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An innovative approach for the evaluation of the third stage of the epidemiologic transition

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Abstract

The aim of this article is to justify an innovative approach to the evaluation of the third stage of the epidemiologic transition. A comprehensive review of the scientific literature on theory of the epidemiologic transition, including its stages and existing classifications, was conducted. In addition, statistical data from the World Bank, the World Health Organization (WHO), and World Data Atlas were analyzed to examine contemporary demographic and health trends.

The results indicate that there are no clearly defined or universally accepted criteria for assessing the third stage of the epidemiologic transition. This lack of methodological clarity limits cross-country comparisons and reduces the analytical and practical value of the concept. At the same time, the precise evaluation of this stage is essential for the formulation of effective socioeconomic policies and for establishing strategic priorities in demography and public health.

Key words: *The Kyrgyz Republic, epidemiologic transition, classifications, evaluation of stages*

INTRODUCTION

Background

The epidemiologic transition theory, proposed by Omran in 1971, was developed to provide a comprehensive approach to interpretation of demographic processes. Based on dynamics of birth and mortality rates in several developed countries he identified three stages of the epidemiologic transition: the age of pestilence and famine, the age of receding pandemics, and the age of degenerative and man-made diseases. The criteria proposed for the third stage include an average life expectancy of the population is 70 years or more, the total mortality rate below 20 per 1000 population, and an infant mortality below 25 per 1000 live births. In this stage, the principal causes of death shift toward chronic noncommunicable diseases (NCDs), as well as road traffic injuries and other types of accidents.

Olshansky and Ault (1986) proposed a fourth stage of the epidemiologic transition, termed "the age of delayed degenerative diseases," based on the experience of the USA since 1980, in which declining age-specific mortality results in a gradual shift of non-communicable diseases to older ages groups.

In 1998 Omran revisited and updated the theory of epidemiologic transition distinguishing between western and non-western models. The western model consists of 5 stages: 1) age of pestilence and famine, 2) age of receding pandemics, 3) age of degenerative, stress, and man-made diseases, 4) age of declining cardiovascular mortality, ageing, lifestyles modification, emerging and resurgent diseases and 5) futuristic stage. According to Omran (1998) the fifth stage may be characterized as the age of aspired quality of life, with paradoxical longevity and persistent inequities. Other scholars have proposed alternative interpretations of this stage. Defo (2014) considers it is the age of aspired quality of life, equity, development, and social justice for all. Gaziano's (2005) suggests that it reflects the age of obesity, physical inactivity, and diabetes, while Olshansky's (1998) defines it as the age of emerging infectious diseases.

Numerous studies indicate that in many regions and countries the epidemiological transition doesn't correspond to Omran's classic model (Liu et al., 1998; Semenova, 2005; Hill et al., 2007; Narh-Bana et al., 2012; Santosa, 2015; Frenk et al., 2018). Data on the epidemiologic transition of the former USSR is particularly controversial. Isupov (2016) considers that the first stage of the epidemiologic transition began in the USSR in 1942-1943. Gavrilov, Gavrilova (2014) suggest that the former USSR passed through all three stages of the epidemiologic transition. In contrats, Vishnevsky (2003) notes that famine in 1930s and 1946-1947s, and high mortality rate of infectious disease indicate that the USSR remained in the first stage of the epidemiologic transition until approximately 1960. Since 1960 the epidemiological transition has varied

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across ethnic groups and republics of the former USSR (Tulchinsky, Varavikova, 1996). Omran (1971) believed that the accelerated model of the classic epidemiologic transition is characteristic of the former USSR and Japan. However, in 1990s in Russia experienced a reversal of the epidemiologic transition (Gaylin, Kates, 1997). At present the regions of Russia are at different stages of the epidemiologic transition and the main challenges of the early stages have not been fully resolved (Shibalkov, 2017). Belarus is described as transforming from the third to the fourth stage of the epidemiologic transition (Antipov, Antipova, 2014), while Moldova has not completed the epidemiologic transition characterized by excess mortality from cardiovascular diseases, cirrhosis, and road accidents (Penina, 2010). It has also been noted that several stages of the epidemiologic transition may overlap in the same country (Wahdan M., 1996). In this context, the conclusion of Guillot et al. (2011) that the Kyrgyz Republic reached the third stage of the epidemiologic transition between 1920 and 1960 remains highly debatable. Overall, the available evidence demonstrates substantial inconsistency and contradiction in the assessment of the epidemiological transition in the former USSR and post-Soviet republics. The development of numerous classifications and models of the epidemiologic transition indicates the complexity of this process (Omran, 1971, 1998; Vallin, Mesle, 2004; Harper, Armelagos, 2010; United Nations, 2012; Marinho et al., 2013; Roth et al., 2015). Each of the proposed classifications and models contributes to better understanding of demographic and epidemiologic transformations, the emergence of new infections and re-emergence of previously controlled diseases and supports the formulation of strategies to prevent their negative consequences in different countries and regions of the world. This article substantiates an innovative approach based on a comprehensive assessment of the epidemiological transition. Such an approach is important for determining priorities in social-economic policy in the field of demography and public health.

