Chapter 1
A Silent Revolution

… we are in the midst of a silent revolution. It is a revolution that extends well beyond demographics, with major economic, social, cultural, psychological and spiritual implications.

(United Nations Secretary-General Kofi Annan, at the launching of the United Nations International Year of Older Persons 1998)

1.1 Demographic Autumn

Social scientists have long known that world population aging would culminate in the twenty-first century, but few anticipated until relatively recently that some nations with the oldest populations could face the prospect of a 'demographic winter'. This would entail severe population decline and excessive aging, rather than a more hospitable 'demographic autumn' of population stability where the numbers of children and the elderly become nearly equal and constant. Currently the process of population aging is progressing beyond formerly perceived limits in most developed countries, with extreme developments in Central, Southern and Eastern Europe together with parts of Asia. United Nations projections for the whole of Europe envisage that, if birth rates follow current trends, its total population would decline by 70 million between 2000 and 2050, a figure greater than the present population of the United Kingdom (United Nations 2009). Although some welcome population decline as a means of restraining global warming and conserving the earth's resources, population decline heightens the effects of population aging and makes its consequences more unmanageable. Contemporary developments are undermining many national labour forces, at the same time bringing high peaks in needed expenditure on pensions, health and welfare. Occurring also is a trend towards people aged 65 years and over becoming more numerous than children and expanding their overall representation to between 25% and 35% of many national populations.

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In developed countries, population aging – defined as an increase in the proportion of the population in older ages – long appeared to be a relatively benign process that would continue to develop slowly, occasion only manageable concerns, and reach its limit when about 16% of any national population was aged 65 or more. During the last quarter of the twentieth century the persistence of very low birth rates, together with ongoing improvements in survival at older ages, signaled a significant departure from past trends. Higher proportions in older ages will create a need for more thoroughgoing adaptations, for instance as pressures grow to divert more resources to older age groups. Population aging is destined to remain one of the major forces of social change in the first half of the twenty-first century and beyond. It will have consequences for young and old.

Until recently, lack of recognition of the new circumstances encouraged laissez-faire attitudes to population aging, finding reassurance in the belief that countries with the oldest populations have not been affected adversely so far. At the other extreme, awareness of the deepening of population aging has sometimes evoked alarmist claims of imminent crises for health and welfare systems. More realistically, it is clear that the challenges of population aging will not begin to peak until the 2020s. All societies will be affected, especially developed countries that already have the most rapidly aging populations, and developing countries with rapidly growing numbers of vulnerable people, young and old. In developing countries there often are meager resources for health services and social expenditure, let alone for supporting the burgeoning numbers of the elderly who have additional age-related needs. By 2050, nearly 80% of the world's older people will be living in developing countries. There will then be two 'super giant' populations of older people: China could have 331 million – almost as many as in all the developed regions combined – while India's total may be 222 million. At mid-century, India and China together could have nearly 40% of the world's aged.

There is potential to address adverse trends provided there are timely, proactive efforts to prevent them from escalating. The sudden failure of banks and other major companies in the 2008–2009 global financial and economic crisis provided a dramatic illustration of the pitfalls of ignoring risks and failing to build resilience for challenging times. Successful negotiation of population aging calls for foresight concerning prospective developments and efforts to build resilience. While population aging and growth in the numbers of older people are affecting most countries, they currently differ in the pace of change and their potential to adapt. The differences are such that regions range between being relatively favourably positioned, such as North America and Australasia, or open to adverse outcomes in the future, such as Eastern Europe and the world's developing countries.

Awareness of unfavorable prospects is a starting point for interventions. One of the chief benefits of long range population projections is that they serve, not as predictions, but as warnings of circumstances to be averted through timely action. Delays in addressing what might seem issues for future decision makers will aggravate difficulties and make them more intractable. This is because tendencies towards population decline and excessive aging steadily acquire a momentum of their own that becomes increasingly difficult to slow, let alone reverse. Negative trends become self-reinforcing if populations develop undermined

age structures as successive generations beget ever lower numbers of children. The social setting for family formation is therefore crucial. Although there is no overarching theory describing and explaining population aging, there are a number of relevant theories, including transition theories, which focus on the nature of long-term changes in national populations. These help to show the progress of the "silent revolution", elucidating changes and providing a broad setting for discussing international trends. This chapter first introduces the concept of 'later life' and global trends in aging as the setting for a consideration of the transition theories and their limits.

