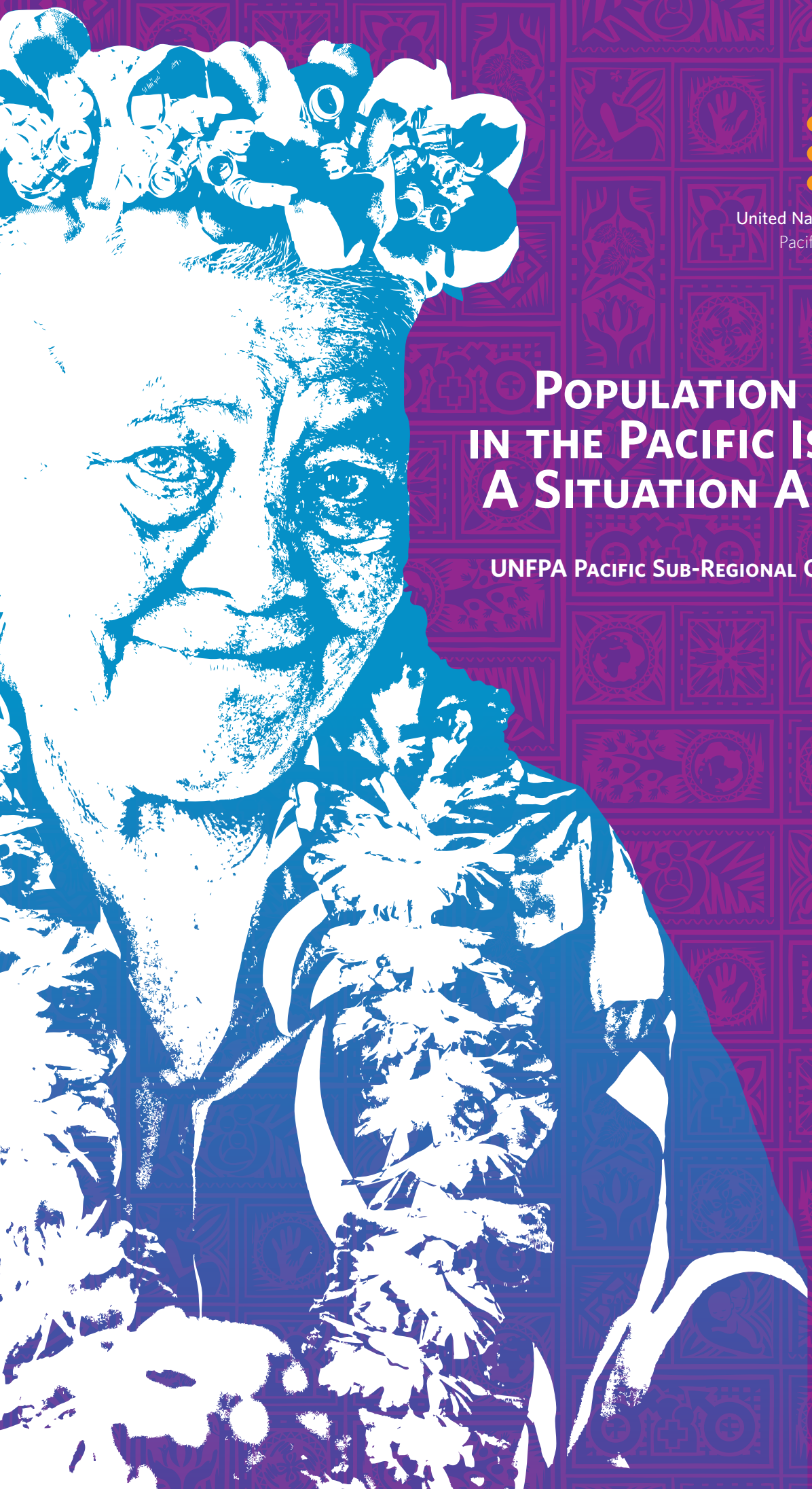

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UNFPA Pacific Sub-Regional Office Suva, Fiji
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Responsibility for any shortcomings of the report belongs to me and not to any of the above-named individuals.

Andreas Demmke
Technical Advisor, Population and Development
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Foreword

This report provides a detailed assessment of population ageing in the Pacific Islands at the individual country level. The report reiterates the implications of population ageing for social welfare of the older population and related policy issues that Island governments will face in the coming decades, and provides an update of an earlier report published in 2009. The United Nations Population Fund (UNFPA) intends to work with the countries, other international and regional organizations, NGOs and civil society in the future researching these issues in greater detail and assisting the countries of the region to formulate appropriate policies and programmes in a timely manner.

The issue of population ageing was first brought to the attention of the international community in 1969 when the Government of Malta placed the issue on the agenda of the 24th session of the UN General Assembly. The first World Assembly on Ageing was held in 1982 and resulted in the Vienna International Plan of Action on Ageing. At this point in time ageing was seen as an issue mostly affecting the more developed countries. By the time the second World Assembly on Ageing was held in Madrid, Spain, in 2002, population ageing was recognized as an issue affecting developing countries as well as the more developed regions.

This document supplements the report on Ageing in the Twenty-First Century: A Celebration and A Challenge, published in 2012, which was prepared in a collaborative effort of the United Nations and other major international organizations working in the area of population ageing.

Population dynamics should receive much more attention in the Pacific Islands region. As this report makes clear, the process of ageing is already well underway in the Pacific and will present major challenges to Pacific Islands governments, communities and families in the coming decades.

Dr. Laurent Zessler
Director and Representative
UNFPA Sub-regional Office
Suva, Fiji

Acronyms

DHS	Demographic and Health Survey
ENT	Ear, Nose, Throat
ESCAP	Economic and Social Commission for Asia and the Pacific
FSM	Federated States of Micronesia
HIES	Household Income and Expenditure Survey
ILO	International Labour Organization
LDCs	Less Developed Countries
MDCs	More Developed Countries
MDG	Millennium Development Goals
MIPAA	Madrid International Plan of Action on Aging
MPA	Macao Programme of Action
NGO	Non-Government Organization
NMI	Northern Mariana Islands
PICs	Pacific Island Countries
PNG	Papua New Guinea
PSR	Potential Support Ratio
SIS	Shanghai Implementation Strategy
SPC	Secretariat of the Pacific Community
TFR	Total Fertility Rate
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
WHO	World Health Organization

Abstract

Ageing refers to the process whereby an increasing proportion of a population is aged 60 years and over. Until the 1980s, most Pacific Island populations were either ageing slowly or not at all and the proportion of the population over 60 years remained below 6 percent. Median age remained within the range of 16-20 years. In the last two decades of the 20th century the pace of ageing accelerated and the number of older persons in the 15 Pacific Island countries in which the United Nations Population Fund has programmes[1] is projected to increase from around 512 thousand in 2014 to 2 million in 2050. The oldest old (80 years and over) are projected to increase from around 34 thousand in 2014 to 205 thousand in 2050, and the majority of older persons will be women.

The old age dependency ratio will increase substantially and the ratio of care-givers to those in need of care will decline significantly.

Addressing the needs of a rapidly ageing population will present major challenges for Pacific Island governments, communities and families. The provision of health services and long-term care for the oldest old or disabled will be particularly difficult—especially in the rural areas and outer islands. This is exacerbated as many countries confront the dual challenge of a resurgence of infectious disease and a growing burden of degenerative disease.

In the Pacific, the extended family is the main provider of care and social security for the older persons and this will remain the case. Family solidarity remains strong but is weakening in urban areas. Governments will need to develop ways to supplement family care with more formal institutional care as the number of older people grows. Civil society, faith based organization, and the private sector will also have an important role to play in supporting the older persons.

The development of national strategies and plans to address the challenges of population ageing are at an early stage in the Pacific. Some countries have established national coordinating bodies to address the issue but many countries have not. There is a need to raise awareness of the implications of ageing among civil servants, NGOs, civil society groups and the general public. The first priority is to expand the knowledge base at the national level and to establish an inter-governmental network to share information, data, and experience. International and regional agencies can assist in this process.

[1] Cook Islands, FSM, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, PNG, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu

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Ageing refers to the process whereby an increasing proportion of a population is aged 60 years and over. Up until the 1980s, most Pacific Island populations were either ageing slowly or not at all and the proportion of the population over 60 years remained below 6 percent. Median age remained within the range of 16-20 years. In the last two decades of the 20th century the pace of ageing accelerated and is projected to reach a peak around 2025. The number of older persons in the Pacific is projected to increase at an average annual rate of 3.7 percent between 2014 and 2050 and to grow in number from around 512 thousand to 2 million. The oldest old (80 years and over) is currently growing at a faster rate than the 60 and over age group. The oldest old are projected to increase at an average annual rate of 5 percent between 2014 and 2050 and by 2050 there will be 205 thousand persons aged 80 and over.

Demographic impact

The demographic impact of ageing over the next few decades will be profound in most Pacific Island Countries. The median age will rise to around 27 years by 2030 and about 30 years by 2050. Some Pacific Island countries will reach a median age of 40-42 years by 2050. The old age dependency ratio will consequently increase substantially and the ratio of care-givers (working age population) to those in need of care will decline significantly; there will be less than half of care givers per older persons in future as illustrated by the sharply decreasing Potential Support Ratio.

Geographical variations

There are wide variations in the extent, pace and timing of ageing across the Pacific Islands. Countries such as Palau, Niue, the Cook Islands, and Fiji are presently ageing the fastest. This is due to the fact that the countries entered the demographic transitions at an earlier date than was the case in most other Pacific Island countries. Furthermore, international migration has been large-scale with most emigrants being of working age and the smaller number of returnees being near or beyond retirement age. There is some evidence to suggest that ageing will become more pronounced in rural areas than in urban areas, as is the case elsewhere in the developing world.

Feminization of the older population

In the Pacific, women comprise the majority of the older population and this will continue to be the case well into the future so long as female life expectancy exceeds that of male. Projections indicate that the proportion of women among the "oldest old" will increase to about two-thirds by 2050. The high proportion of women among the has serious implications for their welfare. Most of the older women are widowed and therefore lack the support of a spouse. While only about 15 percent of males 60 years and older are widowed, it is more than half of women aged 60 and older in some countries of the Pacific region. This is explained by the longer life expectancy of women compared to men, and the fact that husbands are usually older than their wives. As a result, it is estimated that Pacific Islands women live approximately 6.5 years as widows. Women in Kiribati, the Solomon Islands, and Tuvalu experience widowhood for more than 10 years.

Implications of population ageing

The ageing of Pacific populations will have serious implications for the delivery of health care and other social services. Addressing the needs of a rapidly ageing population will present major challenges for Pacific Island governments, communities and families. The provision of health services and long-term care for the oldest old or disabled will be particularly difficult —especially in rural areas and outer islands. Many countries face the dual challenge of a resurgence of infectious disease and a growing burden of non-communicable disease.

In the Pacific, the extended family is the main provider of care and social security for the older persons and this will remain the case. Family solidarity remains strong but is weakening in urban areas and in those areas affected by out-migration. Governments will need to develop ways to supplement family care with more formal institutional care as the number of older people grows.

The coverage of pension or superannuation schemes in the Pacific is quite limited because the majority of the population has spent their working lives in the rural village sector or the urban informal sector where pension plans are not available. Universal, non-contributory schemes are also limited in scope. The expansion of such schemes is likely to place pressure on national budgets.

Recommendations

- National Coordinating Bodies should be set-up in those countries that presently lack them. International and regional agencies should stand ready to provide the financial and technical assistance that countries may require.
- In those countries that already have National Coordinating Bodies, a review of the structure, activities and effectiveness of these bodies should be undertaken. International agencies can also provide support to facilitate these reviews.
- National and international efforts need to be undertaken to greatly expand the knowledge base on population ageing and its implications in individual Pacific Island countries and across the region and its sub-regions. The Research Agenda on Ageing in the Twenty-first century endorsed in Valencia in 2002 can be used to identify the key issues on which research is required.
- Research is urgently needed to assess the poverty status of older persons in the Pacific Islands. Recent DHS and HIES may provide scope for further analysis. Further analysis of disability data from censuses and surveys is also recommended.
- A knowledge sharing network needs to be established linking all Pacific countries regardless of political status. Given the variations across the region in population ageing, those countries in the early stages can share valuable lessons with those that will age later. NGOs, civil society, the private sector, and regional and international agencies should also participate in the network.
- A public information programme is required to raise awareness of ageing trends and their implications among both service providers and the general public.
- Conduct a comprehensive review of the national infrastructure and enabling environment for addressing the needs of the older population and identify the key weaknesses.
- Review the regional arrangements for monitoring the implementation of the Madrid International Plan of Action on Ageing and the Macao Programme of Action for the Asia-Pacific region.

1 Introduction

1.1 What is ageing?

Population ageing refers to the process whereby older persons comprise an increasingly larger share of the total population. It is broadly accepted that the age of 60 defines the transition between middle age and old age, but it is obvious that use of the terms "old" or "elderly" varies widely depending on the context in which they are used. For example, eligibility for a government pension may not occur until 65 years of age or even older. On the other hand, in village-based cultures any person with grandchildren may be considered "old".

In the present study, the older population is defined as persons aged 60 years or over, and most of the analysis presented in the report refers to this group. Because the older population is also ageing, however, reference is also made to the "oldest old", defined as persons aged 80 years and older.

1.2 Socio-economic implications of ageing

Ageing is a demographic phenomenon in the first instance but it is accompanied by a range of socioeconomic challenges, both for the individuals concerned and for the institutions that provide the services that old people, both men and women, are in particular need of. These needs arise from the fact that the older population is much more likely to be sick, infirm, or disabled than young people or the middle-aged. These conditions, along with others, also diminish the ability of the old to earn an income, even as the costs and complexity of their health care are increasing. The welfare and quality of life available to the old is therefore crucially dependent upon the capacity of the institutions that have the responsibility for providing the necessary support according to cultural norms and values.

In the presently industrialized world, state-sponsored pensions, social safety nets, and subsidized health care were established over 100 years ago and existed well before the populations of the more developed countries began to age rapidly. In the less developed regions of the world, ageing is occurring not only at a much faster rate than previously experienced but also in a socio-cultural context in which the welfare of the old remains primarily the private responsibility of families or wider kin and social groups. While supportive institutions such as provident funds, private pensions and health insurance schemes are available to that proportion of the population that has spent their working life in government employment or in large private corporations, a very large proportion of the populations of the less developed countries have spent their working lives in village economies or the urban informal sector and lack access to such institutions.

In the Pacific Islands, the subject of this report, the care and welfare of the old is generally held to be the responsibility of the immediate family in the first instance (sons and daughters) followed by the extended family (nephews and nieces and others). Community based organizations, including faith based organizations, provide added support services. While this is a strongly held cultural value across the region, the realization of this value in practice is already becoming difficult as a result of urbanization, internal and international migration, individualization and other aspects of "modernization", even though the ageing process in the Pacific is still in its early stages.

Thus, it is highly likely that rapid ageing, a process that is already underway in some Pacific countries, will place increasing strain on family and kinship networks, and will compel Pacific governments to introduce new institutional arrangements that will supplement, if not supplant, the resources available to older persons through their families.

1.3 Purpose and structure of this report

The primary purpose of this report is to describe the current and likely future situation in the Pacific Islands region with respect to population ageing. An understanding of the ageing process as a social and demographic phenomenon requires a long-term perspective; thus the study looks both backwards to the demographic situation prevailing at the end of the 20th century and forwards to the likely situation in the middle of the 21st century based on population projections. Against this demographic background the study will review the policy issues that Pacific countries will need to address and the policy options that are available to them.

Population projections that seek to forecast the number of older persons in a population have more certainty than a projection aimed at foreshadowing the total size a population might reach in future or its overall age composition. The reason for this is that the population that is undergoing ageing already exists and any additions to it can only come from in-migration and any deductions to it from death or out-migration. Thus, projection assumptions made with respect to future levels of fertility are irrelevant and only death and migration need to be considered. Of these, migration is the least predictable, and this raises analytical difficulties in the Pacific because most of the smaller Island countries have become "migration oriented" societies. The impact of migration, both internal (rural-urban and outer islands-main island) and international, can make a major difference in terms of how rapidly or slowly the domestic older population grows.

However, future trends in fertility are clearly relevant to the issue of the overall age structure and the relative balance between the older population and the younger population that has the responsibility, directly or indirectly, to care for it. Consequently, many of the indicators used in this report reflect changes in fertility patterns and their implications for the support of the older population.

Concerns about ageing of Asia-Pacific populations are not new. The 1992 "Bali Declaration" recommended that "governments formulate long-term development strategies that take into consideration the changing age structure of the population, in particular the implications of population ageing for economic and social development. Development policies and programmes must take into account the characteristics of future cohorts of older people, their potential for involvement in the process of development and the role of the family and community in caring for the elderly" (UNESCAP, 1992, 65). This report provides a current picture of ageing patterns in the Pacific at both the sub-regional and individual country levels and employs population projections to provide insights into the likely future trends of ageing. The overall purpose is to assist the countries to prepare for a future in which older persons comprise a much larger proportion of the population.

The study proceeds from an overview of the global patterns of ageing covering the period 1950-2050 in the following chapter to a review of the levels of ageing in the Pacific Islands countries in Chapter 3. In Chapter 4, some of the key impacts of an ageing population are described. Chapters 5 and 6 review the implications of population ageing for social policy and give an overview of policy and implementation options. Chapter 7 includes conclusions, recommendations, and possible ways forward.

1.4 Data sources and geographical areas

The demographic data employed in this study are derived from two main sources:

(1) The United Nations Department of Economic Affairs (UNDESA) publication World Population Ageing 2013;

(2) Population estimates and projections for each Pacific Island country carried out by UNFPA Pacific Sub-regional Office for the year 2014 and beyond. A description of the projections methodology employed is provided in Annex 10.

The primary focus is on the 15 United Nations programme countries[2], although the analysis of past censuses includes the ageing situation in the dependent territories of France and the United States[3]. Four of these 15 countries (Solomon Islands, Kiribati, Tuvalu and Vanuatu) are classified as Least Developed Countries (LDCs). All of these countries are politically independent, as are Fiji, Nauru, PNG, Samoa, and Tonga. Three countries (Palau, Marshall Islands and the Federated States of Micronesia) are linked to the United States in a Compact of Free Association. Two countries (Cook Islands and Niue) are self-governing in Free Association with New Zealand, and the Tokelau Island is a dependent territory of New Zealand. The political status of each of the 15 countries has important consequences for both demographic dynamics and the level of development and how they are linked.

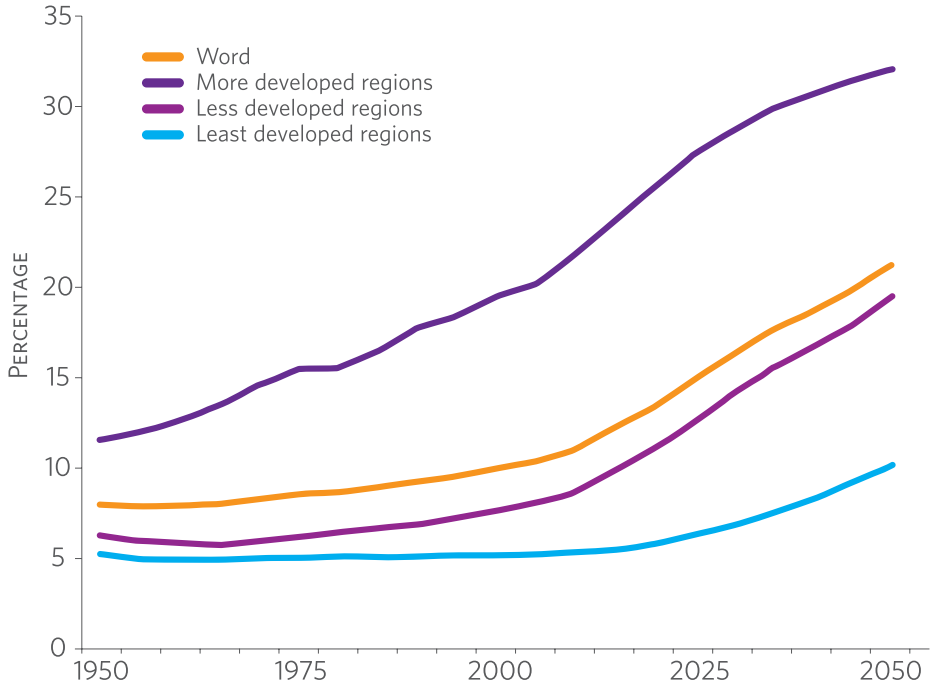
[2] Cook Islands, FSM, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, PNG, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu
[3] The French territories are French Polynesia, New Caledonia and Wallis and Futuna. U.S. territories are American Samoa, the Northern Mariana Islands, and Guam.

2 Overview of population ageing: global patterns 1950-2050

2.1 Trends: changing and projected proportion of older persons

The proportion of older persons increased very slowly in all world regions between the 1950s and 1970s but accelerated after 1975 (Fig. 1). By 2050, about one in every five persons is expected to be aged 60 and over. Population ageing is most advanced in the more developed countries, in which 21 percent of the population was already aged 60 and over by 2007 and this proportion is projected to more than 30 percent by the middle of this century. Within four decades, about one third of the population of the developed countries will be "old".

FIGURE 1: Percentage of population aged 60 years and over by region, 1950-2050



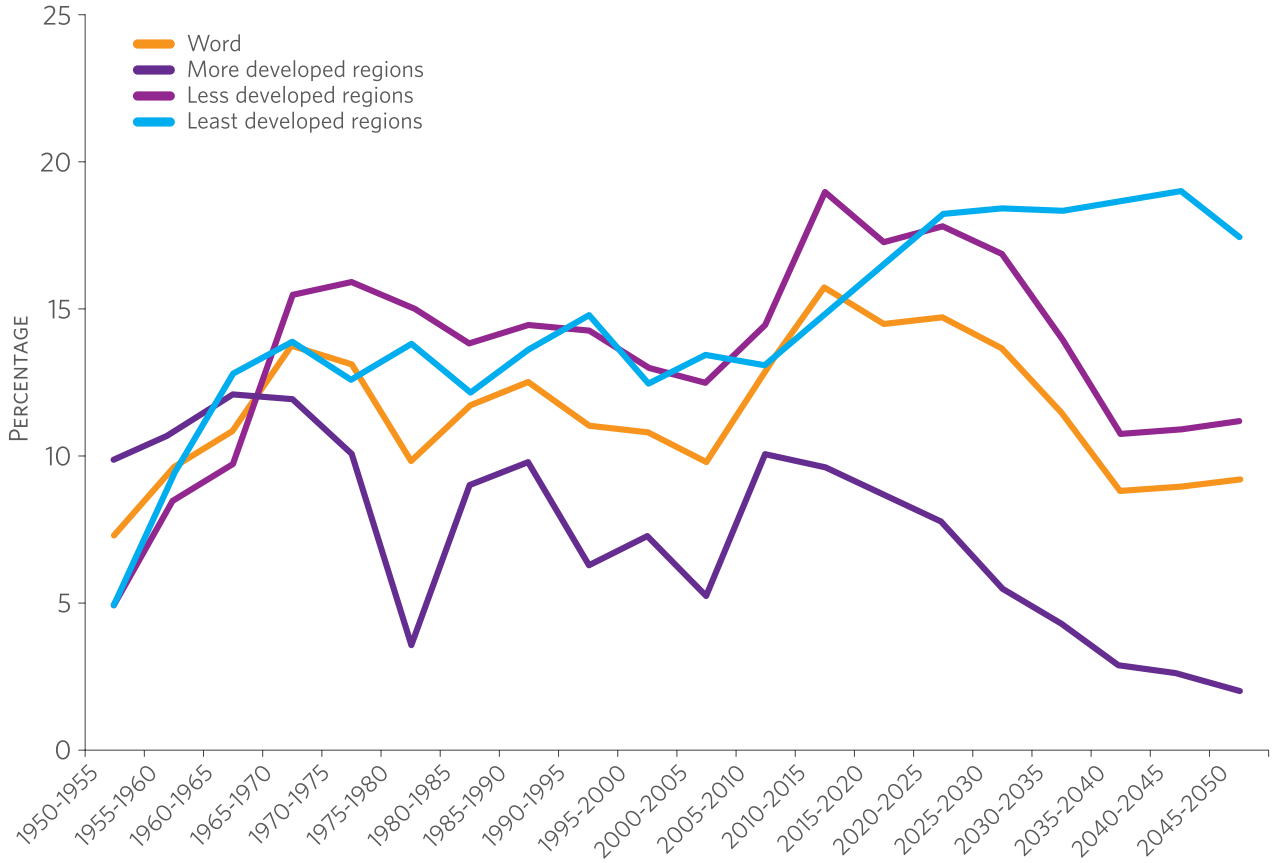
Source: UNDESA (2013)

The speed at which populations are ageing varies according to the region and the period of time. At a global level, the rate of growth of the old population is currently 2.6 percent annually and this rate is expected to rise slightly to 2.7 percent over the next two decades (Fig. 2). In the MDCs, the number of older persons is increasing at the much lower rate of 1.8 percent per year and this rate will decline over the next two decades. In LDCs, population ageing will occur at a much faster rate. The rate of growth of the older population has already reached 3.0 percent in the current decade and is projected to rise to 3.4 percent by the 2025-2030 period.

These data show that the pace of ageing in developing regions will be much more rapid than was the case in the more developed regions. As will be shown in the following sections, this will be the case in the Pacific as well.