Study methodology

The research methodology included a comprehensive review of scientific literature on the epidemiologic transition, of its stages and theoretical models, as well as analysis of data from the World Bank, WHO, Our World in Data and World Data Atlas. To develop criteria for a more accurate assessment of the third stage of the epidemiologic transition a comparative analysis was conducted of key demographic indicators - fertility, mortality, life expectancy - and trends in mortality from infections, cardiovascular and other non-communicable diseases in the Kyrgyz Republic, Moldova, Russia, Thailand, South Korea and Japan. In addition, the total and public health expenditures in selected countries analyzed were studied. The Kyrgyz Republic, Moldova and Russia were selected as post-Soviet republics for comparative analysis. According to Santosa (2015), Japan reached the third stage of the epidemiologic transition in 1970-1974, South Korea in 1995-2000 and Thailand in 2000-2004. These countries were therefore included as reference cases representing different trajectories and timing of transition to the third stage.

Results and discussion

Based on in-depth analysis of the causes of death of the Australian population over the past 100 years Booth et al. (2016) identified 1970 as «watershed» marking the transition from the third and to the fourth stages of the epidemiologic transition. In this context, key demographic and health indicators of the Australian population in 1960 and 1970 are considered as a model of the third stage of the epidemiologic transition. These indicators are compared with corresponding data from the Kyrgyz Republic, Moldova, Russia, Thailand, South Korea, and Japan (see Table 1).

Table 1 – Some key demographic and health indicators of the Australian population in 1960 and 1970 (third stage of the epidemiologic transition (AIHW, 2005)

Indicator	1960	1970
Birth rate per 1000	22,2	19,7
Mortality rate per 1000	8,7	8,6
Fertility, children per woman	3,4	2,7
Life expectancy, year	70,8	71,0
Infant mortality per 1000 live births	20,3	17,8
Maternal mortality per 100000 live births	52,5	20,6
ASMR* from cardiovascular diseases per 100000	320,0	450,0
ASMR from cancer per 100000	193,0	214,4
ASMR from respiratory diseases per 100000	99,8	122,7
ASMR from injury and poisoning per 100000	79,6	83,6
ASMR from infectious per 100000	15,3	9,8
ASMR from tuberculosis per 100000	6,5	2,1

Note - ASMR* - age-standardized mortality rate

Life expectancy at birth in Australia in the third stage of the epidemiologic transition was 70,8 years in 1960 and 71 years in 1970. In contrast, life expectancy in 1960 was substantially lower in the Kyrgyz Republic (56,1 years), Thailand (54,7 years) and South Korea (55,4 years). It was slightly higher in Moldova (62 years), Russia (66,1 years) and Japan (67,7 years) (table 2). These differences indicate that, with respect to life expectancy at birth, the Kyrgyz Republic and the other selected countries had not yet reached the demographic and epidemiologic characteristics associated with the third stage of the epidemiologic transition in 1960.

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Table 2 – Life expectancy (year) in the Kyrgyz Republic and selected countries, 1960-2023 (World Bank Data, 2024)

Country	1960	1970	1980	1990	2000	2005	2010	2015	2023
Kyrgyz Republic	56,1	60,3	62,9	68,3	68,6	68,0	69,3	70,7	72,0
Russia	66,1	68,1	67,0	68,9	65,5	65,5	68,8	71,2	73,0
Moldova	62,0	65,0	65,0	67,6	67,0	67,8	69,6	71,5	71,0
Thailand	54,7	59,4	64,4	70,2	70,6	72,1	74,2	76,1	76,0
South Korea	55,4	62,2	66,0	71,6	75,9	78,2	80,1	82,0	83,0
Japan	67,7	72,0	76,1	78,8	81,1	81,9	82,8	83,8	84,0

In the following decades life expectancy gradually increased in all the countries analyzed. The threshold of 70-year - considered characteristic of the third stage of the epidemiologic transition based on the Australian example - was reached in was reached in Japan in 1963, in South Korea in 1987, in Thailand in 1993, in Moldova in 2010, and in both the Kyrgyz Republic and Russia in 2011 (World Bank Data, 2024).

