



Demographic aging in Cuba: Perspectives, evolution and approaches*

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ABSTRACT

Demographic aging in Cuba has brought about substantial changes in mortality and morbidity. Its upward trend and rapid acceleration affect elder care and pose a challenge to public health. This article, covering the period from 1950 to 2015, examines three aspects of this population phenomenon through a positive lens: aging as an achievement, a challenge and a development opportunity; demographic and epidemiologic transitions; and policies and strategies to address it. The overall fertility rate has dropped from 4.01 to 1.45, while life expectancy at birth and life expectancy at 60 have risen from 59.40 to 78.45 years and from 16.04 to 22.58, respectively. The proportion of people in Cuba aged ≥ 60 years is 19.8%. Leading causes of morbidity and mortality have shifted away from contagious infectious diseases to non-communicable diseases. In Cuba, aging is the result of steadily dropping fertility and mortality rates, and negative net migration. The challenge of older adult dependency and need for care is discussed. Although this demographic indicator represents an achievement and a development opportunity, population aging poses a challenge to development and public health. Comprehensive and intersectoral policies and strategies have been established toward mitigating its negative effects.

Keywords

Demographic aging; public health; demographic transition; health transition; public policies; Cuba.

Cuba's aging population is a recurring theme due to changes that have taken place in recent decades. Defined as the increase in the proportion of older adults—generally aged ≥ 60 years—, aging is the result of the combined effects of fertility, mortality and migrations,

which produce significant changes in the population structure (1–3). To explain the aging process, which began with the Industrial Revolution, two theories were formulated: demographic transition and epidemiologic transition (4, 5).

Cuba has the highest aging index in Latin America: 19.8% (6). Fertility and mortality levels in all provinces are as low as those in highly developed countries,⁴ placing Cuba in the “post-transitional phase.” The country's negative migratory flow and low economic development make Cuba's case unique and show that demographic transition can be completed under such conditions (2).

The purpose of this article is to examine aging in Cuba from different analytical perspectives, trace its theoretical foundations, and outline the policy proposed to

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⁴ For the purpose of this article, developed countries are those that have attained a high degree of industrialization, according to main indicators: nominal per capita gross domestic product (GDP) above US\$25 000 in 2005, per capita GDP by purchasing power parity above US\$25 000 in 2005 and human development index above 0.900 in 2004 (<http://www.un.org/en/development/desa/publications/world-population-prospects-the-2012-revision.html>).

address it effectively, in which the health sector plays a major role.

DEMOGRAPHIC AGING IN CUBA: ANALYTICAL PERSPECTIVES

Analysis of demographic aging generally proceeds from its negative effects, such as the growing prevalence of chronic diseases, older adults' dependency and its influence on families and communities, and increased demand for health care (1). These factors create social and health problems that constitute a major challenge for developing countries where lack of resources and preparation for addressing the aging process are compounded by its acceleration due to a negative migratory balance (5, 7).

One would think that in a country with limited resources, the growing demand for high-cost health services would present an insurmountable challenge to society. Add to this the negative economic impact of aging on an older adult who is sick or disabled, and on his or her family. Special care may be needed for years, as well as medicines and other goods and services to mitigate the effects of dependency due to aging (1, 2).

Nevertheless, these elements, which emphasize the negative aspects, are not the only ones that should be considered, because they obscure the positive significance of changes in the population age structure. Analysis of demographic aging should also take into account its positive aspects, since prolonging people's lives is an achievement of humanity as well as an opportunity for socioeconomic development (1, 2).

The United Nations' declaration that aging is not a problem but an achievement, and that it is not merely an issue of safety or social well-being but also of development and economic policy as a whole (1, 7), led to a more positive approach among experts and Cuban authorities. Population aging can therefore be seen as a social achievement, since longevity has been a goal of our species, and its attainment has greatly influenced scientific and technological progress. It is also an opportunity for socioeconomic development if society takes advantage of accumulated experience in preparing younger generations of workers (transfer) by keeping older adults employed in adequate conditions. This population segment also creates new demands for goods and services; meeting these needs

could constitute a source of employment and income (1).