In global terms the contribution of the Pacific Islands region to the total number of older persons in the world is miniscule, simply because the Pacific contains less than 1 percent of the world's total population. In local terms, however, the expected increase in the absolute number of older persons over the next several decades is substantial. The population of older persons can be expected to quadruple —from 512,000 in 2014 to about 2 million by 2050. A total of 1.5 million older people will be added to the population of the Pacific by 2050. The vast majority of these (about 95 percent) will be in Melanesia, as this is where the vast majority of the Pacific's population lives. Over the same period the number of older people in Micronesia and Polynesia will increase by about 50,000.

FIGURE 2: Average annual growth rate of population aged 60 years or over: world and development regions, 1950-2050



Source: UNDESA (2013)

The social and economic challenges of population ageing will be formidable in all regions of the world, including the Pacific Islands. For most of the 20th century, the rapid growth of youth powered by high fertility rates over several decades was the primary challenge faced by governments. Accommodating the growing numbers of young people required the rapid expansion of educational and training institutions and a concerted effort to increase the supply of jobs. The momentum of population growth caused by the youth "bulge" has kept the focus of health care on children and youth. In the 21st century the rapid pace of ageing will bring quite different challenges, especially among Pacific Island countries with their far-flung islands suffering from poor communications and transport and low incomes.

2.2 Determinants: decline in fertility and improvements in life expectancy

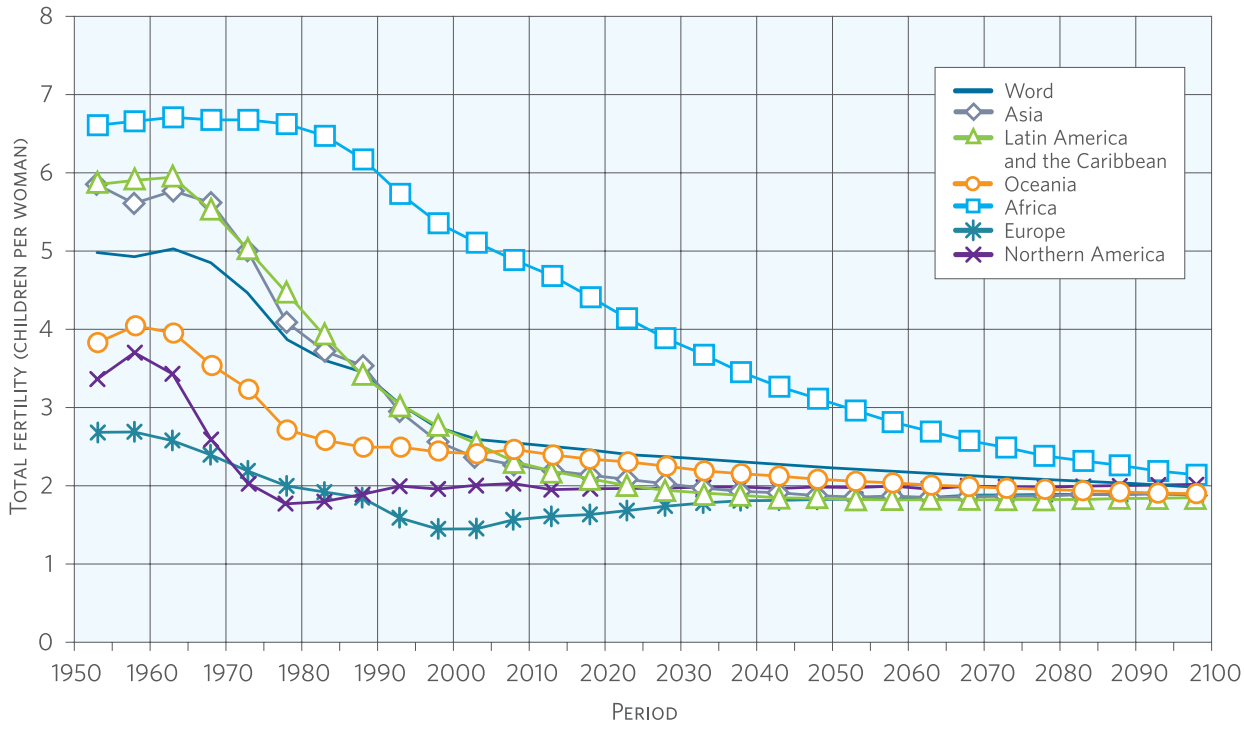
Population ageing results from the "demographic transition", a process that primarily results from advancements in health care that typically accompany economic development. This process manifests itself through initial decline in mortality rates followed after some time by declining fertility, eventually completing a transition from a high mortality and fertility demographic regime to a regime of low mortality and low fertility (Annex 11). In Europe and North America, the demographic transition occurred over a period of 100 years or more. In today's developing countries, the demographic transition is being compressed into a much shorter period of time. This helps to explain why the pace of ageing in developing countries is projected to be so much faster than it was in the countries that are now more developed. Fertility decline reduces the number and proportion of children in a population while mortality decline increases the number and proportion of older persons.

The fertility and mortality transitions can be measured by means of two key indicators—the "Total Fertility Rate" (the number of children a woman would have in her lifetime if she experienced the current age-specific fertility rates) and "Life Expectancy at Birth" (the average number of years that a person would live from birth given current mortality rates by age and sex).

2.3 Fertility trends

At the global level, total fertility (TFR) declined by 50 percent between 1950 and 2005, or from 5.0 to 2.5 children per woman on average (Fig. 3). In the 1950s, developing countries, including those in the Pacific, had TFRs of over 6 children per woman. Over the next 50 years, however, the TFR dropped steadily in all regions and if the assumptions contained in the population projections are correct it will converge in all countries to about 2.0 by 2100. The Pacific Islands and its sub-regions exhibit similar patterns of decline as in the LDCs as a whole but generally started their fertility transitions from a higher level.

FIGURE 3: Total fertility trajectories for the world and major areas, 1950-2100 (medium variant)

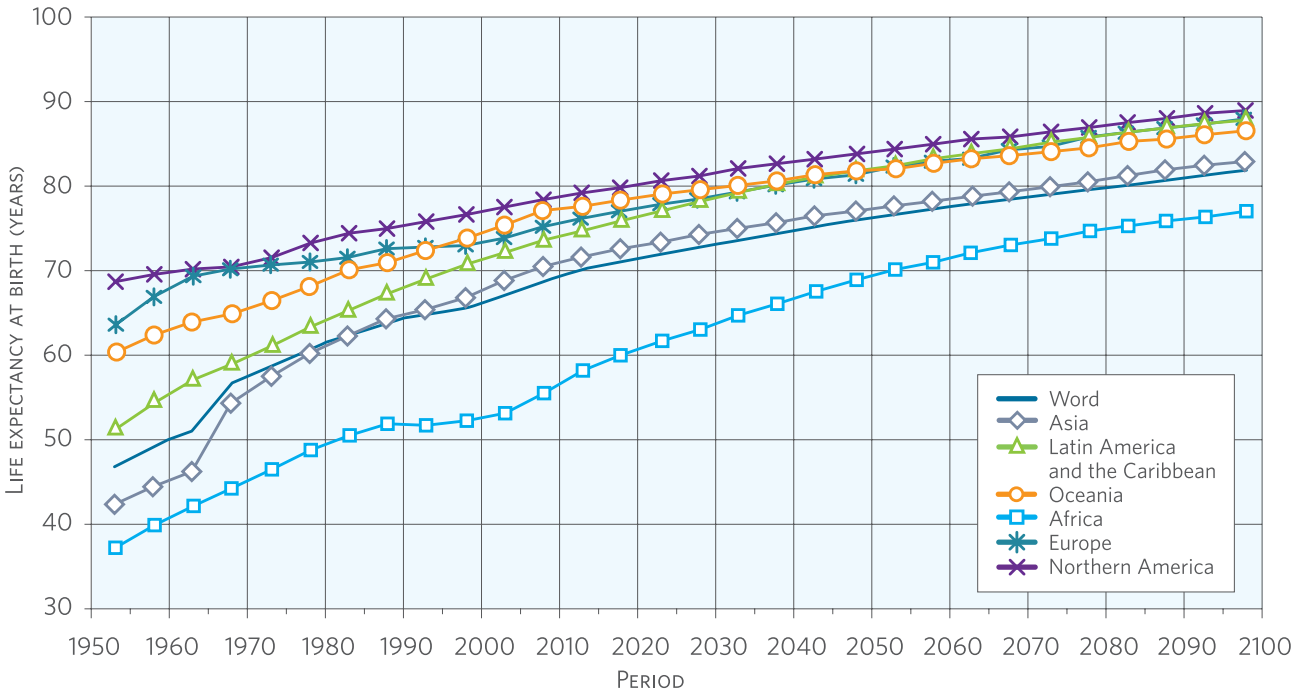


Source: UNDESA (2012)

2.4 Mortality decline

As is the case with fertility, long term trends in life expectancy are similar across all regions but the starting points are different (Fig. 4 and Table 1). The twentieth century witnessed the most rapid decline in mortality in human history. In 1950-1955, life expectancy at the world level was 47 years and it had reached 69 years by 2005-2010. Over the next 40 years, life expectancy at birth at the global level is expected to reach 76 years in 2045-2050 and 82 years in 2095-2100. The more developed regions already had a high expectation of life in 1950-1955 (64.7 years) and have since experienced further gains in longevity. By 2005-2010 their life expectancy stood at 76.9 years, 10 years higher than in the less developed regions where the expectation of life at birth was 67.0 years. Although the gap between the two groups is expected to narrow between 2005 and mid-century, in 2045-2050 the more developed regions are still expected to have considerably higher life expectancy at birth than the less developed regions (82.8 years versus 74.8 years). Throughout 2010-2100, systematic progress against mortality is further expected to increase life expectancy at birth up to 88.9 years in the more developed regions and 80.8 years in the less developed regions, thereby further reducing the gap in mortality between the two groups. The general upward trend in life expectancy for the more developed and the less developed regions conceals different trends among the world's major areas. In Asia, Latin America and the Caribbean, Northern America and Oceania[4], life expectancy has been increasing at a steady pace. Higher life expectancy means that increasing proportions of the population survive into older ages and this process obviously contributes to ageing (UNDESA 2012).

FIGURE 4: Life expectancy at birth for the world and major areas, 1950-2100



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2013). World Population Prospects: The 2012 Revision. New York: United Nations.

[4] American Samoa, Australia, Cook Islands, FSM, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, PNG, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna.

TABLE 1: Life expectancy at birth by development region and major area, 1950-1955, 1990-1995 and 2010-2015

	Life expectancy at birth (years) - Both sexes combined			Total gain in life expectancy (years)		Average gain in life expectancy per decade (years)	
Development group or major area	1950 - 1955	1990 - 1995	2010 - 2015	1950-1955 to 1990 - 1995	1990 - 1995 to 2010 - 2015	1950-1955 to 1990 - 1995	1990 - 1995 to 2010 - 2015
World	46.9	64.8	70.0	17.8	5.2	4.5	2.6
More developed regions	64.7	74.1	77.7	9.4	3.6	2.4	1.8
Less developed regions	41.6	62.7	68.3	21.1	5.6	5.3	2.8
Least developed counries	36.4	51.7	60.6	15.3	9.0	3.8	4.5
Other least developed counries	42.4	64.8	70.0	22.4	5.2	5.6	2.6
Africa	37.4	51.7	58.2	14.4	6.5	3.6	3.2
Asia	42.2	65.4	71.4	23.2	6.0	5.8	3.0
Europe	63.6	72.6	76.1	9.0	3.5	2.2	1.8
Latin America and the Caribbean	51.4	68.9	74.7	17.6	5.8	4.4	2.9
Northern America	68.6	75.8	79.1	7.3	3.3	1.8	1.6
Oceania	60.4	72.5	77.6	12.1	5.1	3.0	2.5

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2013) World Population Prospects: The 2012 Revision. New York: United Nations.

3 Population ageing in Pacific Island Countries

3.1 Introduction

At the beginning of the 20th century, most Pacific Islands were still recovering from the high death rates that followed from the introduction of new diseases into the region in the 18th and 19th centuries and therefore had low rates of population growth. Some countries did not recover from high mortality until the 1930s, and colonial authorities were content with increasing fertility as it signaled a return to population health. However, fertility rates accelerated for several decades until by the 1970s the Total Fertility Rate (TFR) had reached 7 children per woman or even higher in some countries. Rapid social change and increasing government support for family planning resulted in the TFR falling steadily over several decades so that by the beginning of the 21st century some Pacific Island countries had TFRs below 3.

The "momentum" created by earlier rates of high population growth has resulted in a distinctive "youth bulge" in the present age distributions of many Pacific countries. The youth population has continued to grow even though individual fertility has declined substantially in recent years. Age distributions in the Pacific are consequently narrowing at the base and widening in the adult age range, while still remaining very narrow at the top. However, the process of ageing is already occurring and ageing indicators such as the Median Age, the Proportion of the population 60 years and older, the Ageing Index, as well as the Potential Support Ratio of many Pacific Island populations illustrate this (Annex 1).

While the previous chapter focused on the global patterns of ageing, the present chapter presents an analysis of recent and future population ageing in individual Pacific Island Countries (PIC). The estimate number of people older than 60 years of age in 2014 is about 512 thousand, and the number of people aged 80 years and older about 34 thousand. The majority of these are women, because women live longer lives than men (Table 2).

TABLE 2: Estimated number of older people, PIC: 2014

Country	Population aged 60 and older			Population aged 80 and older		
	Males	Females	Total	Males	Females	Total
PNG	166,685	171,404	338,089	7,923	10,061	17,984
Fiji	36,465	41,407	77,872	2,152	3,555	5,707
Solomon Islands	17,356	17,328	34,684	1,886	1,795	3,680
Vanuatu	8,359	8,125	16,484	948	959	1,907
Samoa	6,649	7,638	14,287	582	1,077	1,658
Tonga	4,056	4,821	8,877	413	679	1,092
FSM	3,290	3,682	6,972	204	377	581
Kiribati	2,596	3,760	6,357	137	339	477
Marshall Islands	1,366	1,262	2,628	52	96	148
Palau	990	1,145	2,135	75	185	259
Cook Islands	1,002	1,062	2,064	85	129	214
Tuvalu	432	577	1,009	29	57	86
Nauru	159	213	372	6	13	19
Niue	130	162	292	10	17	27
Tokelau	63	83	147	na	na	na
TOTAL	**249,599**	**262,669**	**512,268**	**14,501**	**19,338**	**33,839**

Source: UNFPA population projections (2014)

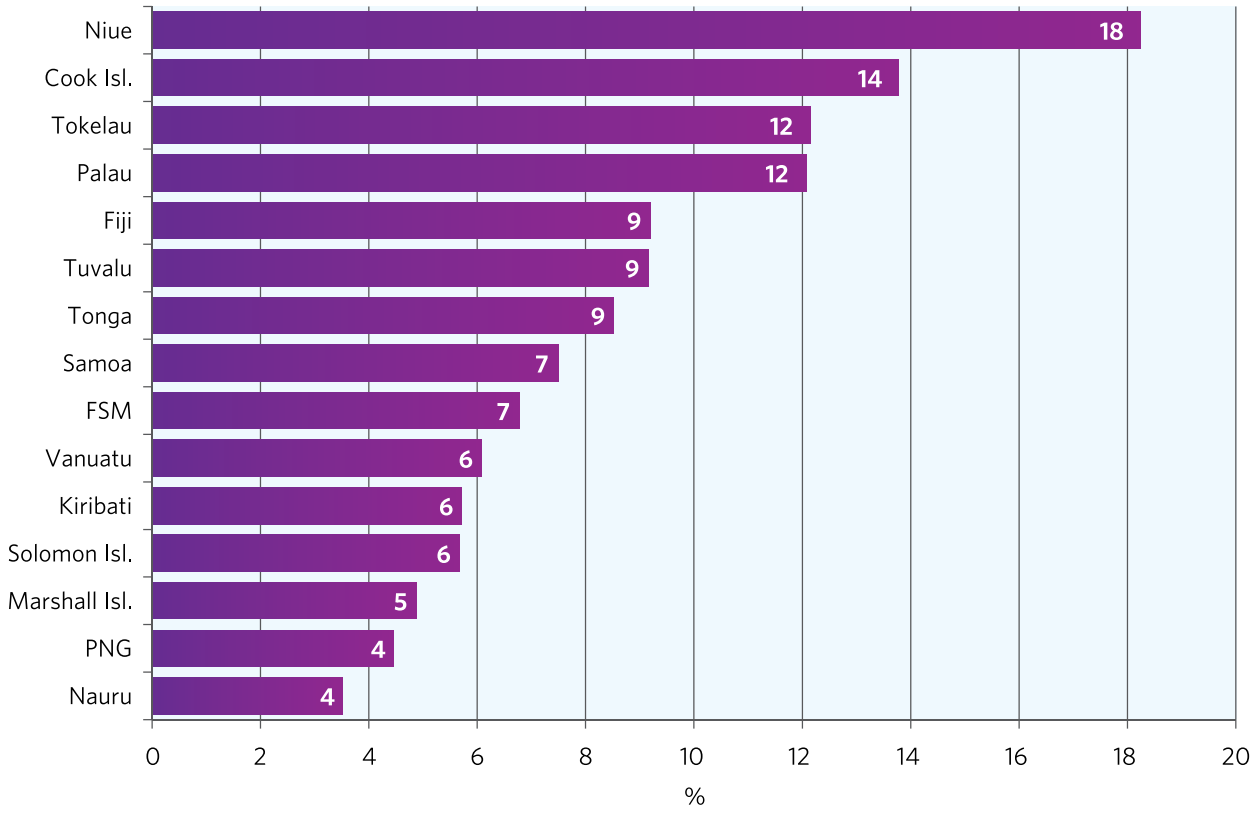
3.2 Current and projected proportion of older persons

Pacific Island countries vary widely in the extent of ageing to date and the expected trends over the next several decades. As of 2014, the countries with the highest proportion of persons aged 60 and over are the small Polynesian countries such as Niue, the Cook Islands and Tokelau whose populations are significantly affected by international migration, but in the context of declining fertility and mortality (Fig. 5). But these are not necessarily the same countries that will have a high proportion of older persons by 2050 (Fig. 6 and Annex 2). The populations of these small countries, and their age structures, are significantly affected by variations in migration patterns; thus it is difficult to predict what age structure will emerge over several decades.

Based on projected trends, however, the highest proportions of older persons in 2050 will be found in Palau, Niue, Fiji, and the Cook Islands. The factors that contribute to ageing in these populations differ from country to country. Palau has experienced a sharp decline in fertility while the Cook Islands have had several decades of net emigration of persons in the working age range as well as steadily declining fertility.

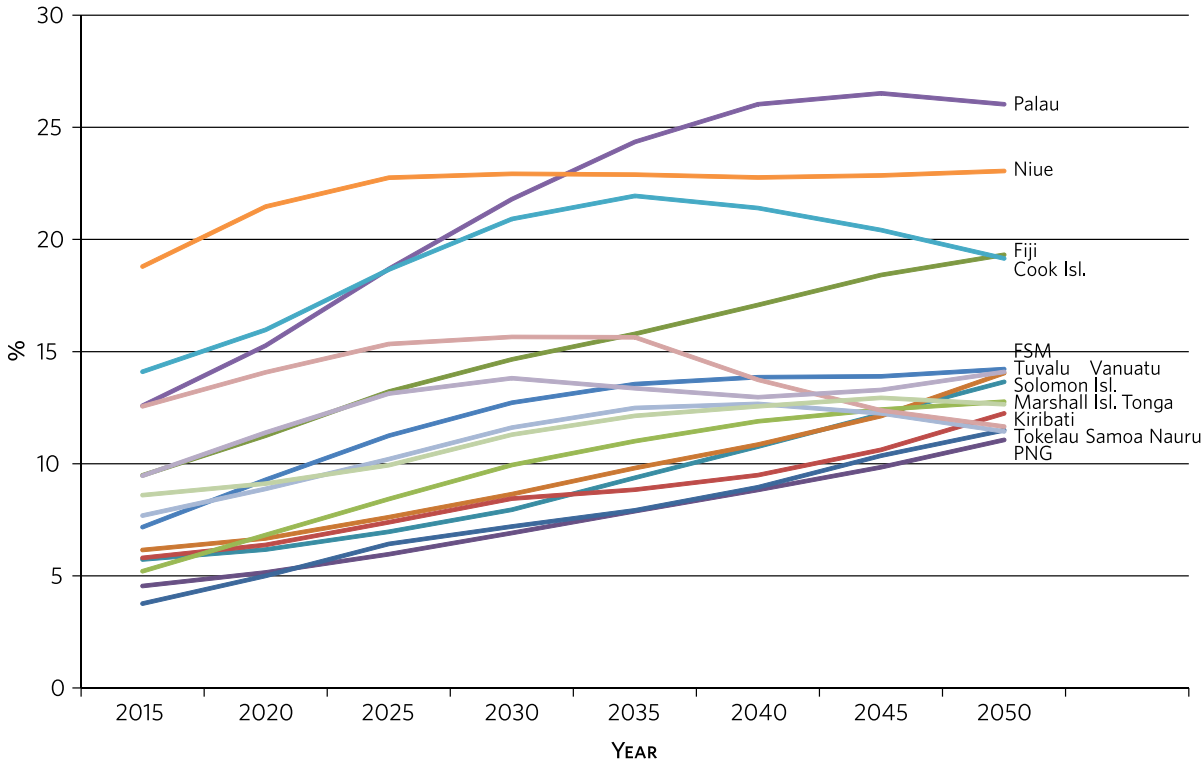
The total number of persons aged 60 years and older in the Pacific Islands in 2014 was approximately 512 thousand, including PNG with 340 thousand. By 2030, this number is projected to reach 1 million and by 2050 will double again to 2 million. The population of older persons will quadruple in PNG, Solomon Islands, Vanuatu and Nauru between 2015 and 2050 (Figs.7 and 8, Illustration 1, and Annex 3).

