# DEMOGRAPHY OF AGING

*from* *The Encyclopedia of Elder Care*

aging, biological aging, chronological age, cohort aging, death, delayed mortality, larger population, life expectancy, older person, population

Aged, Aging, Death, Life Expectancy, Population

The distribution of research among major themes is changing in important ways within the demography of aging. There has been a reduction in the amount of work done on the theme that was the original source of the influence of the demography of aging on other fields, including those of public policy deliberations. This theme is *the increasing proportion of older people in a population*. Themes that are gaining in prominence include the *aging of cohorts or generations* (collections of neighboring birth cohorts) and the *postponement of mortality and compression of morbidity within the population at advanced ages*, which we might call "delayed mortality and compressed morbidity among the oldest old."

Each field of social science activity has, ideally, a set of core concepts, theories, and methods for estimation and analysis. Around the core is a well-defined periphery where researchers are preoccupied with aspects of the core variables. Around the periphery is a boundary that reliably serves to demarcate what is inside and what is outside that field of social science. As a field of social science, the demography of aging approximates this ideal, with one major exception. This field seems to have few markers that help reliably locate its boundary when the research deals with some aspect of aging.

## CORE AND PERIPHERY OF THE DEMOGRAPHY OF AGING

The classic theoretical and empirical works were built around the notion that population aging is an increase in the proportion of older persons in a population. However, the basis for classifying whether a person belongs or does not belong to the older population is an unresolved issue.

For decades, it was widely accepted that it is adequate to define *older* in terms of a chronological age such as 65 years or, less often, 60 years. This view has been challenged. First, a collection of persons at the same chronological age can vary widely on a measure of aging based on the functioning of personal biological systems. Second, the number of additional years that a person can be expected to live (derived from the mean of the probability distribution of death at each future possible age) provides the basis for a more policy-relevant measure of population aging than does the numbers of years already lived (Sanderson & Scherbov, 2008). The alternate measure is the change in the proportion of the population with remaining life expectancy of less than 15 years.

The classic concept of *population aging* implies that we should always deal with the *relative size* of the designated older population segment, however defined, within the larger population of all ages to which it belongs. Hence the demography of aging does not have as a core variable the absolute size of the older population.

A *process* of aging is an essential concept in the demography of aging. The most commonly used associated statistical measurement is an increase in the proportion of older persons in the total population. Thus population aging is a process and is not a variable that has a value at a specific point of time or date.

Based on this approach to measurement, the demography of aging has traditionally had at its core comparisons and analyses of variations in the speed of population aging among countries, among regions within a country, and among other defined population segments such as racial/ethnic groups (Rowland, 2012). Some studies have also portrayed variations over time in the speed of population aging in the world and in specific regions (Rowland, 2012). For example, much has been written in the popular media about the higher-than-average speed of aging of the population of European stock across the northern hemisphere during the 20th century (Rowland, 2012).

In the immediate periphery around the core are the analyses that provide explanatory theory and related empirical work designed to achieve advances in the understanding of *why* some populations are aging more rapidly than others (Rowland, 2012). Based on these analyses, models for predicting future population aging for countries, and selected population segments within them, have been developed and applied. The outputs of these models have supported public policy deliberations (Rowland, 2012; Siegel & Olshansky, 2011).

Beyond the core and the immediate periphery off the classic demography of aging is a large and highly influential literature concerning the implications of population aging (Lee & Mason, 2011; Rowland, 2012). However, as one moves from one example to another among relevant research outputs, it can become difficult to decide whether a particular work is an exhibit of the demography of aging.

The decision turns partly on how *demography* is defined. It is beyond the scope of this article to provide an adequate definition. For our purposes, it is sufficient to point to a relevant essential component of demographic work. The units of analysis of demographic work are always collections of persons, often seen as population segments or as whole populations (the latter being an exhaustive collection of designated segments). Demography deals with attributes of these collections. The attributes could be states at a particular point of time or date, changes of states, or behaviors associated with these changes (provided that the units of analysis remain the said collections).

The demography of aging therefore deals with either (a) the measurement and analysis of variations in population aging or (b) the use of variables that measure population attributes in the process of developing and evaluating hypotheses concerning the causation or future evolution of population aging.