In countries with aging populations, such as Cuba, it is important to consider older adults' capacities and take advantage of these as a source of sustainable development. Social research can help organize this situation so that work conditions are adapted for this population group.

DEMOGRAPHIC AND EPIDEMIOLOGIC TRANSITIONS: EVOLUTION AND PERSPECTIVES

Demographic transition, arising from modernization in industrialized countries since the late 1700s, is the main theoretical reference for explaining the aging process worldwide. This theory explains the shift from high or very high levels of fertility and mortality to low or very low levels, which first occurred in industrialized countries and has now expanded, to a greater or lesser extent, to all countries (4, 8–11).

The demographic transition in Latin America and Cuba

In Latin America and the Caribbean, population aging that began in the 1970s is distinguished by its rapid acceleration compared with European countries (5), especially in Cuba, Argentina, Uruguay, the Dutch Antilles, Barbados, Guadalupe, Martinique and Puerto Rico, in that order. Other countries, such as Haiti, are in the initial stages of this process (2, 5).

The following mortality and fertility indicators are useful for illustrating the evolution of Cuba's demographic transition and comparing it with some developed countries and Latin America.

Overall fertility rate. This indicator trended downward from 1950 to 2015 with differences between countries (12). From 1950 to 1990, in all countries and regions analyzed, population replacement (more than two children per woman, on average) was ensured. From 1990 to 1995, developed countries and Cuba were already below replacement; it is estimated that Latin America will be in a similar situation in 2030–2035. Cuba has had the lowest rate for this indicator since 1990 (Table 1), evidence of the speed with which the country's overall fertility rate has dropped (13, 14).

Life expectancy at birth. Unlike the previous indicator, life expectancy at birth

presented an upward trend from 1950 to 2015, with the best comparative values in Cuba after 1990 (Table 1), although there were variations in countries (12). It is estimated that this indicator, which reflects the average number of years the members of a generation are expected to live, will continue rising in all countries and will surpass age 80 for those born in 2045–2050 (12–14). In 2015, Latin America presented significant advances in life expectancy: for all countries except Bolivia and Haiti, this indicator surpassed age 70 (12, 15).

Life expectancy at age 60. This indicator reflects the average number of additional years that people who reach age 60 are expected to live in a given moment. From 1950 to 1955, it was 15.36 years in Latin America, 16.84 years in developed countries, and 16.04 years in Cuba (Table 1). From 1955 to 2015, it rose, with variations, in the groups of countries analyzed (12–15). This situation is expected to continue, although at a slower pace, in successive decades until 2050. This confirms that the aging process will continue its upward trend.

As a result of these changes, the proportion of the population aged ≥ 60 years has increased in all countries and regions (Table 2): 10 percentage points in Cuba, 4.2 in Latin America and 10.3 in developed countries. Projections to 2030 estimate an increase of 12.7 percentage points in the proportion of older adults in Cuba and 6.9 in the rest of the countries. The proportion will continue rising until at least 2050 (12–15). Already by 2010, more than 15% of the population in Cuba, developed countries and some Latin American countries was aged ≥ 60 years, which is considered advanced aging (2, 12). By 2030, it is estimated that the remaining countries will have entered this category (12–15). Latin American governments should take note of how rapidly this process is occurring, since it will present an enormous social and public health challenge in the next few years.

In 1950, the proportion of people aged ≥ 75 years was small (Table 2). In the period studied, however, it rose to 5% in developed countries, 3.9% in Cuba, and 1.7% in Latin America. This age group is predicted to continue growing until about 2045 (12–15).

