



The economics of healthy and active ageing series  
New evidence for the **Western Pacific Region**  
**Republic of Korea**

# HOW WILL POPULATION AGEING AFFECT HEALTH EXPENDITURE TRENDS IN THE **REPUBLIC OF KOREA** AND WHAT ARE THE IMPLICATIONS IF PEOPLE AGE IN GOOD HEALTH?

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## Acronyms

<b>GDP</b>	gross domestic product
<b>NHI</b>	National Health Insurance system
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>THE</b>	total health expenditure
<b>WHO</b>	World Health Organization

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***“Changes  
in people’s  
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consequences”***

## Introduction

Countries around the world are experiencing population ageing in some form, with the share of older people in the population increasing (UN, 2019). This is driven by rising life expectancy, which results from declines in infant mortality, fertility and premature death. Low- and middle-income countries are experiencing some of the most rapid rates of increase in the number of people aged 65 years and older, while high-income countries are seeing a substantial rise in the number of the so-called ‘oldest old’ (people aged 80 years and above).

In the World Health Organization (WHO) Western Pacific Region, home to 1.9 billion people, substantial diversity exists in terms of the population age-mix. While 28.4% of the population in Japan in 2020 is estimated to be over 65 years of age, this falls to below 4% in other countries, including Papua New Guinea, Solomon Islands and Vanuatu. Overall, the share of the population aged over 65 years in the region is expected to more than double from 12.4% in 2020 to 28.4% in 2060, while the proportion of people aged over 80 years will see a four-fold increase from 2.3% to 9.6% over the same period (UN, 2019).

Changes in people’s needs due to population age-mix shifts have consequences for health and long-term care systems. Data from most countries show that, on average, older people have higher health expenditures than younger people. This often leads to the assumption that health expenditure growth will accelerate as older people make up an increasing share of the population, potentially challenging the sustainability of health systems. Yet, while providing appropriate health and social care to an increasing number of older persons does place additional pressure on the health system, (calendar) ageing is not the main driver of expenditure growth. Many argue instead that factors such as organization of care, technology, price regulation, proximity to death and health status are more important drivers of health care spending.

In this note we assess the role of population ageing as a determinant of future health expenditure growth in the Republic of Korea. We also consider how ageing in better or worse health impacts these projections. Data and methods for the projections used in this report are outlined in the annex.

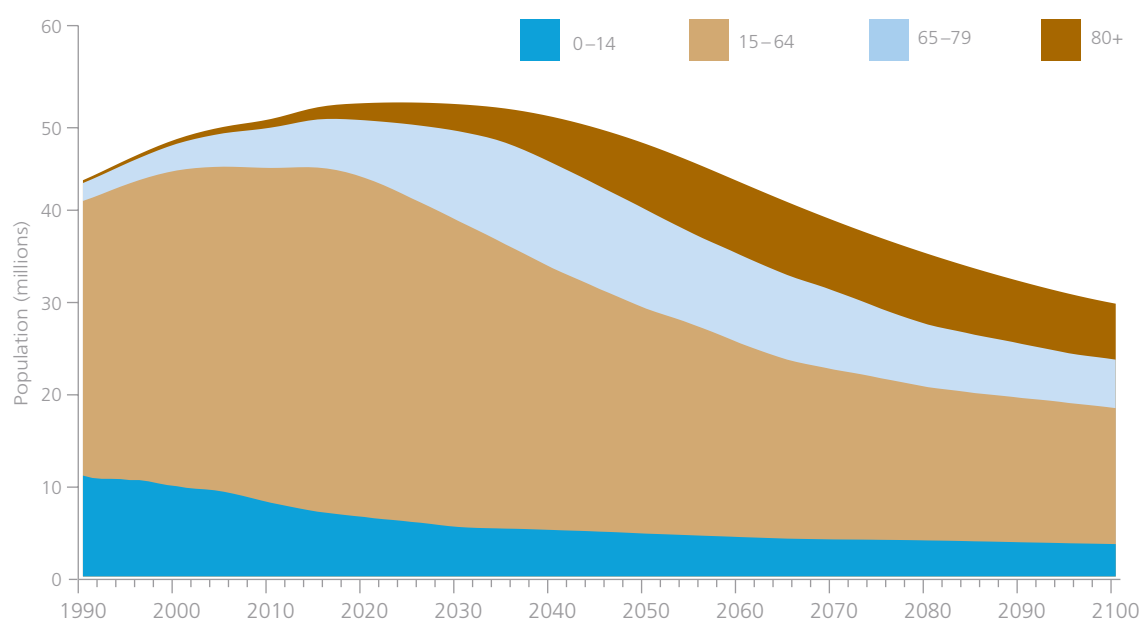
## Population ageing, health and health spending in the Republic of Korea