FIGURE 5: Proportion of population aged 60 years and older, PIC: 2014



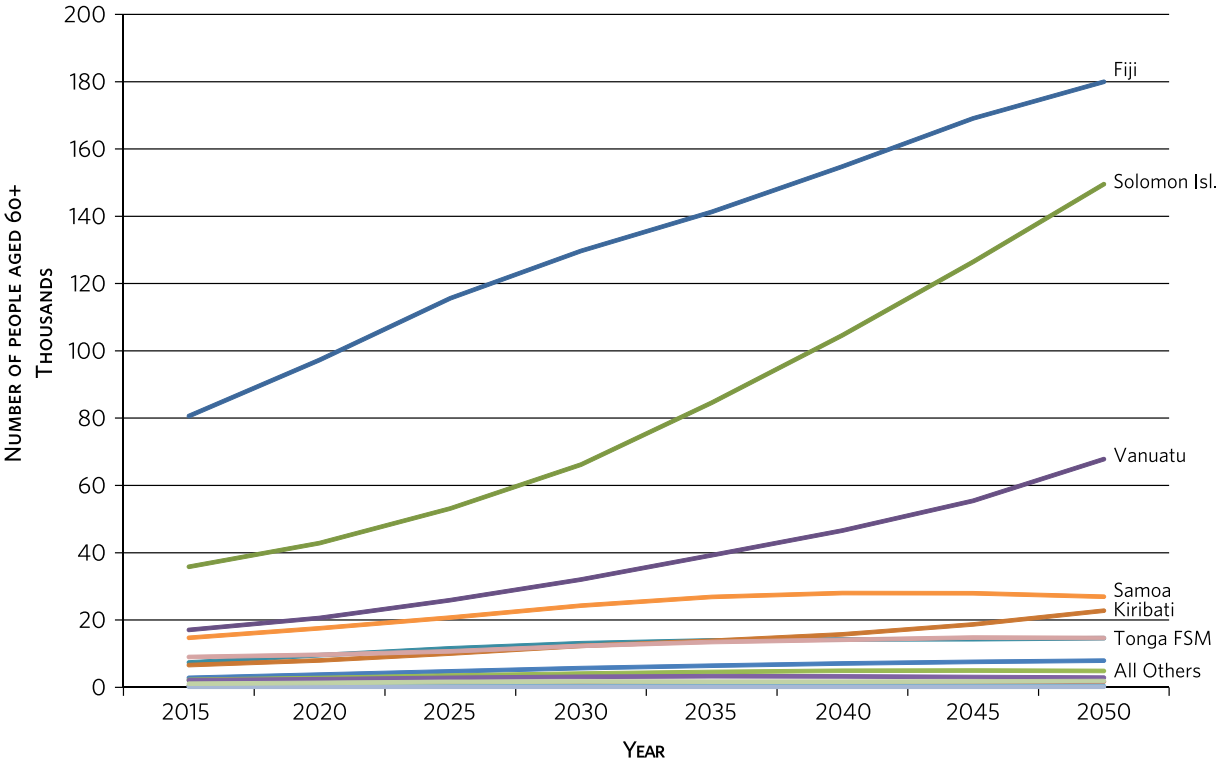
Source: UNFPA population projections (2014)

FIGURE 6: Percentage of population aged 60 years and older, PIC: 2015-2050



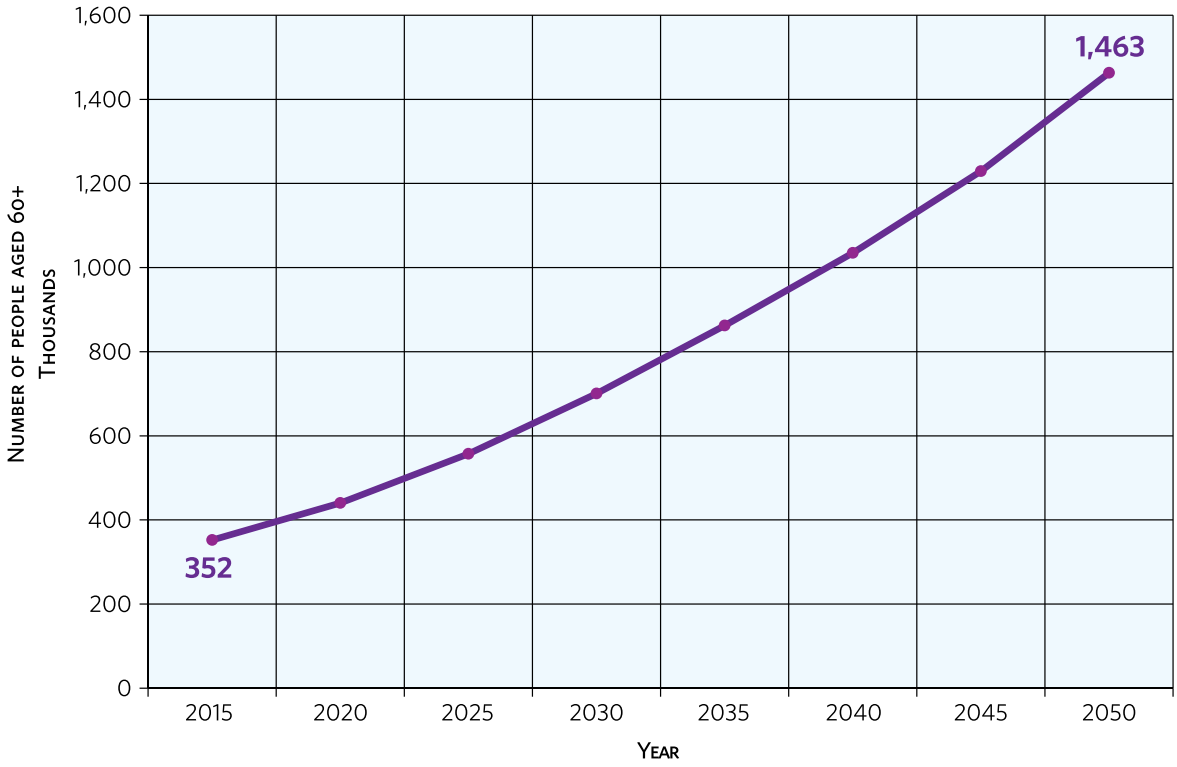
Source: UNFPA population projections, 2014 (Annex 2)

FIGURE 7: Projected population aged 60 years and older, PIC: 2015-2050



Source: UNFPA population projections, 2014 (Annex 3)

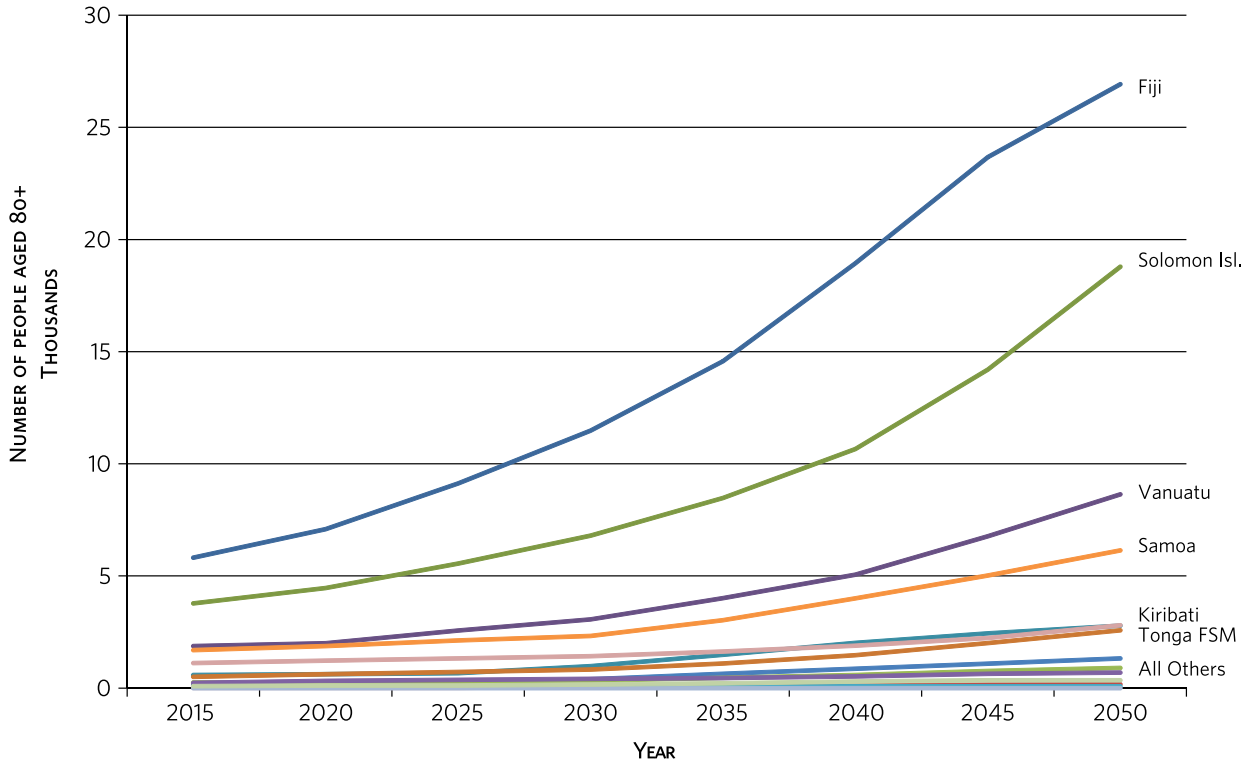
FIGURE 8: Projected population aged 60 years and older, PNG: 2015-2050



Source: UNFPA population projections, 2014 (Annex 3)

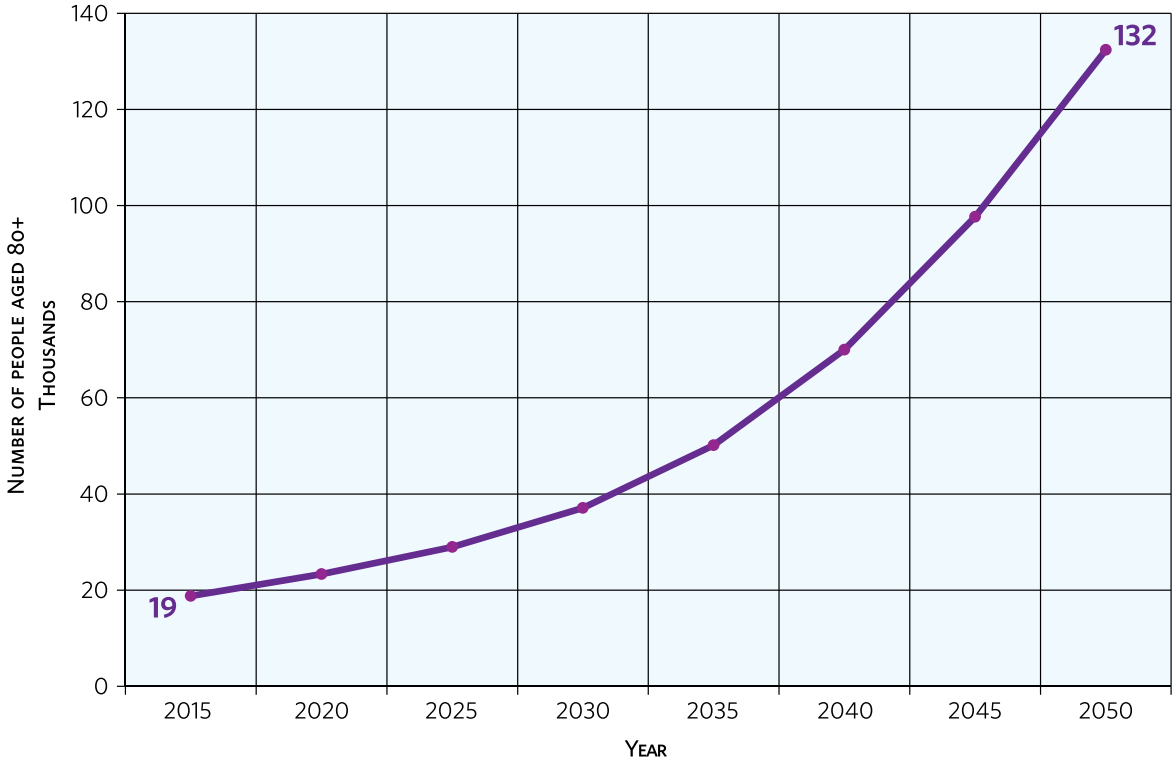
The total number of the oldest old persons aged 80 years and older in the Pacific Islands in 2014 was approximately 34 thousand, including PNG with 18 thousand. By 2030, this number is projected to reach 65 thousand and by 2050 will triple again to 205 thousand. The population of oldest old persons will increase much faster than the population aged 60 and older because the older population is ageing itself (Figs. 9 and 10, Illustration 1, and Annex 4).

FIGURE 9: Projected population aged 80 years and older, PIC: 2015-2050



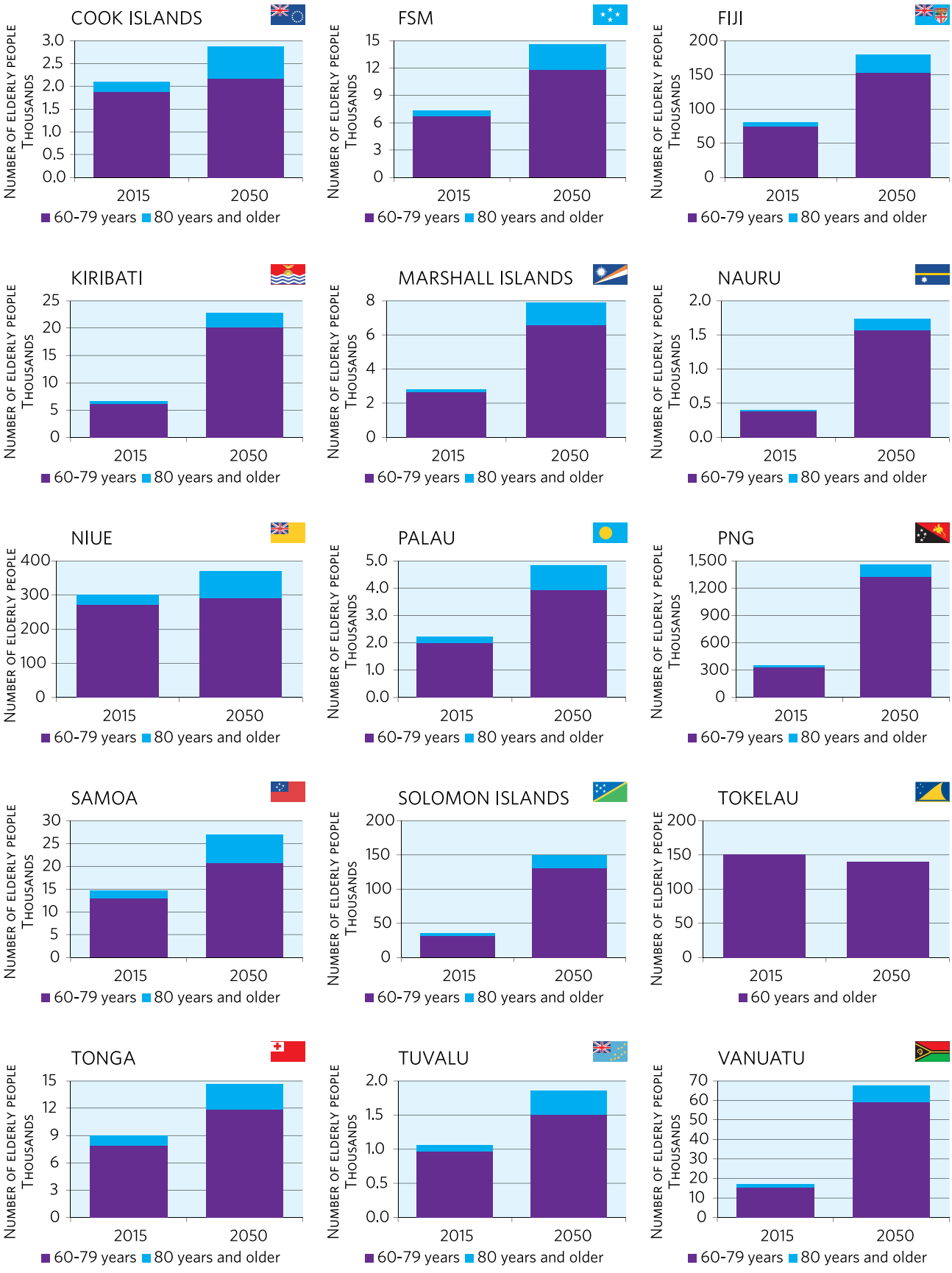
Source: UNFPA population projections, 2014 (Annex 4)

FIGURE 10: Projected population aged 80 years and older, PNG: 2015-2050



Source: UNFPA population projections, 2014 (Annex 4)

ILLUSTRATION 1: Number of older people, PIC: 2015 and 2050



Source: UNFPA population projections, 2014

4 The demographic impact of ageing, 2015-2050

4.1 Introduction

The demographic impact of rapid population aging can be measured by a variety of indicators that reflect different dimensions of the age composition of the population. This chapter reviews changing age structures employing graphical representation (age pyramids) and various indices, including the ageing index, the median age, the potential support ratio and the parent support ratio. Each of these indicators measures a different aspect of ageing.

4.2 The changing age structure

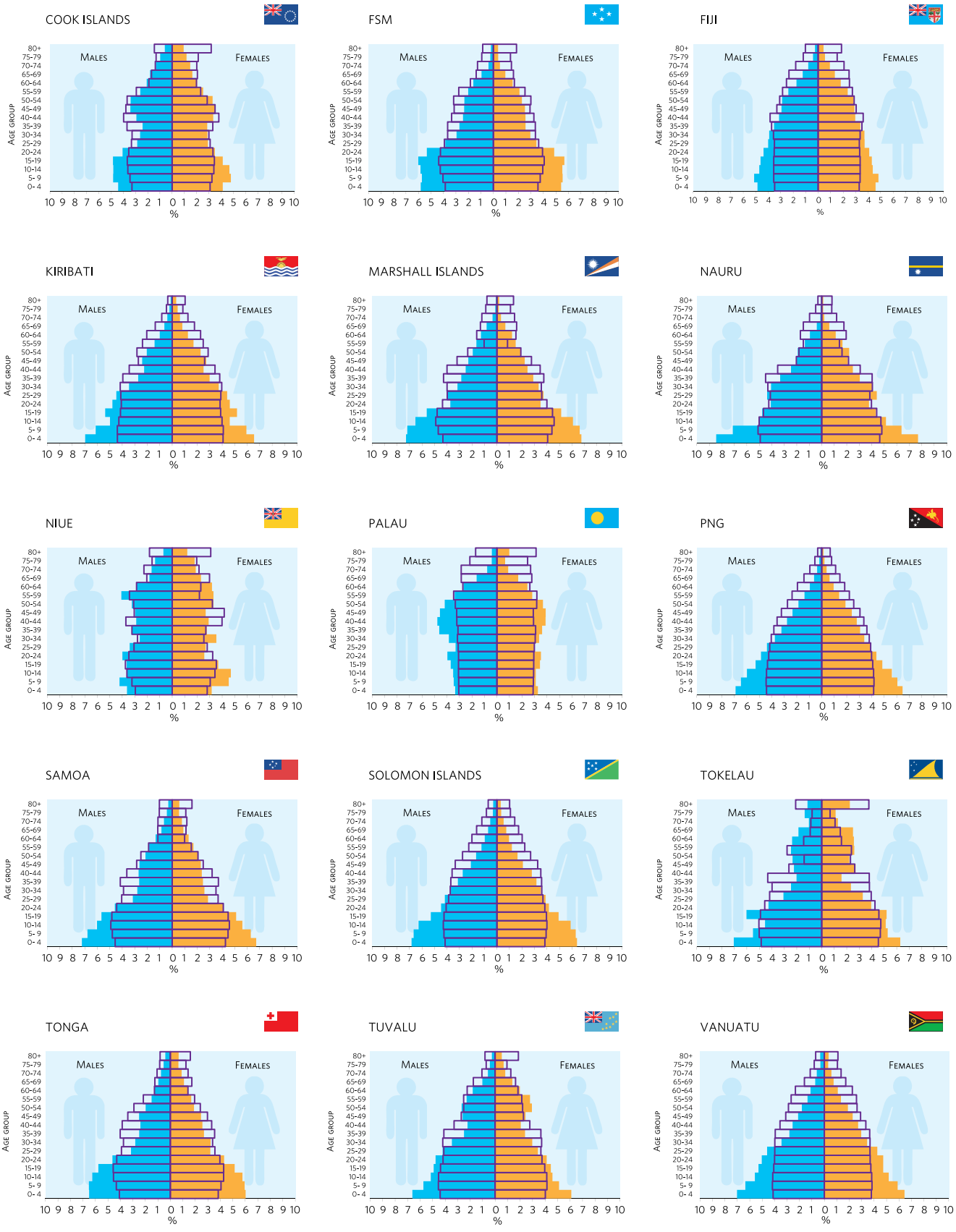
A simple visual tool for understanding the changing age composition of a population undergoing ageing is the "age pyramid". Illustrations 2 and 3 show the age pyramids and the population structure by broad age groups (0-14 years, 15-59 years, and 60 years and older) at two points in time for each PIC – 2015 and 2050. Most of the 2015 pyramids have a more classic shape of a population experiencing rapid population growth due to high fertility—as evident in the wide base of the pyramid.

Projected to 2050 assuming a continuation of recent trends, the pyramids would have a very different shape with almost vertical sides and a widening at the top, especially for females. This age distribution and high median age is typical of the populations of the more developed countries at the present time.

Furthermore, the expected change in age structure is also illustrated by the rising median age of the populations. The median age is that age which divides the age distribution in half, that is, half the population is older and half younger. With ageing, the median age obviously rises because a larger proportion of the population is older. The median age is rising at a global level and in all world regions and is expected to reach 36 years by 2050. By that time the median age in the More Developed Countries (MDC) will be 46 years, an unprecedented level. Even today's Less Developed Countries (LCD) will reach a median age of 35 by 2050.

In the Pacific, Palau and Niue will likely reach 40 years by 2050, and the Cook Islands and Fiji 36-37 years, and will have a significantly older population than all the other PICs. The average increase in the median age of the PICs between 2015 and 2050 will be 8 years, which is another indication of the accelerating pace of ageing (Fig.11, and Annex 5).

ILLUSTRATION 2: Population age pyramids, PIC: 2015 (shaded area) and 2050 (outlined)

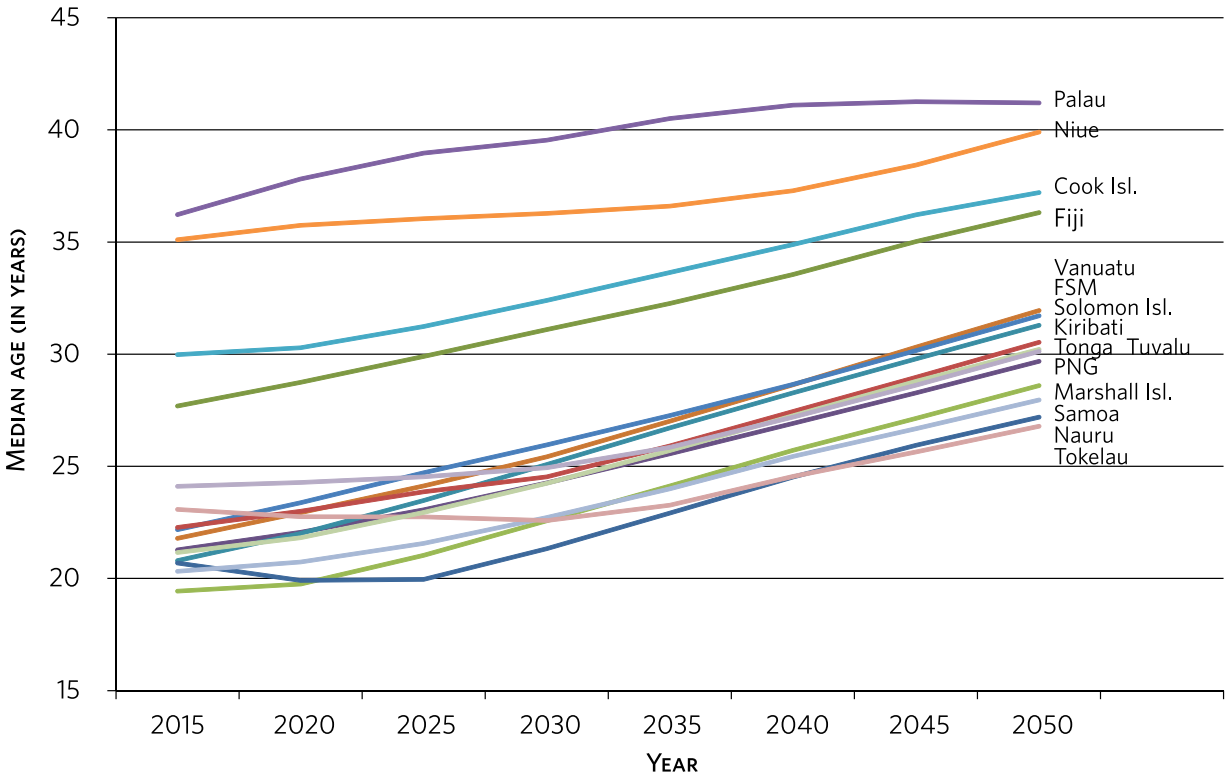


Source: UNFPA population projections, 2014

ILLUSTRATION 3: Population by broad age groups (%), PIC: 2015 and 2050

Source: UNFPA population projections, 2014

FIGURE 11: Trends in the Median Age, PIC: 2015-2050



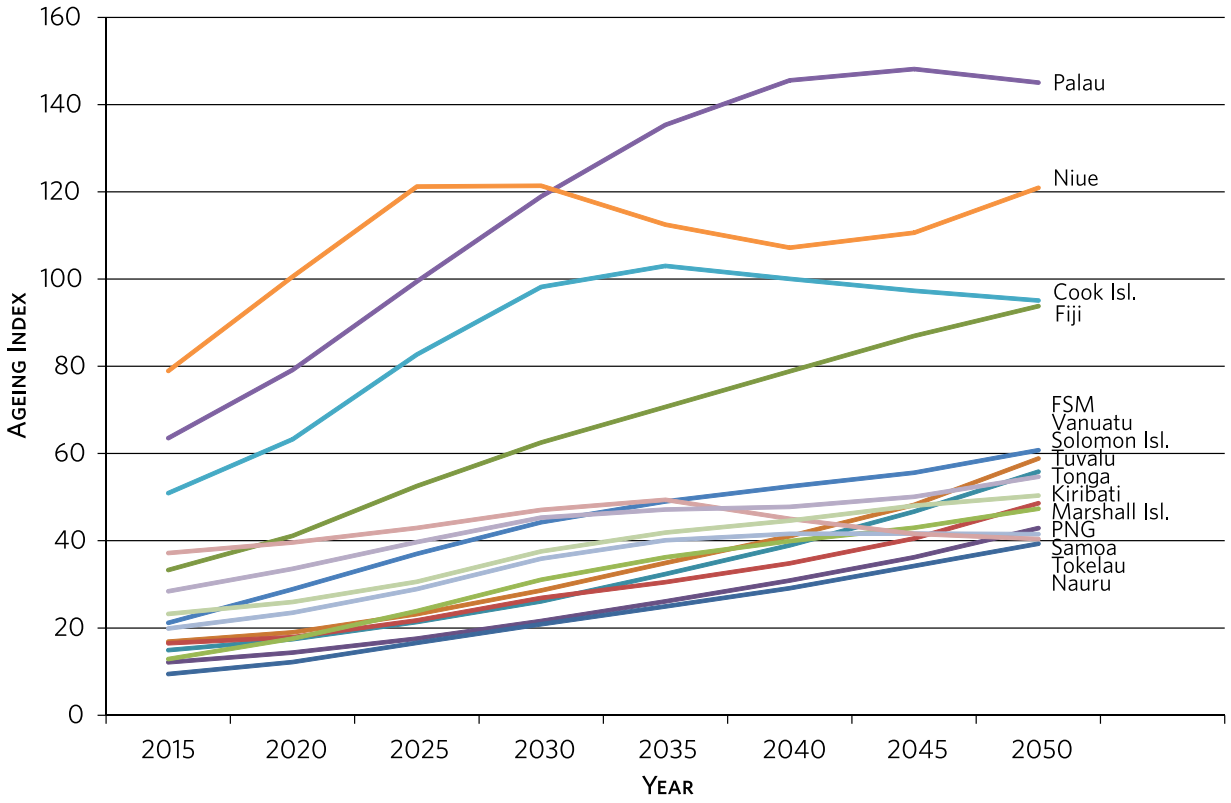
Source: UNFPA population projections, 2014 (Annex 5)

4.3 The Ageing Index

The ageing index refers to the number of older persons per 100 persons under the age of 15. An index of 100 means that the number of persons over 60 is equal to the number of children aged 0-14. An index above 100 means that there are more older persons in the population than there are children.