In Australia, the birth rate was 22.2 per 1,000 population in 1960 and 19.7 in 1970. During the same period, birth rates were higher in the Kyrgyz Republic, Thailand, and South Korea, and lower in Japan (Table 3).

Table 3 – The birth rate in the Kyrgyz Republic and selected countries, 1960-2023 (World Bank Data, 2024)

Country	1960	1970	1980	1990	2000	2005	2010	2015	2023
Kyrgyz Republic	40,7	32,3	31,9	31,5	21,7	21,6	26,7	27,3	21,3
Russia	23,4	14,7	16,3	13,6	9,1	10,6	12,3	13,1	8,9
Moldova	27,7	19,6	21,1	18,6	11,3	10,3	11,1	10,9	10,8
Thailand	42,7	37,8	26,5	19,2	14,5	12,9	11,8	10,8	8,2
South Korea	42,3	29,8	21,3	15,4	12,0	9,7	9,1	8,2	4,6
Japan	17,4	18,7	13,8	10,4	9,1	8,8	8,6	8,0	6,0

The birth rate on average within 19-22 per 1000 population typical for the third stage of the epidemiologic transition based on the example of Australia was observed at different times across the countries studied. In the Kyrgyz Republic this level was recorded in 2000-2005 (21,6 and 21,7 per 1000 respectively). In Russia, comparable values were observed between 1960 and 1970 (ranging from 23.4 to 14.7 per 1,000). In Moldova and Japan, similar levels were documented in 1970 (19.6 and 18.7 per 1,000, respectively), in South Korea in 1980 (21.3 per 1,000), and in Thailand in 1990 (19.2 per 1,000). In the Kyrgyz Republic, however, the birth rate increased to 26,7 and 27,3/1000, in 2010 and 2015, respectively, before declining again by 2023 in line with trends in the other analyzed countries (table 3).

In Australia the average fertility rate inherent in the third stage of the epidemiologic transition was 2,7-3,4 children per woman in 1960-1970. The similar fertility levels were observed in Russia and Moldova in 1960. In contrast, fertility was considerably higher in 1960 in the Kyrgyz Republic, Thailand, and South Korea (5,5 and 6,1 children per woman respectively, Table 4). A fertility of 2,7 children per woman was recorded in the Kyrgyz Republic in 2000, while in South Korea it reached 2,5 children per woman in South Korea in 1980. In Japan fertility had fallen already below replacement level by 1960.

Table 4 – Fertility rate in the Kyrgyz Republic and selected countries, 1960-2023 (World Bank Data, 2024)

Country	1960	1970	1980	1990	2000	2005	2010	2015	2023
Kyrgyz Republic	5,5	5,2	4,4	3,9	2,7	2,6	3,1	3,2	2,8
Russia	2,7	2,0	2,0	1,9	1,2	1,4	1,6	1,8	1,4
Moldova	3,3	2,6	2,5	2,4	1,4	1,2	1,3	1,3	1,7
Thailand	6,1	5,6	3,4	2,1	1,7	1,6	1,5	1,5	1,2
South Korea	6,1	4,3	2,5	1,6	1,3	1,2	1,2	1,2	0,7
Japan	2,0	2,1	1,8	1,6	1,3	1,3	1,4	1,4	1,2

Mortality rate in the range 8,6-8,7/1000 characteristic of the third stage of the epidemiologic transition on the example of Australia was first observed in the Kyrgyz Republic in 1990 (8,4/1000), in Russia in 1960 ((8,3/1000) and in South Korea in 1970 (8,7/1000). In Moldova mortality remained comparatively high throughout 1960-2023 (9,5-14,0/1000). In

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Japan, by contrast, mortality rate was low (6,1-7,6/1000) rising in 2010-2023 (9,3-13,0) (table 5).