Epidemiologic transition

Public health officials must add other factors to this analysis, such as epidemiologic transition (4, 8), which is ongoing

TABLE 1. Historical evolution and projections of fertility, by selected regional and country indicators, 1950–2050

Indicator and period	Comparison group		
	Developed countries ^a	Latin America	Cuba
Overall fertility rate			
1950–1955	2.83	5.86	4.01
1970–1975	2.15	5.02	3.47
1990–1995	1.67	3.02	1.65
2010–2015	1.68	2.18	1.45
2030–2035	1.82	1.90	1.57
2045–2050	1.85	1.83	1.66
Life expectancy at birth			
1950–1955	64.67	51.37	59.40
1970–1975	71.08	61.03	70.98
1990–1995	74.09	68.93	74.79
2010–2015	77.73	74.70	78.45
2030–2035	80.85	79.10	82.44
2045–2050	82.82	81.76	84.31
Life expectancy at 60^b			
1950–1955	16.84	15.36	16.04
1970–1975	18.15	17.52	19.05
1990–1995	20.03	19.36	20.47
2010–2015	22.60	21.86	22.58
2030–2035	24.61	24.09	25.18
2045–2050	25.84	25.60	26.56

^a For the purpose of the article, developed countries are those that have attained a high degree of industrialization, according to main indicators: nominal per capita gross domestic product (GDP) above US\$25 000 in 2005; per capita GDP by purchasing power parity above US\$25 000 in 2005 and human development index above 0.900 in 2004 (<http://www.un.org/en/development/desa/publications/world-population-prospects-the-2012-revision.html>).

^b Average number of years that a person aged 60 can be expected to live in a given period.

Source: Created by the authors based on annual health statistics, birth and death records, and reference 12.

TABLE 2. Historical evolution and projections of the proportion of older adults. Selected years, countries and regions, 1950–2045

Indicator and year	Comparison groups		
	Developed countries ^a	Latin America	Cuba
Percentage of population aged ≥60 years			
1950	11.5	5.6	7.0
1970	14.6	6.3	9.1
1990	17.7	7.3	12.0
2010	21.8	9.8	17.0
2030	28.7	16.7	29.7
2045	31.4	23.0	36.3
Percentage of population aged ≥75 years			
1950	2.4	1.0	1.3
1970	3.4	1.2	1.6
1990	5.4	1.7	3.7
2010	7.4	2.7	5.2
2030	10.9	4.9	9.5
2045	13.9	8.2	15.2

^a For the purpose of this article, developed countries are those that have attained a high degree of industrialization, according to principal indicators: nominal per capita gross domestic product (GDP) above US\$25 000 in 2005, per capita GDP at purchasing power parity above US\$25 000 in 2005 and human development index above 0.900 in 2004 (<http://www.un.org/en/development/desa/publications/world-population-prospects-the-2012-revision.html>).

Source: Created by the authors based on references 12 and 13.

and explains changes in mortality, morbidity and fertility patterns, and in the organization of health services, closely

related to economic conditions (7). This construct continues to be refined in line with new theoretical approaches and the

dynamics of the context in which it is inserted.

Today, demographic and epidemiologic transitions are considered two parts of a continual process in which patterns of health and illness in a society become transformed in response to broader demographic, socioeconomic, technological, political, cultural and biological changes. Therefore, both parts should be analyzed together. This approach includes the transition in health conditions that define a population’s epidemiologic profile (called strict transition or strict epidemiologic transition) and the organized social response to these conditions through the health care system (called health care transition) (8).

In Cuba, chickenpox was the leading cause of morbidity from contagious infectious diseases in 1970–2015, with an overall relative increase of 16.1%. However, year-to-year analysis shows this indicator’s irregular behavior, with an upward swing in 1990, most likely related to the onset of the severe economic crisis the country was suffering, and a sustained decline in 2010 and 2015 (Table 3). Measles was the second-leading cause in 1970, but since 1993, no new cases have been reported. Viral hepatitis held third place at the beginning of the time series analyzed, and although it increased slightly in 1990, there was a marked drop in 2015, with a relative decrease of 96.2% in the period. Mumps held fourth place in 1970, and its incidence declined steadily; no cases have been reported since 2011. Although the tuberculosis rate declined during the period, it remained one of the leading causes of morbidity, while the incidence of syphilis varied during those years. Despite lack of data for the period noted, in 2013, the tuberculosis rate in Cuba was far below rates reported in Latin American countries; only Puerto Rico’s was lower. That same year, Cuba presented very favorable incidence indicators for malaria, dengue, human immunodeficiency virus (HIV) infection and AIDS (14).

