

Demographic Transition and Epidemiology Perspectives from the Old Age

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ABSTRACT

Aging can be considered a demographic, social, and cultural phenomenon. To address it, we can use the theory of demographic transition, which serves to explain demographic changes over the years. Similarly, when understanding the changes in an aging population, it is important to consider the changes resulting from life expectancy and longevity, as both undergo shifts. The demographic transition is closely related to the epidemiological transition, a process through which the population's morbidity and mortality profile shifts from a predominance of infectious diseases and acute causes of death toward a greater burden of chronic non-infectious diseases and degenerative conditions associated with aging. Therefore, the demographic transition and the epidemiological transition are interdependent processes that explain the transformation of older adults' health profile. Understanding this relationship allows for the guidance of health planning, the prioritization of preventive interventions, and the design of public policies grounded in scientific evidence, with the aim of promoting healthy aging, preserving functional ability, and ensuring a better quality of life for an increasingly long-lived population. Aging brings about physical, psychological, and social changes that require specialized care. Therefore, the demographic transition and the epidemiological transition are interdependent processes that explain the transformation of older adults' health profile. Understanding this relationship makes it possible to guide health planning, prioritize preventive interventions, and design public policies based on scientific evidence, with the aim of promoting healthy aging, preserving functional ability, and ensuring a better quality of life for an increasingly long-lived population. Aging brings about physical, psychological, and social changes that require specialized care. For this reason, the demographic transition must focus on strengthening health services, promoting the prevention of chronic diseases, facilitating access to medications, promoting rehabilitation programs, and encouraging healthy lifestyles.

Keywords: population aging, epidemiology, old age, health

INTRODUCTION

To understand the phenomenon of contemporary population aging and its resulting impact on public health, it can be analyzed through the framework of the Theory of Demographic Transition, which has its origins in observations of the changes in birth and death rates experienced by various countries over the past century. In the late 19th and early 20th centuries, interest in studying population trends gained momentum due to a long period of economic transformations linked to industrial development, as well as processes of social modernization [1].

Conceptually, the theory describes the process of transformation through which a preindustrial society—defined by high birth and death rates—evolves into an industrial or postindustrial society, characterized by a decline in both rates. The natural growth rate of a population is derived from the relationship between these two indicators. It should be noted that, in seeking universal validity, this theoretical framework does not directly account for the effect that migration may have on population growth in specific regions [1]; rather, it establishes itself as the explanatory framework for global population growth based on its internal dynamics.

At the heart of this theory lies a critical time lag: the decline in mortality occurs primarily and rapidly as a result of improved living conditions and advances in medical technology; in contrast, the decline in birth rates is a slower process, associated with subsequent cultural and socioeconomic changes. This historical inconsistency led, at the time, to rapid population growth, and the surviving cohorts or generations from that period constitute the bulk of the older adult population in the 21st century. Furthermore, the appeal of this the-

ory extended to various schools of thought, including Marxist perspectives, because the notion of differing growth rates depending on the stage of development is compatible with the transition toward new models of social organization, emphasizing the role of progress as the definitive precursor to low fertility [3] [4].

In the fields of demography and gerontology, the completion of this transitional process directly results in the aging of population structures. As fertility rates decline steadily and life expectancy increases due to reduced mortality, the population pyramid undergoes an inversion. This exponential increase in the proportion of older adults radically alters the epidemiological landscape, shifting the focus of medical care from infectious diseases to chronic degenerative conditions [7] [12].

DEMOGRAPHIC TRANSITION AND EPIDEMIOLOGY

Demographic transition is a process of transformation in the population structure characterized by a sustained decline in fertility and mortality rates, accompanied by an increase in life expectancy. As a result, the proportion of people aged 60 and older gradually increases, leading to population aging. This phenomenon represents one of the main challenges for health care systems due to the social, economic, and health implications resulting from the change in the age composition of the population [9] [10].

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Demographic transition is closely linked to epidemiological transition, a process through which the population's morbidity and mortality profile shifts from a predominance of infectious diseases and acute causes of death toward a greater burden of chronic, non-infectious diseases and degenerative conditions associated with aging [7]. Currently, the leading causes of disease and disability among older adults include high blood pressure, diabetes mellitus, cardiovascular disease, cancer, chronic respiratory diseases, bone loss, and neurodegenerative disorders, such as Alzheimer's disease and other forms of dementia [5].

Population aging is also associated with an increase in the prevalence of multimorbidity, defined as the coexistence of two or more chronic diseases in a single individual. This condition contributes to the onset of geriatric syndromes, including frailty, falls, urinary incontinence, cognitive decline, polypharmacy, and malnutrition, all of which increase the risk of disability, functional dependence, recurrent hospitalizations, and premature mortality [2] [8].

From an epidemiological perspective, these changes alter public health priorities and require the strengthening of strategies for health promotion, disease prevention, timely detection, and comprehensive management of chronic conditions. Furthermore, it is essential to implement person-centered care models aimed at maintaining functional capacity, autonomy, and quality of life throughout the aging process [8] [9].

In the Region of the Americas, the demographic transition is occurring at a rapid pace, posing significant challenges to the sustainability of health and social protection systems. The Pan American Health Organization notes that the growth of the older adult population requires strengthening primary health care, developing long-term care services, and promoting evidence-based public policies that support healthy aging and reduce health inequalities [10].

Therefore, demographic transition and epidemiological transition are interdependent processes that account for the changing health profile of older adults. Understanding this relationship makes it possible to guide health planning, prioritize preventive interventions, and design public policies based on scientific evidence, with the aim of promoting healthy aging, preserving functional ability, and ensuring a better quality of life for an increasingly long-lived population [5].