1.2 The Threshold of Later Life

Perceptions of the nature of changes and their implications depend considerably on the age-threshold adopted to describe the older population or those in 'later life'. 'Old age' is a social construct with meanings that differ and change over time and from place to place. Short life expectancy, for example, is sometimes associated with an early start to old age because it is a sign of harsh living conditions, economic and social disadvantages and poor control of diseases and environmental hazards. Marked inequalities in length of life still persist within and between countries. For both sexes, life expectancy at birth ranges today from 52 years in sub-Saharan Africa, to 67 in developing countries generally and 77 in developed countries (Population Reference Bureau 2010). Longer-lived populations do not necessarily have increasingly higher perceived thresholds for the start of old age. For more than a century, 65 years remained a common pensionable age for men in industrialized countries that were experiencing the greatest improvements in life expectancy. Realization of the economic burden implied in maintaining this, however, has recently prompted a shift towards higher ages of eligibility for pensions. Extension of working life, on a full-time or part-time basis, is emerging as an economic necessity (Vaupel and Loichinger 2006).

Individual aging has biological, psychological and sociological dimensions. This results in considerable diversity in characteristics and capacities among people who are the same chronological age, which is the most comparable and only practicable general purpose measure of age. Chronological age is relevant as a partial indicator of life stage, health, labour force participation and income. It also defines generational (birth cohort) membership, which determines the historical context of individual's lives. People born in the same year are subject to the same events and changes that can shape collective fortunes and misfortunes at each stage of life. Examples include being of military service age at the outbreak of a war, or belonging to an unusually large generation, such as a baby boom generation. During the latter's working lives many have experienced heightened competition for employment and promotion and, as they retire, their numbers are placing increasing pressure on government financing of pensions.

Studies of population change have long employed age 65 as the start of later life. In the United States, for example, the National Research Council (2001: 30) defined

'the elderly' as persons 65 and over. Nevertheless, age 60 has been the threshold of old age in some United Nations publications, evidently in recognition of the growth in the numbers of older people in the shorter-lived populations of developing countries. Using this lower cut-off greatly augments the numbers in the older population and changes its composition. Globally, the population aged 60 and over in 2000 was 45% higher than the population 65 and over. The corresponding figure for Europe was 38% (United Nations 2009). Although there are grounds for employing the younger boundary for less developed countries, where life expectancy is lower and ill health and lifetime poverty curtail economically active life, the opposite arguments support a higher threshold for developed countries. The absence of an agreed marker for the start of later life or old age results in different findings about the course of population aging, the lower the threshold the more pronounced the apparent changes and the greater the likelihood of overstatement.

This book uses age 65 years as the start of later life because it provides comparability with many national and international studies, as well as with the demographic literature. It is not a genuine boundary of 'old age', nor is there one. Age 65 also serves as a consistent starting point for identifying stages of later life. A utilitarian approach to life stages has been the long-standing practice of distinguishing between the young-old (65–74 years), the old-old (75–84 years) and the oldest-old (85 years and over), which assumes significant differences in health statuses and needs between broad groupings, despite exceptions due to many people remaining healthy and independent throughout long lives. More satisfactory is Peter Laslett's (1989) reconceptualization of later life in contemporary developed countries as encompassing people's Third and Fourth Ages. A key distinction between them is that active living and independence characterize the Third Age, while dependency is the main characteristic of the Fourth (see Chap. 11).

Ten per cent of the population aged 65 and over represents a convenient lower limit to denote the group of countries experiencing appreciable population aging. It is a figure requiring fairly low birth rates by historical standards, that is, long-term total fertility rates of less than three children per woman. Twenty per cent is taken as the point of entry into the group of countries with the oldest populations, because 20% is close to the perceived upper limit of population aging in classical transition theory. Beyond this, 30% age 65 and over is taken as the threshold of 'hyper-aging'. It seems inevitable that figures of this order will be associated with destabilized age structures, more older people than children and adverse consequences for economies and societies. The slow unfolding of the hyper-aging scenario, however, dampens the sense of urgency and encourages procrastination.

