UDC616.127-036.8-055.2:574.24(470.67)

Relative risk of death from heart attack myocardium of the female population of ecological zones of the Republic Dagestan

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Objective: analysis of the relative risk (RR) of death from myocardial infarction (MI) among women of ecological zones of the Republic of Dagestan (RD).
Materials and methods: Epidemiological study of all cases of death from MI among women of RD for 2002-2011 was held taking into account the place of residence
Results: An analysis of the RR of mortality in the high-altitude zones indicates that the foothills and mountains of the Republic of Dagestan are areas of increased risk of death from MI among female population, however, in the plain the similar indicator is insignificantly lower.The highest mortality rate from MI among women was registered in the south of the mountain ecological zone (9.1 cases per 100,000 female population) with RR 1.4.These data can be considered as evidence of the effect on the risk of death from myocardial infarction among the female population of a sharply continental climate in the south of the mountains, characterized by high-altitude hypoxia, affecting the oxygen supply processes of the myocardium.
Conclusion: The territory of increased relative risk death from myocardial infarction among the female population of rural areas is the high-mountainous regions of the southern mountains of the Republic of Dagestan.

Keywords: woman, myocardial infarction, relative risk, mortality

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For citation: Ibrahimova SS, Magomedova UA. Relative risk of death from myocardial infarction of female population of ecological zones of the Republic of Dagestan. Environmental medicine. 2018;1(1):14-20. DOI: 10.34662/EM.2018.1.1.14-20
Translated from Ecologicheskaya Medicina. 2018. vol. 1, N. 1(1), pp.17-23.
Translated by Kakvaeva S.B

Among the causes of mortality in Russia, as in most developed countries, circulatory system diseases dominate. It should be noted that the death rates from circulatory system diseases are characterized by significant fluctuations in the regions of the Russian Federation [11].

In recent years, there has been a decrease in mortality from circulatory system disease among the male and female population of the Russian Federation, however, at the beginning of this century, its indicators significantly exceed those for men and women of the economically developed countries of the European Union. So, if at the end of the twentieth century, these figures were twice as high, then, at present, they are eight times higher. It should be noted that the death rate from myocardial infarction, by contrast, tends to increase. So, for the period 2002-2009. Mortality rates from myocardial infarction were raised among the male population from 52.3 to 55.9, and in the female population, to a large extent, from 34.9 to 41.1 [7, 8, 10].Traditionally, coronary heart diseaseis considered as a disease of middle-aged men, which often leads to an underestimation of the risk of this disease in women. The peak incidence occurs at the age of 65-75 years, but in recent years there has been an increase in the incidence of coronary heart disease in women of fertile age [3, 5, 12].

Coronary heart diseasekills one out of four women, compared with one in thirty who die from breast cancer, 23% of women die within one year after myocardial infarction and 46% of women who have suffered a myocardial infarction are disabled due to heart failure, which develops within six years after suffering a myocardial infarction [14, 15].Climate-geographical features of morbidity and mortality from myocardial infarction in the Russian Federation

were considered in separate studies, but their results are often quite contradictory [4, 6].

Purpose: Analysis of the relative risk of death from Myocardial Infarction among the female population of various ecological zones of the Republic of Dagestan.

Material and Methods

When analyzing the work, death certificates (form No. 106 / y-98) for 2002-2011 were used.

The statistical processing of the materials was carried out by means of software based on MS Acces 2.0 and MS Excel 2003. In the calculations, the annual population size data of the State Statistics Committee of the Republic of Dagestan were used. Myocardial infarction mortality rates were calculated per 100,000 populations (intensive indicators).

Intensive death rates from Myocardial Infarction were calculated over the periods of 2002-2006. and 2007–2011, as well as over a ten-year period (2002–2011) for individual ecological zones, the whole s / m and the taxiways. The characteristics of the average annual and average annual rates of mortality from heart attack, the confidence limits of the average long-term intensive indicators, the indicators of the average annual growth rate, trend, and its errors were obtained [2].

