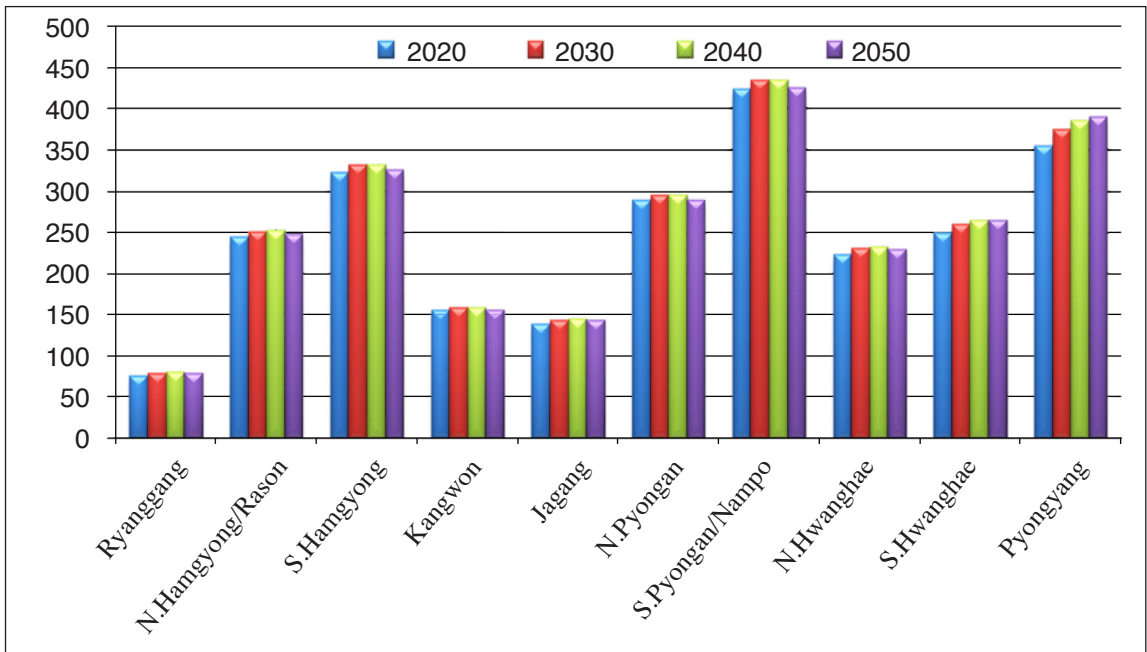
According to the medium scenario, the population in most of the provinces decreases from 2035 onwards. However, the population in S.Hwanghae and Pyongyang continue to increase until 2045 and 2050 respectively.

Table 6-4. Provincial projection by 5-year interval according to medium scenario (10 000 persons)

Province	2020	2025	2030	2035	2040	2045	2050
Total	2485.0	2534.0	2568.0	2585.0	2587.0	2579.0	2560.0
Rygang	77.0	78.6	79.6	80.1	80.2	79.9	79.4
N.Hamgyong/Rason	245.3	249.5	252.3	253.3	252.9	251.5	249.1
S.Hamgyong	324.1	329.3	332.5	333.5	332.5	330.2	326.6
Kangwon	155.8	158.3	159.8	160.3	159.8	158.7	156.9
Jagang	139.2	141.9	143.8	144.8	144.9	144.4	143.4
N.Phyongan	289.3	293.8	296.5	297.3	296.3	294.1	290.7
S.Phyongan/Nampho	425.3	431.9	435.8	436.9	435.4	432.2	427.2
N.Hwanghae	223.7	228.1	231.1	232.7	232.8	232.1	230.4
S.Hwanghae	249.9	256.1	260.7	263.7	265.1	265.5	264.8
Pyongyang	355.4	366.5	375.9	382.4	387.1	390.4	391.5

\* excluding army

Figure 6-3. Provincial population according to the medium scenario, 2020, 2030, 2040 and 2050 (10,000 persons)



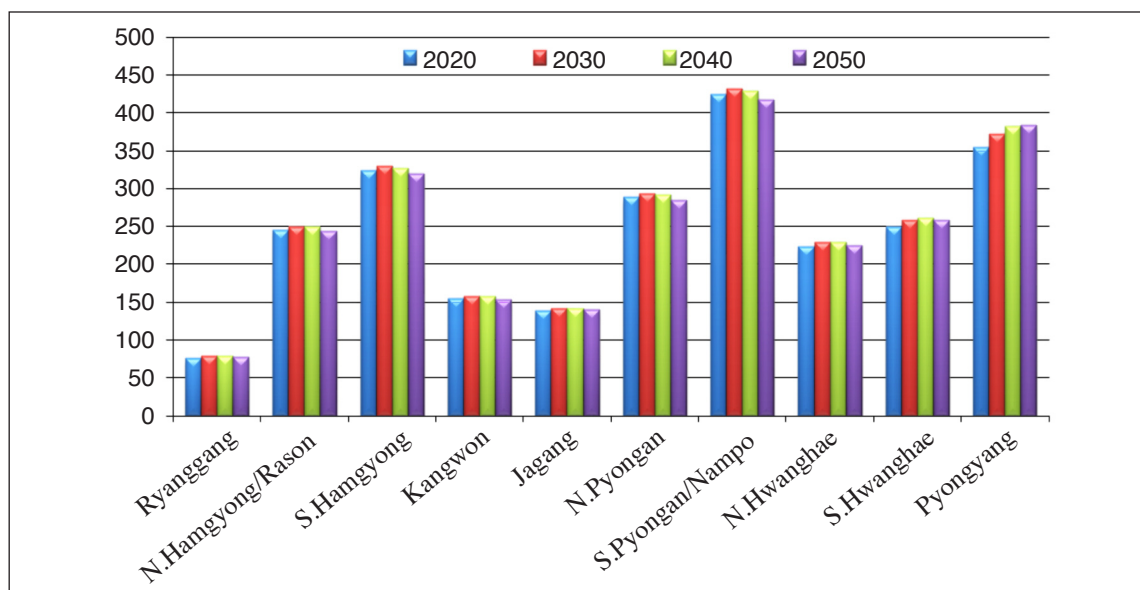
According to the low scenario, the population in Pyongyang and S. Hwanghae decrease from 2045 and 2040 respectively. The population in other provinces decreases gradually from 2035.