1.3 Global and Regional Changes

For most of human history, the world's population would have had a young, pyramid-shaped age structure, with lower numbers in each older age group, which is consistent with a long run balance between high birth and death rates. At a smaller

Table 1.1 Numbers and percentages of older people in United Nations regions, 1950–2050

	Population aged 65 and over				Population aged 80 and over			
Region	1950	2000	2025	2050	1950	2000	2025	2050
Numbers (millions)								
World	131	417	832	1,487	15	70	161	395
More developed regions	64	172	266	334	8	37	71	121
Less developed regions	67	246	566	1,153	6	33	90	274
Africa	7	27	59	142	1	3	7	21
Asia	57	211	472	906	5	29	81	228
Europe	45	107	152	189	6	22	39	66
Latin America & the Caribbean	6	30	71	142	1	6	15	40
Northern America	14	40	73	98	2	10	17	36
Oceania	1	3	6	10	0	1	2	3
Percentages								
World	5.2	6.9	10.4	16.2	0.6	1.1	2.0	4.3
More developed regions	7.9	14.3	20.8	26.2	1.0	3.1	5.5	9.5
Less developed regions	3.9	5	8.4	14.6	0.4	0.7	1.3	3.5
Africa	3.3	3.3	4.2	7.1	0.3	0.4	0.5	1.1
Asia	4.1	5.7	9.9	17.3	0.4	0.8	1.7	4.4
Europe	8.2	14.8	20.8	27.4	1.1	3.0	5.3	9.6
Latin America & the Caribbean	3.5	5.8	10.6	19.5	0.4	1.1	2.2	5.5
Northern America	8.2	12.4	18.3	22.0	1.1	3.3	4.4	8.0
Oceania	7.3	9.9	14.6	18.7	1.0	2.3	3.6	6.5

Source: United Nations (2009)

scale, epidemics, famines, wars, natural disasters and migrations would have often resulted in irregular age structures. Despite this, populations with high birth and death rates have an inherent tendency to 'forget' their past and return to a young age structure. This would occur in about 60 years of unhindered natural increase. Statistics for the global population are not known accurately but United Nations estimates show the world's population with around 5% in the older ages in 1950, rising to 7% in 2000, 10% in 2025 and 16% in 2050 (Table 1.1). This major change is the net outcome of varied degrees of population aging in different regions. Figure 1.1 illustrates the prospect of considerable global aging by mid-century, as well as the inherent potential for further substantial changes later.

By 2050, the more developed regions may have 26% aged 65 and over, compared with 15% in less developed regions (Table 1.1). The latter figure reflects the likely continuation of birth rates above replacement level in many developing countries. The highest projected figure for all regions in 2050 is 31% 65 and over in Southern Europe, compared with 27% in Europe as a whole and 24% in Eastern Asia – the oldest region apart from Europe (United Nations 2009). Realization of the projection for Southern Europe could be calamitous for national economies in the region. At the same time the aged population of all regions will not only be growing larger,

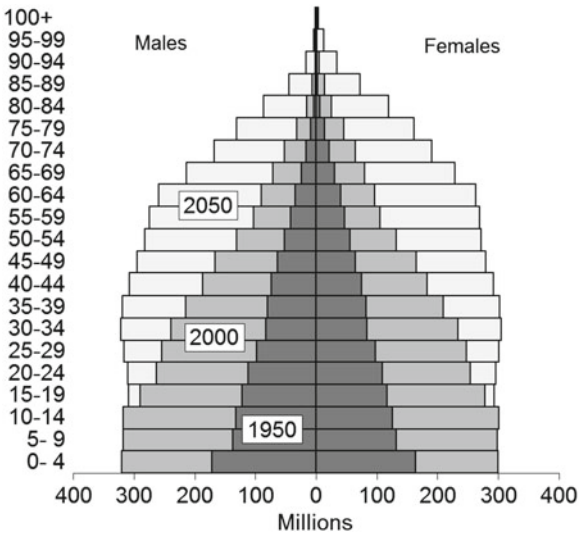

Fig. 1.1 Global age structures, 1950, 2000 and 2050 (Source: United Nations (2009), estimates and medium variant projections)

but also older. In 2050, people 80 years and over may comprise at least a third of the aged in Europe as well as in more developed regions generally, compared with about a fifth in 2000 (Table 1.1). This in itself is a considerable shift that will augment the costs of later life dependency. Even in less developed regions there will be a significant trend towards an aging of the aged.