2020 Population	2020 Share of the population 65 years and above	2019 Total health expenditure per capita (USD)	2019 Total health expenditure as a share of GDP	2017 Life expectancy (years at birth)	2016 Healthy life expectancy (years at birth)
51.3 million	15.8%	3 384	8.0%	82.7	73.0

### *The Republic of Korea's population is ageing rapidly*

The Republic of Korea has one of the lowest total fertility rates in the world (1.17 in 2016) and the total population is expected to fall by more than 16% over the next four decades, to 42.7 million in 2060. In 2020, 15.8% of the population was older than 65 years of age, with 3.6% over 80 years of age – up from 3.4% and <1% respectively in 1960 (Figure 1). These shares will continue to rise rapidly and by 2060 an estimated 40.9% of the population will be over 65 years of age and 18.4% will be in the oldest age groups (UN, 2020). Owing to the rapidly rising number of older people, the economic old-age dependency ratio (ratio of population aged over 65 to population aged 20–64 years) is expected to almost quadruple from 23.6% in 2020 to 89.7% in 2060.

**Figure 1.** Population age-mix in the Republic of Korea, historical and projections, 1990–2100



Source: UN, 2019.

## ***People in the Republic of Korea are living for longer than ever before, but time spent in poor health is increasing***

Life expectancy at birth in the Republic of Korea has increased by almost 30 years since 1960, reaching 82.7 years in 2017 (85.7 years for women and 79.7 years for men) (OECD, 2020; World Bank, 2020). Women aged 65 years in 2017 could expect to live for another 22.7 years, with the corresponding figure for men 18.6 years. These gains in life expectancy were initially driven by a fall in infant mortality, followed more recently by a decline in deaths from cardiovascular diseases, stomach cancers, liver disease and tuberculosis (Yang et al., 2010). The Republic of Korea's industrialization and subsequent rise in gross domestic product (GDP) and living standards, along with better nutrition and improved access to health care have been identified as major factors contributing to these improvements in health (Yang et al., 2010). However, the increase in health-adjusted life expectancy at birth in the Republic of Korea since 1990 has been smaller than the increase in life expectancy, suggesting there has been a rise in the number of years spent living in poor health (Kyu et al., 2018). In addition, while mortality from some cancers and cardiovascular diseases has fallen in recent decades, mortality from other conditions often associated with older age, including dementia, Alzheimer's and Parkinson's disease, have increased (OECD, 2020).

## ***Health spending in the Republic of Korea has increased rapidly in the past decade***

The Republic of Korea has a National Health Insurance (NHI) system, which covers 97% of the population, with the tax-funded Medical Aid Program covering the 3% of individuals on low incomes (Kwon, Lee & Kim, 2015). NHI was introduced in 1977 and merged into a single-payer system in 2000. Mandatory long-term care insurance was introduced in 2008 (Kwon, Lee & Kim, 2015).