It is easy to prepare a profound work about the implications of population aging without making significant research efforts of either type. Some research publications exemplify this property, and others include some aspects of either type. Thus it is inappropriate to take the view that all studies on *the implications* of population aging are instances of the demography of aging. Each case needs to be examined to determine how much the researcher has carried on work in either type of study. Hence, no simple principle can be used to set the boundary around the demography of aging.

## BROADENING THE CORE OF THE DEMOGRAPHY OF AGING

The classic concept of population aging has been joined by two additional concepts that have become the bases for major extensions of theoretical and empirical work in the demography of aging.

In the classic concept, a population segment called "the older population" is related to a larger collectivity to which it belongs. The first of the additional concepts abandons this relation and focuses instead on a cohort or a meaningful collection of adjacent cohorts such as a generation (e.g., the Baby Boomers) (Rowland, 2012; Stone, 1999). The aging process for such a cohort, or a collection of cohorts, comprises both increasing chronological age (which would be an average chronological age for a collection of adjacent cohorts) and what is deemed to be a progressive deterioration of functional and cognitive capacities generally called *biological aging*. A way to summarize these ideas is to say that one is speaking about "cohort aging," provided that the unit of analysis remains a collection of persons. A large and growing body of literature analyzes certain implications of the aging of prominent generations and points to related public policy challenges (Universite de Montreal, 2015)

The second "new" concept of population aging involves a special focus within the study of longevity, combined with related research on morbidity rates at the advanced ages. To imagine this focus, one should consider the following questions: For the population that has already passed the life expectancy age (measured in terms of chronological age), what will be the distribution of the ages at death and what will be the age distribution of highly consequential morbidity among the survivors? An important subsidiary question is "How far out in time can the distribution of ages at death reach?" That is, what are the expected extremes of old age, and within each national population or major segment thereof, how many people might survive to such extreme ages? Furthermore, what proportion of the survivors will exhibit extreme levels of dependency? Analyses surrounding these questions are demographic analyses, and they form part of the demography of aging (Christensen, Doblhammer, Rau, & Vaupel, 2009; Ouellette & Bourbeau, 2011).

Another aspect of this third major theme is the increasing proportion of very old people in the total population (Suzman, Willis, & Manton, 1992; Universite de Montreal, 2015). Important issues in elder care policies, as well as long-term care financing, are linked to this increase.

A phrase that can be used to refer to this third *new* concept of population aging is "postponement of mortality and compression of morbidity beyond the age of life expectancy" and perhaps even more pointedly "delayed mortality and compressed morbidity among the oldest old."

It is very important to incorporate this third concept into the demography of aging. Its dimensions and implications go far beyond academic debates about the absolute limit to the length of a human life. It touches on what is perhaps inevitable institutional residence for a high percentage of those who have major declines in functional and cognitive capacities and consequently the unusually burdensome demands on supports exerted by these residents. Directly linked to this question of institutional residence are the probability profiles of major declines in the said capacities as cohorts move into extreme ages. In addition, there are euthanasia-related issues. The analysis and projection of the numbers and the distribution of affected persons are intrinsically instances of demographic analysis, and thus they belong to the field of the demography of aging.

For more than 50 years, starting perhaps with the United Nations Population Division publication cited earlier, the demography of aging has had at its core a focus on aspects of increases in the proportion of the *older segment* within the larger population to which it belongs. To this core has been added two *newer* concepts: *cohort aging* and *postponement of mortality among the oldest old*.

These additions have helped the demography of aging to continue to be influential in other fields, including those of public policy debates. However, statistical measurement of aging across all three concepts has been weakened by almost exclusive reliance on chronological age.

*See also* African Americans and Health are Disparities; American Indian Elders; Immigrant Elders; Rural Elders.

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**Web Resources**

- NIA Demography of Aging Centers: https://agingcenters.org.
- UN World Population Aging: http://www.un.org/esa/population/publications/worldageing19502050.

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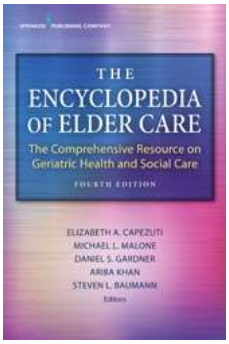


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