Features an average life expectancy of the population in the South Kazakhstan region

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Abstract: In this scientific article the author investigates the middle rate of life expectancy as an integrated indicator of estimates and demographic situations. The studies have shown that one of the major factors influencing life expectancy are the negative and positive aspects of the socio-economic situation. Thereby improving the socio-economic situation in the South Kazakhstan region has led to a decrease in age-specific mortality rates and to an increase of life expectancy of the population.
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Actuality of the problem.

Improving of the socio-economic situation in the South Kazakhstan led to the fact that during the period from 2009 to 2013 as an indicator of life expectancy is increased as in the whole region and as major region, indicating a reduction in mortality among children and working-age population.

One of the main indicators of the civilized countries, according to UN and WHO, is the health level and life expectancy of its population. For research works in this area nearly in all modern developed countries, as well as in many developing ones the public and private funds are being spent, which are surpassing spending in other areas (for example, in the United States the health spending is accounted for some 14 percent of the federal budget).

In fact, the total expenses in a modern developed society to "increase the number and to improve the quality of life" are second only to expenditures on armaments and the issue was the main competitor to the military issue in the mentality of developed societies.

Reduced life expectancy concerns mainly the working age, which leads to paradoxical changes in demographics - aging of the population due to the lower life expectancy.

Scientific field that studies the problem of life expectancy and developing quite closely with the biostatistics, is closely related with views of aging. The accurate answers to many questions that are still debated in medical biology, within this scientific direction, thanks to the developed mathematical basis, are received.

Indicator of life expectancy is gaining an importance in assessing the health of the population and its changes in accordance with this biological criterion as mortality [1,2].

However, this figure as calculated in relation to the whole population is entirely dependent on the age structure of the latter. With a low birth rate the overall mortality rate is high not because of that the mortality is high, but because of that in the structure of this region the large proportion of elderly and senile age is high, which determines the high level of rate.

With the high level of fertility and the proportion of older people is reduced, which results in lower death rates. Therefore, changing the overall mortality is caused mainly by changes in the age structure of the population and does not reflect the real changes in their health.

The overall mortality rate is mainly needed for the calculation of natural population growth. To estimate the true changes in health of the population or when comparing health of the population of the individual regions and groups age-specific mortality should be used. However, even in the presence of 5-7 teams (with an interval of 5 years, of which there are 20) it is difficult to detect a single tendency of occurred shifts or differences: for one age group it may be an increase in the indicator, for the other - the reduction or it remains unchanged. There is a need to link and submit all changes by one number. Such single integral indicator of the age-specific mortality rate is the average life expectancy. Higher importance of this parameter is identified with the best health of population, with a higher viability of society.

True changes or differences of all age-specific indicators in a single numeric meter regardless of changes in the age structure of the population can be presented and standardized by the age mortality rates. However, the direct relationship between the life expectancy and age-standardized mortality rates does not exist.

Thus, an increase of age-specific indicators in younger age may be offset by a reduction of them among the elderly population and vice versa.

In addition, reducing of the common standardized mortality can occur only at the expense of reducing mortality among elders. Indicator of average life expectancy in such a situation will not change. This moment reduces the significance of the standardized measure as an integral criterion in assessing the health of the population.

Indicator of life expectancy is more acceptable integral criterion of age-specific mortality rates to assess the health of the population, as its value (increase or decrease) depends mainly on changes in the levels of mortality among children and working-age [3,4].

Thus, according to some authors [5], reducing life expectancy of the male population of regions depends mainly on the increase in mortality in the age group of 20-59 years, the influence of which on the decline in life expectancy is 75.6 %.

With such significance of life expectancy in assessing health its use in health care is very limited and is mainly given to research. It is explained by labor intensive computing of life expectancy by classical method according to the mortality tables, construction of which requires a lot of mathematical conversions and therefore time-consuming.

Aim of the study was to determine the viability of the population of the South-Kazakhstan region in conditions of the transition period to a market economy.

Research methods. The object of the study is the average life expectancy of the South Kazakhstan region population. The South Kazakhstan region is the most populated region with the dynamic economy. Gross national income is increasing annually by an average of 5-6%. There is a growing demand for labour resources, which determines the need for monitoring health status. For this purpose, the most appropriate is the life expectancy of the population.

The particular interest in connection with the abovementioned is paid to the use of a simplified method of calculating the life expectancy, which does not require complex mathematical calculations and available for any level of enforcement and public health institutions.

Table 1. Methods of calculating of the life expectancy (Lo) by the simplified method.

Age groups (R)	**S_R**	**h**	**$S_R$xh**	**ES_{Rx}h**
Till 1 year	15,5	1	15,5	15,5
1	2,3	1	2,3	17,8
2	1,1	1	1,1	18,9
3	0,8	1	0,8	19,7
4	0,7	1	0,7	20,4
5-9	0,5	5	2,5	22,9
10-14	0,4	5	2,0	24,9
15-19	0,8	5	4,0	28,9
20-24	1,2	5	6,0	34,9
25-29	1,6	5	8,0	42,9
30-34	2,2	5	11,0	53,9
35-39	3,1	5	15,5	69,4
40-44	4,6	5	2,3	92,4
45-49	6,7	5	33,5	125,9
50-54	10,0	5	50,0	175,9
55-59	14,1	5	70,5	246,4
60-64	20,4	5	10,2	348,4
65-69	30,2	5	151,0	499,4
70-74	46,1	5	230,5	729,9
75-79	77,6	5	388,0	1940,0
80 years-old and older	162,6	>20		
Whole population	**12.2**			

The method was developed and reported by W. Mey, M. Andreds at Symposium on "Demography and Medicine", which took place 30.09-3.10.86. In Suhl in the GDR. Made numerous comparisons show that the present method gives results that in a high consistent with the traditional classical method. It does not require data on a computer and tabulating mortality and is calculated manually with a minimum expenditure of time. With the help of it, the life expectancy can be calculated for relatively small groups of population and territories and compare in time and territorial aspects. The method is supposed to obtain the age up to which half survives taken as the basis of the population (100, 1000, 10 000 people, etc.).