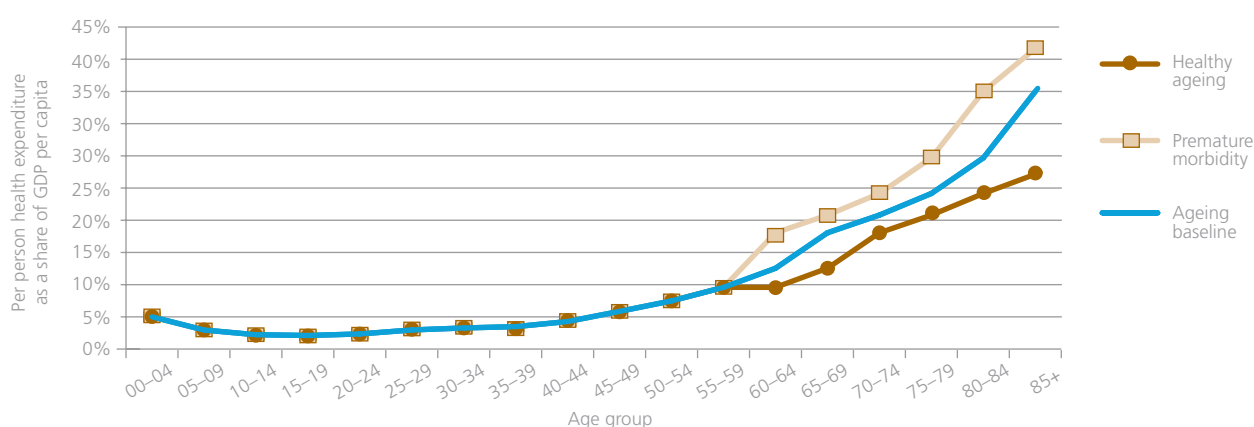
The Republic of Korea has seen one of the largest growth rates in health spending in the Organisation for Economic Co-operation and Development (OECD) in the past 15 years, with total health expenditure (THE) more than doubling from 3.7% in 1995 to 8.0% in 2019, although this remains below the OECD average of 8.8% (Kwon, Lee & Kim, 2015; OECD, 2020). Per person spending has also increased by more than 1.5 times since 2010 and was USD 3 384 (KRW 2,796,389.7) in 2019, below the OECD average of USD 3992 (KRW 1,986,873) (OECD, 2020). Evidence suggests much of this growth in health spending in the Republic of Korea is related to non-demographic factors, such as economic growth, the expansion of NHI for vulnerable individuals, and increased provision and utilization of health care (Cheng et al., 2018). In 2019, public expenditure accounted for 61% of THE, above the 39% share in 1995, but below the OECD average of 74.0%, as a result of high out-of-pocket spending (OECD, 2020).

## How will population ageing in the Republic of Korea affect health expenditure trends?

### Health expenditures in the Republic of Korea generally increase with age

Using OECD health and long-term care expenditure data for 2009, we are able to assess the relationship between calendar age and per person health spending in the Republic of Korea (Figure 2, solid blue line; see annex for details on health spending data) (OECD, 2020). While the data are from 11 years ago, previous work from other countries has shown that health spending by age generally remains relatively constant over time in a given country (Williams et al., 2019), suggesting the data will provide a reasonably accurate baseline for health spending projections. As expected, health expenditures are relatively high at birth until 1 year of age. At about 50 years of age, health expenditures start to steadily increase and continue to rise for all subsequent age groups. Per person health spending for an average 80-year-old is more than 12 times higher than for an average 20-year-old.

**Figure 2.** Per person health expenditure by age group (baseline and two alternative scenarios), 2009, Republic of Korea