Given present ageing trends, the Aging Index will reach almost 100 in the Cook Islands and Fiji in 2050, and 121 and 145 in Niue and Palau respectively, which means that there will be more older persons than children (Fig. 12 and Annex 6). All other PICs will also show an increasing trend in their Ageing Index from 2015 to 2050, but their Index will not exceed 60, which should nevertheless have profound implications for health and welfare policies for PIC planners and policy makers (see chapters 5-7).

FIGURE 12: Ageing Index, PIC: 2015-2050



Source: UNFPA population projections, 2014 (Annex 6)

4.4 Potential Support Ratio and Parent Support Ratio

The "dependency burden" refers to the number of dependents (aged 0-14 years and/or older than 60 years of age) relative to the number of "working age" persons (aged 15-59 year). As populations undergo ageing, dependency shifts from youth dependency to old age dependency. The two types of dependency—youth and old age—can be expressed in similar kinds of indicators but substantively they have very different implications for health and welfare. The health services required by children are relatively inexpensive (immunization and treatment of infections) compared to the services required for the older persons, which might range from hip replacements to heart surgery to chemotherapy. Disability increases with age, including impaired sight or hearing or immobility. The education costs associated with youth dependency are obviously higher than those associated with old age dependency, which are usually minimal, but the costs of health care outweigh education costs by a substantial margin. In the case of health, more money may be spent (either by insurance companies or state-funded public health services) in the last few years of an individual's life than in all previous years.

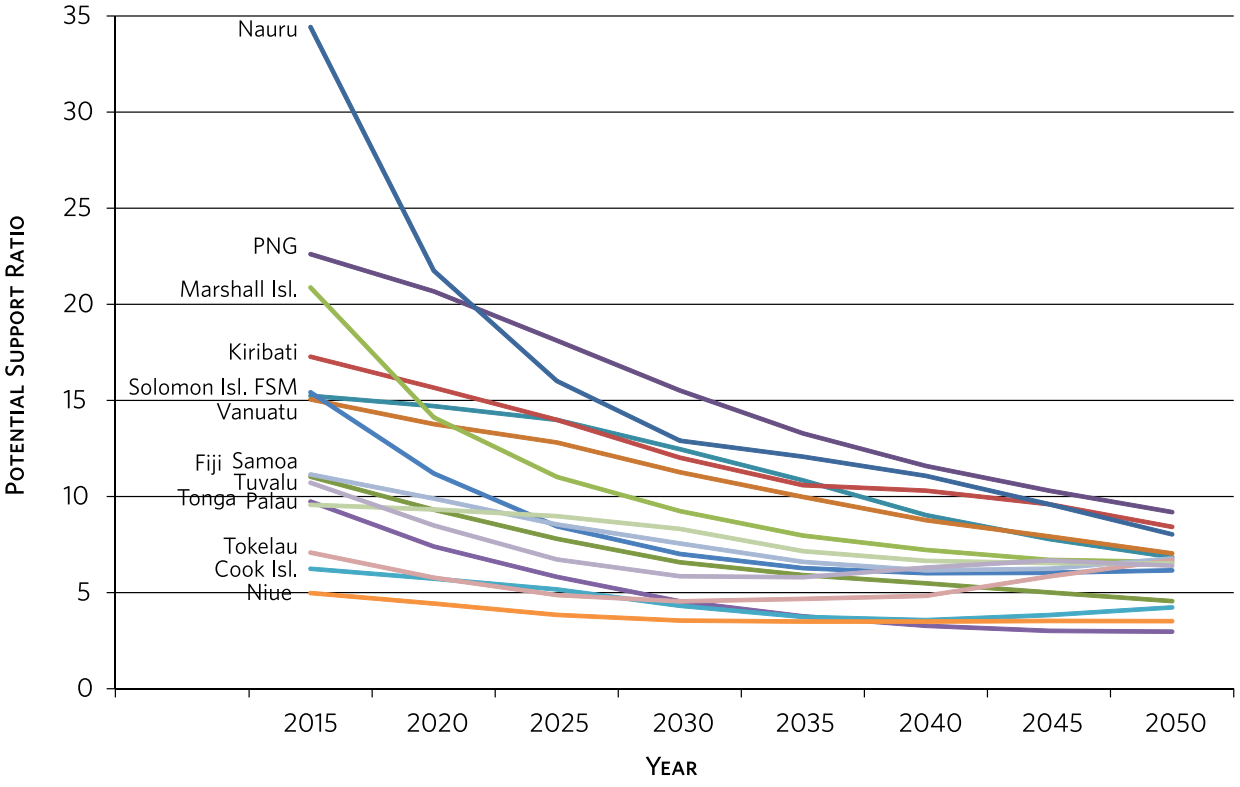
Two measures of old age dependency are shown in Figure 13 and 14: the Potential Support Ratio and the Parent Support Ratio. The Potential Support Ratio (PSR) refers to the ratio of population aged 15-64 to the population aged 65 and over. The PSR is a measure of the degree to which the population that is presumably no longer working is supported by the population that is working. A ratio of 1 means that 1 person of working age needs to support on average one older person. A falling PSR indicates that the population (formally) working and aged 15-64 is decreasing relative to the population aged 65 years and older, thus increasing the "burden" on the working population. The measure is a simple demographic one that does not allow for the possibility that some persons aged 15-64 are not working or that some persons aged 65 and over are continuing to work. Nevertheless, it gives a valid indication of the impact and implications of an ageing population.

The Parent Support Ratio measures the ratio of persons aged 80 years of age and over to the population aged 45-59[5]. This ratio measures the extent of support available to the oldest old from their children, assuming that their children are 20-35 years younger than they are. As with the Potential Support Ratio, the Parent Support Ratio is a demographic measure: it does not refer to persons who are actually related but is merely an approximation of the family support that might be available. An increase in this ratio means that an increasing proportion of persons aged 45-59 have a very old person to care for, either directly or indirectly.

Figure 13 (and Annex 7) shows that the Potential Support Ratio is projected to fall in all Pacific countries, meaning that there will be fewer persons of working age relative to the number of older people, and there will be only between 3-9 'workers' per older person.

On the other hand, and conversely, the Parent Support Ratio is projected to rise very rapidly over the next 35 years (Fig. 14, and Annex 8). While this ratio was only between 2-10 in 2015, it will have risen to between 6-26 in 2050; therefore, in Niue there will be 26 persons aged 80 and over for every 100 persons aged 45-59. Palau and the Cook Islands will have Parent Support Ratios of about 25 by the year 2050. This is no doubt a function of high rates of emigration, which have been projected to continue, that result in the children of older persons living abroad.

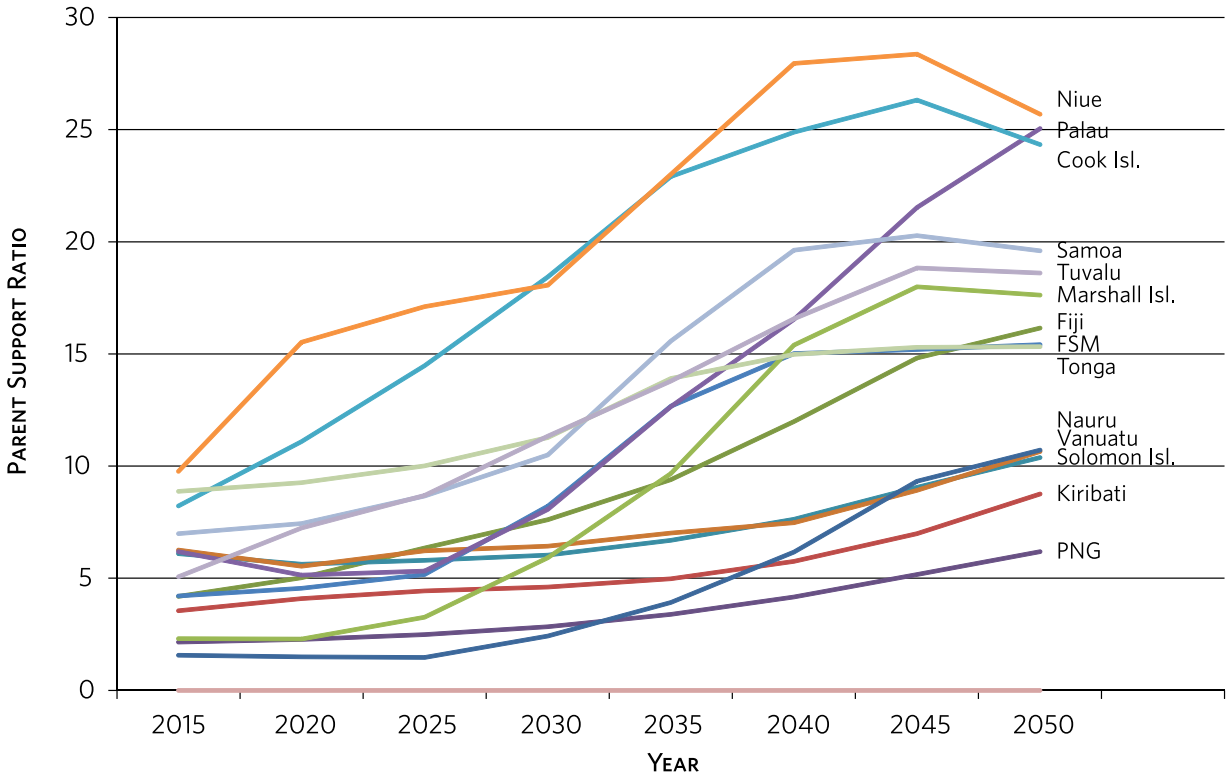
FIGURE 13: Potential Support Ratio, PIC: 2015-2050



Source: UNFPA population projections, 2014 (Annex 7)

[5] The parent support ratio is normally calculated using the population aged 85 and over per 100 persons aged 50-64. For the Pacific Island countries the ratio has been calculated using the 80 and over population per 100 persons aged 45-59 because of the difficulty of obtaining data on the population 85 and over.

FIGURE 14: Parent Support Ratio, PIC: 2015-2050

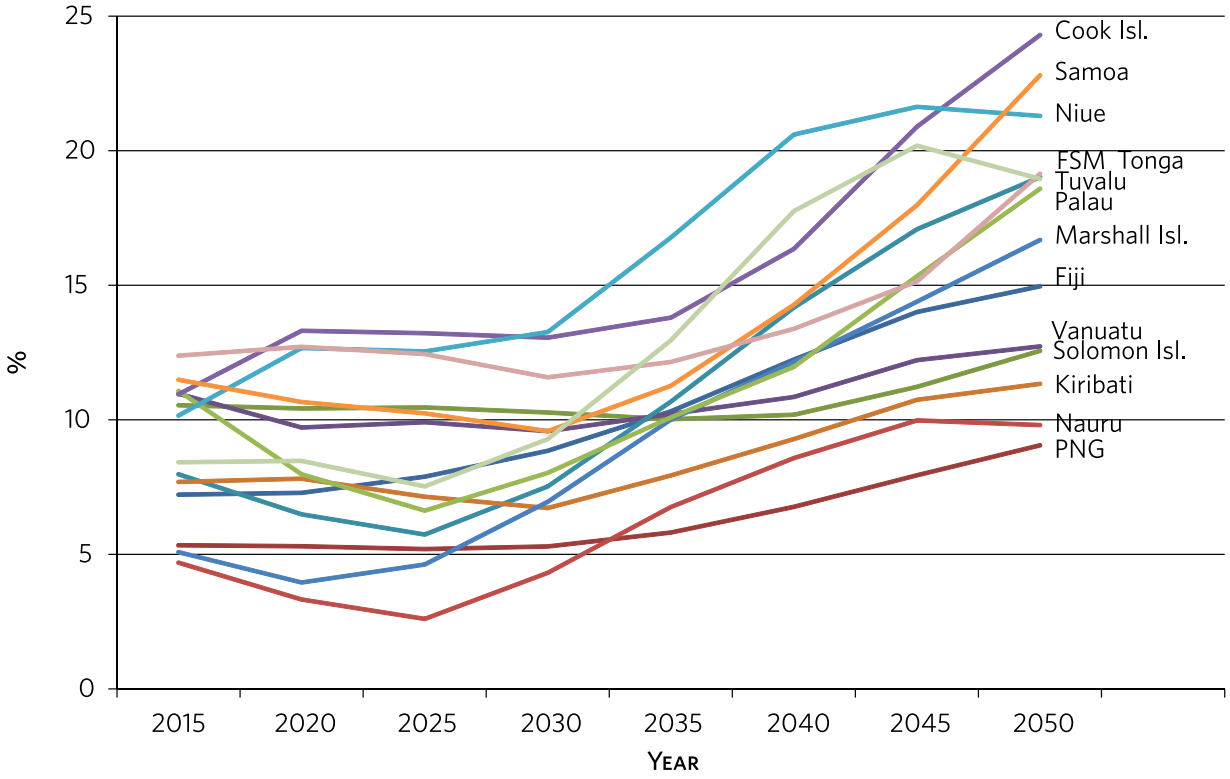


Source: UNFPA population projections, 2014 (Annex 8)

4.5 Ageing of the older population

With increased longevity, a higher proportion of the older population (60 and over) will survive to even older ages; thus the older population will also age. This process is evident in Figure 15 (and Annex 9), which shows the increasing proportion of "oldest old" (80 and over) in the older population.

FIGURE 15: Proportion of the population 80 years of age and over in the population aged 60 and over, PIC: 2015-2050



Source: UNFPA population projections, 2014 (Annex 9)

This process is clearly more advanced in the Polynesian countries of the Cook Islands, Samoa, and Niue where almost one-quarter of the older population will be 80 years and older in 2050. In contrast, in 2015 these rates were only in the range of 5-11 percent. In general however, in Melanesia the proportion will be much lower than elsewhere in the Pacific.

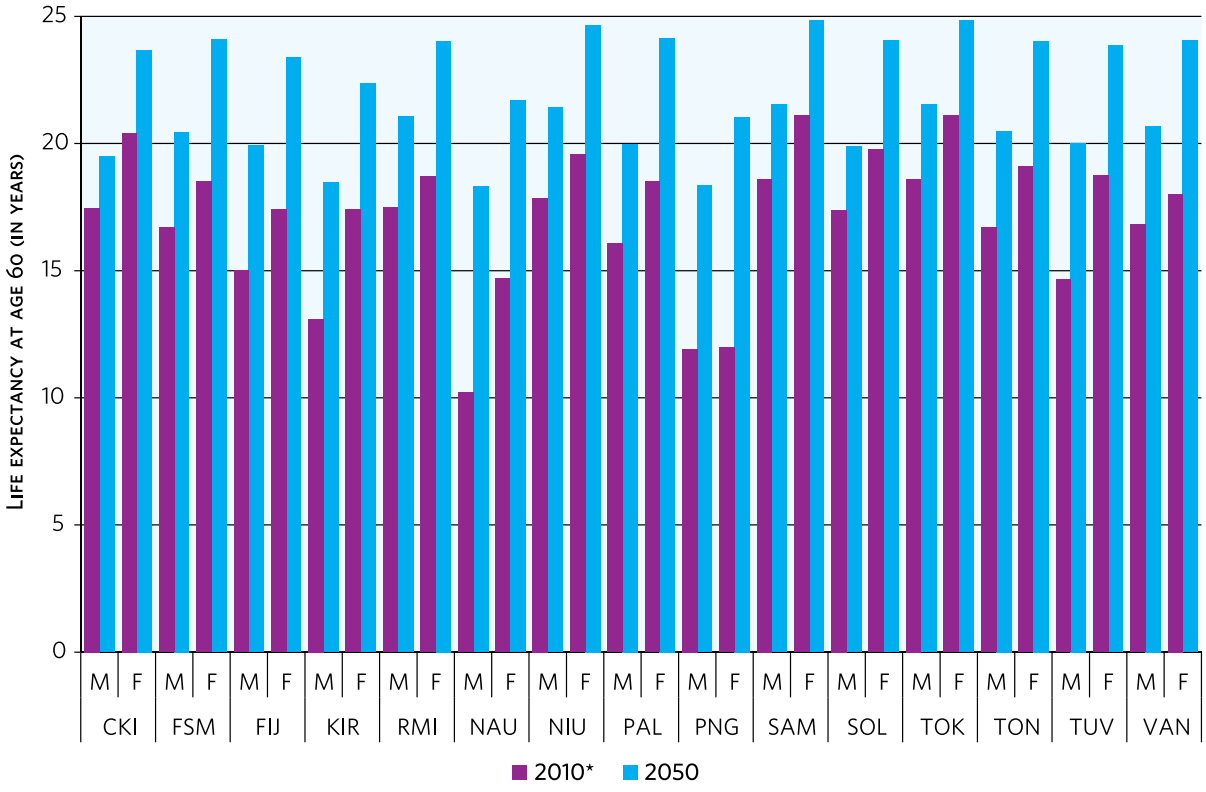
The cause of ageing within the older population is increasing survivorship. The first half of the 21st century will experience steadily increasing survivorship to age 60 and beyond. Furthermore, the average number of years that a person can expect to live past age 60 is also increasing. While males and females aged 60 years around 2010 could expect to live 16 and 18 years longer on average, this will be an additional 20 to 24 years in 2050, a gain of 4-5 years on average (Table 3 and Fig. 16). The implications of these changes for health care are obviously quite profound for remote island countries—especially rural areas and outer islands (see chapters 5-7).

TABLE 3: Life expectancy at age 60 [E(60)], PIC: latest available year (around 2010), and in 2050

Country	± 2010*		2050		Increase in E(60) between 2010 and 2050 in years	
	Males	Females	Males	Females	Males	Females
Fiji	15.0	17.4	19.9	23.4	4.9	6.0
Solomon Isl.	17.4	19.8	19.9	24.0	2.5	4.3
Vanuatu	16.8	18.0	20.7	24.0	3.9	6.0
FSM	16.7	18.5	20.4	24.1	3.8	5.6
Kiribati	13.1	17.4	18.5	22.4	5.4	5.0
Marshall Isl.	17.5	18.7	21.0	24.0	3.6	5.3
Nauru	10.2	14.7	18.3	21.7	8.1	7.0
Palau	16.1	18.5	20.0	24.2	3.9	5.7
Cook Isl.	17.5	20.4	19.5	23.7	2.0	3.3
Niue	17.9	19.6	21.4	24.7	3.6	5.1
Samoa	18.6	21.1	21.5	24.8	2.9	3.7
Tokelau	18.6	21.1	21.5	24.8	2.9	3.7
Tonga	16.7	19.1	20.5	24.0	3.8	4.9
Tuvalu	14.7	18.7	20.0	23.9	5.4	5.1
PNG	11.9	12.0	18.4	21.0	6.4	9.1

NOTE: for projection of E(60) the medium pace of mortality improvement as outlined in the UN models for mortality improvement, was used (Annex 10, Table VI.6). *refers to latest available census year

FIGURE 16: Life expectancy at age 60 [E(60)], PIC: latest available year (around 2010), and in 2050



Source: UNFPA estimates (Table 3)

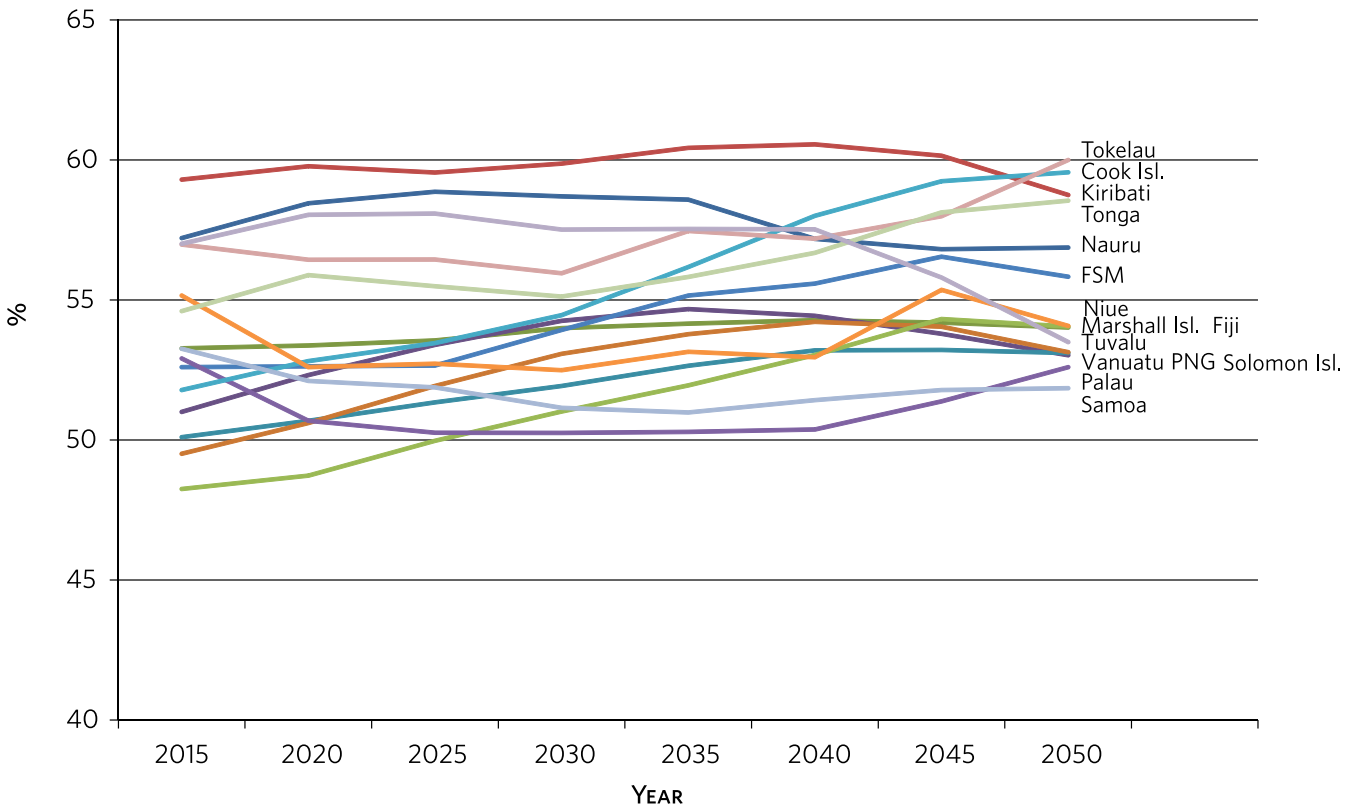
4.6 The feminization of ageing

Women and men differ on several issues that are relevant for ageing policies. They have different health and morbidity patterns and women usually have lower income but larger and better family support networks.

Given that male death rates are usually higher than female death rates across all age groups, more women than men can be expected to survive into old age, and are more to be living alone. On the other hand, grandmothers also perform child-care tasks and may prefer to live in a co-residential family arrangement so long as their own health permits.

The majority of older people are women, which is just as evident in the Pacific as in other world regions (Fig. 17). The proportions of older women among the population aged 60 years and older will increase slightly from 2015 to 2050. However, it needs to be noted that this is at least partially caused by the assumed life expectancy at birth based on using UN models for mortality improvements. Projections forward to 2050 indicate that the proportion of females of the older population will be between 52-60% for all PICs. The feminization of ageing is likely to be more pronounced in the Polynesian and Micronesian countries of Tokelau, the Cook Islands, Kiribati and Tonga.

Figure 17: Proportion of the population 60 years and older that is female, PIC: 2015-2050



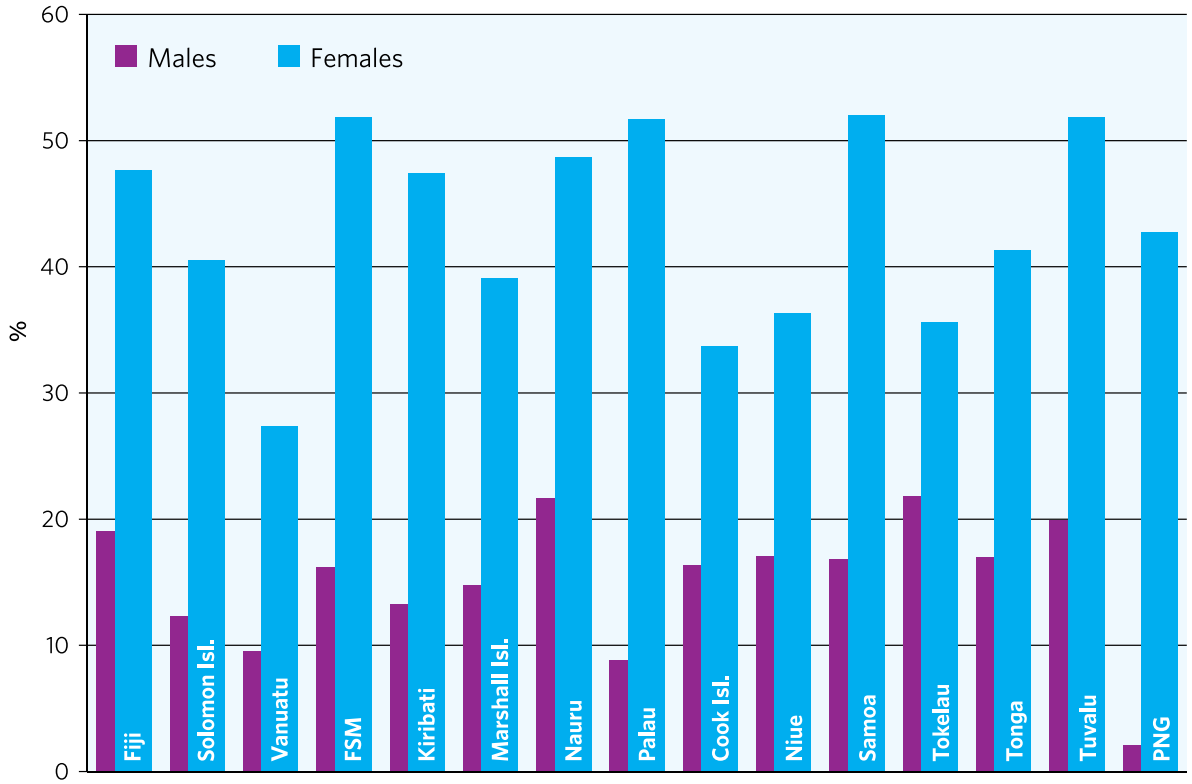
Source: UNFPA population projections, 2014

As there are a high proportion of women among the older persons, this poses serious implications for their welfare. Most of the older women are widowed, and therefore lack the support of a spouse. While only about 15 percent of males aged 60 years and older are widowed, it is on average 43 percent of women of the same age, and it is more than half of women aged 60 and older in FSM, Palau, Samoa and Tuvalu (Fig. 18). This pattern is explained by the longer life expectancy of women compared to men, and the fact that husbands are usually older than their wives, as is expressed by the so-called Singulate mean age at marriage (SMAM), which is an approximation of the average age at first marriage (Table 4).