Since 1959, childhood vaccination has played a key role in reducing a group of preventable diseases, including those already mentioned. In general, since the 1990s, an absolute and relative decline in contagious infectious diseases has been observed along with a predominance of non-communicable diseases (3, 12–14).

TABLE 3. Morbidity from main contagious infectious diseases.^a Cuba, selected years

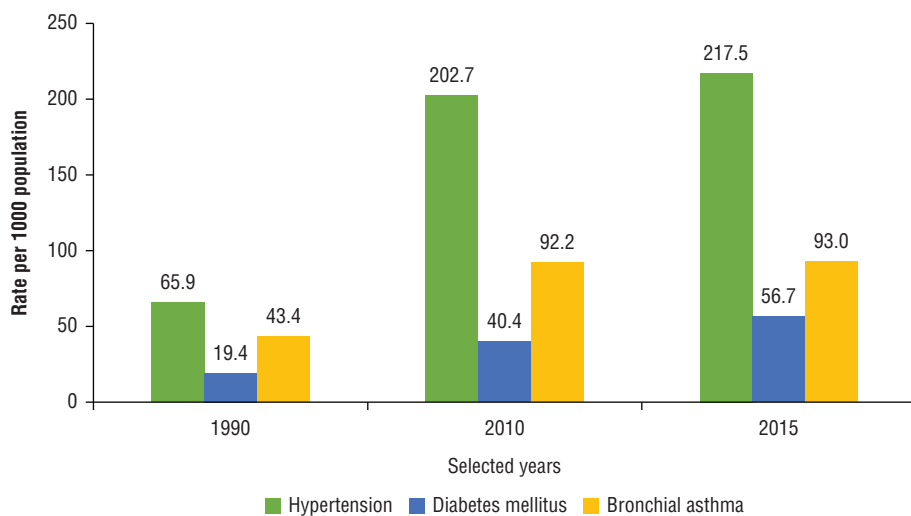
Year and ranking	Cause	Notified cases	Rate ^b
1970			
1	Chickenpox	12 714	148.3
2	Measles	8 911	104.2
3	Hepatitis	8 692	101.4
4	Mumps	2 820	32.9
5	Tuberculosis	2 606	30.5
1990			
1	Chickenpox	37 583	354.4
2	Hepatitis	13 214	124.6
3	Tuberculosis	546	5.1
4	Leptospirosis	517	4.9
5	Meningococcal disease	449	4.2
2010			
1	Chickenpox	32 377	288.1
2	Syphilis	1 445	12.9
3	Hepatitis	1 261	11.2
4	Tuberculosis	782	7.0
2015			
1	Chickenpox	19 330	172.2
2	Syphilis	4 582	40.8
3	Hepatitis	433	3.9
4	Tuberculosis	651	5.8

^a Notified by surveillance system and diagnosis confirmed.

^b Per 100 000 population.

Source: Created by the authors from annual health statistics published by the Ministry of Public Health.

FIGURE 1. Prevalence of main chronic non-communicable diseases. Cuba, selected years



Source: Created by the authors from annual health statistics published by the Ministry of Public Health.

Early prevention of contagious infectious diseases is known to have made a positive impact on life expectancy and also contributed to the growing population of older adults (16). Therefore, preventive vaccines should be administered to older adults affected by immune senescence.

Since 1990, as the population of older adults has grown, prevalence of chronic diseases has increased (Figure 1). From 1990 to 2015, a relative increase of 239.0% was observed in prevalence of hypertension, 192.3% in diabetes mellitus and 114.3% in bronchial asthma (3, 12–14). A comprehensive analysis of Table 3 and

Figure 1 show that as morbidity from infectious diseases was significantly declining, prevalence of chronic diseases was rising. These shifts correspond to the accelerated aging of the Cuban population, and to social and health policies in effect since the mid-20th century, and carried out through health plans and programs (2).

During 1970–2015, the leading causes of death in Cuba remained constant (Figure 2). However, mortality from malignant tumors rose, mortality from heart disease dropped slightly, and mortality from cerebrovascular diseases remained stable. This mortality structure is similar to that of developed countries, where population aging carries significant weight (13).

