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Issues Of Studying Expected Life In Uzbekistan (On The Example Of The Tashkent Region)

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ABSTRACT

This article reveals the history and practical significance of calculating the life expectancy of the world's population in the World Health Organization (WHO) assessment criteria. Uzbekistan has adopted many laws aimed at socio-economic and demographic development of the country. The impact of these laws is reflected in the stable relationship between the dynamics of quantitative and qualitative characteristics of the population and the parameters of economic and social development. The research work is devoted to the introduction of the indicator of life expectancy (hereinafter LE) of the Republic of Uzbekistan, as an indicator for calculating health insurance.

KEYWORDS

Mortality, demographic process, mortality table, statistics, population, age-sex structure of the population, population census, demographic analysis.

INTRODUCTION

The Life Expectancy Index is the main indicator of the average life expectancy in the countries of the world.One of the key indicators of socio-demographic development. Life expectancy is calculated annually according to the methodology of the United Nations Development Program (UNDP) based on statistical data obtained from national institutions and international organizations, which are accumulated in the Population Division of the United Nations Department of Economic and Social Affairs (UN DESA). The life expectancy index can be calculated separately for women and men,

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reflecting the gender characteristics of this phenomenon [12].

Life expectancy is one of the main indicators of the quality of the health system in the assessment criteria of the World Health Organization (WHO). It has a direct correlation with the indicator of total health care costs. The life expectancy in the world is 67.2 years (65.0 for men and 69.5 for women) according to the UN and 66.57 years (64.52 for men and 68.76 for women). In many countries with low life expectancy, namely Swaziland, Angola, Lesotho, Botswana, Zimbabwe, South Africa, Namibia, Zambia, Malawi, the Central African Republic, Mozambique and Guinea-Bissau, Sierra Leone, the number of HIV-infected is extremely high. The proportion of infected among the adult population of these countries ranges from 10% to 26%. But in developed countries at present, the typical value of life expectancy at birth is approximately 78 years for men, and 82 years for women with small variations [12].

MAIN PART

Death, like birth, is the second most important demographic process. The most important and priority direction of the use of mortality statistics is the tendency to analyze the current demographic situation and measure it. The above cannot be imagined without the use of the life table or survival table. Life tables or life tables are numerical models of mortality that serve to characterize the overall level and age characteristics in different populations. There are different approaches to constructing life tables. In the middle of the 18th century, the Swedish scientists P.V. Vargentin, A. Quetelet, W. Farr proposed using the demographic method of constructing the mortality table [4]. The theoretical foundations of this method were developed by W. Farr. The basis of the above method was constructed on the data of statistics of age-specific mortality and age-sex structure of the population obtained during censuses and current population census. An alternative method for constructing life tables was also developed by R. Beck. His theory included the direct calculation of the indicators of the life table in a situation where the distribution of deaths on the elementary aggregates of the Lexis grid is known. The modern version of the demographic method for constructing mortality tables was developed in the 19th century by the American demographer C. Chan. This method is implemented in special applied packages for demographic analysis.

The first mortality tables were constructed using the death list method [4]. This method is used in the absence of data on the age structure of the population and is based on the following assumptions: a slow change in the number of births, a slow change in age mortality, a closed population. The grouping of the deceased by age is used as the initial statistical data. In this case, the ratio of the number of deaths at age x to the total number of deaths over a certain period of time gives $d_x = M_x / M$. Subtracting d_x sequentially from $l_o = 1$, we obtain the l_x series, and then all the other indicators of the table.

If, with a constant birth rate and mortality rate, the number of birth changes exponentially with the denominator e^k, then to calculate the numbers dying d_x, we obtain the following formula:

$$d_x = \frac{M_x e^{kx}}{\sum_{x=0}^{w} M_x e^{kx}} (1),$$

This method was proposed by L. Euler and used to calculate a number of mortality tables before the appearance of the demographic method [7. 90].

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The so-called demographic method is used to calculate modern mortality tables for the conventional generation. The demographic method for constructing mortality tables assumes the availability of not only data on the distribution of deaths by age, but also data on the age structure of the population.