Thus there are more widows than widowers among the old. Furthermore, a higher proportion of widowers than widows re-marry on the death of their spouse. Therefore there is a higher proportion of women among the older persons than men, who are lacking support, and social protection safety nets.

Based on each country's most recent census data, women are on average 2.2 years younger than their spouses, and live an average of 4.3 years longer. As a result, it is estimated that Pacific Islands women live approximately 6.5 years as widows. Women in Kiribati, the Solomon Islands, and Tuvalu experience widowhood for more than 10 years (Fig. 19).

FIGURE 18: Proportion of males and females aged 60 years and older who are widowed (%), PIC: latest census year



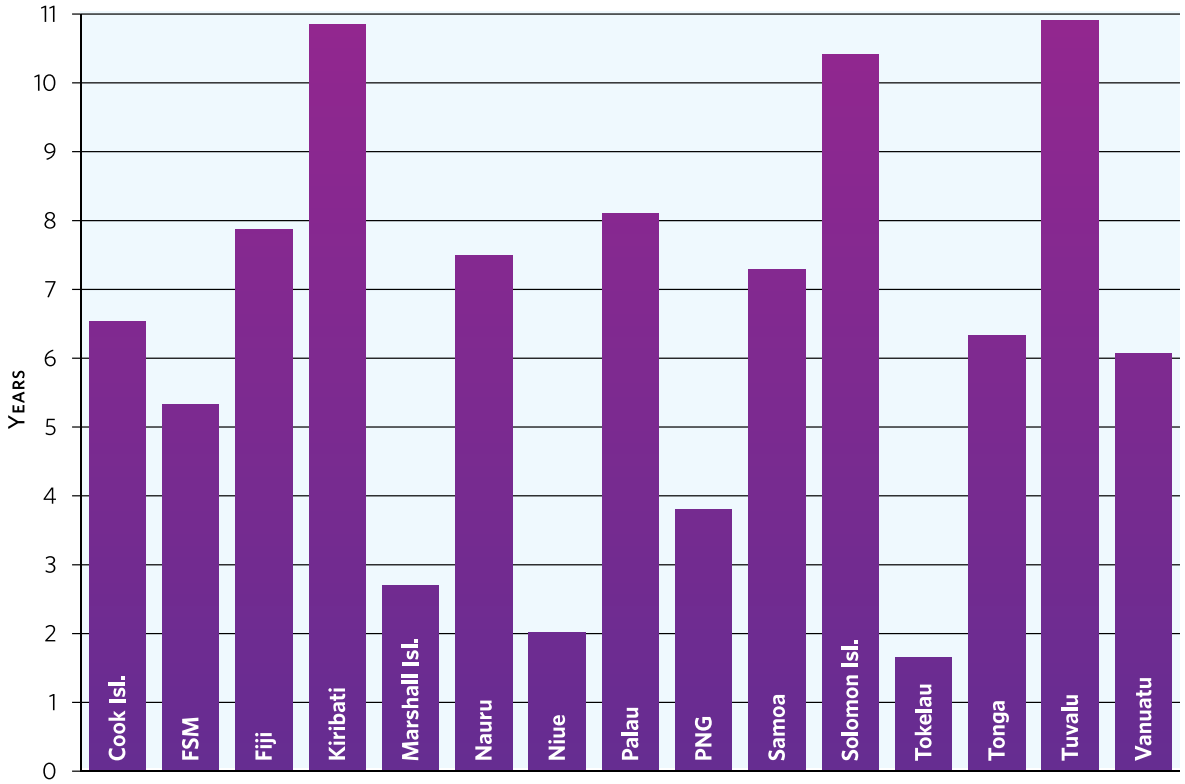
*Note: Data for the Cook Islands refer to 2006, Marshall Islands to 1999, and PNG to 2000

TABLE 4: Singulate mean age at marriage (SMAM), and life expectancy at birth, PIC: latest census year

Country	SMAM			Life expectancy at birth (in years)			Total
	Males	Females	Difference	Males	Females	Difference	Difference
Cook Isl.	31.7	31.4	0.3	73.6	79.8	6.2	6.5
FSM	27.4	25.5	1.9	68.4	71.8	3.4	5.3
Fiji	27.7	24.1	3.6	65.2	69.5	4.3	7.9
Kiribati	24.0	21.5	2.5	58.0	66.3	8.3	10.8
Marshall Isl.	25.7	24.2	1.5	71.3	72.5	1.2	2.7
Nauru	24.4	22.6	1.8	57.5	63.2	5.7	7.5
Niue	23.9	24.6	-0.7	72.5	75.2	2.7	2.0
Palau	28.9	26.6	2.3	66.3	72.1	5.8	8.1
PNG	22.2	19.5	2.7	53.7	54.8	1.1	3.8
Samoa	27.9	23.5	4.4	72.7	75.6	2.9	7.3
Solomon Isl.	27.1	23.3	3.8	66.1	72.7	6.6	10.4
Tokelau	26.5	27.7	-1.2	72.7	75.6	2.9	1.7
Tonga	27.2	24.7	2.5	69.3	73.1	3.8	6.3
Tuvalu	27.2	22.1	5.1	65.3	71.1	5.8	10.9
Vanuatu	25.5	22.5	3.0	69.6	72.7	3.1	6.1
Average	26.5	24.2	2.2	66.8	71.1	4.3	6.5

Source: Latest available population census data/report

FIGURE 19: Average number of years women live longer than their husbands, PIC: latest census year



Source: UNFPA estimates (Table 4)

5 The implications of population ageing in the Pacific Islands

5.1 Introduction

The challenges facing families, communities and societies as a population ages are universal but the social, economic, political and cultural context of each country determines the manner in which these challenges are addressed and the extent to which policies and programmes can be implemented. In the Pacific Islands, geographical factors place a significant constraint on all aspects of social and economic development and this clearly includes the design and implementation of policies and programmes to address population ageing. This chapter reviews the general implications of an ageing population and places the main issues in the context of Pacific Island conditions.

An ageing population exhibits a number of additional features that may not initially appear obvious. First, ageing continues throughout the age range. In other words, the old get older, like everyone else. Furthermore, ageing varies by sex and residence. Given that life expectancy is normally higher for women, a higher proportion of women survive to older age than men. The higher survivorship of women continues throughout the age range to the very oldest. Consequently, a higher proportion of older persons are women. Finally, ageing occurs at different rates in rural and urban areas. Although fertility usually declines in urban areas before rural areas, rural-urban migration can have a similar effect because out-migration is usually selective of young people of labour force age. The implications of this are two-fold:

1) the reduced proportion of working age population in rural areas accelerates ageing of the population in these areas;

2) older persons in rural areas may have less direct support than their counterparts in urban areas. The latter is indicated by changes in household composition over time in urban and rural areas.

5.2 Health services

Increasing life expectancy presents an apparent paradox in that improved health conditions and lower mortality contributes to greater longevity; but those who live long lives will tend to experience higher rates of morbidity as they become older and will spend more time sick or disabled. With modern life-saving technology, it is possible for older persons to survive frequent life-threatening incidents (heart attacks, strokes, respiratory problems, cancers) that might have been fatal in the past. However, the availability of such life-saving treatment depends upon the level of development a country has reached and the funds available to supply such services—whether from a public or private health system.

In developed countries, per capita health expenditure for older persons is higher than for younger age groups. As the proportion of older people in the population rises, health care needs increase leading to higher total expenditure. In developing countries, including the Pacific Islands, increasing the budgetary allocation for health services in the face of so many other needs may involve difficult policy choices. In developing countries health services are frequently inadequate and already overburdened. In some countries, the resurgence of infectious disease is occurring at the same time that non-communicable diseases are growing in importance, thereby creating a "double burden" for the provision of health services.

The health services required for an ageing population tend to be both labour- and technology-intensive. In the Pacific the specialized technology and expertise required to address the needs of the old is often unavailable, even in the most developed Island countries. Most Pacific countries have established referral programmes whereby patients are sent abroad for treatment (to Australia, Hawaii or New Zealand) that is unavailable at home. Given the high costs associated with referral to overseas facilities, access is highly restricted and "rationed". Older patients are unlikely to receive high priority through these schemes, which are generally focused on children and working age persons.

Another arrangement is for specialized medical staff to be brought to the Islands on a periodic or rotational basis. Such arrangements are frequently voluntary on the part of the overseas medical staff or otherwise financed by international NGOs or private health providers. Such arrangements may be effective on a small scale and where the necessary ancillary facilities (operating theatres, etc) are available and maintained. But it is precisely the establishment and maintenance of medical facilities that presents a major challenge to health budgets in the Pacific. Only the largest urban centres are likely to have the required facilities and in many cases these are in private hospitals catering for the small minority of persons who can afford private treatment or have some form of health insurance.

As in many aspects of health, a preventive approach is likely to be more cost-effective than a curative one. Thus, a major priority in the International Plan of Action on Ageing (IPAA, Madrid 2002) is "advancing health and well-being into old age". Addressing this priority requires a range of policies and actions, including:

(a) promoting health and well-being throughout life;
(b) ensuring universal and equal access to health care services;
(c) addressing HIV/AIDS among older people;
(d) training health care providers on the needs of the older population;
(e) addressing the mental health needs of older persons;
(f) maintaining functional capacity throughout the life course.

Many of the required policy measures under these headings can be taken by Pacific Island countries experiencing ageing without incurring very large expenditures. Such measures as the promotion of healthy lifestyles, including improved nutrition, can and should be tailored to the local culture and the available foods. Ensuring equal access to healthcare for older persons involves the removal of social and economic inequalities based on age. These inequalities can be addressed following an assessment undertaken with the participation of old people themselves. In the Pacific, geographic factors are a primary cause of unequal access to health and social services. Outer islands and remote communities are the most difficult to service because of the high cost and unreliability of transport and communications.

5.3 Long-term care

The older population is much more likely to suffer from disability or impaired capacity than other age groups and the disability may become permanent. The most common disability is loss of mobility. Loss of hearing, poor eyesight and mental illness or cognitive disorders may also occur. In extreme cases disability may require long term care that goes beyond medical treatment as such and the care required to maintain a reasonable quality of life may be beyond the capacity of the immediate or extended family.

In the Pacific, the care of old people in the family home is a strongly held value and this remains the typical arrangement. So long as life expectancy was below 60 years, the proportion of older persons in the population was low, and because infectious rather than degenerative diseases were the main cause of death, home care was a practical and appropriate arrangement. As life expectancy rises and degenerative rather than infectious disease becomes the main cause of death, home care becomes less

appropriate. Disability arising from degenerative disease may require constant (24 hour) attention and assistance by persons with appropriate training in geriatric medicine. Death from cancer, for example, may be preceded by a long period during which intensive care is required. Such assistance is not available in the average home in the Pacific.

As ageing proceeds in the Pacific, the development of more formal types of long-term, institutional care to support or supplement home care will become essential. The need will be greatest where ageing is most advanced and where the care-giving population has been depleted by migration. This applies most obviously in the Polynesian countries and Fiji. In some countries—Cook Islands, Niue and Tokelau—the population holds New Zealand citizenship and can potentially avail themselves of long-term care in that country. In other Pacific Island countries—most obviously Fiji, FSM, Marshall Islands, Samoa and Tonga—substantial migrant populations exist in Australia, New Zealand and the United States. These migrant communities are potentially able to finance long-term care for their older persons, either in their home countries or in their adopted homes. The issue of long-term care therefore intersects with issues of migration, multiple citizenship and also pension rights and transferability.

More research is needed on the implications of ageing for long-term care in the Pacific Islands. First, more analysis of census and survey data on disability patterns by age is required. Second, more information on the living arrangements of the older population is needed, including the living arrangements of older persons who are also disabled. Rural/urban differences would be an important cross-cutting dimension of this analysis. Studies of present arrangements for institutional care in the Pacific are also needed. Options for strengthening institutional care while also finding the right balance between informal (family) care and formal (facility-based) need to be explored in the context of the cultural values and preferences of Pacific Islanders.

5.4 Family and community support

Institutional care may be more comfortable for those suffering from a disability, but placing older persons in an institution may be resisted by families because it suggests that the family is unwilling or unable to meet their cultural obligations. In the Pacific, the normal expectation is that children support their parents in exchange for the support that parents provided to their children. For the oldest old, however, this is a difficult expectation to satisfy, and the oldest old are the fastest growing age group in many countries. Furthermore, a range of processes, including urbanization, formalization of work, migration, and nuclearization of the family (in short, "modernization") are undermining the willingness and capacity of younger families to meet the cultural expectation of their parents and grandparents.

Given the "feminization" of ageing, older women are more likely to suffer because of these processes and are also more likely to be living alone. On the other hand, grandmothers also perform child-care tasks and may prefer to live in a co-residential family arrangement so long as their own health permits. In Asia, co-residence is declining and institutionalization increasing. It is unlikely that these trends are occurring in the Pacific but concrete data are currently lacking. In the long run it is inevitable that institutionalization will increase, but the form of institutionalization may be different from that found in more developed countries.

It would be useful for Pacific countries in which ageing is occurring rapidly to assess the potential types of institutional arrangements that are most suitable for societies in which the extended family is still the strongest social unit even though it is coming under strain. In the industrially developed countries, retirement "villages" that combine individual residence with hospital and hospice services provide a sharp contrast to the single-family home in which most people live their lives. In the Pacific, however, some variant on "village" living is common and a village type living arrangement for older people is not such a radical departure from customary residence.

Informal care-giving, particularly to the oldest old, can be stressful and care-givers can easily become overburdened—especially when attempting to balance child care and employment obligations. Community care involving volunteers or extended family members can ease the pressure on the immediate family. Commonly such arrangements do not involve compensation for the care giver, but there are limits to generosity and compensation in some form may be called for.

It is important to acknowledge that informal care does not, and cannot, replace professional care. What is generally required is a continuum of care from a range of sources—family, community, hospitals or clinics and hospices. The appropriate mix of these forms depends in part on individual and cultural preferences, personal needs, and availability.

The issue of institutional versus family care also intersects with the issue of housing options. Many older people may prefer "independent living" to living with family or other older people. But independent living also raises issues of transport and mobility, especially among those who may suffer a disability. In urban areas, the transport needs of the older population can partially be met by subsidized public transport and the modification of vehicles to meet the access requirements of the old and infirm. In rural or outer island areas in the Pacific the impediments to mobility may be greater, especially where sea travel is concerned.

5.5 Work, income and social protection

Priority direction I of the IPAA 2002 is to ensure that older persons are "full participants in development...and share in its benefits". This priority arises because ageing carries with it the possibility that the purposeful and meaningful social and economic roles of older persons will be taken away from them. Social and economic participation encompasses a wide variety of activities, including work and employment, involvement in decision-making and expressive culture.

Ageing is a triumph of development. Increasing longevity is one of humanity's greatest achievements. People live longer because of improved nutrition, sanitation, medical advances, health care, education, and economic well-being.

With regard to work and employment, it is a widely accepted principle, expressed in the IPAA 2002, that older persons should have the opportunity to work for as long as they wish and are able to do so productively. In reality there are many obstacles to the full employment of older persons. In the Pacific, public sector employees may face compulsory retirement at the age of 50, 55 or 60. Private sector practice may follow the public sector on the grounds that older persons should yield their jobs to younger people who are more educated and qualified and wish to form their own families. This argument is certainly compelling in countries where the proportion of youth in the population remains high or is still rising and where formal employment opportunities are limited. But employment growth should in any case be at the heart of macroeconomic policies and rapid employment growth would avoid the "zero-sum" situation whereby the old have to yield to the young resulting in the virtual "rationing" of jobs. More flexible retirement policies might result in compromise arrangements whereby older workers past retirement age might combine part-time work with mentoring and training functions.

In the Pacific, as in most developing countries, the majority of the population which is now old have spent their working lives in the rural village economy or the urban informal sector. Consequently, the possibility of "retirement" in the sense of being in receipt of a pension does not exist. Personal savings are usually minimal or non-existent. In the village economy, the capacity to work depends mainly on the health and disability status of older persons, assuming that they have the usual access to planting land and the typical array of capital goods.

The principle of "employment for all" is supported by the IPAA 2002, but achieving this objective is difficult, particularly in rural settings. Older women, for example, face many obstacles, including illiteracy or low levels of education, lack of job experience, skills or qualifications. The provision of micro-credit for older persons is one strategy that could assist older men and women continue to earn an income beyond their own subsistence. Another related principle enunciated by IPAA is "lifelong access to education and training". Given rapid changes of technology, older people who wish to work and are capable of working may nevertheless require re-training. In the Pacific, the concept of adult education is little known and polytechnics are oriented almost entirely to the young. In rural areas and outer islands, opportunities to obtain occupational training or re-training are usually minimal. Government support for the retraining of older workers is virtually non-existent.

Other forms of social protection include contributory or non-contributory pension or superannuation schemes. The scope and effectiveness of these schemes in the Pacific is not well known. Some countries (Papua New Guinea and Fiji, for example) have national provident funds to which both public and private employees contribute. Non-contributory old age pensions are paid in Cook Islands and Niue, but the amounts involved are small both in relation to needs and the government budget.

Pacific Islanders who have worked for at least 20 years in New Zealand and have reached retirement age are able to receive their New Zealand superannuation in their home countries under certain conditions. The value of these payments is well in excess of what Island governments could afford. In effect, superannuation sourced from abroad plays a similar role in the island economy as migrant remittances. These payments are usually indexed to inflation but in the country of origin not the PICs.

Research is needed on the full range of social protection schemes available in Pacific Island countries and their effectiveness. Household Income and Expenditure Surveys (HIES) are a potential source of data on the number of older persons in receipt of pension or old age social security payments. Household Income and Expenditure Surveys can also provide data on the poverty status of older persons using various measures of poverty. Complete destitution is rare in the Pacific, especially in rural areas where the traditional village economy remains intact. The presence of beggars in Pacific towns suggests that destitution may exist in urban areas but what can be observed on the street needs to be interpreted with caution.

Research is also required on current and future impact of old age security on government budgets. This is obviously more urgent in those countries that have already begun to experience population ageing; but all countries can benefit from a review of the potential budgetary impact of ageing given that the creation of investment funds to supplement or replace the direct contribution from annual budgets is a long term strategy with a time frame of decades rather than years.

5.6 Conflict and emergency situations

The older population is particularly vulnerable during emergency situations arising from natural disasters, epidemics or civil war. Older persons suffer more in natural disasters (cyclones, tsunamis and earthquakes) due to their impaired mobility. During epidemics the older population is likely to have higher infection rates and death rates than younger adults. In conflict situations the needs of the older people tend to be ignored or overlooked.

In countries experiencing a generalized HIV/AIDS epidemic, the older population may be forced to become caregivers to their grandchildren if the parental generation has died. If grandchildren are also infected the strain on grandparents may be serious, possibly leading to their impoverishment. This aspect of the HIV/AIDS epidemic has been little studied in the Pacific, although Papua New Guinea is the only country in which this is likely to be a serious issue at present.

In the Pacific, natural disasters such as cyclones, tsunamis, droughts, floods and earthquakes are common. Every country has a disaster preparedness plan but the extent to which the special needs of older persons have been addressed varies from country to country.

5.7 Positive aspects of ageing

In Pacific Island cultures, older people are normally given a great deal of respect and even veneration. In those Pacific societies in which chiefly titles are inherited by primogeniture, chiefs may hold their titles to an old age and only upon their death is the title transferred to the next right-holder. Even in those Pacific societies lacking inherited chiefly titles, older people—men in particular—are given respect as sources of traditional knowledge and skills and arbitrators of disputes or conflict.

In urban settings, however, this cultural respect is eroding. Traditional skills are less relevant and the functions of chiefs more obscure. The role of older persons in economic development may not be obvious. The savings of older persons provide a pool of investment capital either directly in bank savings or indirectly through pension funds or stocks and bonds.

Older persons make vital contributions to society, and older workers may be more productive than younger ones because of their experience, motivation and lower rates of absenteeism. But the public image of older persons may focus more on the negative aspects, such as the costs of their health care.

The promotion of a positive image of older people is an important objective of the IPAA. In the Pacific, where custom and tradition are still respected (even if this respect is eroding under globalization) this task is less difficult than it might be in a fully industrialized and monetized economy. Examples of how the traditional knowledge and skills of the old can contribute to recovery after natural disasters would not be difficult to find given the frequency of cyclones, floods and droughts.

6 Policy and implementation issues in the Pacific Islands

6.1 International frameworks

International agreements often provide the broad framework within which individual countries design social policies and programmes. Population ageing was not an international issue during the first half of the 20th century because the populations of most countries were becoming younger and "youth" was the demographic group of prime concern. The issue of ageing populations was first raised in the United Nations by the Government of Malta in 1969. The first World Assembly on Ageing was held in Vienna in 1982 resulting in the Vienna International Plan of Action on Ageing. In 1991 the United Nations Principles for Older Persons was adopted and 1999 was declared the International Year of Older Persons.

At the Second World Assembly on Ageing in Madrid, countries committed themselves to eliminating all forms of discrimination, in particular age discrimination, to ensure that "persons, as they age, [...] enjoy a life of fulfilment, health, security and active participation in the economic, social, cultural and political life of their societies". This echos and builds on agreements which emerged from United Nations conferences and summits before the Second World Assembly, such as the International Conference on Population and Development (Cairo, 1994), the World Summit on Social Development (Copenhagen, 1995), the Fourth World Conference on Women (Beijing, 1995) and the Millennium Development Summit in 2000.

These international initiatives were undertaken while the phenomenon of population ageing was largely concentrated in the industrially developed countries. By the time of the Second World Assembly on Ageing held in Madrid in 2002, ageing had begun to occur in developing countries. This came about because many developing countries had experienced a rapid "demographic transition" to low mortality and fertility without necessarily achieving the level of economic development that was previously thought necessary to bring the transition about. The demographic transition became partially detached from the economy due to the central role of government policies and programmes somewhat independently of the level of development.

As a result of the appearance of population ageing in less developed countries (LDCs), the Second World Assembly on Ageing (2002) selected "Ageing and Development" as its first "priority direction". While many of the issues raised under this priority are also relevant to the more developed countries (MDCs), the socio-economic context of LDCs raises a number of issues that are unique to them. Two examples can be used to illustrate this. First, in LDCs many people are becoming old whilst still illiterate and innumerate. Second, most of the older population in the LDCs has spent their working lives in the urban informal sector or in rural village economies. This contrasts with the situation in MDCs where literacy is universal—even among the old—and the majority of older persons are eligible for contributory or non-contributory pension plans and other forms of old age social security. It follows that the challenges facing developing countries undergoing population ageing are more daunting than in the MDCs, even though conceptually similar.

The overall aim of the Madrid International Plan of Action on Ageing 2002 (MIPAA) is to "...ensure that persons everywhere are able to age with security and dignity and to continue to participate in their societies as citizens with full rights". To achieve this, the Plan of Action identifies three priority directions:

I. Older persons and development
II. Advancing health and well-being into old age
III. Ensuring enabling and supporting environments

Under each of these priority direction a set of objectives is identified along with recommended actions that governments can take. The following section notes those objectives and actions of particular relevance to the Pacific Islands.

I: OLDER PERSONS AND DEVELOPMENT

At the highest level, the main policy recommendation is that the issue of ageing should be incorporated within the social and economic policies, strategies and actions of countries, including poverty reductions strategies and plans. Older persons should be full participants in development processes and share in its benefits. Public policy should focus on the elimination of the barriers that prevent older persons from participating in social, cultural and economic activities. Given that ageing is occurring at a rapid rate in some countries, it follows that the contribution of the older population to development will increase in the future and impediments to their participation should be removed to the maximum extent possible.

I (a) Enhanced recognition of the social, cultural, economic and political contribution of older persons.

Governments can undertake a range of actions to achieve this objective, including measures to encourage volunteering by older persons and advocating among employers on the benefits and advantages of employing older persons.