Table 5 – Mortality rate in the Kyrgyz Republic and selected countries, 1960-2023 (World Bank Data, 2024)

Country	1960	1970	1980	1990	2000	2005	2010	2015	2023
Kyrgyz Republic	15,7	11,2	9,9	8,4	7,7	7,7	7,1	6,2	4,0
Russia	8,3	8,9	11,0	12,1	15,5	15,7	14,1	12,9	12,0
Moldova	11,6	9,5	10,8	10,4	11,7	12,0	11,8	11,4	14,0
Thailand	13,2	10,1	7,3	5,7	6,9	7,1	7,2	7,4	9,0
South Korea	12,6	8,7	6,9	5,7	5,4	5,3	5,3	5,6	6,0
Japan	7,5	6,6	6,1	6,6	7,6	8,3	9,3	10,1	13,0

An infant mortality rate of 18-20 per 1000 live birth and below characteristic of the third stage of the epidemiologic transition based on the Australian example was registered in the Kyrgyz Republic only in 2015 (19,9/1000). Similar levels of infant mortality rate have been observed in Russia since 1990 (18,4/1000), in Thailand since 2000 (18,7/1000), in Moldova since 2005 (16,8/1000). In Japan infant mortality declined from 30,4 to13,4/1000 between 1960-1970 and in South Korea it decreased from 29,4 to13,2/1000 between 1980-1990 (table 6).

Table 6 – Infant mortality rate in the Kyrgyz Republic and selected countries, 1960-2023 (World Bank Data, 2024)

Country	1960	1970	1980	1990	2000	2005	2010	2015	2023
Kyrgyz Republic	-	87,8	78,7	53,9	42,2	34,1	26,1	19,9	15,0
Russia	-	31,1	23,2	18,4	16,5	11,9	8,9	7,0	4,0
Moldova	-	49,1	39,3	27,5	26,1	16,8	14,7	13,4	14,0
Thailand	103,1	71,0	46,7	30,2	18,7	14,8	11,7	9,3	8,0
South Korea	79,7	47,1	29,4	13,2	6,4	4,8	3,5	3,0	2,0
Japan	30,4	13,4	7,4	4,6	3,3	2,8	2,3	2,0	2,0

A maternal mortality rate in the range of 20.6–52.5 per 100,000 live births was used as a criterion for identifying the third stage of the epidemiologic transition, based on the example of Australia. As shown in Table 7, the maternal mortality rate in the Kyrgyz Republic exceeded this threshold in 2015, reaching 66 per 100,000 live births, but subsequently declined to 42 per 100,000 in 2023. In Russia, this indicator met the criteria for the third stage beginning in 2005 (42 per 100,000 live births), while in the other countries studied, the threshold had already been reached by 2000.

Table 7 – Maternal mortality rate in the Kyrgyz Republic and selected countries, 1960-2023 (World Bank Data, 2024)

Country	1990	2000	2005	2010	2015	2023
Kyrgyz Republic	80	79	82	79	66	42
Russia	-	56	42	25	18	9
Moldova	-	44	34	29	22	19
Thailand	-	43	43	42	38	34
South Korea	-	17	15	15	12	4
Japan	-	9	7	6	5	3

One of the important indicators of the transformation of the epidemiologic transition from one stage to another are trends in mortality patterns from infectious to non-communicable diseases (Omran, 1971). As shown in Table 8, cardiovascular diseases accounted for largest share (58%) of total mortality in the Kyrgyz Republic, and when combined with cancer (11%) and other non-communicable diseases (14%) these conditions amounted to 78% of all deaths. A similarly high proportion of cardiovascular mortality was observed in Russia (55%) and Moldova (59%). In contrast, the share of cardiovascular diseases in total mortality was considerably lower in Thailand (29%), South Korea (36%), and Japan (35%).

The proportion of deaths attributable to infectious diseases was highest in Japan (13%) and the Kyrgyz Republic (10%), whereas in Russia (5%) and Moldova (4%) it was lower. The relatively high share observed in Japan likely reflects population ageing, as infectious causes in older age groups (e.g., pneumonia) remain significant contributors to mortality in advanced stages of the epidemiologic transition (WHO NCD profiles, 2018).