Mexico's demographic context is an accelerated reflection of the global transitional model. Unlike developed nations, where the aging process unfolded over centuries, in Mexico the transition took hold in just a few decades. During the second half of the 20th century, the implementation of public health policies, mass vaccination campaigns, and the introduction of antibiotics led to a drastic drop in overall mortality rates. At the same time, family planning programs launched in the 1970s achieved a sustained decline in fertility. This dual trend altered the population structure, leading to an exponential increase in life expectancy at birth [11].

The direct result of this transformation is a rapid increase in the proportion of people aged 60 and older. This change in the age structure is closely linked to the epidemiological transition, a concept that describes the shift in a population's patterns of health and disease. In Mexico, this process is characterized by a dual burden: while some infectious and parasitic diseases persist, the national landscape is overwhelmingly dominated by chronic degenerative diseases, which are the leading causes of morbidity and mortality among older adults.

The magnitude of this epidemiological challenge among older adults in Mexico is evident, for example, in the following key indicators:

In Mexico, the National Health and Nutrition Survey reveals that diabetes mellitus and hypertension affect an extremely high percentage of the adult population, with rates increasing significantly among people over 60 years of age, for whom the diagnosis and management of these conditions become a priority due to their asymptomatic nature [6].

As a result of increased longevity and the resulting accumulation of chronic diseases, another example is fall syndrome, which has become one of the leading causes of emergency medical care. Public health data from Mexico indicate that approximately one-third of older adults have experienced or are likely to experience at least one fall per year, a figure that doubles in institutional settings or among patients in fragile health [5].

This epidemiological landscape underscores the complexity of geriatric care in the country. Increased life expectancy has led to a large number of older adults living with multiple conditions simultaneously. This clinical scenario necessitates the implementation of complex treatment regimens which, if not closely monitored based on functional criteria, exponentially increase the risk of adverse events, thereby reinforcing the direct link between prevention strategies and chronic diseases.

CONCLUSIONS

It is important to note that the theory of demographic transition has been instrumental in assessing the components of epidemiology—not only in terms of the clinical prevalence of diseases and health problems, but also beyond a simple analysis—as the foundation for a deep understanding aimed at developing strategies and shaping care for older adults, which is relevant because it is part of social and health public policy.

Health care, as well as the promotion and protection of older adults' health, aims to establish strategies, programs, and services designed to ensure access to medical care, disease prevention, and the overall well-being of this segment of the population.

Aging brings about physical, psychological, and social changes that require specialized care. Therefore, the demographic transition must focus on strengthening health services, promoting the prevention of chronic diseases, facilitating access to medications, promoting rehabilitation programs, and encouraging healthy lifestyles.

In addition to medical care, the social environment must also promote social inclusion, community participation, and the protection of older adults' rights. Combating age discrimination, preventing abuse, and ensuring access to support services contribute significantly to improving their quality of life.

It should not be forgotten that, alongside the training and education of staff who care for this age group, prevention must be considered a priority, in addition to comprehensive and humane care, as well as the development of long-term care systems that meet the needs of those who are dependent or have disabilities.

Finally, epidemiology in the field of aging is an indispensable tool for ensuring that older adults can age in good health, with autonomy, and with dignity. Proper planning and delivery of care not only benefit older adults but also enhance the well-being of families and society as a whole.

REFERENCES

1. Alberich, J. (2015). Demografía y evolución de las poblaciones humanas. Ediciones UIB.
2. Barnett, K., Mercer, S. W., Norbury, M., Watt, G., Wyke, S., & Guthrie, B. (2012). Epidemiology of multimorbidity and implications for health care, research, and medical education: A cross-sectional study. *The Lancet*, 380(9836), 37–43. [https://doi.org/10.1016/S0140-6736\(12\)60240-2](https://doi.org/10.1016/S0140-6736(12)60240-2)
3. Barros, J. (2002). Modelos de crecimiento de la población y transición demográfica. Universidad Autónoma de Madrid.
4. Bayarre, H. (2006). Métodos y técnicas aplicadas a los estudios de población. Editorial Ciencias Médicas.
5. Instituto Nacional de Estadística y Geografía [INEGI]. (2022). Estadísticas a propósito del Día Internacional de las Personas Adultas Mayores (1° de Octubre). [PDF institucional]. https://www.inegi.org.mx/contenidos/saladeprensa/aproposito/2022/EAP_ADULMAY2022.pdf
6. Instituto Nacional de Salud Pública [INSP]. (2023). La salud de los mexicanos en cifras: resultados de la Ensanut 2022. Portal INSP. <https://insp.mx/informacion-relevante/la-salud-de-los-mexicanos-en-cifras-resultados-de-la-ensanut-2022>
7. Omran, A. R. (1971). The epidemiologic transition: A theory of the epidemiology of population change. *The Milbank Memorial Fund Quarterly*, 49(4), 509–538. <https://doi.org/10.2307/3349375>
8. Organización Mundial de la Salud. (2021). Década del envejecimiento saludable: Informe de referencia. Ginebra: OMS.
9. Organización Mundial de la Salud. (2023). Informe de progreso sobre la Década del Envejecimiento Saludable de las Naciones Unidas 2021–2023. Ginebra: OMS.
10. Organización Panamericana de la Salud. (2023). Perspectivas demográficas del envejecimiento poblacional en la Región de las Américas. Washington, D. C.: OPS.
11. Pizarro, A. (2010). Historia de la demografía y las revoluciones poblacionales. México, Editorial Síntesis.
12. Universidad de Granada (2015). Apuntes de Geografía Humana: El estudio de la población y sus modelos teóricos. Servicio de Publicaciones de la UGR.