Table 6-5. Provincial projection by 5-year interval according to low scenario (10,000 persons)

Province	2020	2025	2030	2035	2040	2045	2050
Total	2483.0	2525.0	2550.0	2559.0	2553.0	2536.0	2507.0
Rygang	77.0	78.3	79.1	79.3	79.1	78.6	77.7
N.Hamgyong/Rason	245.1	248.7	250.5	250.8	249.6	247.3	243.9
S.Hamgyong	323.9	328.1	330.2	330.1	328.1	324.7	319.8
Kangwon	155.7	157.8	158.7	158.7	157.7	156.0	153.6
Jagang	139.0	141.4	142.8	143.3	143.0	142.0	140.4
N.Phyongan	289.1	292.8	294.5	294.3	292.4	289.2	284.7
S.Phyongan/Nampho	424.9	430.3	432.8	432.5	429.6	425.0	418.3
N.Hwanghae	223.5	227.3	229.5	230.3	229.8	228.2	225.6
S.Hwanghae	249.7	255.1	258.9	261.0	261.6	261.1	259.3
Pyongyang	355.1	365.2	373.0	378.7	382.1	383.9	383.7

\* excluding army

Figure 6-4. Provincial population according to the low scenario, 2020, 2030, 2040 and 2050 (10,000 persons)





# CHAPTER 7. CONCLUSIONS AND RECOMMENDATIONS

The projection of the national population of DPRK and functional projections leads to the following conclusions and recommendations.

## Conclusions

- In the three fertility scenarios, the total population growth is prospected as below;

- All three scenarios projected a gradual decrease in the population after some period of growth. In the high scenario (i.e., if the current TFR is sustained), the population will start to reduce in 2043. The year in which the population starts to decline is earlier in the medium scenario (2040) and the low scenario (2037). In the medium scenario, the population size reaches a maximum of 26.57 million in 2038, a 6.7% (i.e., 1.66 million) increase compared to 2014. However, according to three scenarios, the population size in 2050 is projected to be 1.66 million, 1.38 million and 0.85 million larger than in 2014, depending on the scenario.

- In the three scenarios, the 0-14 age groups decrease due to the gradual decrease of fertility rate. In 2050, the population of 0-14 age group is expected to be 10.5%, 13.2% and 18.6% below the population size in 2014.

- The population of 15-59 age group is projected to increase during 8 years until 2022 but sharply decrease afterwards. This reduction is in the range of 5.9%-8.3% of the 2014 population.

- The elderly (60+) population is expected to increase fast during 20 years (2014-2034) and dully later. The elderly population, which was 3.39 million in 2014, will be 6.56 million in 2050, nearly twice (93.5%) the 2014 population.

- According to the medium scenario, the following changes in the population composition (ages 0-14, 15-59 and 60+) are expected:

- The share of 0-14 age group decreases slowly from 20.7% in 2014 to 17.0% in 2050.

- The share of 15-59 age group decreases gradually from 65.7% in 2014 to 58.1% in 2050.

- In contrast, the share of 60+ age group increases slowly from 13.6% in 2014 to 24.9% in 2050, meaning a 11.3% increase. In 2050, one out of four persons will be 60 years or older.

- The dependency ratios (population aged 0-14 and/or 60+ divided by the population aged 15-59) shows the following trend:

- As the number of birth decline, the young-age dependency ratio (population 0-14 divided by population 15-64) decreases slowly from 31.5% in 2014 to 29.3% in 2050.

- Contrarily, the old-age dependency ratio (population 60+ divided by population 15-64) increases fast. It will be 22.2% (two times) higher in 2050 (42.9%) than in 2014 (20.7%).

- Finally, the total dependency ratio increases rapidly during the period of 20 years from 2014 (52.2%) to 2034 and more slowly until 2050 (72.2%).

- The projection results of urban and rural population are as below;

- Because of economic development and the administrative transfer of some rural areas into urban, the urban population in 2050 will be 1.79 million (11.7%) larger than in 2014. In contrast, the rural population will increase in itself but decrease by 410 thousand (4.2%) due to administrative changes in some regions (high scenario).

- If the proportion urban population remains constant at the current level, then the urban and rural population will be 850 thousand and 530 thousand higher in 2050 respectively than in 2014. The rates of increase are similar: 5.6% and 5.5% (low scenario).

- The school population by educational category is projected to decrease gradually in the future.

- The number of pupils in primary education changes because of changes in the sizes of birth cohorts. During 20 years from 2014 to 2034, this population remains at about 1.7 million, but it tends to decrease from 2034 onwards due to the gradual reduction of fertility according to all the three scenarios. In 2050, the number of pupils in primary education is expected to have decreased 10.5% (low scenario), 12.9% (medium scenario) and 18.1% (high scenario) compared to the numbers in 2014.

- The number of junior middle students is expected to increase a little in the later half of 2030s due to the third period of high fertility, but to decrease in other periods in all the three scenarios. In 2050, the number of junior middle students is expected

to be 17.3%, 19.1% and 23.6% lower than in 2014, according to respective scenario.

- The number of senior middle students shows a similar tendency as the number of junior middle students. The number is expected to increase a little at the later half of 2030s due to the third period of high fertility but to decrease generally according to all the three scenarios. In 2050, the number of senior middle students is expected to be 17.3%, 19.8%, 22.4% and 25.9% smaller than in 2014, according to respective scenario.

The higher the education level considered, the larger is the decrease. It means that the rate of decrease of junior middle students is higher than that of primary students and the rate of senior middle students is higher than that of junior middle students.

According to the medium scenario, the rate of decrease of the primary school population is 12.9% (220 thousand) but it is 19.1% (210 thousand) for the junior middle student population and 22.4% (260 thousand) for the senior middle student population, meaning 6.2% and 9.5% higher than primary students, respectively.

- The labour force will increase until 2022 and decline afterwards.

The labour force of 13.03 million in 2014 increases to 13.28 million (0.25 million) in 2020, followed by a gradual decline to 12.87 million (by 0.41 million) in 2030, 12.63 million (by 0.24 million) in 2040 and 12.27 million (by 0.36 million) in 2050. Therefore, the labour force will decline by about one million between 2020 and 2050.

Since labour force participation rates differ significantly by age and sex, the labour force should be projected using labour force participation rates by age and sex in order to obtain accurate projections of the labour force.

- Elderly requiring assistance by type of ADLs is projected as follows;

- The elderly population is projected to increase fast and since those who require partial or full assistance is assumed to be a fixed proportion of the elderly population, their number increases rapidly too.

- During the period 2014-2050, elderly males who need assistance in bathing are expected to more than double (increase 114.1%) and female to increase 80%.

- The elderly requiring partial or full assistance in dressing 92%, from about 180 thousand to 340 thousand.

- The number of elderly requiring partial or full assistance in using toilet was

about 130 thousand in 2014, 50 thousand males and 80 thousand females. In 2050, that number will be 100 thousand for males and 140 thousand for females.

- In 2014, the number of elderly required full or partial assistance in incontinence was about 40 thousand for males and about the same number for females. The figures are expected to have increase in 2050 to 90 thousand for males and 70 thousand for females.

- In 2014, about 60,000 of elderly required full or partial assistance in feeding. In 20, twice that number will need assistance.

- The number of elderly needing assistance varies with age. It is much higher in age group 70-79 years than in other age groups. The reason is the expected increase in life expectancy.

- More people need assistance in bathing, dressing and toilet than in feeding, incontinence and mobility.

- The projection results of elderly with disabilities are as follows;

In 2014, there were 700 thousand of elderly having some or a lot difficulty in walking or climbing stairs but in 2050, it is expected to double to 1.36 million. Locomotor disability is the most prevalent disability, 35% of the total number of reported disabilities in 2014. The number of persons with other disabilities will increase during 2014-2050 at about the same rate as locomotor disability (around 90%). The reason is that the disability rate is assumed not to change in the projection period.