The initial indicator for calculating tables by this method is the age-specific mortality rate, which is equated to the table age-specific mortality rate. The key point of the demographic method of constructing life tables is the transition from mortality rates to the probabilities of dying life tables.
To switch to tabular die probabilities, use the following formula:

$$q_x = \frac{2n \cdot m_x}{2 + n \cdot m_x} \quad (2),$$

This formula is used under the assumption that deaths are evenly distributed over the age range from x to x + n. You can go to it from the indicators ${}_nL_x$ and ${}_n m_x$. The dependence of ${}_nq_x$ on ${}_n m_x$ is as follows:

$${}_n q_x = \frac{n \cdot {}_n m_x}{1 + (n - {}_n a_x) \cdot {}_n m_x} \quad (3),$$

Where n is the length of the age interval, ${}_n\alpha_x$ – average number of person-years, lived in the interval from x to x + n years who died in this interval.

Taking into account the fact that the survival function is nonlinear throughout its entire length, the American demographer T. Greville proposed in 1943 an adjusted formula for the transition from real mortality rates to the probabilities of death in the mortality table [11]:

$${}_n q_x = \frac{{}_n m_x}{\frac{1}{n} + {}_n m_x * (0.5 + \frac{n}{12} * ({}_n m_x - 0.095))} \quad (4),$$

|Where x is the exact age, n is the length of the age interval (table step), ${}_nm_x$ – age-specific mortality rate reduced to 1, ${}_nq_x$ – the probability of dying in the age range from x to x + n years.

When calculating short life tables, the method of V.V. Paevsky, first implemented for calculating mortality tables for the population of the USSR in 1926 - 1927 [8]. The number of survivors of age x + n is calculated using the following formula:

$$l_{x+n} = l_x \cdot e^{-n \cdot {}_n m_x} \quad (5),$$

Where lx is the number of survivors of age x, and ${}_nm_x$ is the mortality rate in the age range from x to x + n.

RESULTS AND DISCUSSION

A lot of laws have been adopted in Uzbekistan, focused on the socio-economic and demographic maturation of the state. The action of these laws is manifested in a stable localization between the statics of the quantitative and qualitative characteristics of the state of the population and the parametric development of the economy and social sphere. Therefore, demographic forecasts are the basis for building plans for the development of the economy, labor resources, forecasts for the development and functioning of the service sector. Therefore, forecasting demographic development in most cases precedes the development of other types of forecast. Based on statistical data, we will build a table of economic activity (employment) of the Tashkent region. It should be noted that the table of economic activity or employment depends on the table of survival. The first column is the age group. We have the following age groups (up to 16 years old, 16-24 years old, 25-29 years old, 30-39 years old, 40-49 years old, 50-54 years old, 55 years old and older). The next column is the age indicators of economic activity. For example, for returns 40-49, we have an age-related indicator of economic activity equal to

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0.6, and so on for each age. From the table of survival, we use the number of those living to age x and the number of those living at a given age X or a given age group. Next, we get the number of employed model stationary population. For example, the above indicator is at the age of 30-39 the highest. At the end of all calculations, we obtain the average duration of the forthcoming working (economically active) life of the population at age x (see table 1).

Table 1

Table of economic activity (employment) of the Tashkent region [11]

Ages	**Population size**	**Kx3**	**lx**	**Lx**	**Lx3**	**Tx**	**ex**
under 16	0	0	899850	1573022	0	20437	23
16-24	172621	0,4	879450	879077	3516	20437	23
25-29	245892	0,5	582072	581624	2908	16921	29
30-39	360145	0,7	954977	953812	6677	14013	15
40-49	320405	0,6	925193	923094	5539	7336	8
50-54	108044	0,3	442669	440781	1322	1797	4
55 and older	34772,6	0,04	1201521	1187437	475	475	0

The table shows that the average duration of the forthcoming working (economically active) life of the population of Tashkent region is the highest at the age of 25-29 years, and the lowest at the age of 55 and older.