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Table 8 – Proportion (%) of selected diseases and conditions in the overall structure of mortality in the Kyrgyz Republic and selected countries, 2016 год (WHO NCD profiles, 2018)

Country	CVD*	Other NCD**	Cancer	CRD***	Diabetes	Infectious	Trauma
Kyrgyz Republic	53	14	11	4	1	10	8
Russia	55	11	19	2	1	5	8
Moldova	59	13	15	2	1	4	6
Thailand	29	20	23	7	4	6	10
South Korea	36	15	25	6	2	8	8
Japan	35	16	16	4	3	13	9

Note - *CVD – cardiovascular diseases, **NCD – noncommunicable diseases, ***CRD – chronic respiratory diseases

Thus, the presented data show significant differences in the proportion of infectious and non-communicable diseases within the overall mortality structure of countries analyzed indicating that these countries are at different stages of the epidemiologic transition. As noted earlier, Guillot et al. (2013) suggested that the Kyrgyz Republic was in the third stage of the epidemiologic transition in 1920-1960. However, a more detailed analysis shows that by 1960—and even more so in the preceding decades from the late 1920s onward—the Kyrgyz Republic did not meet the criteria for the third stage. Age-standardized mortality rate from cardiovascular diseases in the Kyrgyz Republic increased from 537 per 100000 population in 1990 to 673 in 2000 and to 733 in 2006. It then declined to 693/100000 in 2009 and to 476,9/100000 in 2015 (Ibraimova et al., 2011; Ministry of Health of Kyrgyzstan, 2016). This decline in cardiovascular mortality should not be interpreted as the beginning of the «cardiovascular revolution» and, as an evidence that the Kyrgyz Republic had entered the fourth stage of the epidemiologic transition for the following reasons.

First, the decline was partly associated with significant demographic changes, particularly the large-scale outmigration of ethnic Russians from the Kyrgyz Republic to Russia. Between 1989 and 1999, the proportion of Russians in the population decreased from 21.5% to 12.5%, and by 2009 it had fallen to 8% among men and 9.4% among women. Cardiovascular mortality among ethnic Russians was higher than among the Kyrgyz population (Guillot et al., 2013). Therefore, changes in the population's ethnic composition likely contributed to the observed reduction in cardiovascular mortality.

Second, in Western countries the so-called cardiovascular revolution was the result of a significant increase in public health spending. Increased investment enabled the development and implementation of modern methods of diagnostics, treatment, and prevention of cardiovascular diseases (Vallin, Mesle, 2004). So, in Australia the age-standardized mortality rate from cardiovascular diseases was 830/100000 and 799,1/100000 in 1968 and 1970, respectively, and declined to 152,3/100000 and 137,8/100000 in 2015 and 2017, respectively. (Australian Bureau of Statistics, 2018). Total health expenditure in Australia increased from 4.8% of GDP in 1970 to 7.2% in 1975. Moreover, the public share of total health expenditure rose from 56.7% to 72.8% during the same period (Hilless & Healy, 2001). Between 2000 and 2017, public health expenditure in Australia remained high, ranging from 5.5% to 6.3% of GDP (World Bank, 2018). In contrast, public health expenditure in the Kyrgyz Republic was relatively low during the Soviet period and declined further after the collapse of the USSR, amounting to only 5.9–46.1 USD per capita between 2000 and 2022 (Davis, 1987; World Bank, 2024) (Table 10). Such limited financial resources did not allow for the effective implementation of modern methods of diagnostics, treatment, and prevention of cardiovascular diseases.

Table 10 – Public health expenditures (% of GDP and USD per capita) in the Kyrgyz Republic and selected countries, 2000-2022 (World Bank Data, 2024)

Country	2000	2005	2010	2015	2022
Kyrgyz Republic	2,1* - 5,9**	3,7 – 18,4	3,4 – 30,2	2,6 – 30,4	2,6 – 46,1
Moldova	2,4 – 10,4	2,9 – 41,8	4,6 – 90,9	3,8 – 84,9	4,5 – 258,1
Russia	2,9 – 56,6	2,9 – 217,6	3,0 – 347,4	3,1 – 292,4	4,9 – 761,6
Thailand	1,7 – 34,3	2,0 – 58,2	2,5 – 126,9	2,7 – 160,5	3,4 – 268,9
South Korea	1,9 – 238,5	2,6 – 505,7	3,5 – 810,9	3,8 – 1100,4	5,9 – 1913,8
Japan	5,7 - 2204	6,3 - 2340	7,5 - 3326	9,1 - 3139	9,8 – 3345,3

Note - *% of GDP, **USD per capita

Public health expenditures in Japan reached 5,7% of GDP in 2000 and increased to 9,8% of GDP in 2022. At the same time, the age-standardized mortality rate from cardiovascular diseases in Japan was 7 times lower (73/100000) than in the Kyrgyz Republic and Russia (respectively 476,9 и

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495,9/100000). in 2016 (Ministry of Health of Kyrgyzstan, 2016; Shalnova, Drapkina, 2019; OECD/WHO, 2020).