Future numbers of the aged are better known than future percentages, because the world's aged at mid-century are already born, whereas percentages depend to a considerable extent on the future numbers of children yet to be born. In the early decades of the twenty-first century, people born in the twentieth century's population explosion, will enter the older ages, as will the developed countries' baby boom generations born in various intervals between 1946 and 1966. In the first half of this century, the numbers aged 65 and over in more developed regions is projected to nearly double, rising from 172 million to 334 million. Dwarfing even this is the almost fivefold increase in less developed regions – from 246 million in 2000 to 1.2 billion in 2050 (Table 1.1).

1.4 National Population Aging

At the national level, there is no uniform advance of countries from demographic youth to old age: the ranking of countries from oldest to youngest changes from year to year. This mainly reflects differences through time in birth rates and the size of generations reaching later life. Uncertainty surrounding future changes also leads to contrasts in the projected populations of countries from one projection series to another, especially for figures 50 years into the future. Projected population sizes

are highly sensitive to assumptions about future fertility (see Bongaarts and Bulatao 1999: 516). For example, the United Nations' medium variant projection for Europe at 2050 was 691 million in the 2008 series, compared with 603 million in the 2000 series. Much of the divergence occurs after 2025 because of the cumulative effect of higher birth rates in the 2008 projections (United Nations 2001, 2009). Later projections will undoubtedly continue to modify assumptions as new developments occur.

In 1950, only nine countries – with total populations of one million or more – had at least 10% of their populations aged 65 and over and the highest figure was only 11% (France). The trend towards population aging is well illustrated, however, through the rapid changes in the number of aging populations. By the year 2000, there were 41 such countries and by 2050, they could number more than 100. This century, many smaller countries, with total populations of less than a million, will also experience substantial aging. In 1950 and 1975, all of the world's aging populations (those with 10% or more aged 65 and over) were in Europe, with the exception of the United States. By the end of the twentieth century, this was still largely true despite the many additions to the numbers of aging countries. However, the new entries did include Japan, which had emerged as having one of the world's most rapidly aging populations, together with Australia, New Zealand, Canada, and Hong Kong, now a semi-autonomous region (SAR) of China.

Beyond 2025 lie the most dramatic developments. By 2050 virtually all of the countries with the oldest populations at the start of the century are projected to have more than a quarter aged 65 and over. Eleven of these, mostly in Europe and Eastern Asia, could then be facing hyper-aging – the situation in which population aging becomes most difficult to halt or reverse. The resulting 'population implosion' is potentially as consequential for the societies concerned as the population explosion. Medium variant projections for Japan, for example, indicate a possible decline of 20% in its population in the first half of this century (United Nations 2009). Countries projected to have more than 30% of their populations in the older ages at mid-century include Italy, Greece, Portugal and Spain – in Southern Europe – together with Germany, Japan, Hong Kong and Singapore (Table 1.2). By 2050, population aging is likely to be a truly worldwide phenomenon, except in much of sub-Saharan Africa. At that time the United States, the United Kingdom, Australia and New Zealand could be among the youngest of the more developed countries if their levels of fertility and net migration remain relatively high. China, with 23% 65 and over at mid-century, would have a similar level of aging (Table 1.2). Because of the great size of China's total population, it will have a considerable impact on the extent of aging world-wide.

1.5 Aging and Demographic Transition Theory

The principal framework for studying trends in population aging has been demographic transition theory (Weeks 2002: 99–106; Casterline 2003). Its relevance, at least in its 'classical' form, as conceived by its founders and based on Europe's

Table 1.2 Percentages aged 65 years and over in the world's oldest populations, 1950–2050