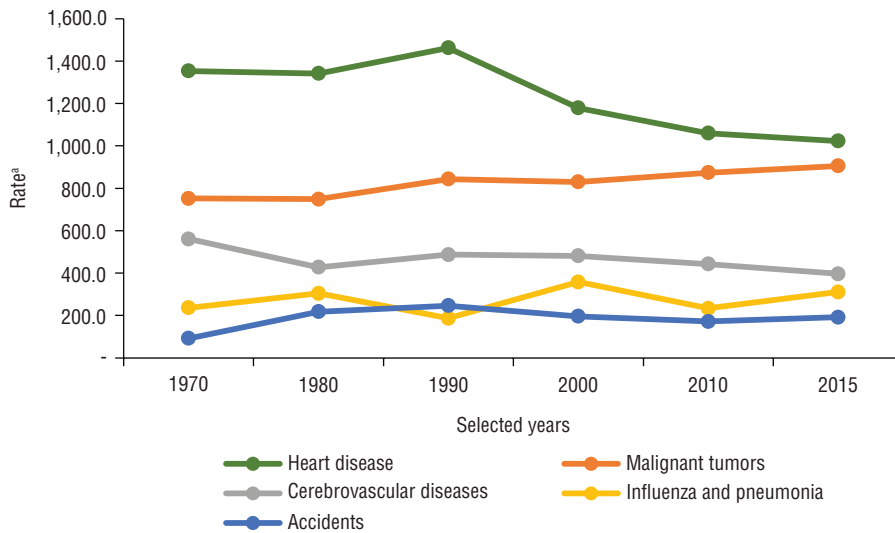
ADDRESSING POPULATION AGING IN CUBA: A PUBLIC HEALTH PERSPECTIVE

Population aging creates considerable economic and social challenges, since the State needs to ensure optimal care for the elderly. This task should be shared by all sectors of society, so that together they contribute to prolonging life and better quality of life.

Cuba’s new economic model prioritizes elder care and includes several guidelines on this topic (17). Since population aging calls for a comprehensive public health response, health systems must be adapted to the needs, expectations and preferences of older adults. Coordinated initiatives involving all sectors and elderly-friendly settings also need to be promoted (18). In health sector policy, the primary health care strategy is considered the basis for achieving healthy aging, setting up community-level long-term and end-of-life care, increasing the number of geriatric services and specialists in the country, and training health professionals in matters of aging.

Growing old in the same place where a person has always lived makes it easier for an older adult maintain ties with their community and social networks. Aging in place can also empower older adults to contribute to society and continue to be active members of their community (19). One of the actions aimed at achieving healthy aging is involving older adults in Seniors’ Clubs, a community initiative that encourages physical activity and dispenses information on healthy life styles, social and cultural activities,

FIGURE 2. Mortality of older adults by leading causes. Cuba, selected years



^aRate per 10 000 population aged ≥60 years.

Source: Created by the authors based on annual health statistics published by the Ministry of Public Health.

social participation and the well-being of its members.

Professionals working in primary care have a set of practical evaluation and treatment guidelines for the most common health problems in the community setting, such as falls, dementia, depression, urinary incontinence, chronic pain and administration of medicines. In 2016, older adults had an average of 1.2 medical check-ups per year, above the accepted standard of one annual check-up.

Aging generates new needs for care that need to be considered in terms of families and social organization. Current approaches favor providing long-term care in diverse settings: the home, community centers, assisted living facilities, hospitals and other health institutions (20). In this sense, caregiver training is another challenge posed by population aging.

Cuba also has Senior Centers providing community-based comprehensive day care for older adults who live alone or without relatives who can care for them during the day and who only have difficulty performing certain daily tasks. In 2016, there were 276 Senior Centers with capacity for 8 217 people (6). Specialized Senior Centers have also been set up to care for older adults with mild to moderate dementia. There are also assisted living facilities providing short-, medium- and long-term institutional care for people with moderate or severe dependency who have no other alternatives in the community. There are 148 assisted living facilities throughout the

country providing residential care to 4.5 of every 10 000 older adults (6).