These data suggest that when public health expenditure reaches and exceeds 5% of GDP, countries gain greater capacity to effectively control non-communicable diseases—particularly cardiovascular diseases—leading to a subsequent decline in mortality from these conditions.

For a more comprehensive and accurate description of the third stage of the epidemiologic transition I propose to use not only the indicators of Australia but also Canada and Spain (table 11).

Table 11 – Demographic data and health indicators of Australia, Canada, and Spain at the third stage of the epidemiologic transition (Canada PHAC, 2014; AIHW, 2017; World Bank Data, 2024)

Indicator	Австралия, 1956 год	Испания, 1964 год	Канада, 1957 год
Life expectancy, year	70,0	70,2	70,0
Birth rate per 1000	22,8	20,9	27,2
Death rate per 1000	9,0	8,7	8,1
Fertility, children per woman	3,3	2,8	3,8
Infant mortality per 1000 live births	22,2	40,3	33,1
Maternal mortality per 100000 live births	60,0	33,1	45 (1960)
ASMR* from cardiovascular diseases per 100000	800	435 (1970)	400
ASMR* from trauma per 100000	83,4	42,9	54,0
ASMR* from infectious per 100000	22,2	22,5	10,2

Note - ASMR* - age-standardized mortality rate

As can be seen from this table the third stage of this process was observed in Canada in 1957 and in Spain in 1964. The life expectancy of the population in these countries ranged from 70 years to 70,2 years, birth rate from 20,9 to 27,2 per 1000, death rate from 8,1 to 9,0 per 1000, fertility rate from 2,8 to 3,8 children per woman, infant mortality from 22,2 to 40,3 per 1000 live births, maternal mortality from 33,1 to 60,0 per 100000 live births, ASMR from cardiovascular diseases from 400 to 800 per 100000, ASMR from trauma from 42,9 to 83,4 per 100000 and ASMR from infectious from 10,2 to 22,5 per 100000. As shown in table 12, despite some differences the given maximum and minimum values of indicators can be recommended as criteria for the third stage of the epidemiologic transition.

Table 12 – The maximum and minimum values of demographic data and health indicators specific to the third stage of the epidemiologic transition

Indicator	Maximum	Minimum
Life expectancy, year	72,7	70,0
Birth rate per 1000	20,6	16,6
Death rate per 1000	8,6	7,3
Fertility, children per woman	3,4	2,2
Infant mortality per 1000 live births	28,8	17,8
Maternal mortality per 100000 live births	33,1	12,4
ASMR* from cardiovascular diseases per 100000	510	430
ASMR* from trauma per 100000	83,6	42,9
ASMR* from infectious per 100000	22,5	8,0

Note - ASMR* - age-standardized mortality rate

As noted above, the Kyrgyz Republic entered the third stage of the epidemiologic transition in 2011 and key demographic data and population health indicators presented in table 13.

Table 13 – Demographic data and health indicators of the Kyrgyz Republic at the third stage of the epidemiologic transition (World Bank, 2024)

Life expectancy, year	70
Birth rate per 1000	21,3
Death rate per 1000	4,0
Fertility, children per woman	2,8
Infant mortality per 1000 live births	23
Maternal mortality per 100000 live births	42
ASMR* from cardiovascular diseases per 100000	543,9
ASMR* from trauma per 100000	59,2
ASMR* from infectious per 100000	38,6

Note - ASMR* - age-standardized mortality rate

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Thus, the use of both maximum and minimum values of demographic and population health indicators allowed for a more precise delineation of the third stage of the epidemiologic transition and demonstrated that Guillot's (2011) assertion that Kyrgyzstan was in this stage during the 1920s–1960s is not supported by the evidence.

The proposed approach to assessing the third stage of the epidemiologic transition may be particularly useful for developing countries facing a double or triple burden of communicable and non-communicable diseases, as well as injuries and external causes. It can support the development of comprehensive socio-economic policies aimed at reducing mortality from these causes.

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