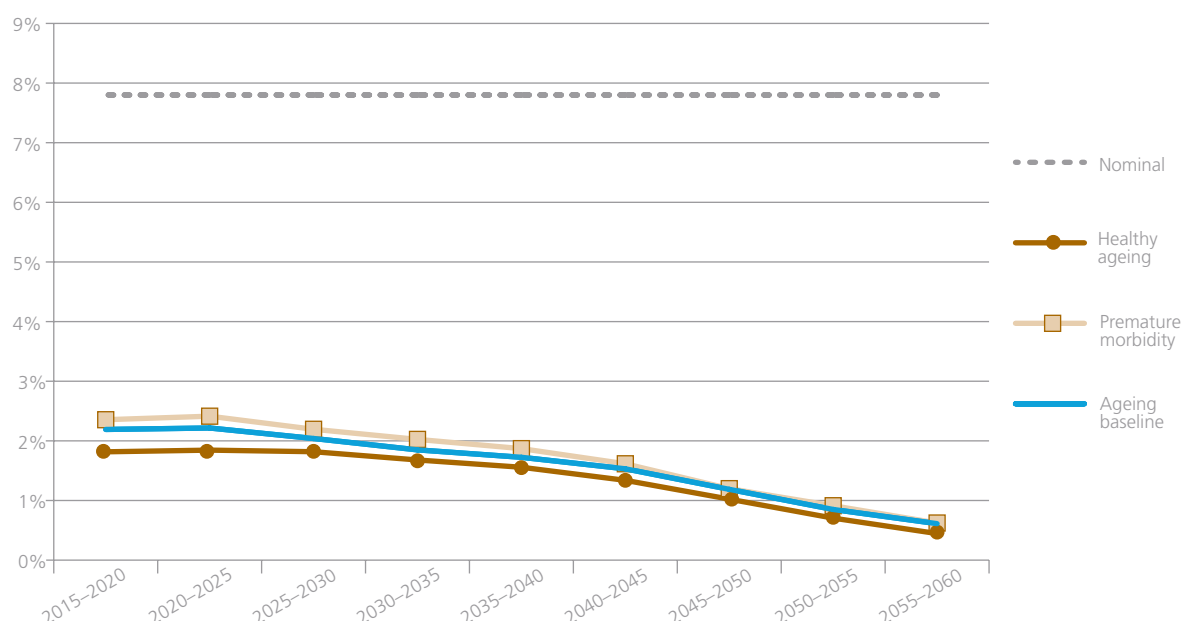
Source: OECD, 2020.

### Population ageing in the Republic of Korea is expected to contribute modestly to growth in per person health spending through 2060

Using 2009 per person spending levels by age (Figure 2, solid blue line), we project the contribution of population ageing to health care expenditure growth through 2060 for the Republic of Korea (Figure 3). Our projections indicate that the additional growth in average annual per person health care spending attributable to population ageing is expected to peak at 2.2 percentage point per year between 2020 and 2025, before steadily declining to 0.6 percentage points per year in 2060 (Figure 3).

To place this in context, the average nominal per person annual growth rate in health expenditure due to all causes including population ageing (shown in Figure 3, grey dashed line) was approximately 7.8% in the Republic of Korea from 2010–2017 (WHO, 2020). From this, one could infer that population ageing in the Republic of Korea accounts for less than one-third of per person health spending growth, with the remaining growth driven by prices, volume of care and technology.

**Figure 3.** Projected additional growth in per person health expenditure attributable to population ageing, Republic of Korea, 2015–2060



Source: Authors' calculations.

**Population ageing on its own is expected to slowly increase health spending as a share of the economy between now and 2060**