	Oldest populations in 2050				Selected comparisons		
Country	2010	2025	2050	Country	2010	2025	2050
Japan	22.6	29.7	37.8	Ukraine	15.6	18.6	24.7
Italy	20.4	24.4	33.3	Sweden	18.3	21.7	24.1
Singapore	10.2	22.9	32.6	Norway	15.0	19.4	23.8
Hong Kong	12.9	22.1	32.6	Denmark	16.7	21.3	23.8
Germany	20.5	25.1	32.5	Australia	13.9	19.1	23.8
Portugal	17.9	22.4	32.1	Russian Fed.	12.9	17.7	23.4
Spain	17.2	20.4	31.8	China	8.2	13.4	23.3
Greece	18.3	22.4	31.3	New Zealand	13.0	18.1	23.2
Bulgaria	17.6	21.9	30.3	United Kingdom	16.6	19.4	22.9
Slovenia	16.4	22.4	30.2	United States	13.0	18.1	21.6
Poland	13.5	21.0	29.9	India	4.9	7.3	13.7
Austria	17.6	22.0	29.4				
Croatia	17.3	22.2	28.2				
Czech Republic	15.2	20.5	27.6				
France	17.0	22.6	26.9				
Belgium	17.4	22.2	26.6				
Hungary	16.4	20.3	26.2				
Switzerland	17.3	21.9	26.0				
Latvia	17.4	19.5	25.9				
Finland	17.2	23.9	25.9				
Netherlands	15.4	21.7	25.6				
Canada	14.1	20.5	25.5				

Source: United Nations (2009)

historical experience, has waned sharply since the 1970s. Nevertheless the theory still has broad relevance in understanding the antecedents of the present situation in developed countries, as well as current trends in developing countries. It describes and explains the shift from a pre-transition stage, characterized by young triangular age structures and high birth and death rates, to a hypothetical post-transition stage with older, more rectangular age structures and low birth and death rates. In between is the transition itself when population growth and aging occur and birth and death rates drop from high to low levels.

Generally, mortality decline begins first, initiating a period of sustained growth due to births outnumbering deaths. Population aging commences when birth rates start to fall, reducing the representation of children in the population and raising the representation of adults. Fertility decline is the main cause of population aging in the classical demographic transition. In theory, the transition ends when crude birth and death rates converge again at a low level, producing a rectangular-shaped age structure with similar numbers in all age groups below the main ages of death. The final age structure is that of a stationary population with a zero growth rate, equal numbers of births and deaths each year, and constant numbers and percentages in each age group. The demographic transition began in different parts of Europe in

Table 1.3 Characteristics of populations during and after the demographic transition

	Pre-transition	Transitional	Post-transition	Future declining[a]
Annual growth rate% (both sexes)	0	3	0	−0.3
Age structure % (both sexes)				
0–14	36.9	45.4	20.1	13.4
15–64	60.6	52.1	63.9	53.3
65+	2.5	2.5	16.0	33.3
Total	100.0	100.0	100.0	100.0
Dependency ratios (both sexes)				
Child[b]	60.9	87.3	31.5	25.3
Aged[c]	4.2	4.7	25.1	62.4
Total	65.1	92.0	56.6	87.7
Percentage surviving (females)				
To age 5	46.8	81.7	98.2	99.9
To age 65	7.8	43.3	83.1	98.2
Life expectancy (females)				
At birth	20.0	50.0	75.0	88.4
At age 5	36.6	55.9	71.4	83.4
At age 65	7.5	11.9	15.7	24.0

Sources: Hauser (1976); Coale and Demeny (1983); Coale and Guo (1990: 33); United Nations (2009)

The dependency ratios refer to the total population and differ from figures based on the female population only

[a] Whereas the figures in the other columns derive from demographic models, those in the last column are based on data for Italy from 2008 medium variant projections (United Nations 2009). The rates refer to 2045–2050, other data to 2050. The percentages surviving at ages 5 and 65, and the corresponding life expectancies were estimated from model data

[b] Child dependency ratio: 0–14/15–64 × 100

[c] Aged dependency ratio: 65+/15–64 × 100

the late eighteenth and early nineteenth centuries. Since mortality decline typically preceded fertility decline, populations would have initially become demographically younger. This was because the greatest improvements in survival occurred among infants and children through better understanding of hygiene and progress in controlling infectious diseases and famines. Statistical models of the classical transition show that through these early changes the percentage of children in a population rises appreciably while the percentage in the older ages varies little (Table 1.3).