- The change of population in the most of provinces is similar as that of national population. The reason is the method of proportions used to prepare the provincial population projections.

- According to the high scenario, the population increases in most provinces until 2040 but decrease afterwards when the national population start to decrease. However, the population in Pyongyang and S.Hwanghae continue to increase until 2050.

- According to the medium scenario, the population decreases in most provinces from 2035 onwards. However, the population in S.Hwanghae and Pyongyang continue to increase until 2045 and 2050 respectively.

- According to the low scenario, the population in Pyongyang and S.Hwanghae decrease from 2045 and 2040 respectively. The population in other provinces decreases gradually from 2035.

## Recommendations

1. The total fertility rate, which in 2008 was 2.0 and in 2014 1.9 is expected to stay below the replacement level of 2.1. The population of DPRK continues to grow until 2038 (medium scenario) because the age structure of the population is favourable for growth because of the relatively large proportion of women of reproductive age. That growth factor will gradually disappear and the national population will start declining around 2040. It is recommended that the Government prepares a reasonable population policy in a strategic manner.

2. As a consequence of the gradual decline in fertility, the enrolment in primary schools and middle schools is expected to start declining in the 2030s. It is recommended that the national planning of education takes the projection into account and designs in scientific way and implements such interventions as modernization of schools, training of teachers, the Government's inputs to the educational development, provision of materials and technology, etc.

3. The labour force projections indicate that the labour force increases until about 2022 and declines afterwards. These projections should be considered in the planning of the labour force and the design of policies.

Particularly, in making and implementing 5-year (2016-2020) national strategy for economic development, research should be done to prepare a programme to cope with favorable labour force conditions like the increase of labour force until 2022.

People are living longer, because the economy is developing and the living standards of the people increasing. It is recommended to revise the legal retirement age, which is currently 60 for men and 55 for women.

In addition, it is recommended to improve the quality of the labour force by educational development and ensuring that all people are well-versed in science and technology. Finally, a modern, IT-based national economy is a response to the challenges incurred by the reduction of labour force.

4. As a consequence of the doubling of the elderly (60+) population between 2014 and 2050, the number of people needing assistance in ADLs and the number of people with disability will increase significantly.

For this, the projection results of elderly according to their ages and the types of assistance should be used as valuable information for short- and long-term planning of elderly care, life organization and health care in families and relevant facilities including hospitals.

In addition, the protection of the disabled should use the projection of the number of elderly by type of disability to plan the strategy for the protection of the disabled elderly in a scientific to cope with the important future challenges.

# Annex

## 1. Population by 5-year Age Group and by Sex (including army) (10,000 persons)

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>2014</b>									
0-4	169	87	82	169	87	82	169	87	82
5-9	167	86	81	167	86	81	167	86	81
10-14	179	92	87	179	92	87	179	92	87
15-19	197	101	96	197	101	96	197	101	96
20-24	201	104	97	201	104	97	201	104	97
25-29	182	92	90	182	92	90	182	92	90
30-34	177	89	88	177	89	88	177	89	88
35-39	172	87	85	172	87	85	172	87	85
40-44	223	112	111	223	112	111	223	112	111
45-49	201	99	102	201	99	102	201	99	102
50-54	154	75	79	154	75	79	154	75	79
55-59	130	63	67	130	63	67	130	63	67
60-64	89	42	47	89	42	47	89	42	47
65-69	97	42	55	97	42	55	97	42	55
70-74	76	28	48	76	28	48	76	28	48
75-79	49	14	35	49	14	35	49	14	35
80+	28	5	23	28	5	23	28	5	23
<b>Total</b>	<b>2492</b>	<b>1218</b>	<b>1274</b>	<b>2492</b>	<b>1218</b>	<b>1274</b>	<b>2492</b>	<b>1218</b>	<b>1274</b>
<b>2015</b>									
0-4	170	87	83	170	87	83	169	87	82
5-9	166	85	81	166	85	81	166	85	81
10-14	176	91	85	176	91	85	176	91	85
15-19	194	99	95	194	99	95	194	99	95
20-24	203	105	98	203	105	98	203	105	98
25-29	185	95	90	185	95	90	185	95	90
30-34	178	89	89	178	89	89	178	89	89
35-39	168	85	83	168	85	83	168	85	83
40-44	215	108	107	215	108	107	215	108	107

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
45–49	208	103	105	208	103	105	208	103	105
50–54	161	78	83	161	78	83	161	78	83
55–59	134	65	69	134	65	69	134	65	69
60–64	92	43	49	92	43	49	92	43	49
65–69	93	41	52	93	41	52	93	41	52
70–74	78	29	49	78	29	49	78	29	49
75–79	53	16	37	53	16	37	53	16	37
80+	29	5	24	29	5	24	29	5	24
<b>Total</b>	<b>2502</b>	<b>1223</b>	<b>1279</b>	<b>2502</b>	<b>1223</b>	<b>1279</b>	<b>2502</b>	<b>1223</b>	<b>1279</b>
<b>2016</b>									
0–4	170	87	83	170	87	83	170	87	83
5–9	165	85	80	165	85	80	165	85	80
10–14	173	89	84	173	89	84	173	89	84
15–19	190	97	93	190	97	93	190	97	93
20–24	202	104	98	202	104	98	202	104	98
25–29	189	97	92	189	97	92	189	97	92
30–34	178	89	89	178	89	89	178	89	89
35–39	168	85	83	168	85	83	168	85	83
40–44	204	103	101	204	103	101	204	103	101
45–49	214	106	108	214	106	108	214	106	108
50–54	169	82	87	169	82	87	169	82	87
55–59	137	66	71	137	66	71	137	66	71
60–64	98	46	52	98	46	52	98	46	52
65–69	87	38	49	87	38	49	87	38	49
70–74	80	31	49	80	31	49	80	31	49
75–79	55	17	38	55	17	38	55	17	38
80+	33	6	27	33	6	27	33	6	27
<b>Total</b>	<b>2513</b>	<b>1229</b>	<b>1284</b>	<b>2513</b>	<b>1229</b>	<b>1284</b>	<b>2513</b>	<b>1229</b>	<b>1284</b>



continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>2017</b>									
0–4	171	87	84	170	87	83	170	87	83
5–9	166	85	81	166	85	81	166	85	81
10–14	171	88	83	171	88	83	171	88	83
15–19	186	96	90	186	96	90	186	96	90
20–24	201	103	98	201	103	98	201	103	98
25–29	194	100	94	194	100	94	194	100	94
30–34	178	90	88	178	90	88	178	90	88
35–39	170	86	84	170	86	84	170	86	84
40–44	190	96	94	190	96	94	190	96	94
45–49	219	109	110	219	109	110	219	109	110
50–54	178	86	92	178	86	92	178	86	92
55–59	139	66	73	139	66	73	139	66	73
60–64	106	50	56	106	50	56	106	50	56
65–69	82	36	46	82	36	46	82	36	46
70–74	81	32	49	81	32	49	81	32	49
75–79	56	18	38	56	18	38	56	18	38
80+	37	7	30	37	7	30	37	7	30
<b>Total</b>	<b>2524</b>	<b>1235</b>	<b>1289</b>	<b>2524</b>	<b>1235</b>	<b>1289</b>	<b>2523</b>	<b>1235</b>	<b>1288</b>
<b>2018</b>									
0–4	171	87	84	170	87	83	169	86	83
5–9	167	85	82	167	85	82	167	85	82
10–14	169	87	82	169	87	82	169	87	82
15–19	182	94	88	182	94	88	182	94	88
20–24	199	102	97	199	102	97	199	102	97
25–29	198	102	96	198	102	96	198	102	96
30–34	179	90	89	179	90	89	179	90	89
35–39	173	87	86	173	87	86	173	87	86