Further, on the basis of statistical data, tables of survival were constructed, taking into account the morbidity of the population of the Tashkent region (appendixes). It should be noted that the final result of the research work is the forecast of the population of the Tashkent region for 2050. To implement the forecast, the age movement method was used. The next step is to analyze the forecast of the population of the Tashkent region for 2050. Using the forecast data, we have compiled the following table.

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Table 2

Analysis of the forecast of the population of the Tashkent region for 2050 [11]

Age contingent	Men	%	Women	%	Both sexes	%	Relative rate of men	Relative rate of women
0-4	1827489	4,5	1636656	4,2	2805550	3,3	2,2	1,9
5-9	1720006	4,2	1443064	3,7	2493748	2,9	2	1,7
10-14	2153594	5,3	1864837	4,8	3994376	4,7	2,5	2,2
15-19	2414456	5,9	2162426	5,6	5205143	6,1	2,8	2,5
20-24	2848231	7	2611563	6,7	6477968	7,6	3,4	3,1
25-29	3280641	8	3052568	7,8	7727148	9,1	3,9	3,6
30-34	3670153	9	3476675	8,9	8316120	9,8	4,3	4,1
35-39	4062969	9,9	3863051	9,9	8218982	9,7	4,8	4,6
40-44	4387688	10,7	4206499	10,8	8093445	9,5	5,2	5
45-49	4469017	10,9	4328557	11,1	8012227	9,4	5,3	5,1
50-54	4159350	10,2	4098911	10,5	7828471	9,2	4,9	4,8
55-59	3711873	9,1	3711873	9,5	7311604	8,6	4,4	4,4
60-64	3101225	7,6	3101225	8	6622200	7,8	3,7	3,7
65-69	2509435	6,1	2509435	6,4	5935184	7	3	3
70-74	1855706	4,5	1855706	4,8	4760917	5,6	2,2	2,2
75-79	1225543	3	1225543	3,1	3530130	4,2	1,4	1,4
80-84	700688,8	1,7	700688,8	1,8	2211375	2,6	0,8	0,8
85-89	301593	0,7	301593	0,8	1061893	1,3	0,4	0,4
90-94	98528	0,2	98528	0,3	373763	0,4	0,1	0,1
95-99	28071,7	0,1	28071,7	0,1	109841	0,1	0	0
100 and more	513,6	0	513,6	0	2480	0	0	0

The table shows that by 2050 in the Tashkent region, people aged 45-49 will predominate in the total share of the male population, and in smaller proportions will be those over 80 years old. In women, most of all will come at the age of 40-44 years. In general, by 2050, the number of 30-34 year olds will increase and the share of 5-9 year olds will sharply fall. By 2050, there will be such a situation that by the age of 50-54 the number of women will be less than that of men, and only at the age of 55 they will be equal. It should be noted that at the age of 5-9 years, both men and women will decline sharply. However, women at this age will decline more (by 0.5% relative to the baseline period).

CONCLUSION

In short, the Republic of Uzbekistan is the leader in Central Asia in terms of life expectancy. This is confirmed by the results of a Global Load Weight Study published by the medical publication The Lancet. According to

the study, Uzbekistan is the leader in terms of life expectancy among Central Asian countries - 73.8 years. Tajikistan is not far behind, where the indicator is 73.7 years. In Kazakhstan, the average age of life is 72.4 years, in Kyrgyzstan - 70.9 years, in Turkmenistan - 70.4 years. The longest average age of life, according to researchers, is in Hong Kong - 84.3 years, Japan - 83.8 years, Italy - 83.5 years. Scientists note that from 1950 to 2017, the life expectancy of men in the world increased from 48 to 70.5 years, women - from 53 to 76 years [14]

Based on this, it can be seen that the currently developed demographic forecasts by government agencies confirm the relevance and significance of demographic forecasting.

The novelty of this study is due to the fact that it presents an analysis of the demographic situation in Uzbekistan, studies the world experience in calculating life tables, taking into account the influence of certain types of causes of death on life expectancy.

The theoretical and methodological foundations of the research were the theoretical concepts of the demographics listed, the works of modern domestic and foreign demographers and other scholars on the basics of demographic forecasting. Based on the above, the relevance of this study is due to the fact that in 2022 it is planned to conduct a population census in Uzbekistan.

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