The slowness of mortality decline dampened the pace of population rejuvenation in Europe. In contrast, rapid mortality decline occurred in many developing countries from the late 1940s onwards, such that in the space of even a single decade, some experienced the mortality reductions that had taken many decades in Europe. Their more recent and rapid pace of mortality control was founded on imported aid together with the provision of basic health services. The unexpectedly huge impact of these innovations created the population explosion, an unprecedented phase of accelerated population growth. From 1950 to 1990, annual population

growth rates in the less developed regions were above 2%, a level that produces a doubling of total numbers in 35 years (United Nations 2009). The peak rate, in the late 1960s, was 2.5%. The population explosion is projected to raise the numbers of the aged in developing countries to more than half a billion by 2025 and more than a billion by 2045 (United Nations 2009).

Despite Europe's early start in the demographic transition, the aging of its population began relatively late, emerging only in the last quarter of the nineteenth century when fertility decline became prominent. Scientific recognition of population aging as a phenomenon soon followed but ongoing research interest in it did not develop until after the Second World War (Myers and Eggers 1996). An important prelude, however, was a short-lived surge of attention to population aging during the Great Depression when the United States, the United Kingdom, France, Germany and a number of other countries experienced below replacement fertility for the first time. Their birth rates soon rose again and allayed national concerns about long-term aging and depopulation, but it is notable that current issues echo those that first became prominent during the 1930s. Historical statistics for Sweden illustrate the protracted nature of population aging before the last quarter of the twentieth century. Sweden's proportion aged 65 was about 5.5% in the second half of the eighteenth century, falling slightly to 5.2% in the first half of the nineteenth century as mortality decline raised the representation of children. A figure around 5% is thought to have been typical for Western Europe in 1850 (United Nations 1973: 266–268). By 1900 the Swedish figure was 8%, rising slowly to 10% in 1950 and 18% in 2010.

Sometimes the theoretical end of the transition is taken to be when replacement fertility is reached, that is when the generation in the reproductive ages produces just sufficient children to replace themselves. Replacement takes into account children's survival to maturity: hence the higher a population's death rate, the greater the number of children needed to achieve replacement. In developed countries an average of about 2.1 children per woman is sufficient to replace the population. Population aging, however, continues far beyond the time when fertility reaches this level because larger generations, born when birth rates were higher, continue to move into older ages. The end of population aging, and the theoretical end of the transition period, occur much later, when a stationary population with a fairly rectangular age structure has emerged.

Contrary to past expectations, the anticipated post-transition period has proved illusory. Birth rates below replacement level have already plunged about half of the world's population into a new era of intensified population aging. A little-known milestone in the history of the human population was passed at the end of 2003, by which time half of the world's population was living in a country, or a sub-region of a country, with a birth rate of less than 2.1 children per woman (Wilson 2004; Wilson and Pison 2004). This included China, Brazil, Thailand and about 200 million people in regions of India. Below replacement fertility will cause many countries to confront a continuing struggle for demographic viability, rather than the demographic tranquility, or demographic autumn, envisaged for the post-transition period. Developments unforeseen in classical demographic transition theory will have the greatest importance for the future of aging societies. Because the post-transition

stage has not eventuated, population aging will continue much longer than anticipated and in some countries it will far exceed previously supposed limits of change.

1.6 Further Transition Theories

By the last quarter of the twentieth century, there was widespread recognition that the classical transition was often inconsistent with continuing developments. This led to the theory of the second demographic transition which aims to describe and explain family building behaviour in contemporary Europe and, by extension, circumstances in a number of other low fertility societies (Lesthaeghe and van de Kaa 1986; van de Kaa 1987; Lesthaeghe and Surkyn 2008). The theory's main preoccupation is below replacement fertility. Hence it is relevant to explaining key features of the experience of population aging in many countries since the 1970s. Adoption of the name 'the second demographic transition' (SDT) reflects that the theory's proponents regard below replacement fertility, not as part of the first or classical demographic transition (FDT), but as a key distinguishing feature of a new set of circumstances. Whereas the classical or first demographic transition anticipated an ultimate birth rate sufficient to maintain a balance of births and deaths indefinitely in the post-transition stage, the birth rate in the majority of developed countries has tended to decline even further, creating a long-term prospect of deaths exceeding births.