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
40–44	178	90	88	178	90	88	178	90	88
45–49	221	110	111	221	110	111	221	110	111
50–54	186	91	95	186	91	95	186	91	95
55–59	142	67	75	142	67	75	142	67	75
60–64	113	54	59	113	54	59	113	54	59
65–69	78	35	43	78	35	43	78	35	43
70–74	81	33	48	81	33	48	81	33	48
75–79	56	19	37	56	19	37	56	19	37
80+	42	9	33	42	9	33	42	9	33
<b>Total</b>	<b>2535</b>	<b>1241</b>	<b>1294</b>	<b>2534</b>	<b>1241</b>	<b>1293</b>	<b>2534</b>	<b>1240</b>	<b>1294</b>
<b>2019</b>									
0–4	170	87	83	169	87	82	168	86	82
5–9	169	86	83	169	86	83	169	86	83
10–14	167	86	81	167	86	81	167	86	81
15–19	179	92	87	179	92	87	179	92	87
20–24	196	100	96	196	100	96	196	100	96
25–29	201	104	97	201	104	97	201	104	97
30–34	181	92	89	181	92	89	181	92	89
35–39	176	88	88	176	88	88	176	88	88
40–44	170	86	84	170	86	84	170	86	84
45–49	218	109	109	218	109	109	218	109	109
50–54	194	95	99	194	95	99	194	95	99
55–59	146	69	77	146	69	77	146	69	77
60–64	119	56	63	119	56	63	119	56	63
65–69	77	35	42	77	35	42	77	35	42
70–74	80	32	48	80	32	48	80	32	48
80+	45	10	35	45	10	35	45	10	35
<b>Total</b>	<b>2546</b>	<b>1247</b>	<b>1299</b>	<b>2545</b>	<b>1246</b>	<b>1299</b>	<b>2544</b>	<b>1246</b>	<b>1298</b>

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>2020</b>									
0–4	172	88	84	170	87	83	169	86	83
5–9	169	86	83	169	86	83	169	86	83
10–14	166	85	81	166	85	81	166	85	81
15–19	176	90	86	176	90	86	176	90	86
20–24	193	98	95	193	98	95	193	98	95
25–29	202	104	98	202	104	98	202	104	98
30–34	184	94	90	184	94	90	184	94	90
35–39	177	88	89	177	88	89	177	88	89
40–44	166	84	82	166	84	82	166	84	82
45–49	211	105	106	211	105	106	211	105	106
50–54	201	99	102	201	99	102	201	99	102
55–59	153	72	81	153	72	81	153	72	81
60–64	123	58	65	123	58	65	123	58	65
65–69	80	36	44	80	36	44	80	36	44
70–74	77	31	46	77	31	46	77	31	46
75–79	59	20	39	59	20	39	59	20	39
80+	48	12	36	48	12	36	48	12	36
<b>Total</b>	<b>2557</b>	<b>1253</b>	<b>1304</b>	<b>2555</b>	<b>1252</b>	<b>1303</b>	<b>2554</b>	<b>1251</b>	<b>1303</b>
<b>2021</b>									
0–4	173	89	84	171	88	83	169	87	82
5–9	170	87	83	170	86	84	169	86	83
10–14	165	85	80	165	85	80	165	85	80
15–19	173	89	84	173	89	84	173	89	84
20–24	190	97	93	190	97	93	190	97	93
25–29	202	104	98	202	104	98	202	104	98
30–34	189	97	92	189	97	92	189	97	92
35–39	177	89	88	177	89	88	177	89	88

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
40–44	166	84	82	166	84	82	166	84	82
45–49	200	100	100	200	100	100	200	100	100
50–54	208	102	106	208	102	106	208	102	106
55–59	160	76	84	160	76	84	160	76	84
60–64	126	58	68	126	58	68	126	58	68
65–69	86	39	47	86	39	47	86	39	47
70–74	72	30	42	72	30	42	72	30	42
75–79	60	21	39	60	21	39	60	21	39
80+	51	13	38	51	13	38	51	13	38
<b>Total</b>	<b>2567</b>	<b>1258</b>	<b>1309</b>	<b>2566</b>	<b>1257</b>	<b>1309</b>	<b>2563</b>	<b>1256</b>	<b>1307</b>
<b>2022</b>									
0–4	174	89	85	172	88	84	169	87	82
5–9	170	87	83	170	87	83	169	86	83
10–14	165	85	80	165	85	80	165	85	80
15–19	170	88	82	170	88	82	170	88	82
20–24	186	95	91	186	95	91	186	95	91
25–29	200	103	97	200	103	97	200	103	97
30–34	193	99	94	193	99	94	193	99	94
35–39	177	89	88	177	89	88	177	89	88
40–44	169	85	84	169	85	84	169	85	84
45–49	187	94	93	187	94	93	187	94	93
50–54	213	105	108	213	105	108	213	105	108
55–59	169	81	88	169	81	88	169	81	88
60–64	128	59	69	128	59	69	128	59	69
65–69	93	42	51	93	42	51	93	42	51
70–74	68	28	40	68	28	40	68	28	40
75–79	61	22	39	61	22	39	61	22	39
80+	54	14	40	54	14	40	54	14	40

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	2578	1264	1314	2576	1263	1313	2572	1261	1311
<b>2023</b>									
0–4	175	90	85	173	88	85	169	86	83
5–9	170	87	83	170	87	83	169	86	83
10–14	166	85	81	166	85	81	166	85	81
15–19	168	86	82	168	86	82	168	86	82
20–24	182	93	89	182	93	89	182	93	89
25–29	198	101	97	198	101	97	198	101	97
30–34	197	102	95	197	102	95	197	102	95
35–39	178	90	88	178	90	88	178	90	88
40–44	172	86	86	172	86	86	172	86	86
45–49	175	88	87	175	88	87	175	88	87
50–54	214	106	108	214	106	108	214	106	108
55–59	177	85	92	177	85	92	177	85	92
60–64	131	60	71	131	60	71	131	60	71
65–69	100	45	55	100	45	55	100	45	55
70–74	65	27	38	65	27	38	65	27	38
75–79	61	23	38	61	23	38	61	23	38
80+	57	15	42	57	15	42	57	15	42
Total	2588	1269	1319	2585	1268	1317	2580	1265	1315
<b>2024</b>									
0–4	176	90	86	173	89	84	168	86	82
5–9	170	87	83	169	86	83	168	86	82
10–14	169	86	83	169	86	83	169	86	83
15–19	167	85	82	167	85	82	167	85	82
20–24	178	92	86	178	92	86	178	92	86
25–29	196	100	96	196	100	96	196	100	96
30–34	200	103	97	200	103	97	200	103	97