I (b) Participation of older persons in decision-making at all levels.

Among other actions to achieve this, governments can encourage and facilitate the formation of organizations of older persons and make it possible for these organizations to represent the older population in key decision-making bodies.

I (c) Employment opportunities for all older persons who want to work and are able to do so productively.

In rural settings in which most production is related to subsistence this objective may not be difficult to achieve. In the Pacific, subsistence production generally carries on well into old age, although the nature of the work changes according to physical capacity. Given Pacific land-tenure systems, the old are usually the landowners and make their own decisions as to what work to do and when. In urban setting, however, the situation is different. In particular, labour markets determine who can work and the terms and conditions of the work. However, governments can advocate for the use of older workers by employers and facilitate the self-employment of older workers, for example by providing credit for small-scale enterprise. Policies should also aim to increase the labour force participation rates of older women, who tend to suffer most from discrimination in the labour force. Introducing more flexible retirement policies that eliminate disincentives to work beyond the statutory retirement age would be useful for those who wish to continue working.

I (d) Equality of opportunity throughout life with respect to continuing education, training and retraining as well as vocational guidance and placement services.

At the basic level, many older people need literacy and numeracy training. Others need training in computer use given the current importance of IT. In the Pacific, vocational training is mainly focussed on youth, as might be expected given the still high proportion of youth in the population. However, improving adult literacy now would ensure that fewer persons will be illiterate or innumerate on reaching old age. Without literacy other forms of training cannot occur.

It is also true that older persons may be effective teachers, trainers and volunteers and their life-long experience can be utilized to much greater effect than is often the case. Policy measure can be taken to mobilize the expertise of older people to enable them to participate as mentors, mediators and advisers. Volunteering is an effective means to do this where older persons are not lacking basic income but whose potential is not being realized.

I (e) The reduction of poverty among older persons.

A core objective of the IPAA 2002 is the reduction of poverty among older persons. In spite of the emphasis placed on poverty eradication in current international frameworks (such as the MDGs), poverty among older persons receives insufficient attention. Older women are particularly vulnerable to poverty because of their lower educational achievement and more limited labour force experience. The feminization of poverty is a particular risk in the case of the older persons. The analysis of poverty using HIES and similar surveys should ensure that the poverty status of female-headed households is assessed by age as well as geographical region so as to ensure that programmes to reduce poverty are appropriately focused.

I (f) Promotion of programmes to enable all workers to acquire basic social protection/social security, including where applicable pensions, disability insurance and health benefits.

In the long run, the prevention of poverty in old age requires social security programmes. Thus, a key policy objective of the IPAA 2002 is to develop and implement policies aimed at ensuring that all persons have adequate economic and social protection during old age. In the Pacific, most countries have pension or superannuation schemes for public servants and private sector workers but rural village workers and urban informal sector workers are generally not covered. Some countries pay social security payments to older persons while others provide assistance to older people who are destitute. A review of social protection/social security systems is needed—particularly in those countries that are ageing rapidly. A central issue is how to provide coverage to the self-employed and informal sector workers and the rural village population.

II: ADVANCING HEALTH AND WELL-BEING INTO OLD AGE

Health issues are at the forefront of concerns about ageing. Good health is a vital individual asset. There is no doubt that ageing increases the risk of poor health and disability. There can often be a large discrepancy between life expectancy and life expectancy adjusted for the number of years spent sick or disabled.[6] There is a wide range of possible actions that governments can take to prevent ill health in older ages, but individual responsibility certainly plays a part.

About the Global Burden of Disease (GBD) project

The Global Burden of Disease (GBD) is a systematic, scientific effort by a collaborative of researchers worldwide to quantify the comparative magnitude of health loss to diseases, injuries, and risk factors by age, sex, and geography over time. It is the most comprehensive effort to date to measure epidemiological levels and trends around the world, and its most recent iteration measures the impact of hundreds of diseases, injuries, and risk factors in 187 countries. The Institute for Health Metrics and Evaluation at the University of Washington is the coordinating center for this effort.

The principle guiding the GBD approach is that the best estimates can only be generated by analyzing all available sources of information in an area and correcting for problems with the data. The results are presented in terms of disability-adjusted life years (DALYs), a time-based measure that combines years of life lost due to premature mortality (YLLs) and years lived with a disability (YLDs), metrics that were specifically developed to assess the burden of disease.

The Institute for Health Metrics and Evaluation and other academic partners have collaborated on a new GBD 2010, published on 14 December 2012, which provides regional estimates of deaths and DALYs (using a new method for calculation of DALYs) for the years 1990, 2005 and 2010. These estimates contributed to WHO global health estimates which were published in 2013.

WHO has prepared a comprehensive and consistent set of DALY estimates for years 2000-2011, consistent with and incorporating UN agency, interagency and WHO estimates for population, births, all-cause deaths and specific causes of death as well as WHO estimates for some specific diseases and analyses carried out for the Global Burden of Disease 2010 study.

[6] Two concepts attempt to capture this phenomenon: (1) YLD refers to the number of years lived with a disability; DALYs refer to the sum of the years of potential life lost due to premature mortality and the years of life lost due to disability or ill health.

II (a) to reduce the effect of factors that increase the risk of disease and consequently potential dependence in older age.

A major objective under this heading is actions to be undertaken include the promotion of healthy lifestyles, which implies the reduction of known risk factors such as lack of exercise, unhealthy diets, alcohol consumption and tobacco use that contribute to ill health in later life. Older persons also need access to sufficient food and adequate nutrition.

II (b) Ensuring that the old have universal and equal access to health care services.

While this is a major challenge in urban areas, it is exceptionally difficult to achieve in the remote outer islands of the Pacific, which are burdened by poor transport and communications as well as small populations. The small scale of these islands limits the scope of economic development as well as the range of services that can be provided locally. The absence of the types of health care services that the old require is likely to provide an additional incentive to out-migration leading to ever-greater concentration of population in urban areas. When these populations were young, migration was driven by the education needs of young people; with ageing, the needs of older persons will possibly become the main incentive. The strengthening of primary health care to address the needs of older persons would go some way towards reducing the incentive to migrate in order to access services.

The reorientation of health services toward the needs of older persons will require expanded educational opportunities in gerontology and geriatrics for health professionals. Training needs include a focus on mental health. In the Pacific, where the family will continue to be the main provider of residential care for older people for some time to come, education programmes focused on family care providers are also necessary in order to provide care-givers with the information they need to be effective and to avoid unnecessary institutionalization.

Addressing the needs of the disabled will be a particular challenge in the Pacific Islands. Aside from the non-independent territories, few Pacific countries have sufficient specialists to serve current needs. Surgeons, heart specialists, urologists, ENT specialist are all in short supply, in part due to the emigration of medical personnel and in part because of the lack of supporting institutions and the relatively low salaries on offer. These challenges are difficult to address in the Pacific Islands given that economic growth has been extremely slow and government revenues have stagnated.

III: ENSURING ENABLING AND SUPPORTIVE ENVIRONMENTS

Governments at all levels have a particular role to play in addressing issues of the "living environment" in which older persons find themselves. First and foremost is the issue of appropriate and affordable housing.

III (a) "Ageing in place" in the community with due regard to individual preferences and affordable housing options.

The underlying principle is that older persons should be able to make the choice of living independently, living with family or in institutional care. The IPAA 2002 urges governments to encourage "independent living" but acknowledges that this raises issues of mobility, including transport and the design of dwellings to suit those with impaired mobility or other disabilities. Urban spaces should be free of barriers to mobility and access.

Community care and "ageing in place" is the preferred policy for many governments and this approach is particularly suitable in the Pacific with its largely intact extended family system. But family caregivers may become overburdened in the absence of support and community care can be under-resourced. Consequently, a continuum of affordable care options is desirable. Family caregivers need access to information and training to better perform their role. In some contexts, older women are themselves caregivers for the oldest old or for grandchildren and therefore need appropriate support.

III (b) Eliminate all forms of violence to and neglect and abuse of older persons and to create support services to address elder abuse.

The mistreatment of the older people is present in many social contexts and takes various forms, including abuse, neglect and physical violence. Older women are particularly vulnerable to neglect and psychological abuse. Governments can raise public awareness of these problems and pass legislation to address the worst forms of elder abuse. Governments also have a major role to play in improving the public image of older persons and highlighting their contribution to the economy, society and culture. Positive images of older persons can help to reduce discrimination against them.

6.2 Implementation issues

The Madrid International Plan of Action on Ageing, 2002 provides the broad framework of recommendations within which national governments, NGOs, civil society and other actors can address population ageing. National governments have the primary responsibility of translating these global recommendations into national plans, policies and strategies.

Formulating strategies to address population ageing is a new challenge for Pacific Island governments. Only two Pacific countries (Vanuatu and Federated States of Micronesia) attended the 2002 Second World Assembly on Ageing that adopted the International Plan of Action, and these countries are not among those that are ageing most rapidly at present. There is clearly a need for individual countries to assess their ageing situation and to commence the process of developing strategies and action plans with the assistance and support of international agencies.

A United Nations General Assembly resolution in 1995 called on the UN Regional Commissions to take the lead in formulating action plans on ageing. The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) organized a regional meeting in Macao (1998) and adopted the "Macao Declaration and Plan of Action on Ageing" (MPA). UNESCAP subsequently organized a regional seminar in Shanghai (2002) which formulated a strategy for the implementation of both the MPA and MIPAA. The Shanghai Implementation Strategy (SIS) reiterates the main policy goals and strategies elaborated in the MIPAA and the MPA and recommends actions that governments should undertake to achieve these goals, including:

- Establish a comprehensive and systematic framework for gathering data and information and undertaking research to identify the circumstances and needs of older persons as well as policy options;
- Encourage the use of the Research Agenda on Ageing for the Twenty-first Century endorsed by the Valencia Forum 2002;
- Enhance the participation of NGOs, older persons' associations and other sectors of civil society in the implementation of the regional and international plans of action on ageing;
- Establish indicators to measure the impact of strategies to assist Governments and other national actors in the implementation process;
- Develop, in those countries that do not yet have a national policy or plan of action on ageing, measures that would allow a systematic review of the implementation of their commitments on ageing.

While the involvement of Pacific Island countries in formulating the Macao Declaration and Plan of Action on Ageing and the Shanghai Implementation Strategy appears to have been minimal, several countries have established "National Coordinating Bodies" on ageing, as recommended by the Macao Declaration. These countries include: Cook Islands, Fiji, Kiribati, Marshall Islands, Palau, Papua New Guinea, Samoa, Tonga, Vanuatu and Guam. The majority of these bodies is governmental in nature and mostly located within Departments or Divisions of social welfare. Fiji is currently the only Pacific Island country that has endorsed a National Policy on Ageing, covering the period 2011-2015. Papua New Guinea has reported that a policy framework was established in 2000 and the policy itself is under development, and the Cook Islands is currently drafting a National Policy for the Elderly - Te Rauti Para Policy, which will be submitted for Cabinet's approval shortly. Similarly, only one country (Marshall Islands) has conducted a survey of programmes available for older persons. There is no evidence to suggest that any Pacific Island country has prepared or commenced a research programme on ageing issues.

7 Conclusions and recommendations

7.1 Conclusions

- As in other world regions, population ageing is occurring in the Pacific Islands and will accelerate in the coming decades. Current trends in fertility and mortality are unlikely to change significantly in the near future, so ageing would appear to be inevitable and irreversible. International migration will contribute to ageing in Polynesia and Micronesia as the young emigrate and returnees are concentrated in the older ages.
- The pace of ageing varies widely between sub-regions and individual countries. Ageing is occurring most rapidly and is most advanced in the small countries of Polynesia and Micronesia. The countries that are projected to have the oldest populations by 2050 are those that are linked to more developed countries on the Pacific rim, either as dependent territories or through close migration and socio-economic relationships. The pace of ageing is much lower in Melanesia with the exception of Fiji.
- By 2050, the number of persons aged 60 and over in the Pacific is projected to increase from 512,000 in 2014 to 2 million by 2050. The oldest old (80 and over) will increase from around 34,000 in 2014 to 205,000 by 2050—a six-fold increase.
- The majority of older persons in the Pacific will be women. Among the oldest old, over 60 percent are likely to be women by 2050.
- Ageing is likely to be more pronounced in rural areas than in urban, but insufficient analysis has been done at the country level to confirm this.
- The poverty status of older persons in the Pacific has not been studied in depth but it is likely that the older population living in rural and outer island areas is more likely to suffer hardship than their urban counterparts—in part because of their greater vulnerability to natural disasters, and lower access to health care.
- The extended family remains largely intact across the Pacific Islands and will be the main provider of care for older persons for the foreseeable future. But the social solidarity of the family is weakening under the influence of urbanization, internal and external migration and changing attitudes and values. Family support will need to be supplemented by stronger government programmes, and support from civil societies in the future.
- Traditional Pacific cultures accorded older people much prestige and respect and this remains largely true today. This ensures that older people are unlikely to be mistreated or abused. However, family ties are weakening and the potential for abuse or neglect may be increasing.
- Formal social security schemes are not well developed in the Pacific outside those countries that remain territories of more developed countries. Pension and superannuation schemes mainly cover public sector and formal private sector workers. Rural village workers and urban informal sector workers are largely uncovered by contributory schemes but may have access to government assistance if destitute.

- The transferability of superannuation benefits to the Pacific Islands for persons who have spent their working lives as residents of New Zealand or Australia provides a security floor for some island residents. This and other Island-metropolitan links need to be taken into account when assessing the extent of social protection in migration-oriented countries—particularly in Polynesia.
- The development of policies or strategies to address population ageing is at an early stage in the Pacific. In general, the issue of Ageing needs to be reflected in national development plans, population policies, and health strategies.

7.2 Recommendations

While the priorities outlined in the Shanghai Implementation Strategy remain valid and relevant for the Pacific, these priorities should be re-ordered to reflect the current situation in the Pacific Islands region—as follows:

- National Coordinating Bodies should be set up in those countries that presently lack them. International agencies, governmental bodies, civil societies, and the private sector should stand ready to provide the financial and technical assistance that countries may require.
- In those countries that have National Coordinating Bodies, a review of the structure, activities and effectiveness of these bodies should be undertaken. International agencies can also provide support to facilitate these reviews.
- National and international efforts need to be undertaken to greatly expand the knowledge base on population ageing and its implications in individual Pacific Island countries and across the region and its sub-regions. The Research Agenda on Ageing in the Twenty-first century endorsed in Valencia in 2002 can be used to identify the key issues on which research is required.
- Research is urgently needed to assess the poverty status of older people in the Pacific Islands. Recent Population Censuses, DHS and HIES may provide scope for further analysis. Studies on disability from censuses and surveys are also recommended, as well as research on the roles of older women in their communities.
- A knowledge sharing network needs to be established linking all Pacific countries regardless of political status. Given the variations across the region in population ageing, those countries in advanced stages can share valuable lessons with those that will age later. NGOs, civil society, international agencies should also participate in the network.
- A public information programme is required to raise awareness of ageing trends and their implications among both service providers and the general public.
- Conduct a comprehensive review of the national infrastructure and enabling environment for addressing the needs of the older population and identify the key weaknesses.
- Review the regional arrangements for monitoring the implementation of the Madrid International Plan of Action on Ageing and the Macao Programme of Action for the Asia-Pacific region.
- National policies need to be developed, and visions, goals and objectives formulated. The Fiji National Policy on Ageing can be used as an example with the following general framework:

POLICY VISION

- An inclusive society that instils dignity, respect for human rights and meets basic needs through empowerment of older persons.

GOALS

- Recognition of the contribution of older people to the social, cultural, economic and political sectors of society;
- Strengthened social assistance for older persons;
- Healthy living of the older persons;
- An enabling and supportive environment for older people.

OBJECTIVES

- Greater integration and participation of older persons in decision making and community affairs;
- The human rights of older persons are respected and upheld, particularly of older women;
- Increased labor force participation and self-employment of older persons;
- Increased education and training opportunities for older persons;
- Reduction of poverty among older persons;
- Improve the overall health of older persons;
- Improve understanding of the health status and needs of older persons;
- Improve support of older persons within their community;
- Develop recreation and sporting opportunities for older persons;
- Provide adequate institutional care to meet needs.

7.3 The way forward

The primary responsibility for developing national action plans and strategies to address population ageing lies with national governments, but international agencies, NGOs, civil society organizations can all play a part in supporting government efforts. Within the UN system, responsibility for supporting the implementation of the Madrid International Plan of Action on Ageing 2002 has been given to the regional commissions. In the Pacific this role is played by UNESCAP. The UNFPA also has a major role to play by virtue of the Plan of Action of the International Conference on Population and Development (1994) which includes actions to address population ageing. UNFPA also has an important role to play in producing in-depth situational analyses through the analysis and dissemination of censuses and survey data on older persons. ESCAP and UNFPA should work together to improve the knowledge base on ageing in the Pacific. WHO also has an important role with regard to health care issues and the ILO has expertise in the area of social protection.

Given the relative inattention given to ageing issues in the Pacific Islands, it is important to promote awareness of the MADRID International Plan of Action on ageing among island governments and relevant NGOs.

Inter-governmental cooperation between Pacific Island governments should be fostered, particularly through knowledge-sharing, and the recently developed Fiji Policy on Ageing should form the basis for this. Given the variation across the region in the pace and timing of ageing, those countries that started the process earlier can provide valuable lessons that can be shared with those countries that will age much later. Knowledge sharing should also extend beyond the Pacific Island region to the wider Asia-Pacific region. Many Asian countries retain strong extended family structures as found in the Pacific and face similar challenges in balancing home and institutional care.

The other countries that make up the greater Oceania area, namely Australia and New Zealand, are also important because their populations have been ageing for some time and both countries have put in place national strategies to address ageing issues that can provide lessons for Pacific countries.

Glossary

INDICATOR	DEFINITION
Ageing Index	The ageing index is the number of persons aged 60 and over per 100 persons aged 0-14.
Dependency burden	The "dependency burden" refers to the number of dependents (aged 0-14 years and/or older than 60 years of age) relative to the number of "working age" persons (aged 15-59 year).
Life expectancy	Life expectancy at a specific age is the average number of additional years a person of that age could expect to live if current mortality levels observed for ages above that age were to continue for the rest of that person's life. In particular, life expectancy at birth is the average number of years a newborn would live if current age-specific mortality rates were to continue.
Median age	The median age is the age that divides a population into two groups of the same size, such that half the population is younger than this age, and the other half is older.
Oldest old	Population aged 80 years and older.
Parent support ratio	The parent support ratio is the number of persons aged 85 years or over per 100 persons aged 50-64. (In this report the parent support ratio is calculated as the number of persons 80 years or over per 100 persons aged 45-59).
Potential support ratio	The potential support ratio is the number of persons aged 15 to 64 per every person aged 65 or over.
Singulate mean age at marriage (SMAM)	The Singulate mean age at marriage (SMAM) is an indirect estimate of the average number of years spent in the never-married state by those who marry before age 50, and is based on census data on person's marital status. The SMAM is widely used as an approximation of the average age at first marriage.
Survival rate	The survival rate to a specific age X is the proportion of newborns in a given year who would be expected to survive at age X if current mortality trends were to continue for at least the next X years. Survival rates are derived from the life table, which is an analytical procedure designed to produce life expectancy and other measures of survivorship, based on prevailing age-specific death rates.
Total fertility rate	The total fertility rate is the average number of children a woman would bear over the course of her lifetime if current age-specific fertility rates remained constant throughout her childbearing years (normally between the ages of15 and 49). The current total fertility rate is an indicator of the level of fertility at a given time.

Annexes

Annex 1: Ageing indicators (Median Age, Proportion of Population aged 60 and older, Ageing Index, and Potential Support Ratio) of Pacific Island Countries and Territories, various past censuses

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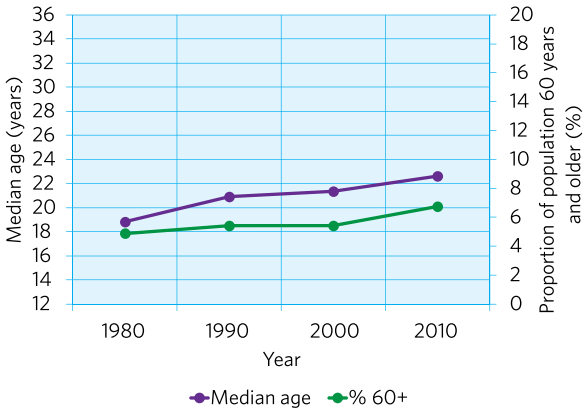

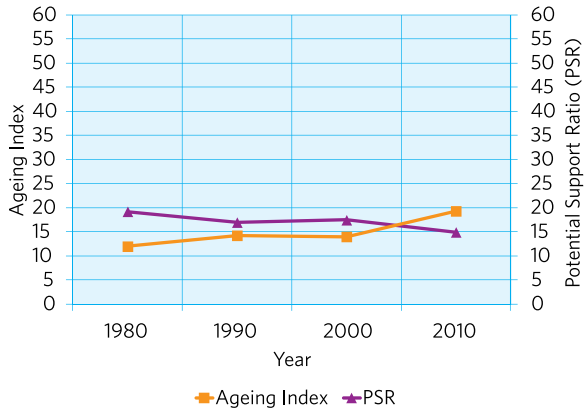

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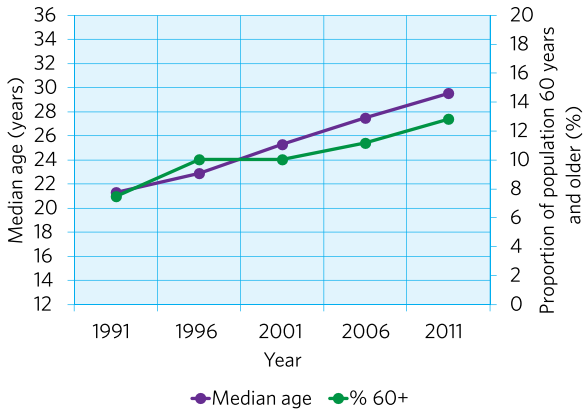

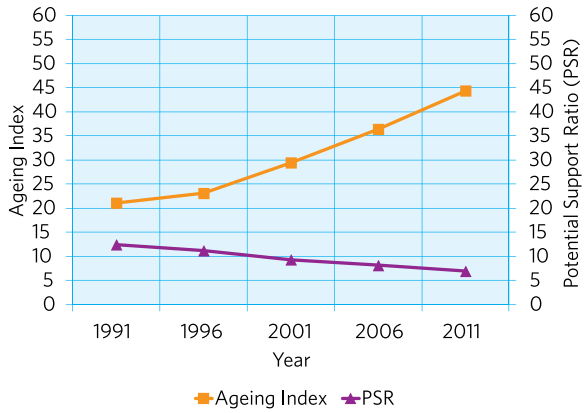

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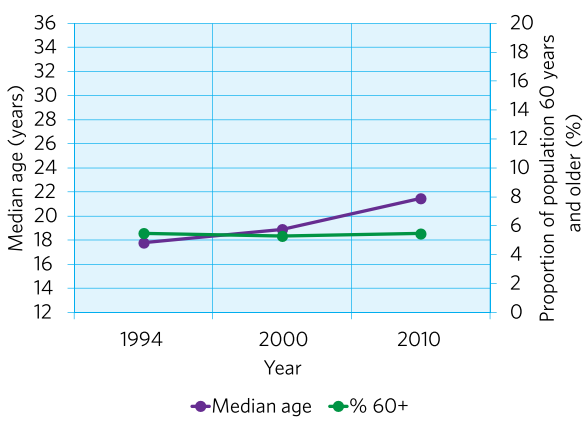

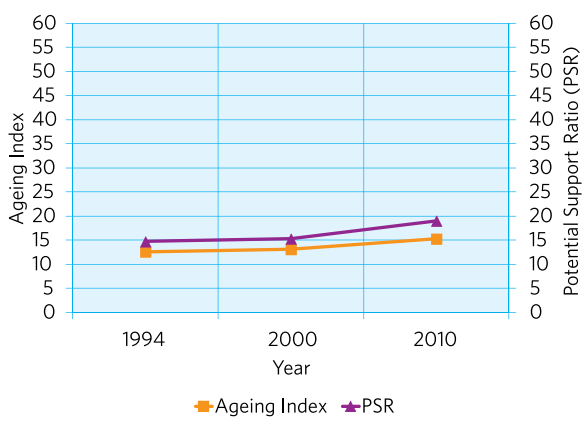

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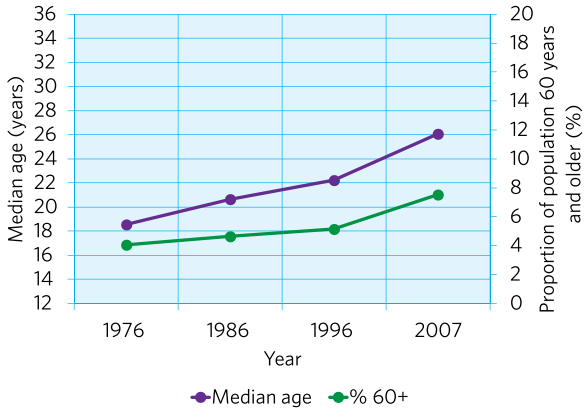