Responsibility for long-term care, however, falls mainly on family members through primary caregivers, most of whom are women, usually daughters or daughters-in-law with no experience caring for dependent older adults. This can have a negative impact on the quality of care provided and on the caregivers' own health, aggravated by their loss of employment. This situation affects the individual and the family economy, in addition to the social cost, at an estimated 2.2% loss of GDP (21). Traditional economic analysis should include the caregiving economy and the challenges posed by balancing work and family responsibilities (22).

Care and support for primary caregivers is a priority objective of the government's strategy to address aging. Caregiving requires knowledge, skills, values and experience, and it is essential to provide these people with training that enables them to do their job well. Cuba has a psychoeducational program for facilitators called "Caring for those who care for us," which is part of the Primary Caregivers School initiative, based on human resources and infrastructure available in the community. This program combines caregiving strategies with the caregiver's work life, helps develop life skills, encourages self-care and finding ways to reduce the caregiver's load, ensures the rights of older adults and their caregivers, and strengthens

community services and support networks. There are 396 caregiver schools, and a Manual for Caregivers of Dependent Older Adults was produced as complementary educational material with practical information for caregivers.

Currently, health care for older adults accounts for 28% of the primary care work load, 32% of surgery, 43% of medical specialties, and 48% of hospitalizations (21). Health professionals need appropriate skills to meet the health needs and demands of older adults. To that end, basic courses, trainings and certificate courses for professionals in the National Health System have been provided. Subjects covering aging were also added to medical and nursing school curricula.

Ensuring sufficient geriatricians to meet the needs of the older adult population is essential. Currently there are 441 specialists, including doctors training in the specialty, or about 2 specialists for every 10 000 older adults. If other doctors also dedicated to elder care are taken into account, this indicator rises to approximately 5 doctors for every 10 000 older adults, who in 2016 provided 6.6 doctor visits per older adult (6). In Cuban hospitals there are 50 geriatric services with one bed for each 2 000 older adults; in 2016 these services recorded 1.4 hospital admissions per 1 000 older adults (6).

Action protocols have been prepared for this group's main health problems: falls, urinary incontinence, cognitive decline and dementia, immobility, acute confusion, hypertension, heart failure, anemia, chronic obstructive pulmonary disease and cancer. Presently there are 18 specialized services for diagnosis, treatment and rehabilitation of mental and motor symptoms of dementia.

Given the magnitude and severity of dementia, Cuba's Strategy for Alzheimer Disease and Dementia Syndromes was approved (23).

Health care related to aging in Cuba has meant solving the main problems arising from this process (Table 4).

CONCLUSIONS AND RECOMMENDATIONS

Accelerated demographic aging in Cuba, resulting from steady declines in fertility and mortality rates and negative net migration, represents an achievement and an opportunity for development but also poses a socioeconomic and public health challenge.

TABLE 4. Lessons learned in the process of addressing demographic aging in Cuba

Difficulty	Solution
Decline in the number of persons of childbearing age, leading to a higher dependency index, fundamentally at the expense of older adults	<ul style="list-style-type: none"> • Extend the retirement age five years for both sexes • Increase pensions according to years worked • Reemployment options for retirees
Decline in the birth rate below replacement level	<ul style="list-style-type: none"> • Create incentives to increase births through changing laws on maternity, such as extended maternity leave, bonuses, recognized paternity leave, differential benefits depending on number of children
Increased morbidity due to non-communicable diseases	<ul style="list-style-type: none"> • Promote healthy lifestyles through Seniors' Clubs and other measures included in primary health care strategy • Availability of specialized services for this population group, such as comprehensive rehabilitation wards • More geriatric services and specialists at all levels of care • Vertical care programs for the most prevalent non-communicable diseases • "Geriatricize" services^a
Growing number of older adults who are alone or disabled	<ul style="list-style-type: none"> * Improved institutional care for this type of elder (assisted living facility and Senior Centers) • Changes in social services: assign paid caregivers, train informal caregivers (caregivers schools), State-sponsored technical aid, create subsidized services such as meal programs, and implement Cuba's Strategy for Alzheimer Disease and Dementia Syndromes

^aContribute skills related to providing care for the main health problems affecting older adults to other health professionals not specialized in geriatrics, professionals in other sectors, medical students, as well as families and the community, in order to improve comprehensive care for this population group.