In European countries, van de Kaa (1987: 8–11) suggested, there was a typical sequence of events leading to below replacement fertility namely:

- A shift from legal marriage to cohabitation: van de Kaa estimated that ultimately 40% or more of men and women in Western Europe would never be legally married.
- A shift in the focus of the family from children to the adult couple. This brings greater emphasis on childbearing as a means of enriching the lives of the parents, or on childlessness as an alternative basis for achieving personal fulfilment. It marks the end of the reign, during the first demographic transition, of the 'child-king', and the succession of the 'king-pair' (van de Kaa 1987; Ariès 1980: 649).
- A shift from preventive contraception, to contraception to permit self-fulfilling choices. Contraception thus changes from a means of preventing births that could reduce a family's well-being and standard of living, to a means of achieving greater self-fulfilment, even through having no children (van de Kaa 1987: 26).
- A shift from uniform to diversified families and households. The wider spectrum of socially sanctioned choices, together with a higher incidence of divorce, leads to a range of alternatives to the nuclear family household.

Even more important than the above changes are contrasts between the attitudes that are thought to underlie the first and second demographic transitions. During the first transition, fertility control was a response to large family size becoming a social handicap, disadvantaging parents in their goals of giving children better opportunities

for education and employment. Norms and attitudes were dominated by concerns for the welfare and future prospects of offspring. At the same time, secularization reduced the influence of traditional religious teachings and made more couples willing to use methods of family planning. Within marriage, the number of children was controlled – quality replaced quantity. Thus society was child-oriented – altruism was the underlying motivation in family life (van de Kaa 1987: 5). Similarly, Ariès considered that the historical decline of the birth rate, in the first demographic transition, was unleashed by an enormous sentimental and financial investment in the child. Wise management required reducing family size so that more time and care could be devoted to each child with better results: "seeing that one's children got ahead in a climate of social mobility was the deep motivation behind birth control" (Ariès 1980: 647).

In contrast, van de Kaa described the motivation underlying the second demographic transition as individualism: norms and attitudes emphasizing the rights and self-fulfilment of individuals. Others have also emphasized the importance of individualism in explaining contemporary low birth rates in more developed countries. Couples and individuals are no longer seen as planning life in terms of the child and his or her future. The child has not disappeared from such plans, but fits into them as one of the options that make it possible for adults to achieve self-fulfilment (Ariès 1980: 650). Thus the child is no longer the essential variable in plans for the future. Whereas people planned their future in terms of familism, a family-oriented lifestyle, during the first demographic transition, in the second they plan their future in terms of any combination of familism, consumerism, careerism and other lifestyles. Replacement fertility becomes unattainable when many remain single, or married and childless, or have small families in which the total numbers of children are insufficient to counterbalance the childlessness of others.

Overall, the second demographic transition argues for a turning point in demographic history entailing a shift from altruism to a greater influence of individualism, and a shift from replacement to below replacement fertility. With its emphasis on preoccupations moving from basic to higher order needs and self actualization (see Chap. 8), it has affinities with Maslow's (1954) hierarchy of needs. Although there is no consensus that current developments are best described and explained in terms of a second demographic transition, it is a significant attempt to find order in a new and diverse situation. Because it addresses shortcomings of the first demographic transition and seeks to explain below replacement fertility it is an important approach to explaining current trends in population aging. An elaboration and critique of this theory and other theories of contemporary fertility change is presented in Chap. 8.

The last column of Table 1.3 illustrates a possible long-term outcome of the second demographic transition, using projected data for Italy in 2050. Comparing the data in this column with the adjacent column for a population in the post-transition stage of the classical transition much greater population aging is apparent: Italy's population growth rate is negative instead of zero, persons 65 and over comprise 33% of the total instead of 16% and there are 62 of them per 100 persons of working age (15–64 years) instead of 25. Table 1.3 also indicates the greater life expectancy in Italy's 2050 population – 88 years for females compared with 75 years at the end of the classical transition.