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
35–39	180	91	89	180	91	89	180	91	89
40–44	174	87	87	174	87	87	174	87	87
45–49	167	84	83	167	84	83	167	84	83
50–54	212	105	107	212	105	107	212	105	107
55–59	185	89	96	185	89	96	185	89	96
60–64	135	62	73	135	62	73	135	62	73
65–69	106	47	59	106	47	59	106	47	59
70–74	65	27	38	65	27	38	65	27	38
75–79	60	23	37	60	23	37	60	23	37
80+	60	16	44	60	16	44	60	16	44
<b>Total</b>	<b>2599</b>	<b>1275</b>	<b>1324</b>	<b>2595</b>	<b>1273</b>	<b>1322</b>	<b>2588</b>	<b>1269</b>	<b>1319</b>
<b>2025</b>									
0–4	176	90	86	172	88	84	166	85	81
5–9	171	88	83	170	87	83	168	86	82
10–14	169	86	83	169	86	83	169	86	83
15–19	166	85	81	166	85	81	166	85	81
20–24	175	90	85	175	90	85	175	90	85
25–29	192	98	94	192	98	94	192	98	94
30–34	201	104	97	201	104	97	201	104	97
35–39	183	93	90	183	93	90	183	93	90
40–44	175	87	88	175	87	88	175	87	88
45–49	164	82	82	164	82	82	164	82	82
50–54	205	101	104	205	101	104	205	101	104
55–59	192	93	99	192	93	99	192	93	99
60–64	142	65	77	142	65	77	142	65	77
65–69	110	49	61	110	49	61	110	49	61
70–74	68	29	39	68	29	39	68	29	39
75–79	58	22	36	58	22	36	58	22	36

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
80+	63	18	45	63	18	45	63	18	45
Total	2608	1280	1328	2604	1277	1327	2595	1273	1322
<b>2030</b>									
0-4	169	86	83	164	84	80	155	80	75
5-9	176	90	86	172	88	84	166	85	81
10-14	171	88	83	170	87	83	168	86	82
15-19	169	86	83	169	86	83	169	86	83
20-24	165	84	81	165	84	81	165	84	81
25-29	175	90	85	175	90	85	175	90	85
30-34	192	98	94	192	98	94	192	98	94
35-39	200	103	97	200	103	97	200	103	97
40-44	182	92	90	182	92	90	182	92	90
45-49	172	86	86	172	86	86	172	86	86
50-54	159	79	80	159	79	80	159	79	80
55-59	196	95	101	196	95	101	196	95	101
60-64	179	84	95	179	84	95	179	84	95
65-69	127	56	71	127	56	71	127	56	71
70-74	93	39	54	93	39	54	93	39	54
75-79	52	21	31	52	21	31	52	21	31
80+	70	22	48	70	22	48	70	22	48
Total	2647	1299	1348	2638	1294	1344	2621	1285	1336
<b>2035</b>									
0-4	157	81	76	153	78	75	145	74	71
5-9	168	86	82	164	84	80	155	79	76
10-14	176	90	86	172	88	84	165	85	80
15-19	171	87	84	170	87	83	168	86	82
20-24	169	86	83	169	86	83	168	86	82
25-29	165	84	81	165	84	81	165	84	81

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
30–34	174	89	85	174	89	85	174	89	85
35–39	191	97	94	191	97	94	191	97	94
40–44	198	102	96	198	102	96	198	102	96
45–49	179	91	88	179	91	88	179	91	88
50–54	169	83	86	169	83	86	169	83	86
55–59	153	75	78	153	75	78	153	75	78
60–64	184	87	97	184	87	97	184	87	97
65–69	162	73	89	162	73	89	162	73	89
70–74	109	45	64	109	45	64	109	45	64
75–79	72	28	44	72	28	44	72	28	44
80+	71	23	48	71	23	48	71	23	48
<b>Total</b>	<b>2668</b>	<b>1308</b>	<b>1360</b>	<b>2655</b>	<b>1301</b>	<b>1354</b>	<b>2629</b>	<b>1288</b>	<b>1341</b>
<b>2040</b>									
0–4	152	78	74	148	76	72	140	72	68
5–9	157	81	76	153	78	75	144	74	70
10–14	168	86	82	164	84	80	155	79	76
15–19	175	90	85	172	88	84	165	85	80
20–24	171	87	84	169	87	82	168	86	82
25–29	168	86	82	168	86	82	168	86	82
30–34	164	84	80	164	84	80	164	84	80
35–39	174	89	85	174	89	85	174	89	85
40–44	190	96	94	190	96	94	190	96	94
45–49	196	100	96	196	100	96	196	100	96
50–54	175	88	87	175	88	87	175	88	87
55–59	162	79	83	162	79	83	162	79	83
60–64	144	69	75	144	69	75	144	69	75
65–69	166	76	90	166	76	90	166	76	90
70–74	140	59	81	140	59	81	140	59	81



continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
75–79	86	33	53	86	33	53	86	33	53
80+	85	29	56	85	29	56	85	29	56
Total	2675	1309	1366	2657	1301	1356	2623	1283	1340
<b>2045</b>									
0–4	154	79	75	149	77	72	140	72	68
5–9	152	78	74	148	76	72	140	72	68
10–14	157	80	77	153	78	75	144	74	70
15–19	168	86	82	164	84	80	155	79	76
20–24	175	90	85	172	88	84	165	84	81
25–29	170	87	83	169	86	83	168	86	82
30–34	168	85	83	168	85	83	168	85	83
35–39	164	84	80	164	84	80	164	84	80
40–44	172	88	84	172	88	84	172	88	84
45–49	188	95	93	188	95	93	188	95	93
50–54	192	98	94	192	98	94	192	98	94
55–59	170	84	86	170	84	86	170	84	86
60–64	153	73	80	153	73	80	153	73	80
65–69	131	60	71	131	60	71	131	60	71
70–74	144	62	82	144	62	82	144	62	82
75–79	110	44	66	110	44	66	110	44	66
80+	102	35	67	102	35	67	102	35	67
Total	2671	1307	1364	2649	1296	1353	2606	1274	1332
<b>2050</b>									
0–4	157	81	76	151	78	73	140	72	68
5–9	154	79	75	149	77	72	140	72	68
10–14	152	78	74	148	76	72	140	72	68
15–19	157	80	77	153	78	75	144	74	70
20–24	168	86	82	163	84	79	154	79	75