The relative risk of death from heart attack associated with the place of residence was calculated according to Fletcher with an indicator of statistical significance. If the Relative Risk is 1, then the indicator indicates a lack of communication between the place of residence (RD - OR-1, s / m - OR-2) and the risk of death from a heart attack. With a relative risk of more than 1 - living in this area increases the risk of death from heart attack. With a relative risk of less than 1, the risk of death among women from heart attack in this area is lower than in the territory of comparison.Taking into account the diversity of climatic and geographical conditions in rural areas of the Republic of Dagestan and differences in the quality of the ecosystem of the population, the intensity of the impact of natural and anthropogenic environmental factors, the rural areas of Dagestan were grouped by ecological zones [9].

The territory of the rural area along the east-west axis, which is 216 km long, consists of the flat, foothill, and mountain ecozones of the EZ; along the north-south axis with a length of 420 km - the northern, central (valley) and southern Ecological Zone. On the territory of the northern and southern ecological zones there are 3 high-altitude belts - plain, foothills and mountains.

For the plain of Dagestan, a temperate continental climate is characteristic. Mountain Da-Gestan is distinguished by a sharply continental climate in the area of watershed ridges and plateaus, the continental climate is in the area of inter-mountain basins. The climate of the mountains in the area of the mountain ranges is severe with cold and long winter, late spring, short and wet summer [1, 13].

Results and its discussion

The data in Table 1 indicate that the average annual mortality rates for Infarction of the female population of RD are characterized by an increase over the period 2007-2011. compared with 2002-2006. by 8.6%. The increase in the average annual mortality rate of IP was registered in the north and south of the foothills, in the southern EZ. For both five-year study periods, the highest Intensive Infarct Mortality Rate among women was registered in the south of the mountain ehz. Scope of fluctuations of the average annual mortality rate from the Myocardial Infarction of the female population for the period 2007-2011 amounted to 4.3 times (from 2.1 in the north of the mountain EZ to 9.1 in the south of the mountain EZ). The highest mean multiyear mortality rate due to myocardial infarction, noted in the south of the mountain ez, is 3.5 times higher than the smallest figure in the south of the run ecozones. The mid-term Intensive Infarct Mortality Rate among the women of six ecozones exceeds the same indicator in the rural area of the Republic.

Throughout the country and the four ecozones, the average annual rate of increase in mortality from heart attack among the female population is represented by negative values. A positive average annual growth rate was observed in the territory of the seven ecozones, with the highest in the south of the lowland EZ. Throughout the entire rural area of the Republic of Dagestan and the five ecozones, there is a negative trend that does not have statistical significance.

The results of the study show that the rate of death from heart attack among women throughout the rural RD is lower than that of RD.

In rural ecozones, the largest relative risk-1 for the female population was observed in the south of the mountain EZ, the smallest - in the south of the lowland EZ, the magnitude of fluctuations in indicators was 3.7 times (Fig. 1).

The most prosperous in terms of relative risk is 1 death from infarction for the female population in the south of the plain EZ, the north of the mountain and the whole of the plain EZ, in whose territory the relative risk is -1 lower than the equivalent indicator for the country.

Of the 11 ecozones, only in the south of the mountainous ecozone of Risk Ratio-1 death from myocardial infarction of the female population exceeds a similar indicator in the republic.

The data presented can be considered as evidence of the impact on the risk of death from heart attack among the female population of the sharply continental climate in the south of the mountain ecozone, characterized by daily temperature fluctuations (day-night), low atmospheric pressure, low oxygen partial pressure affecting oxygen ensure myocardium.

Table 1. The average annual and mean annual mortality rates from myocardial infarction of the female population in the ecozone of the rural area of Dagestan