Further modifications of classical transition theory explain longer survival as well as its implications for population aging and the experience of later life. Important here as a starting point is Omran's (1971, 1981) formulation of the epidemiologic transition, which is concerned with variations in countries' experience of mortality changes through time. It expands the account, in demographic transition theory, of the course of change in the occurrence of diseases and death. Other authors' later revisions to the epidemiologic transition have focused on new developments. In its original form, the epidemiologic transition was an elaboration of the changes in death rates and disease patterns associated with the demographic transition. It identified three stages, corresponding to the three main stages of the demographic transition and differentiated principally according to rates and causes of death, namely:

- Stage 1 (pre-transition): *The age of pestilence and famine*. In this initial stage mortality is high and fluctuating, preventing sustained population growth. Up to 50% of infants and children die before their fifth birthday and life expectancy at birth varies between 20 and 40 years. The representation of the aged is low because life expectancy is short and numbers decline rapidly from age to age. No more than 3% of the population reached their 65th birthday in the pre-transition period. This stage has dominated most of human history. In the United States, for instance, its passing dates from about 1875 (Rogers and Hackenberg 1987: 234).
- Stage 2 (transition): *The age of receding pandemics*. Great changes occur in this middle stage during which mortality declines progressively as epidemics decrease in frequency and magnitude. Average life expectancy at birth rises to 55 years. As the gap between birth and death rates widens, higher rates of population growth occur. This stage began in many developed countries in the nineteenth century and in developing countries after the Second World War. It characterized the period 1875–1930 in the United States.
- Stage 3 (post-transition): *The age of degenerative and man-made diseases*. In this final stage, most deaths are due to so-called 'diseases of old age', the overall death rate converges with the birth rate, and life expectancy at birth increases to little more than 70 years. This is the stage that developed countries had reached by the 1970s: further substantial progress was not expected. Indeed, in Australia at that time, life expectancy was described as 'the most stable element of the demographic scene' (Borrie 1978: 19).

Thus the three-stage model envisaged an end-point at which there was a stabilization of causes of mortality and patterns of survival. Supporting evidence was that: (i) the biblical life span of 'three score years and ten' had scarcely been surpassed; (ii) improvements in life expectancy at birth had been due predominantly to the reduction in mortality at younger ages; (iii) there had been a shift from controllable infectious and parasitic diseases to chronic diseases that are difficult to treat. As in demographic transition theory, Omran considered that the third stage of the epidemiologic transition represented a new equilibrium where the limits to mortality decline were reached. He believed that improvements in mortality from some causes, notably cardiovascular diseases, would be offset by higher mortality from other more intractable causes, such as cancers, leading to little net gain in life expectancy (Omran 1981: 174).

Omran recognized four main patterns or models of mortality change through time, each with the above three stages. The patterns differed according to the timing, speed and extent of progress through the three stages. The two main patterns were the 'Classical or Western Model' and the 'Delayed Model'. The former denoted the experience of Western societies over the last two centuries where there occurred a gradual decline in mortality in response to social, economic and environmental improvements. In contrast the Delayed Model, characteristic of many developing countries after the Second World War, entails rapid falls in death rates accomplished through primary health care, modern medical technology and international aid. These gains, however, remain incomplete without social development and greater improvements in community-based health care.

A feature of the epidemiologic transition is the trend towards an increasing concentration of deaths in older ages. Omran's framework predates recognition of the ongoing revolution in survival which is transforming the outlook for growth in the numbers and percentages of older people in national populations. These developments have led to a reconsideration of the characteristics of the current stage of the epidemiologic transition and proposals for a new fourth stage. This contrasts with trends in fertility which have stimulated proposals for a new transition rather than just a new stage. Nevertheless, many significant changes are now encompassed within the concept of the fourth stage. Chapters 4 and 5 discuss current and prospective developments in health and survival as they relate to aging and the aged.

1.7 Conclusion

Just as current trends in population aging are transforming contemporary societies well beyond previous expectations, so too research is transforming the theoretical bases of our understanding of this phenomenon. Much uncertainty remains and it is important that identifying and explaining developments in aging societies continue to receive close attention. The first half of the twenty-first century will be the most consequential period in the history of population aging. Despite uncertainty, some broad directions and policy issues are clear. Prospects include adverse trends that are potentially modifiable through timely interventions. In many countries a continuation of present demographic trends is likely to prove economically unsustainable and socially disruptive. Action or inaction before the 2020s will be decisive in averting or compounding problems later. Aging is already one of the mainsprings of social change and it is destined to gather further impetus.

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