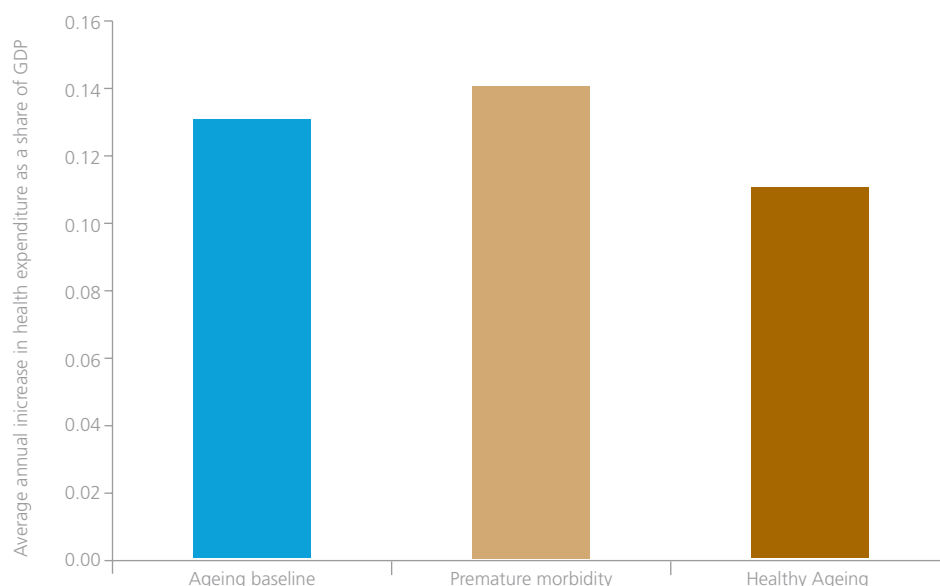
The projections above imply that population ageing in the Republic of Korea will see THE as a share of GDP increase by 5.13 percentage points between 2020 and 2060. While this is a significant additional share of the economy, it is important to stress that baseline data capture total (public and private) health and long-term care spending; therefore, the increase in public health expenditure only will be lower than these projections. In the Republic of Korea, private spending (out-of-pocket and voluntary health care payments) was 40% of current health expenditure in 2018, with public health expenditure accounting for 60% of the total. Applying estimates from our projections to public health expenditures only, we would expect public health expenditure as a share of GDP to increase by approximately 3.13 percentage points over the same period.

In addition, it is important to note that any increase in spending will occur slowly. Over the 40-year period, the average increase in the share of the economy spent on health as a result of population ageing would be just under 0.13 percentage points per year (Figure 4).

**Growth in total health spending as a share of GDP would be comparatively lower by 2060 if people age in good health**

In two hypothetical scenarios we project how future health expenditure growth will differ depending on whether people age in better or worse health than predicted, leading to lower or higher per capita health expenditures respectively than currently (see annex).

**Figure 4.** Average annual increase in total health expenditures as a share of GDP between 2020 and 2060 in the Republic of Korea as a result of population ageing under current health expenditure by age patterns (baseline) and healthy ageing and premature morbidity scenarios



Source: Authors' calculations.

Under a **premature morbidity** scenario where people age in worse health, the additional growth in average annual per person spending attributable to population ageing would peak at 2.41 percentage points per year between 2020 and 2025, before declining to 0.62 percentage points per year in 2060 (Figure 3, line with square). This scenario would see population ageing increase THE as a share of GDP by 5.67 percentage points between 2020 and 2060. This represents an increase of 0.54 percentage points above the projection using actual baseline health expenditures. Over the 40-year period, the average increase in the share of the economy spent on health as a result of population ageing under a premature morbidity scenario would be just over 0.14 percentage points per year (Figure 4). These projections suggest that growth in public health expenditures would be approximately 3.40 percentage points from 2020 to 2060 under a premature morbidity scenario, 0.27 percentage points of GDP higher than under the ageing baseline scenario.

Under a **healthy ageing** scenario where people age in better health, the additional growth in average annual per person spending attributable to population ageing would peak at 1.85 percentage points per year between 2025 and 2030, before declining to 0.45 percentage points per year in 2060 (Figure 3, line with circle). This scenario would see population ageing increase THE as a share of GDP by 4.47 percentage points between 2020 and 2060. This represents a decrease of 0.66 percentage points from the projection using actual baseline health expenditures. Over the 40-year period, the average increase in the share of the economy spent on health as a result of population ageing under a healthy ageing scenario would be just over 0.10 percentage points per year (Figure 4). These projections suggest that growth in public health expenditures would be approximately 2.68 percentage points from 2020 to 2060 under a healthy ageing scenario, 0.45 percentage points of GDP lower than under the ageing baseline scenario.

Comparing the two scenarios for total health spending, people ageing in good health in the Republic of Korea would see health expenditure consume 1.20 fewer percentage points of GDP in 2060 than if people age in poor health. This suggests that investing in healthy ageing strategies may lead to savings of just under 0.03% of GDP per year over the next 40 years. While this seems small, based on 2018 GDP estimates, it would amount to savings of almost USD 19.4 billion in 2060, or just over USD 486 million per year if averaged over the next 40 years. However, it should be emphasized that these figures are based on hypothetical scenarios and should **not** be viewed as forecasts of savings in future health spending.