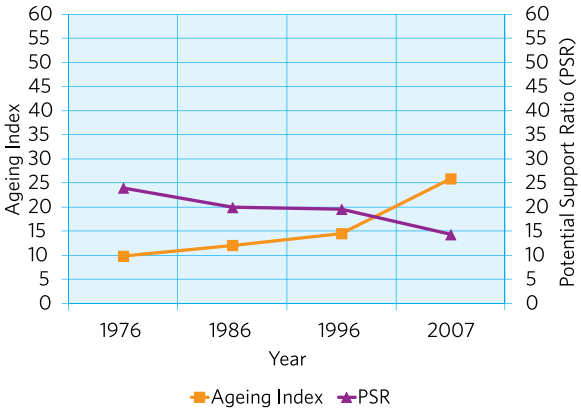

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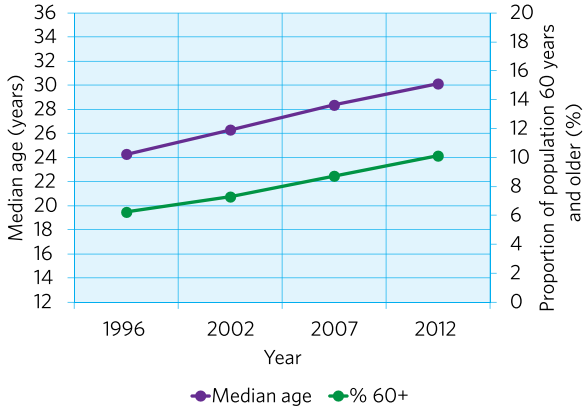

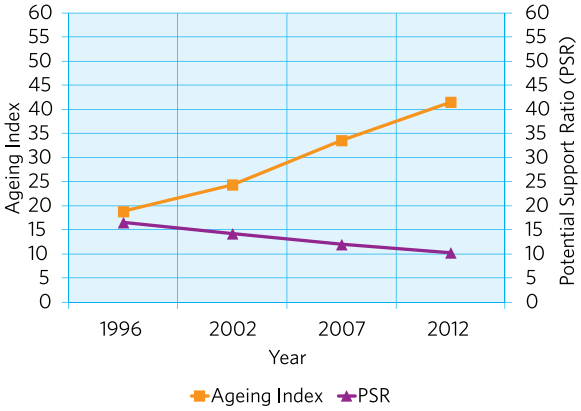

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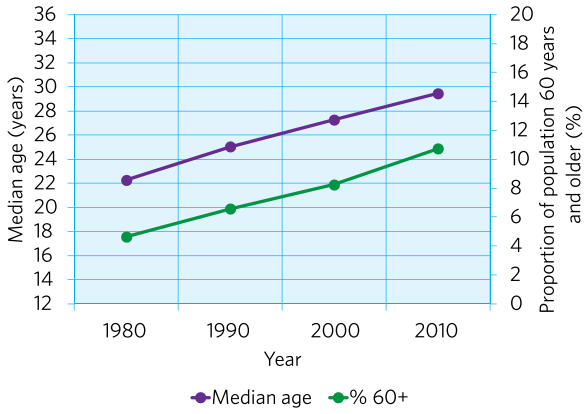

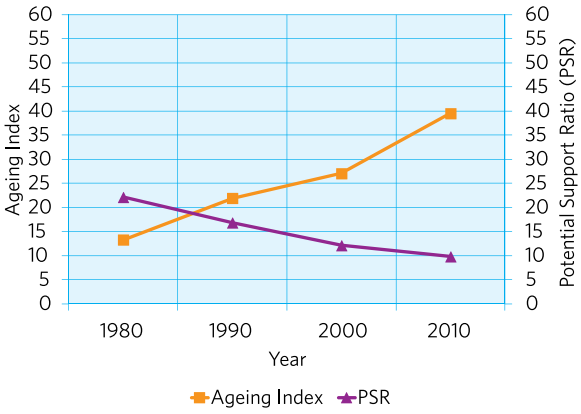

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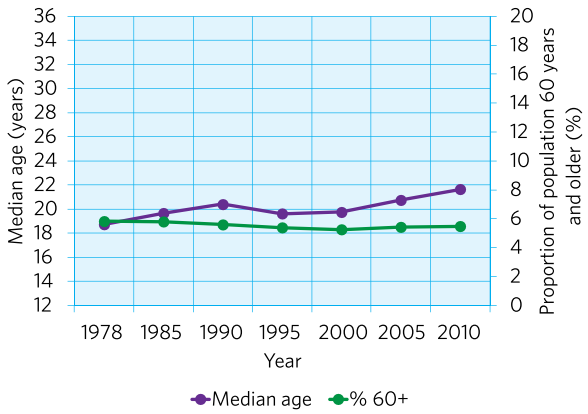

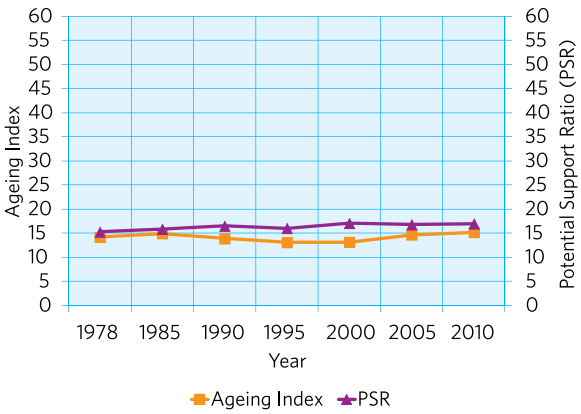

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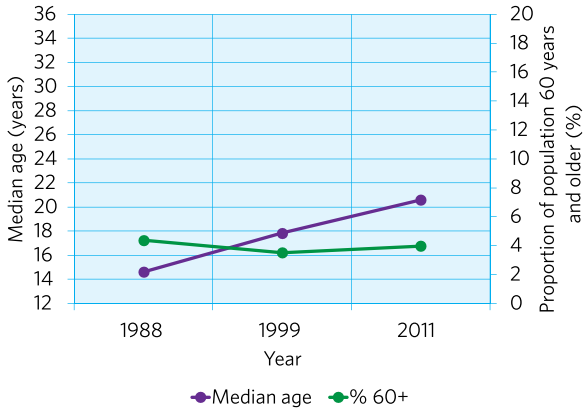

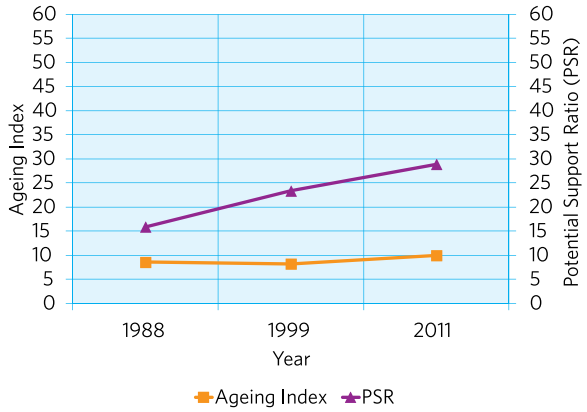

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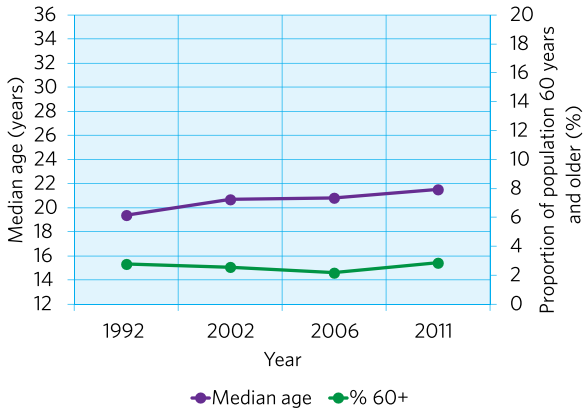

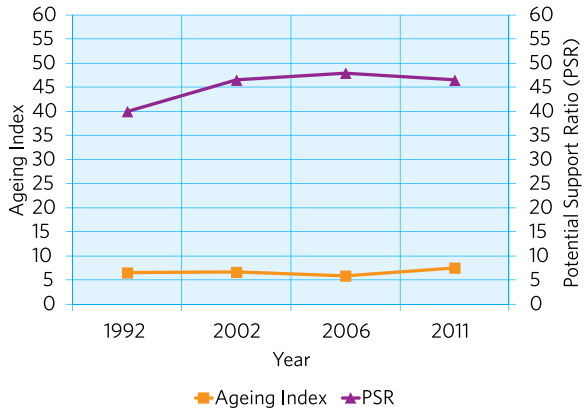

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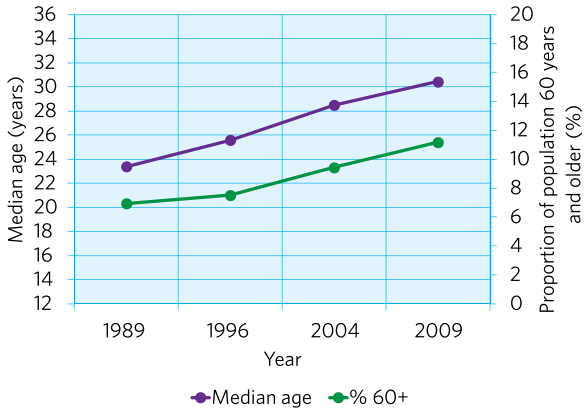

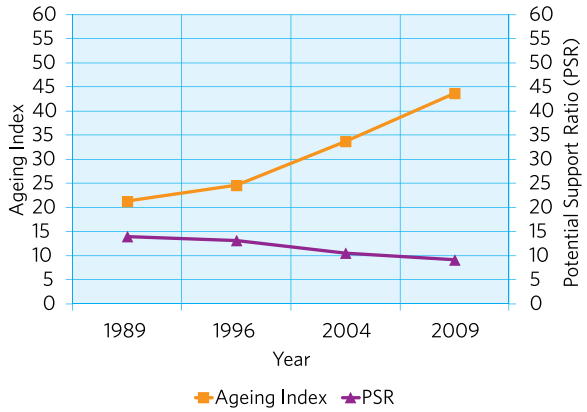

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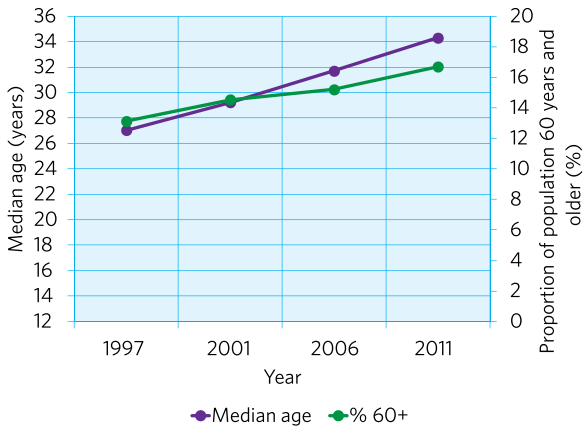

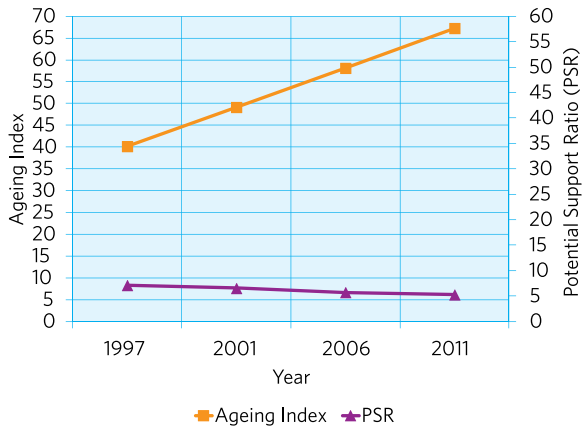

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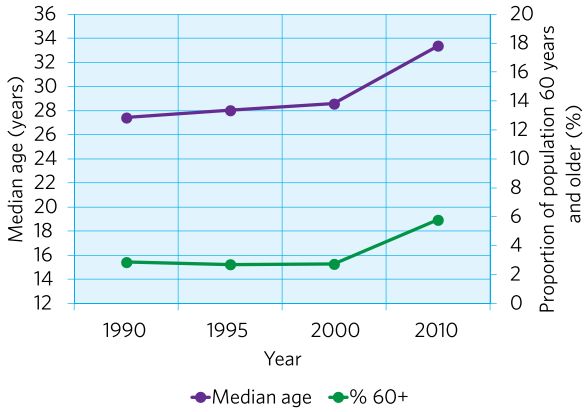

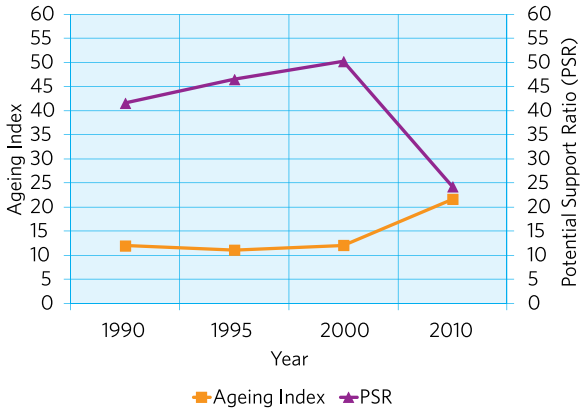

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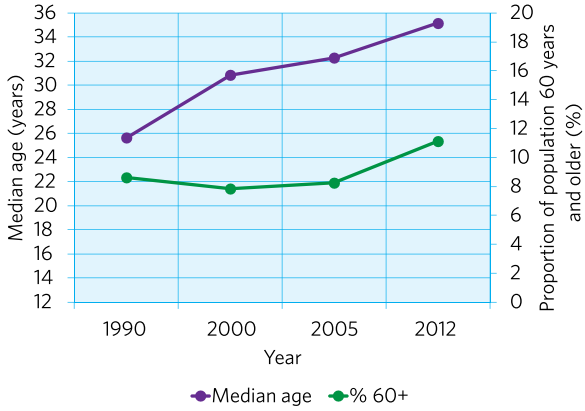

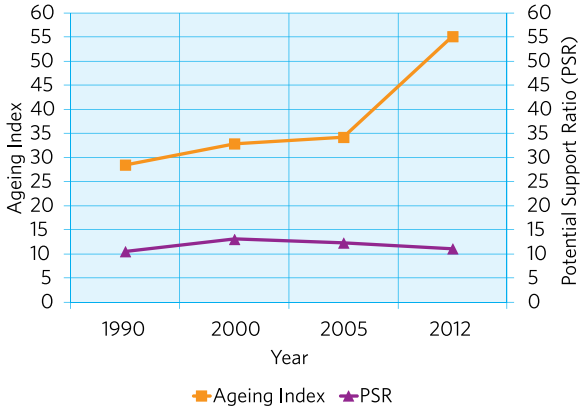

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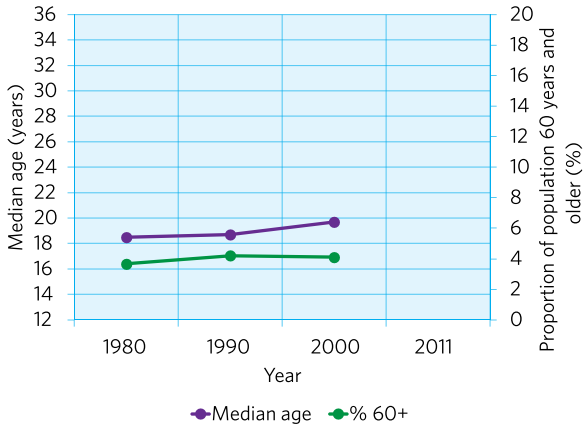

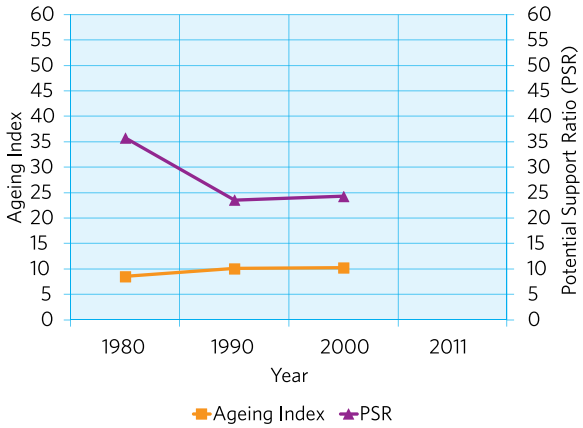

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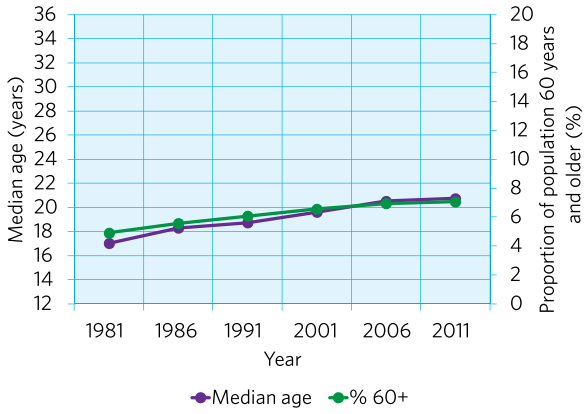

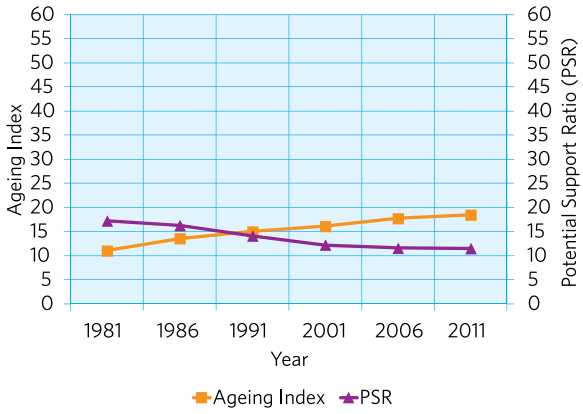

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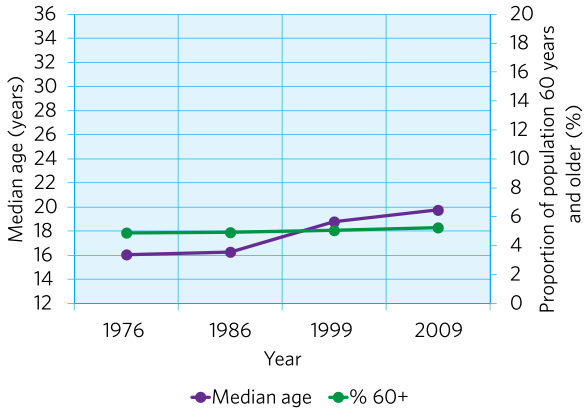

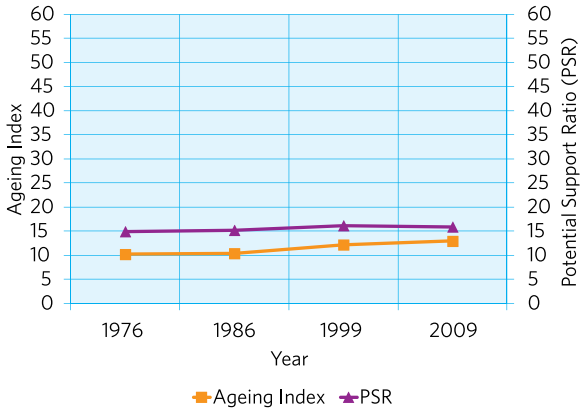

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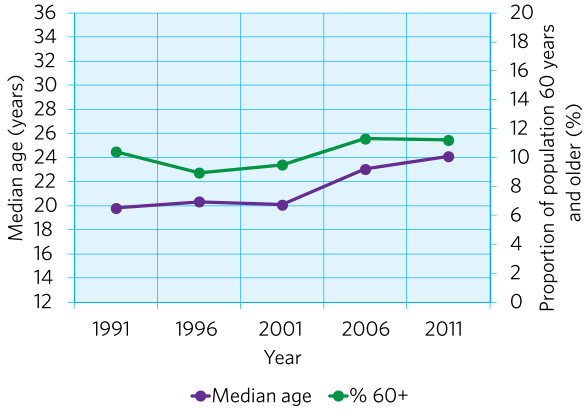

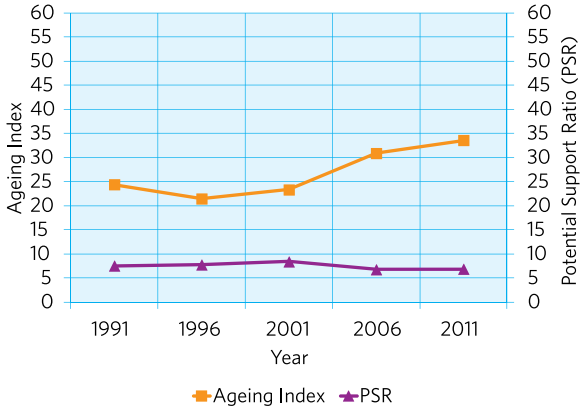

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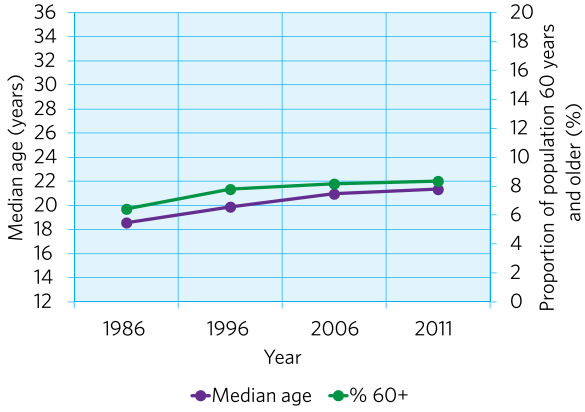

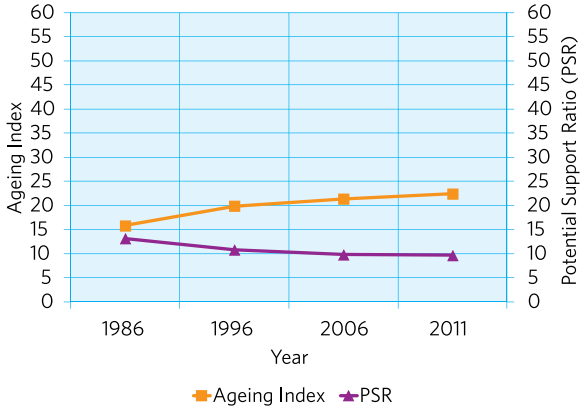

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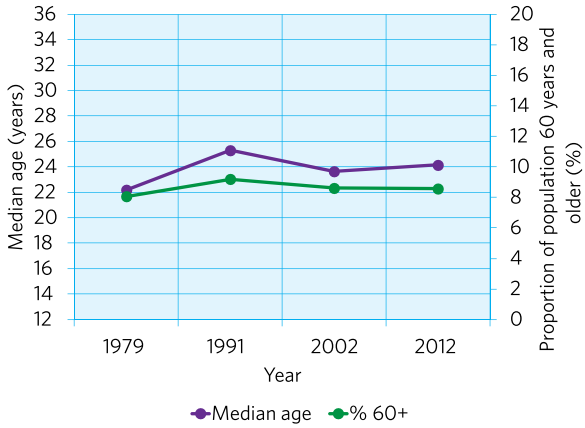

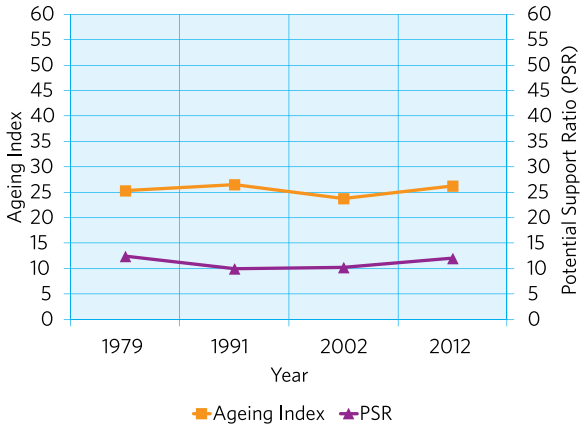

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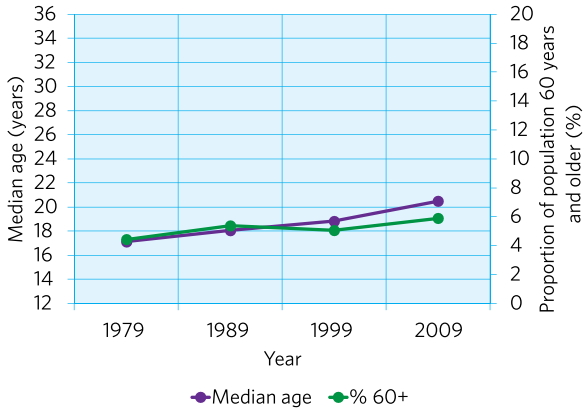