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
25–29	175	89	86	171	88	83	165	84	81
30–34	170	87	83	169	86	83	167	85	82
35–39	167	85	82	167	85	82	167	85	82
40–44	163	83	80	163	83	80	163	83	80
45–49	171	87	84	171	87	84	171	87	84
50–54	184	92	92	184	92	92	184	92	92
55–59	186	93	93	186	93	93	186	93	93
60–64	160	77	83	160	77	83	160	77	83
65–69	140	64	76	140	64	76	140	64	76
70–74	114	50	64	114	50	64	114	50	64
75–79	114	46	68	114	46	68	114	46	68
80+	127	45	82	127	45	82	127	45	82
Total	2658	1302	1356	2630	1288	1342	2577	1260	1317

**2. Population by 5-year Age Group and by Sex (excluding army)  
(10,000 persons )**

Year Age group	Scenario 1			Scenario 1			Scenario 1		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>2014</b>									
0-4	169	87	82	169	87	82	169	87	82
5-9	167	86	81	167	86	81	167	86	81
10-14	179	92	87	179	92	87	179	92	87
15-19	178	84	94	178	84	94	178	84	94
20-24	160	65	95	160	65	95	160	65	95
25-29	174	84	90	174	84	90	174	84	90
30-34	176	88	88	176	88	88	176	88	88
35-39	171	86	85	171	86	85	171	86	85
40-44	222	111	111	222	111	111	222	111	111
45-49	201	99	102	201	99	102	201	99	102
50-54	154	75	79	154	75	79	154	75	79
55-59	130	63	67	130	63	67	130	63	67
60-64	89	42	47	89	42	47	89	42	47
65-69	97	42	55	97	42	55	97	42	55
70-74	76	28	48	76	28	48	76	28	48
75-79	49	14	35	49	14	35	49	14	35
80+	28	5	23	28	5	23	28	5	23
<b>Total</b>	<b>2421</b>	<b>1151</b>	<b>1270</b>	<b>2421</b>	<b>1151</b>	<b>1270</b>	<b>2421</b>	<b>1151</b>	<b>1270</b>
<b>2015</b>									
0-4	170	87	83	170	87	83	169	87	82
5-9	166	85	81	166	85	81	166	85	81
10-14	176	91	85	176	91	85	176	91	85
15-19	175	82	93	175	82	93	175	82	93
20-24	162	66	96	162	66	96	162	66	96
25-29	177	87	90	177	87	90	177	87	90
30-34	177	88	89	177	88	89	177	88	89
35-39	167	84	83	167	84	83	167	84	83
40-44	214	107	107	214	107	107	214	107	107

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
45–49	208	103	105	208	103	105	208	103	105
50–54	161	78	83	161	78	83	161	78	83
55–59	134	65	69	134	65	69	134	65	69
60–64	92	43	49	92	43	49	92	43	49
65–69	93	41	52	93	41	52	93	41	52
70–74	78	29	49	78	29	49	78	29	49
75–79	53	16	37	53	16	37	53	16	37
80+	29	5	24	29	5	24	29	5	24
<b>Total</b>	<b>2431</b>	<b>1156</b>	<b>1275</b>	<b>2431</b>	<b>1156</b>	<b>1275</b>	<b>2431</b>	<b>1156</b>	<b>1275</b>
<b>2016</b>									
0–4	170	87	83	170	87	83	170	87	83
5–9	165	85	80	165	85	80	165	85	80
10–14	173	89	84	173	89	84	173	89	84
15–19	171	80	91	171	80	91	171	80	91
20–24	161	65	96	161	65	96	161	65	96
25–29	181	89	92	181	89	92	181	89	92
30–34	177	88	89	177	88	89	177	88	89
35–39	167	84	83	167	84	83	167	84	83
40–44	203	102	101	203	102	101	203	102	101
45–49	214	106	108	214	106	108	214	106	108
50–54	169	82	87	169	82	87	169	82	87
55–59	137	66	71	137	66	71	137	66	71
60–64	98	46	52	98	46	52	98	46	52
65–69	87	38	49	87	38	49	87	38	49
70–74	80	31	49	80	31	49	80	31	49
75–79	55	17	38	55	17	38	55	17	38
80+	33	6	27	33	6	27	33	6	27
<b>Total</b>	<b>2442</b>	<b>1162</b>	<b>1280</b>	<b>2442</b>	<b>1162</b>	<b>1280</b>	<b>2442</b>	<b>1162</b>	<b>1280</b>

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>2017</b>									
0-4	171	87	84	170	87	83	170	87	83
5-9	166	85	81	166	85	81	166	85	81
10-14	171	88	83	171	88	83	171	88	83
15-19	167	79	88	167	79	88	167	79	88
20-24	160	64	96	160	64	96	160	64	96
25-29	186	92	94	186	92	94	186	92	94
30-34	177	89	88	177	89	88	177	89	88
35-39	169	85	84	169	85	84	169	85	84
40-44	189	95	94	189	95	94	189	95	94
45-49	219	109	110	219	109	110	219	109	110
50-54	178	86	92	178	86	92	178	86	92
55-59	139	66	73	139	66	73	139	66	73
60-64	106	50	56	106	50	56	106	50	56
65-69	82	36	46	82	36	46	82	36	46
70-74	81	32	49	81	32	49	81	32	49
75-79	56	18	38	56	18	38	56	18	38
80+	37	7	30	37	7	30	37	7	30
<b>Total</b>	<b>2453</b>	<b>1168</b>	<b>1285</b>	<b>2453</b>	<b>1168</b>	<b>1285</b>	<b>2452</b>	<b>1168</b>	<b>1284</b>
<b>2018</b>									
0-4	171	87	84	170	87	83	169	86	83
5-9	167	85	82	167	85	82	167	85	82
10-14	169	87	82	169	87	82	169	87	82
15-19	163	77	86	163	77	86	163	77	86
20-24	158	63	95	158	63	95	158	63	95
25-29	190	94	96	190	94	96	190	94	96
30-34	178	89	89	178	89	89	178	89	89
35-39	172	86	86	172	86	86	172	86	86
40-44	177	89	88	177	89	88	177	89	88

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
45–49	221	110	111	221	110	111	221	110	111
50–54	186	91	95	186	91	95	186	91	95
55–59	142	67	75	142	67	75	142	67	75
60–64	113	54	59	113	54	59	113	54	59
65–69	78	35	43	78	35	43	78	35	43
70–74	81	33	48	81	33	48	81	33	48
75–79	56	19	37	56	19	37	56	19	37
80+	42	9	33	42	9	33	42	9	33
<b>Total</b>	<b>2464</b>	<b>1174</b>	<b>1290</b>	<b>2463</b>	<b>1174</b>	<b>1289</b>	<b>2463</b>	<b>1173</b>	<b>1290</b>
<b>2019</b>									
0–4	170	87	83	169	87	82	168	86	82
5–9	169	86	83	169	86	83	169	86	83
10–14	167	86	81	167	86	81	167	86	81
15–19	160	75	85	160	75	85	160	75	85
20–24	155	61	94	155	61	94	155	61	94
25–29	193	96	97	193	96	97	193	96	97
30–34	180	91	89	180	91	89	180	91	89
35–39	175	87	88	175	87	88	175	87	88
40–44	169	85	84	169	85	84	169	85	84
45–49	218	109	109	218	109	109	218	109	109
50–54	194	95	99	194	95	99	194	95	99
55–59	146	69	77	146	69	77	146	69	77
60–64	119	56	63	119	56	63	119	56	63
65–69	77	35	42	77	35	42	77	35	42
70–74	80	32	48	80	32	48	80	32	48
75–79	57	19	38	57	19	38	57	19	38
80+	45	10	35	45	10	35	45	10	35
<b>Total</b>	<b>2475</b>	<b>1180</b>	<b>1295</b>	<b>2474</b>	<b>1179</b>	<b>1295</b>	<b>2473</b>	<b>1179</b>	<b>1294</b>