## Discussion

Our analysis finds that population ageing in the Republic of Korea will result in an increase in total health expenditure as a share of GDP by 5.13 percentage points between 2020 and 2060, an average increase of 0.13 percentage points per year. Our projections rely on current health expenditure patterns that reflect what has been achieved with the existing levels of health systems capacity and utilization rates. If per capita health spending levels for older age groups were to increase in the future, for example due to an expansion in benefits or increased capacity to pay for older people, it is possible that the impact of population ageing in health expenditures may be greater than anticipated.

One factor that may cause health spending by age patterns to change in the future is the health of people at older ages. If the population on average ages in better health than currently, per person health spending for older age groups may be less than they are now. Conversely, people ageing in worse health may cause health expenditures for older age groups to be even higher. In recognition that variations in health status matter for spending by age patterns, we simulate two scenarios assuming healthy or unhealthy population ageing in the future. Our findings indicate that premature morbidity in the population would see health spending as a share of GDP increase by 5.67 percentage points between 2020 and 2060, but healthy ageing would see growth of 4.47 percentage points over the same period. This suggests that policies to promote healthy ageing can help to reduce growth in health spending as a result of population ageing.

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## Annex: Data and methods for population ageing projections

Data for current total health spending by age group in 2009 for the Republic of Korea were extracted from the OECD Stats website, which collects data under the system of the health accounts framework (OECD, 2020). These data capture health expenditure on personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), excluding spending on investments. Per person health expenditures by age are divided by per person GDP to calculate health expenditures per capita as a share of GDP per capita by age group. Population projections by age for the Republic of Korea were extracted from the United Nations Department of Economic and Social Affairs population projections website (UN, 2019).

In model 1 (*ageing baseline*), we isolate the contribution of population ageing to future health expenditure growth for the Republic of Korea, by multiplying per person health expenditures for each age group by the respective age group's population size, with the resulting expenditure across all age groups added together; we then divide by the total population size. This leaves us with a per person health expenditure level which varies from year to year only due to changes in the age-mix of the population.

This model assumes that relative per person spending patterns by age remain constant. That is, any changes in other drivers of health care expenditures, such as prices, technology, quality and volume of care, affect all age groups equally in the future. Doing this allows us to isolate the effects of population ageing on expenditure trends. As a result, if people aged 65 years and over currently spend four times as much on health care as younger age groups, it is assumed that this continues in the future, even if the actual level of spending has increased. Historical data from other countries suggest this is a reasonable assumption (OECD, 2020; Williams et al, 2019).

In models 2 (*premature morbidity*) and 3 (*healthy ageing*) we adjust the baseline ageing model projections to simulate scenarios where people age in worse and better health respectively than indicated by current expenditure by age group. In model 2, older people age in worse health and therefore have a greater demand for and use a greater volume of health services. We assume that such an increase might occur because of an expansion of morbidity leading to the early onset of care for chronic conditions. In this scenario, we modify actual per person health expenditures in the Republic of Korea by assuming that health spending for each age group from 60–64 years and until 80 years is equivalent to baseline 2016 health expenditures for the respective age group 5 years older (Figure 2, line with square). For example, health spending for 65–69-year-olds in this scenario would equal the actual spending of 70–74-year-olds from the baseline data. Spending for the 85 years and above age group relative to the 80–84 years age group in the hypothetical scenario is assumed to remain the same as in the actual Republic of Korea spending data.

For model 3, we assume the reverse scenario: people age in better health than now, leading to a delay in onset of chronic disease and disability, and thus a lower utilization of health care services and lower per capita health spending for older age groups than currently. We modify baseline per person health expenditures in the Republic of Korea by assuming that health spending for each age group from 60–64 years and over is equivalent to baseline 2009 health expenditures for the respective age group 5 years younger (Figure 2, line with circle).

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