Initial data for indicating of life expectancy as simplistic and classical method is an age-specific mortality rate [6, 7]. Calculation of age-specific parameters can be carried out for each year, and to avoid lots of groups we can take common age group with 5- and 10 - years intervals.

Let us consider the example of a simplified method calculation of life expectancy for the population of the South-Kazakhstan region for 2013. (Table 1).

In the graph SR the age-specific mortality rates per 1000 people of each age group are given. In the graph (h) a number of age groups for each age interval is shown. In this example, the first five age groups are taken in a year range, and all the rest - in 5 - year-old. In the graph (SRHh) a sum of age related indicators and age-specific interval is presented.

For example, for the age range of 5-9 years, the value obtained in this way is 2.5. In the graph ESR x h a sum of the affixed amount received by gradually adding each subsequent sum to the previous resulting sum is given. Computation is carried out till the age interval (R), in which the extinction of standard population achieved 50%, which is taken as a basis for calculating the age-specific mortality rates. In this example, all the indicators are calculated in ppm, therefore, we look for that age range in which the number of deaths has reached 500. This interval is 70-74. Interpolation in this age range according to the formula below gives us an opportunity to determine that particular age, in which half the population standard population died. In other words, we define an oriented central embodiment of the average life expectancy (Lo) calculations by a simplified method:

Table 2: Life expectancy by regions and districts of the SKR.

Districts and region	***L_0*** **2009-2010**	***ML_0*** **in districts**	***L_0*** **2013**	**$ML_{0\pm}ml_o$ in districts**
Западный регион Области:				
Turkestan	70,9		71,1	
Saryagach	70,0		71,2	
Kentau	70,1	70,4	71,6	71,1±0,008
Otyrar	68,7		70,2	
Turkestan	70,1		71,8	
Central parts of the region:				
Sairam	69,7		70,3	
Ordabasy	69,3	69,8	69,9	70,3±0,003
Shymkent	70,0		70,6	
North–east part:				
Tulkubas	70,4		70,5	
Baidybek	69,6	70,0	70,4	70,5±0,002
South -east part				
Tolebi	69,2		69,3	
Kazygurt	70,0	69,6	69,7	69,7±0,002
South part of the region:				
Maktaaral	69,6		69,5	
Shardara	68,9		68,4	
Zhetysai	67,6	68,6	66,3	68,0±0,015
Saryagash	71,6		71,4	

The main results of the study.

Using the abovementioned method, we determined the average life expectancy level in the districts for 2013 and a number weighted in the SKR (Table 2). The lowest rates of life expectancy are: in the southern (68,0 ± 0,015 years) and in the south-eastern areas of the region- (69,7 ± 0,002 years), and in the regional section of the lowest rate applies to Tolebi district – 69,2 years. The highest life expectancy is in the western region of SKR (71,1 ± 0,008 years). The exception is the Ordabasy district where the average life expectancy was only 68,7 years (in the central region - 70,3 ± 0,003, and in the north-east -70,5 ± 0,002 years). The highest figure (71.8 years) was in the Turkestan district (see Table. 2). In assessing the significance of differences between the average life expectancy by regions a high statistical significance of the differences between all regions is (the risk of error is less than 0,0001). To study the dynamics of the average life expectancy in the area of the South Kazakhstan region, we used the same data for 2009-2010, calculated by the classical method. These data showed that in a relatively short period of time the average life expectancy as in the whole SKR and the major regions increased (see Table. 2), indicating a decline in age-specific mortality rates in children and working age. In the south-eastern region, it has not changed, and even in the Kazygurt district it is decreased from 70,0 to 69,7 years.

It should be noted that the overall mortality rates in all areas of the SKR for the above mentioned period increased and standardized indicators for age did not change or increased slightly. Consequently, the improvement in life expectancy for this period indicates about its greater sensitivity. The purpose of health care is to reproduce healthy generations, both in quantitative and qualitative terms. In this regard, from all demographics of health the life expectancy is most acceptable.

Conclusion

Indicator of the average life expectancy as an integral indicator of the component age-specific mortality more accurately describes the viability of the population at the definite point of time, or on the value of this index and its dynamics - the main influence makes the mortality of the working-age population.

Therefore, when evaluating and comparing demographic situation in order to identify existing in them positive and negative moment, the main role is certainly played by the average life expectancy.

The differences in life expectancy by region is affected by many factors, the combined effect of which should be dealt with the specialized institutes and research institutions.

Improving the socio-economic situation in the South Kazakhstan region has led to a decrease in age-specific mortality rates and to an increase of life expectancy of the population, both in the districts and in the region.

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