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>2020</b>									
0-4	172	88	84	170	87	83	169	86	83
5-9	169	86	83	169	86	83	169	86	83
10-14	166	85	81	166	85	81	166	85	81
15-19	157	73	84	157	73	84	157	73	84
20-24	152	59	93	152	59	93	152	59	93
25-29	194	96	98	194	96	98	194	96	98
30-34	183	93	90	183	93	90	183	93	90
35-39	176	87	89	176	87	89	176	87	89
40-44	165	83	82	165	83	82	165	83	82
45-49	211	105	106	211	105	106	211	105	106
50-54	201	99	102	201	99	102	201	99	102
55-59	153	72	81	153	72	81	153	72	81
60-64	123	58	65	123	58	65	123	58	65
65-69	80	36	44	80	36	44	80	36	44
70-74	77	31	46	77	31	46	77	31	46
75-79	59	20	39	59	20	39	59	20	39
80+	48	12	36	48	12	36	48	12	36
<b>Total</b>	<b>2486</b>	<b>1186</b>	<b>1300</b>	<b>2484</b>	<b>1185</b>	<b>1299</b>	<b>2483</b>	<b>1184</b>	<b>1299</b>
<b>2021</b>									
0-4	173	89	84	171	88	83	169	87	82
5-9	170	87	83	170	86	84	169	86	83
10-14	165	85	80	165	85	80	165	85	80
15-19	154	72	82	154	72	82	154	72	82
20-24	149	58	91	149	58	91	149	58	91
25-29	194	96	98	194	96	98	194	96	98
30-34	188	96	92	188	96	92	188	96	92
35-39	176	88	88	176	88	88	176	88	88
40-44	165	83	82	165	83	82	165	83	82

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
45–49	200	100	100	200	100	100	200	100	100
50–54	208	102	106	208	102	106	208	102	106
55–59	160	76	84	160	76	84	160	76	84
60–64	126	58	68	126	58	68	126	58	68
65–69	86	39	47	86	39	47	86	39	47
70–74	72	30	42	72	30	42	72	30	42
75–79	60	21	39	60	21	39	60	21	39
80+	51	13	38	51	13	38	51	13	38
<b>Total</b>	<b>2496</b>	<b>1191</b>	<b>1305</b>	<b>2495</b>	<b>1190</b>	<b>1305</b>	<b>2492</b>	<b>1189</b>	<b>1303</b>
<b>2022</b>									
0–4	174	89	85	172	88	84	169	87	82
5–9	170	87	83	170	87	83	169	86	83
10–14	165	85	80	165	85	80	165	85	80
15–19	151	71	80	151	71	80	151	71	80
20–24	145	56	89	145	56	89	145	56	89
25–29	192	95	97	192	95	97	192	95	97
30–34	192	98	94	192	98	94	192	98	94
35–39	176	88	88	176	88	88	176	88	88
40–44	168	84	84	168	84	84	168	84	84
45–49	187	94	93	187	94	93	187	94	93
50–54	213	105	108	213	105	108	213	105	108
55–59	169	81	88	169	81	88	169	81	88
60–64	128	59	69	128	59	69	128	59	69
65–69	93	42	51	93	42	51	93	42	51
70–74	68	28	40	68	28	40	68	28	40
75–79	61	22	39	61	22	39	61	22	39
80+	54	14	40	54	14	40	54	14	40
<b>Total</b>	<b>2507</b>	<b>1197</b>	<b>1310</b>	<b>2505</b>	<b>1196</b>	<b>1309</b>	<b>2501</b>	<b>1194</b>	<b>1307</b>



continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>2023</b>									
0–4	175	90	85	173	88	85	169	86	83
5–9	170	87	83	170	87	83	169	86	83
10–14	166	85	81	166	85	81	166	85	81
15–19	149	69	80	149	69	80	149	69	80
20–24	141	54	87	141	54	87	141	54	87
25–29	190	93	97	190	93	97	190	93	97
30–34	196	101	95	196	101	95	196	101	95
35–39	177	89	88	177	89	88	177	89	88
40–44	171	85	86	171	85	86	171	85	86
45–49	175	88	87	175	88	87	175	88	87
50–54	214	106	108	214	106	108	214	106	108
55–59	177	85	92	177	85	92	177	85	92
60–64	131	60	71	131	60	71	131	60	71
65–69	100	45	55	100	45	55	100	45	55
70–74	65	27	38	65	27	38	65	27	38
75–79	61	23	38	61	23	38	61	23	38
80+	57	15	42	57	15	42	57	15	42
<b>Total</b>	<b>2517</b>	<b>1202</b>	<b>1315</b>	<b>2514</b>	<b>1201</b>	<b>1313</b>	<b>2509</b>	<b>1198</b>	<b>1311</b>
<b>2024</b>									
0–4	176	90	86	173	89	84	168	86	82
5–9	170	87	83	169	86	83	168	86	82
10–14	169	86	83	169	86	83	169	86	83
15–19	148	68	80	148	68	80	148	68	80
20–24	137	53	84	137	53	84	137	53	84
25–29	188	92	96	188	92	96	188	92	96
30–34	199	102	97	199	102	97	199	102	97
35–39	179	90	89	179	90	89	179	90	89
40–44	173	86	87	173	86	87	173	86	87

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
45–49	167	84	83	167	84	83	167	84	83
50–54	212	105	107	212	105	107	212	105	107
55–59	185	89	96	185	89	96	185	89	96
60–64	135	62	73	135	62	73	135	62	73
65–69	106	47	59	106	47	59	106	47	59
70–74	65	27	38	65	27	38	65	27	38
75–79	60	23	37	60	23	37	60	23	37
80+	60	16	44	60	16	44	60	16	44
<b>Total</b>	<b>2528</b>	<b>1208</b>	<b>1320</b>	<b>2524</b>	<b>1206</b>	<b>1318</b>	<b>2517</b>	<b>1202</b>	<b>1315</b>
<b>2025</b>									
0–4	176	90	86	172	88	84	166	85	81
5–9	171	88	83	170	87	83	168	86	82
10–14	169	86	83	169	86	83	169	86	83
15–19	147	68	79	147	68	79	147	68	79
20–24	134	51	83	134	51	83	134	51	83
25–29	184	90	94	184	90	94	184	90	94
30–34	200	103	97	200	103	97	200	103	97
35–39	182	92	90	182	92	90	182	92	90
40–44	174	86	88	174	86	88	174	86	88
45–49	164	82	82	164	82	82	164	82	82
50–54	205	101	104	205	101	104	205	101	104
55–59	192	93	99	192	93	99	192	93	99
60–64	142	65	77	142	65	77	142	65	77
65–69	110	49	61	110	49	61	110	49	61
70–74	68	29	39	68	29	39	68	29	39
75–79	58	22	36	58	22	36	58	22	36
80+	63	18	45	63	18	45	63	18	45
<b>Total</b>	<b>2537</b>	<b>1213</b>	<b>1324</b>	<b>2533</b>	<b>1210</b>	<b>1323</b>	<b>2524</b>	<b>1206</b>	<b>1318</b>