Addressing the accelerated aging of the Cuban population involves implementation of comprehensive, context-specific, intersectoral policies and strategies to mitigate the negative effects of the process. The health sector plays a leading role in these, given the repercussions that increased demand for high-cost health services could have on the organization and the quality of services it provides.

Continuing the systematic study and monitoring of aging in Cuba is recommended to obtain necessary evidence for timely and efficient decision-making by health authorities in order to maintain quality services for this population.

Conflicts of interest. None declared.

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RESUMEN

Enfoques, evolución y afrontamiento del envejecimiento demográfico en Cuba

El envejecimiento demográfico en Cuba ha provocado cambios considerables en la mortalidad y la morbilidad; su tendencia creciente y alta velocidad comprometen la atención de la persona mayor, de ahí que sea un desafío para la salud pública. Este artículo, que abarca el período 1950- 2015, tiene como finalidad exponer la situación de este fenómeno poblacional desde una visión positiva, según tres aspectos: el envejecimiento como logro, desafío y oportunidad de desarrollo; las transiciones demográfica y epidemiológica; y las políticas y estrategias para afrontarlo. La tasa general de fecundidad ha descendido desde 4,01 hasta 1,45, y la esperanza de vida al nacer y la esperanza de vida a la tercera edad se han incrementado desde 59,40 hasta 78,45 años y desde 16,04 hasta 22,58, respectivamente. La proporción de personas de 60 años o más en Cuba asciende a 19,8%. El cuadro de morbilidad y mortalidad ha cambiado de las enfermedades infectocontagiosas a las no transmisibles. El envejecimiento en Cuba se ha producido por la reducción sostenida de la fecundidad, la mortalidad y un saldo migratorio negativo. Se discute el reto que significa la dependencia de la persona mayor y la necesidad de cuidados que requiere. Además del logro y la oportunidad de desarrollo que representa este indicador demográfico, el envejecimiento poblacional constituye un desafío para el desarrollo y la salud pública, para el que se han establecido políticas y estrategias integrales e intersectoriales encaminadas a mitigar sus efectos negativos.

PALABRAS CLAVES

Envejecimiento demográfico; salud pública; transición demográfica; transición de la salud; políticas públicas; Cuba.

Abordagens, evolução e enfrentamento do envelhecimento demográfico em Cuba**RESUMO**

O envelhecimento demográfico em Cuba causou mudanças consideráveis na mortalidade e morbidade; sua crescente tendência e alta velocidade comprometem a atenção dos idosos, portanto, é um desafio para a saúde pública. Este artigo, que abrange o período 1950-2015, visa expor a situação deste fenômeno da população de uma visão positiva, de acordo com três aspectos: o envelhecimento como realização, desafio e oportunidade de desenvolvimento; transições demográficas e epidemiológicas; e as políticas e estratégias para enfrentá-lo. A taxa geral de fertilidade diminuiu de 4,01 para 1,45, e a expectativa de vida no nascimento e a expectativa de vida na terceira idade aumentaram de 59,40 para 78,45 anos e de 16,04 a 22,58, respectivamente. A proporção de pessoas com 60 e mais anos em Cuba é de 19,8%. O quadro de morbidade e mortalidade mudou de doenças infecciosas para doenças não transmissíveis. O envelhecimento em Cuba foi produzido pela redução sustentada da fertilidade e da mortalidade, e um saldo migratório negativo. O desafio da dependência da pessoa idosa e a necessidade de cuidados que eles requerem são discutidos. Além da conquista e da oportunidade de desenvolvimento representada por esse indicador demográfico, o envelhecimento da população constitui um desafio para o desenvolvimento e a saúde pública, para o qual foram estabelecidas políticas e estratégias abrangentes e intersetoriais destinadas a mitigar seus efeitos negativos.

Palavras-chave

Envelhecimento da população; saúde pública; transição demográfica; transição epidemiológica; políticas públicas; Cuba.