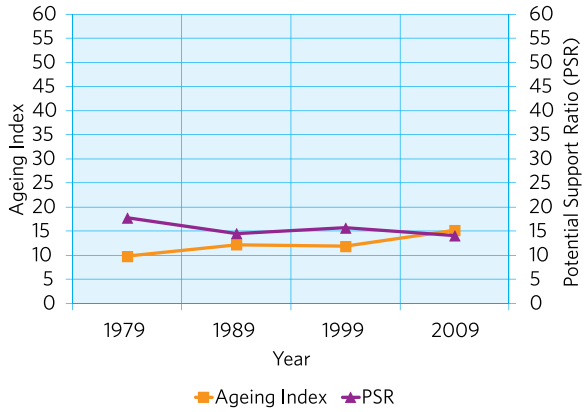

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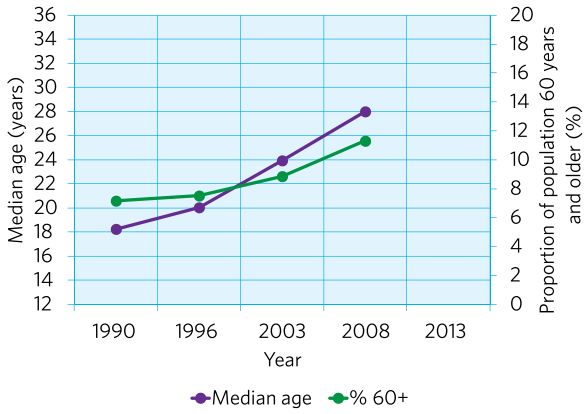
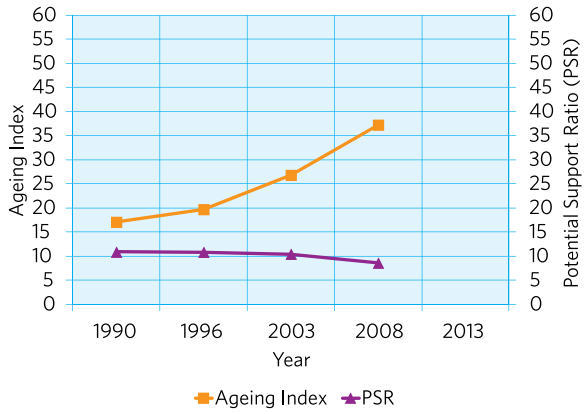




Source: National census reports; UNFPA calculations, 2014

Annex 2: Proportion of population 60 years and older (%), PIC: 2015-2050

COUNTRY	2015	2020	2025	2030	2035	2040	2045	2050
Fiji	9	11	13	15	16	17	18	19
PNG	5	5	6	7	8	9	10	11
Solomon Isl.	6	6	7	8	9	11	12	14
Vanuatu	6	7	8	9	10	11	12	14
FSM	7	9	11	13	14	14	14	14
Kiribati	6	6	7	8	9	9	11	12
Marshall Isl.	5	7	8	10	11	12	12	13
Nauru	4	5	6	7	8	9	10	11
Palau	13	15	19	22	24	26	27	26
Cook Isl.	14	16	19	21	22	21	20	19
Niue	19	21	23	23	23	23	23	23
Samoa	8	9	10	12	12	13	12	11
Tokelau	13	14	15	16	16	14	12	12
Tonga	9	9	10	11	12	13	13	13
Tuvalu	9	11	13	14	13	13	13	14

Source: UNFPA population projections, 2014

Annex 3: Population 60 years and older (numbers), PIC: 2015-2050

COUNTRY	2015	2020	2025	2030	2035	2040	2045	2050
Fiji	80,626	97,280	115,647	129,698	141,328	154,751	169,081	179,947
PNG	352,255	440,210	557,328	700,786	862,088	1,034,763	1,229,535	1,462,936
Solomon Isl.	35,847	42,837	53,135	66,198	84,621	104,614	126,478	149,540
Vanuatu	17,069	20,619	25,925	32,010	39,232	46,587	55,422	67,824
FSM	7,378	9,554	11,569	13,085	13,935	14,258	14,289	14,631
Kiribati	6,583	7,976	10,039	12,336	13,800	15,772	18,704	22,760
Marshall Isl.	2,814	3,755	4,735	5,684	6,421	7,080	7,543	7,915
Nauru	405	579	787	922	1,061	1,253	1,515	1,742
Palau	2,236	2,778	3,461	4,081	4,578	4,889	4,957	4,831
Cook Isl.	2,112	2,391	2,794	3,132	3,286	3,206	3,057	2,868
Niue	301	343	364	367	366	364	366	369
Samoa	14,748	17,535	20,719	24,270	26,861	28,031	27,923	26,927
Tokelau	151	170	185	189	188	166	150	141
Tonga	8,989	9,654	10,677	12,327	13,446	14,128	14,773	14,662
Tuvalu	1,055	1,329	1,583	1,705	1,681	1,659	1,727	1,852
TOTAL	**532,568**	**657,011**	**818,948**	**1,006,791**	**1,212,891**	**1,431,520**	**1,675,519**	**1,958,943**

Source: UNFPA population projections, 2014

Annex 4: Population 80 years and older (numbers), PIC: 2015-2050

COUNTRY	2015	2020	2025	2030	2035	2040	2045	2050
Fiji	5,818	7,089	9,125	11,484	14,578	18,944	23,681	26,924
PNG	18,806	23,329	28,964	37,103	50,131	70,035	97,668	132,423
Solomon Isl.	3,779	4,466	5,559	6,798	8,481	10,657	14,204	18,789
Vanuatu	1,873	2,004	2,570	3,066	4,009	5,056	6,771	8,636
FSM	588	620	664	985	1,488	2,021	2,441	2,783
Kiribati	506	623	717	829	1,094	1,465	2,010	2,581
Marshall Isl.	143	148	219	395	643	860	1,086	1,320
Nauru	19	19	20	40	72	108	151	171
Palau	248	222	229	328	462	585	760	898
Cook Isl.	231	318	369	409	453	524	639	697
Niue	31	44	46	49	61	75	79	79
Samoa	1,694	1,870	2,122	2,325	3,026	4,003	5,019	6,141
Tonga	1,113	1,227	1,328	1,427	1,634	1,891	2,237	2,807
Tuvalu	89	113	119	158	218	295	349	351
TOTAL	**34,939**	**42,093**	**52,052**	**65,395**	**86,351**	**116,517**	**157,095**	**204,600**

Source: UNFPA population projections, 2014
Note: at time of writing, data for Tokelau on population aged 80 years and older was not available

Annex 5: Median Age, PIC: 2015-2050

COUNTRY	2015	2020	2025	2030	2035	2040	2045	2050
Fiji	27.7	28.7	29.9	31.1	32.3	33.6	35.0	36.3
PNG	21.3	22.1	23.1	24.3	25.6	26.9	28.3	29.7
Solomon Isl.	20.8	22.0	23.5	25.1	26.7	28.3	29.8	31.3
Vanuatu	21.8	22.9	24.1	25.4	27.0	28.6	30.3	31.9
FSM	22.2	23.4	24.7	26.0	27.3	28.7	30.2	31.7
Kiribati	22.3	23.0	23.9	24.5	25.9	27.4	29.0	30.5
Marshall Isl.	19.4	19.8	21.0	22.6	24.1	25.7	27.1	28.6
Nauru	20.7	19.9	20.0	21.3	22.9	24.5	25.9	27.2
Palau	36.2	37.8	39.0	39.5	40.5	41.1	41.3	41.2
Cook Isl.	30.0	30.3	31.2	32.4	33.6	34.9	36.2	37.2
Niue	35.1	35.7	36.0	36.3	36.6	37.3	38.4	39.9
Samoa	20.3	20.7	21.6	22.7	24.0	25.4	26.7	28.0
Tokelau	23.1	22.8	22.7	22.6	23.3	24.6	25.6	26.8
Tonga	21.2	21.8	22.9	24.2	25.7	27.3	28.8	30.2
Tuvalu	24.1	24.3	24.5	24.9	25.9	27.2	28.6	30.1

Source: UNFPA population projections, 2014

Annex 6: Ageing Index, PIC: 2015-2050

COUNTRY	2015	2020	2025	2030	2035	2040	2045	2050
Fiji	33	41	53	63	71	79	87	94
PNG	12	14	18	22	26	31	36	43
Solomon Isl.	15	17	21	26	32	39	47	56
Vanuatu	17	19	23	29	35	41	48	59
FSM	21	29	37	44	49	52	56	61
Kiribati	16	18	22	27	31	35	41	49
Marshall Isl.	13	18	24	31	36	40	43	47
Nauru	9	12	17	21	25	29	34	39
Palau	64	79	99	119	135	146	148	145
Cook Isl.	51	63	83	98	103	100	97	95
Niue	79	101	121	121	112	107	111	121
Samoa	20	23	29	36	40	42	42	41
Tokelau	37	40	43	47	49	45	42	40
Tonga	23	26	31	38	42	45	48	50
Tuvalu	28	34	40	45	47	48	50	55

Source: UNFPA population projections, 2014

Annex 7: Potential Support Ratio, PIC: 2015-2050

COUNTRY	2015	2020	2025	2030	2035	2040	2045	2050
Fiji	11	9	8	7	6	5	5	5
PNG	23	21	18	16	13	12	10	9
Solomon Isl.	15	15	14	12	11	9	8	7
Vanuatu	15	14	13	11	10	9	8	7
FSM	15	11	8	7	6	6	6	6
Kiribati	17	16	14	12	11	10	10	8
Marshall Isl.	21	14	11	9	8	7	7	7
Nauru	34	22	16	13	12	11	10	8
Palau	10	7	6	5	4	3	3	3
Cook Isl.	6	6	5	4	4	4	4	4
Niue	5	4	4	4	3	3	4	4
Samoa	11	10	9	8	7	6	6	7
Tokelau	7	6	5	5	5	5	6	7
Tonga	10	9	9	8	7	7	7	7
Tuvalu	11	8	7	6	6	6	7	6

Source: UNFPA population projections, 2014

Annex 8: Parent Support Ratio, PIC: 2015-2050

COUNTRY	2015	2020	2025	2030	2035	2040	2045	2050
Fiji	4	5	6	8	9	12	15	16
PNG	2	2	2	3	3	4	5	6
Solomon Isl.	6	6	6	6	7	8	9	10
Vanuatu	6	6	6	6	7	7	9	11
FSM	4	5	5	8	13	15	15	15
Kiribati	4	4	4	5	5	6	7	9
Marshall Isl.	2	2	3	6	10	15	18	18
Nauru	2	1	1	2	4	6	9	11
Palau	6	5	5	8	13	17	22	25
Cook Isl.	8	11	14	18	23	25	26	24
Niue	10	16	17	18	23	28	28	26
Samoa	7	7	9	11	16	20	20	20
Tonga	9	9	10	11	14	15	15	15
Tuvalu	5	7	9	11	14	17	19	19

Source: UNFPA population projections, 2014
Note: at time of writing, data for Tokelau on population aged 80 years and older was not available

Annex 9: Proportion of the population 80 years of age and older in the population aged 60 and older, PIC: 2015-2050

COUNTRY	2015	2020	2025	2030	2035	2040	2045	2050
Fiji	7	7	8	9	10	12	14	15
PNG	5	5	5	5	6	7	8	9
Solomon Isl.	11	10	10	10	10	10	11	13
Vanuatu	11	10	10	10	10	11	12	13
FSM	8	6	6	8	11	14	17	19
Kiribati	8	8	7	7	8	9	11	11
Marshall Isl.	5	4	5	7	10	12	14	17
Nauru	5	3	3	4	7	9	10	10
Palau	11	8	7	8	10	12	15	19
Cook Isl.	11	13	13	13	14	16	21	24
Niue	10	13	13	13	17	21	22	21
Samoa	11	11	10	10	11	14	18	23
Tonga	12	13	12	12	12	13	15	19
Tuvalu	8	8	8	9	13	18	20	19

Source: UNFPA population projections, 2014
Note: at time of writing, data for Tokelau on population aged 80 years and older was not available

Annex 10: UNFPA Population projections: A note on Methodology

The method used for the country specific projection is the cohort-component method. This is a procedure that simulates population changes as a result of changes in the components of growth: fertility, mortality and migration. Based on past information, assumptions are made about future trends in these components of change.

The assumed rates are applied to the age and sex structure of the population which is the latest available census population, in a simulation that takes into account that

1) people die according to their sex and age,
2) women have children, and
3) some people change their residence.

The cohort-component method of projecting a population follows each cohort of people of the same age and sex throughout their lifetime according to their exposure to fertility, mortality and migration.

The key to making meaningful projections lies in the choice of assumptions about future population developments. These assumptions concern possible future birth, death and migration rates. In general, the broad assumptions employed are based on those used by the UN Population Division, Estimates and Projections Section. Furthermore, the assumptions are based on the theory of demographic transition (Annex 11). According to this theory, over time all countries will undergo change from high rates of births and deaths to low rates of births and deaths. This transition process is usually closely associated with economic, social and scientific developments.

In the case of fertility, the target level is assumed to reach a TFR of 2.0 which is about the average level of the populations of present day Australia, France, New Zealand and the USA (see Figure below). Starting from a country's current estimated level of fertility, a TFR of 2.0 will be reached depending on its recent past trend of fertility (by means of extrapolation). In some cases this date was well beyond the end year of the projection period 2050.

The reason for choosing the fertility level of countries such as Australia, France, New Zealand and the United States of America as the target level is twofold:

1. They are regarded as the metropolitan focal points of Pacific Island countries.
2. These countries have completed the demographic transition. The graph below shows that the TFR of these four countries has been more or less stable throughout the last 35 years (1975–2012).

In the case of mortality, it is assumed that under normal circumstances (meaning the absence of catastrophes such as wars, epidemics and major natural disasters), the health situation and mortality levels in each country will continuously improve throughout the projection period. Starting with the current estimated level of mortality [life expectancy at birth E0)], and based on the recent past pace of mortality improvement, future levels of E(0) are calculated according to Table Vi.6. below.

Levels of migration in general are based on last intercensal estimates of migration, and/or information on most recent arrivals and departure data if available. Otherwise it is estimated to be consistent with last intercensal overall growth rate considering known levels of fertility and mortality.

Migration patterns (age and sex structure) are based on empirical data if available. Otherwise a model migration pattern was used such as "Family migration" model of the UN Population Division.

It should be noted that for these projections only one set of assumptions has been employed.

The computer programme employed was MORTPAK4.1.

Level of TFR of Australia, France, New Zealand, and the USA since 1975

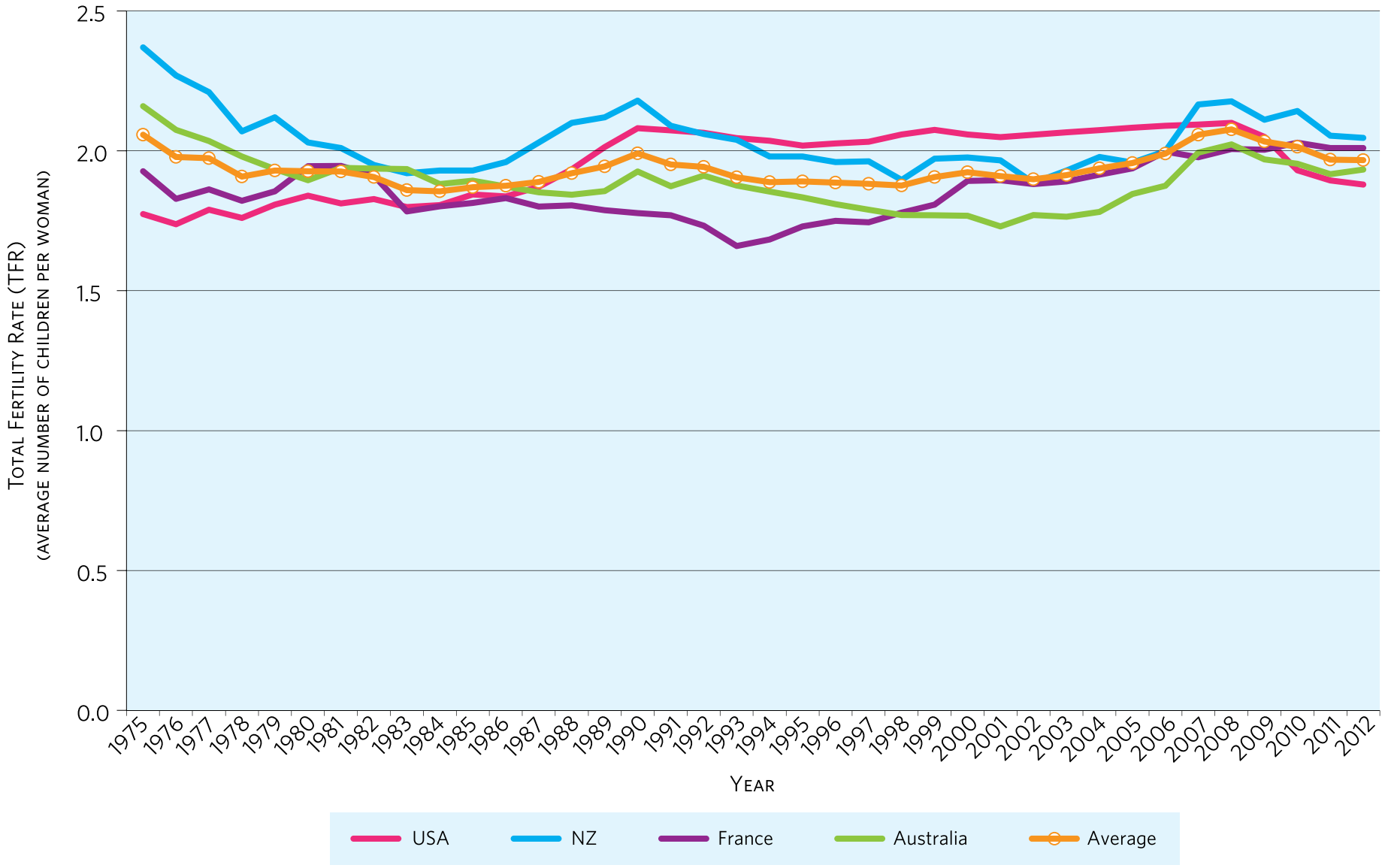


TABLE VI.6.: Models for mortality improvement. Quinquennial gains in life expectancy at birth according to initial level of life expectancy (p.125)

Initial life expectancy level (years)	PACE OF MORTALITY IMPROVEMENT									
	VERY FAST		FAST		MEDIUM		SLOW		VERY SLOW	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
40.0 - 42.5	2.5	2.6	2.1	2.3	1.9	2.0	1.3	1.4	1.1	1.1
42.5 - 45.0	2.8	3.0	2.4	2.5	2.0	2.1	1.4	1.5	1.1	1.2
45.0 - 47.5	3.0	3.1	2.5	2.6	2.1	2.2	1.8	1.9	1.2	1.3
47.5 - 50.0	3.0	3.2	2.6	2.7	2.2	2.3	1.8	1.9	1.3	1.4
50.0 - 52.5	3.2	3.4	2.7	2.9	2.3	2.4	1.9	2.0	1.4	1.5
52.5 - 55.0	3.6	3.7	2.7	3.0	2.4	2.6	2.0	2.0	1.5	1.7
55.0 - 57.5	3.7	3.7	2.6	3.0	2.4	2.6	2.0	2.0	1.5	1.8
57.5 - 60.0	3.8	4.0	2.6	3.0	2.4	2.6	2.0	2.0	1.5	1.8
60.0 - 62.5	3.4	3.8	2.5	3.0	2.2	2.6	1.7	2.0	1.0	1.7
62.5 - 65.0	3.2	3.6	2.3	2.8	1.9	2.4	1.5	2.0	0.9	1.5
65.0 -67.5	3.2	3.5	2.0	2.6	1.6	2.3	1.0	1.8	0.7	1.0
67.5 - 70.0	2.0	3.3	1.5	2.6	1.2	2.1	1.0	1.5	0.6	1.0
70.0 - 72.5	1.5	3.0	1.2	2.0	1.0	1.8	0.8	1.2	0.5	0.8
72.5 - 75.0	1.3	2.0	1.0	1.5	0.9	1.2	0.8	0.9	0.5	0.8
75.0 - 77.5	1.1	1.8	0.8	1.2	0.6	1.0	0.5	0.8	0.5	0.7
77.5 - 80.0	1.0	1.6	0.5	1.0	0.5	0.9	0.4	0.7	0.4	0.5
80.0 - 82.5	0.9	1.4	0.5	0.8	0.5	0.6	0.4	0.5	0.4	0.5
82.5 - 85.0	0.8	1.3	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.4
85.0 - 87.5	0.7	1.3	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2
87.5 - 90.0	0.6	1.2	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2
90.0 - 92.5	0.6	0.8	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2

Annex 11: The Demographic Transition

According to the theory of demographic transition, over time all countries will undergo change from high rates of births and deaths to low rates of births and deaths. This transition process is usually closely associated with economic, social and scientific developments. This is assumed to happen in four distinct stages:

Stage 1: High birth rate, high death rate → little or no population growth
Stage 2: High birth rate, falling death rate → high growth
Stage 3: Declining birth rate, relatively low death rate → slowed growth
Stage 4: Low birth rate, low death rate → very low growth

Historically, high levels of births and deaths kept most populations from growing rapidly through time. In fact, many populations not only failed to grow but also completely died out when birth rates did not compensate for high death rates (**stage 1**). There are few populations/communities left today at stage 1.

Death rates eventually fell as living conditions, nutrition and public health improved. The decline in mortality usually preceded the decline in fertility, resulting in population growth during the transition period (**stage 2**). In Europe and other industrialised countries, death rates fell slowly. With the added benefit of medical advances, death rates fell more rapidly in the countries that began the transition in the 20th century. These are/were primarily developing countries. Their death rates often fell much faster than in European countries because they benefited from Western inventions and innovations.

In general, fertility rates fell neither as quickly nor as dramatically as death rates, and thus populations grew rapidly.

Stage 3 is characterized by falling birth rates, which occur for many reasons and vary from country to country and population to population. A decrease in birth rates may result from: a transition from a non-monetary to a monetary economy, urbanization, a change in values from a community emphasis to individualism, increasing emphasis on consumerism, improved education, availability of (modern) family planning methods (i.e. contraceptives), greater involvement of women in the workplace, rising cost of living, rising cost of raising children, and preferences in how people want to spend their time.

The demographic transition is regarded as completed when both birth and death rates have reached a low and stable level (**stage 4**). As a result, population growth is very low.

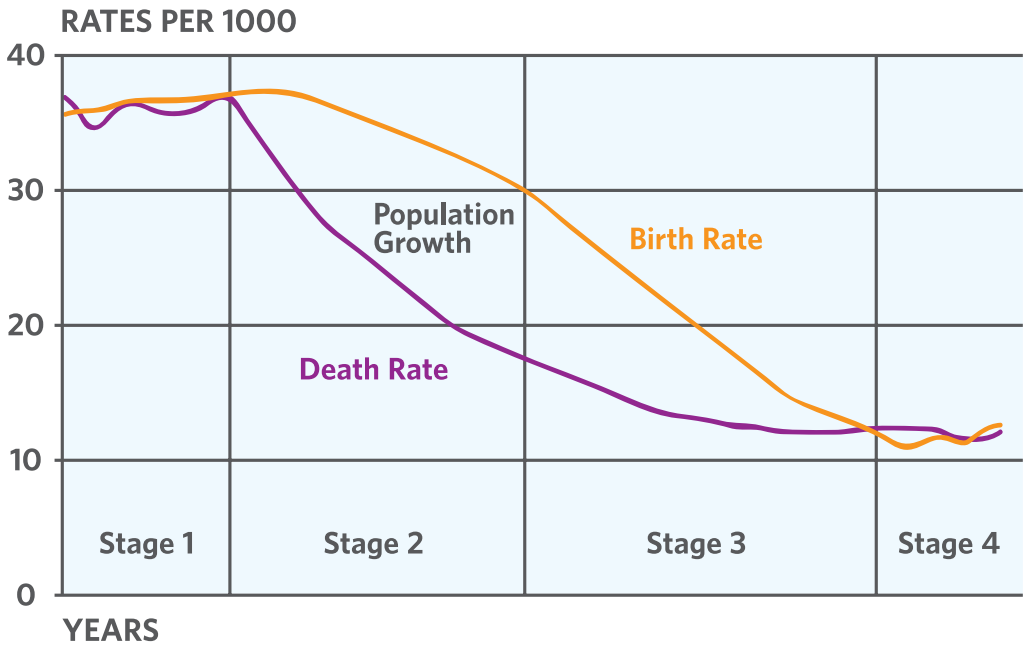
Originally, the theory of demographic transition included only the four stages described above. There is now another stage, the **post-transition period** (although it is uncertain whether all countries will reach this stage).

Post-transition period: Very low birth rate, low death rate → negative growth

When fertility falls to very low levels and stays there for a protracted period, a slow rate of population growth can turn into a negative one, resulting in a population decrease. Many countries in Europe and some in Asia now have TFRs well below two children per woman. The TFRs of the Republic of Korea, Ukraine, Czech Republic, Slovakia, Slovenia, Republic of Moldova, Bulgaria, and Belarus — all about 1.2 — are among the world's lowest, and those of several other countries were not far behind. The TFRs of Macao and Hong Kong were even less than 1 child per woman on average. Many of the factors that lowered fertility in the first place — greater involvement of women in the workplace, rising cost of living, and preferences in how people want to spend their time — appear to be keeping fertility rates very low.

While the theory of demographic transition describes the population history of Western Europe quite well, for many reasons developing countries do not always exhibit the same patterns of change. In some cases early contact with outside societies resulted in local epidemics, as groups succumbed to diseases against which they had no natural immunity, resulting in increased death rates. When health conditions improved as a result of the application of new and efficient disease control technologies, death rates declined, while birth rates sometimes increased. This combination of factors produced population growth rates in today's developing countries that are much higher than ever experienced in pre-industrial Western Europe.

The Demographic Transition



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Notes

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