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>2030</b>									
0–4	169	86	83	164	84	80	155	80	75
5–9	176	90	86	172	88	84	166	85	81
10–14	171	88	83	170	87	83	168	86	82
15–19	150	69	81	150	69	81	150	69	81
20–24	124	45	79	124	45	79	124	45	79
25–29	167	82	85	167	82	85	167	82	85
30–34	191	97	94	191	97	94	191	97	94
35–39	199	102	97	199	102	97	199	102	97
40–44	181	91	90	181	91	90	181	91	90
45–49	172	86	86	172	86	86	172	86	86
50–54	159	79	80	159	79	80	159	79	80
55–59	196	95	101	196	95	101	196	95	101
60–64	179	84	95	179	84	95	179	84	95
65–69	127	56	71	127	56	71	127	56	71
70–74	93	39	54	93	39	54	93	39	54
75–79	52	21	31	52	21	31	52	21	31
80+	70	22	48	70	22	48	70	22	48
<b>Total</b>	<b>2576</b>	<b>1232</b>	<b>1344</b>	<b>2567</b>	<b>1227</b>	<b>1340</b>	<b>2550</b>	<b>1218</b>	<b>1332</b>
<b>2035</b>									
0–4	157	81	76	153	78	75	145	74	71
5–9	168	86	82	164	84	80	155	79	76
10–14	176	90	86	172	88	84	165	85	80
15–19	152	70	82	151	70	81	149	69	80
20–24	128	47	81	128	47	81	127	47	80
25–29	157	76	81	157	76	81	157	76	81
30–34	173	88	85	173	88	85	173	88	85
35–39	190	96	94	190	96	94	190	96	94
40–44	197	101	96	197	101	96	197	101	96

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
45–49	179	91	88	179	91	88	179	91	88
50–54	169	83	86	169	83	86	169	83	86
55–59	153	75	78	153	75	78	153	75	78
60–64	184	87	97	184	87	97	184	87	97
65–69	162	73	89	162	73	89	162	73	89
70–74	109	45	64	109	45	64	109	45	64
75–79	72	28	44	72	28	44	72	28	44
80+	71	23	48	71	23	48	71	23	48
<b>Total</b>	<b>2597</b>	<b>1241</b>	<b>1356</b>	<b>2584</b>	<b>1234</b>	<b>1350</b>	<b>2558</b>	<b>1221</b>	<b>1337</b>
<b>2040</b>									
0–4	152	78	74	148	76	72	140	72	68
5–9	157	81	76	153	78	75	144	74	70
10–14	168	86	82	164	84	80	155	79	76
15–19	156	73	83	153	71	82	146	68	78
20–24	130	48	82	128	48	80	127	47	80
25–29	160	78	82	160	78	82	160	78	82
30–34	163	83	80	163	83	80	163	83	80
35–39	173	88	85	173	88	85	173	88	85
40–44	189	95	94	189	95	94	189	95	94
45–49	196	100	96	196	100	96	196	100	96
50–54	175	88	87	175	88	87	175	88	87
55–59	162	79	83	162	79	83	162	79	83
60–64	144	69	75	144	69	75	144	69	75
65–69	166	76	90	166	76	90	166	76	90
70–74	140	59	81	140	59	81	140	59	81
75–79	86	33	53	86	33	53	86	33	53
80+	85	29	56	85	29	56	85	29	56
<b>Total</b>	<b>2604</b>	<b>1242</b>	<b>1362</b>	<b>2586</b>	<b>1234</b>	<b>1352</b>	<b>2552</b>	<b>1216</b>	<b>1336</b>

continue

Year Age group	Scenario 1			Scenario 2			Scenario 3		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
<b>2045</b>									
0-4	154	79	75	149	77	72	140	72	68
5-9	152	78	74	148	76	72	140	72	68
10-14	157	80	77	153	78	75	144	74	70
15-19	149	69	80	145	67	78	136	62	74
20-24	134	51	83	131	49	82	124	45	79
25-29	162	79	83	161	78	83	160	78	82
30-34	167	84	83	167	84	83	167	84	83
35-39	163	83	80	163	83	80	163	83	80
40-44	171	87	84	171	87	84	171	87	84
45-49	188	95	93	188	95	93	188	95	93
50-54	192	98	94	192	98	94	192	98	94
55-59	170	84	86	170	84	86	170	84	86
60-64	153	73	80	153	73	80	153	73	80
65-69	131	60	71	131	60	71	131	60	71
70-74	144	62	82	144	62	82	144	62	82
75-79	110	44	66	110	44	66	110	44	66
80+	102	35	67	102	35	67	102	35	67
<b>Total</b>	<b>2600</b>	<b>1240</b>	<b>1360</b>	<b>2578</b>	<b>1229</b>	<b>1349</b>	<b>2535</b>	<b>1207</b>	<b>1328</b>
<b>2050</b>									
0-4	157	81	76	151	78	73	140	72	68
5-9	154	79	75	149	77	72	140	72	68
10-14	152	78	74	148	76	72	140	72	68
15-19	138	63	75	134	61	73	125	57	68
20-24	127	47	80	122	45	77	113	40	73
25-29	167	81	86	163	80	83	157	76	81
30-34	169	86	83	168	85	83	166	84	82
35-39	166	84	82	166	84	82	166	84	82
40-44	162	82	80	162	82	80	162	82	80

continue

<b>Year Age group</b>	<b>Scenario 1</b>			<b>Scenario 2</b>			<b>Scenario 3</b>		
	<b>Total</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>
45–49	171	87	84	171	87	84	171	87	84
50–54	184	92	92	184	92	92	184	92	92
55–59	186	93	93	186	93	93	186	93	93
60–64	160	77	83	160	77	83	160	77	83
65–69	140	64	76	140	64	76	140	64	76
70–74	114	50	64	114	50	64	114	50	64
75–79	114	46	68	114	46	68	114	46	68
80+	127	45	82	127	45	82	127	45	82
<b>Total</b>	<b>2587</b>	<b>1235</b>	<b>1352</b>	<b>2559</b>	<b>1221</b>	<b>1338</b>	<b>2506</b>	<b>1193</b>	<b>1313</b>

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