Ecological zones	2002-2006	2007-2011	2002-2011	Confidence limits		Average annual rate of growth.	Trend	Trend error
				Upper	lower			
Plain	4,0	3,5	3,7	1,9	6,0	2,7	-0,07	0,13
Piedmont	4,8	5,7	5,3	2,3	9,3	11,9	0,21	0,21
Mountain	4,6	4,1	4,3	2,3	7,0	-7,4	-0,13	0.14
North Plain	5,1	4,2	4,6	1,9	8,6	-3,2	-0.17	018
Center Plain	4,5	3,2	3,8	0,7	9,1	4,4	-0,16	0,22
North foothill	4,8	5,7	5,3	1,5	11,4	11,9	0,31	0,22
North Mountain	3,7	2,1	2,9	1,1	5,6	-13,1	-0,30	0,08
South Zone	4,4	5,6	5,9	2,7	8,0	5,9	0,18	0,14
South plain	2,0	2,6	2,3	0,3	6,2	14,7	0,14	0,20
South foothill	4,7	5,8	5,2	1,5	11,4	11,7	0,12	0,36
South Mountain	6,9	9,4	8,1	3,1	15,5	-0,8	0,33	0,35
Countryside	4,4	4,2	4,3	2,9	5,8	1,1	-0,03	0,08
The Republic of Dagestan	5,8	6,3	6,0	4,4	7,8	-1,9	0,01	0,12

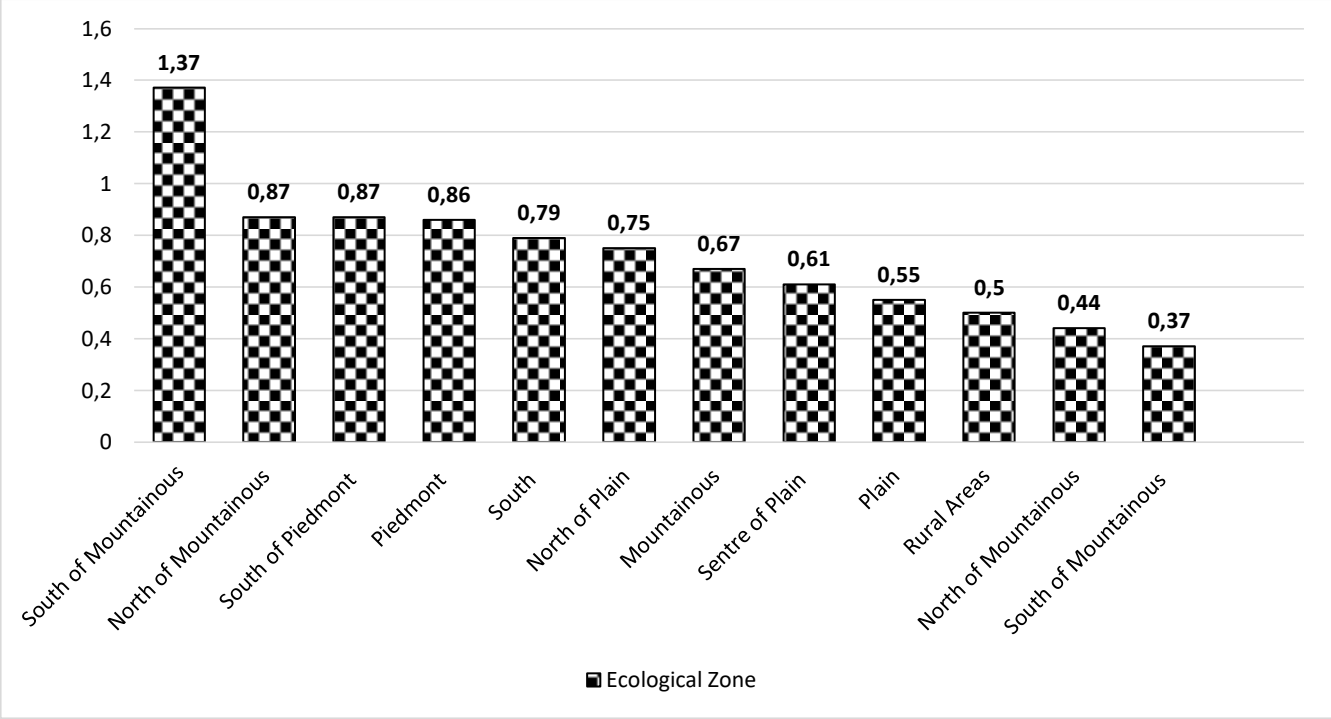

Figure 1. Ranked Indicators of Relative Risk-1 death from a heart attack of the female population in the ecological zones of rural areas RD.

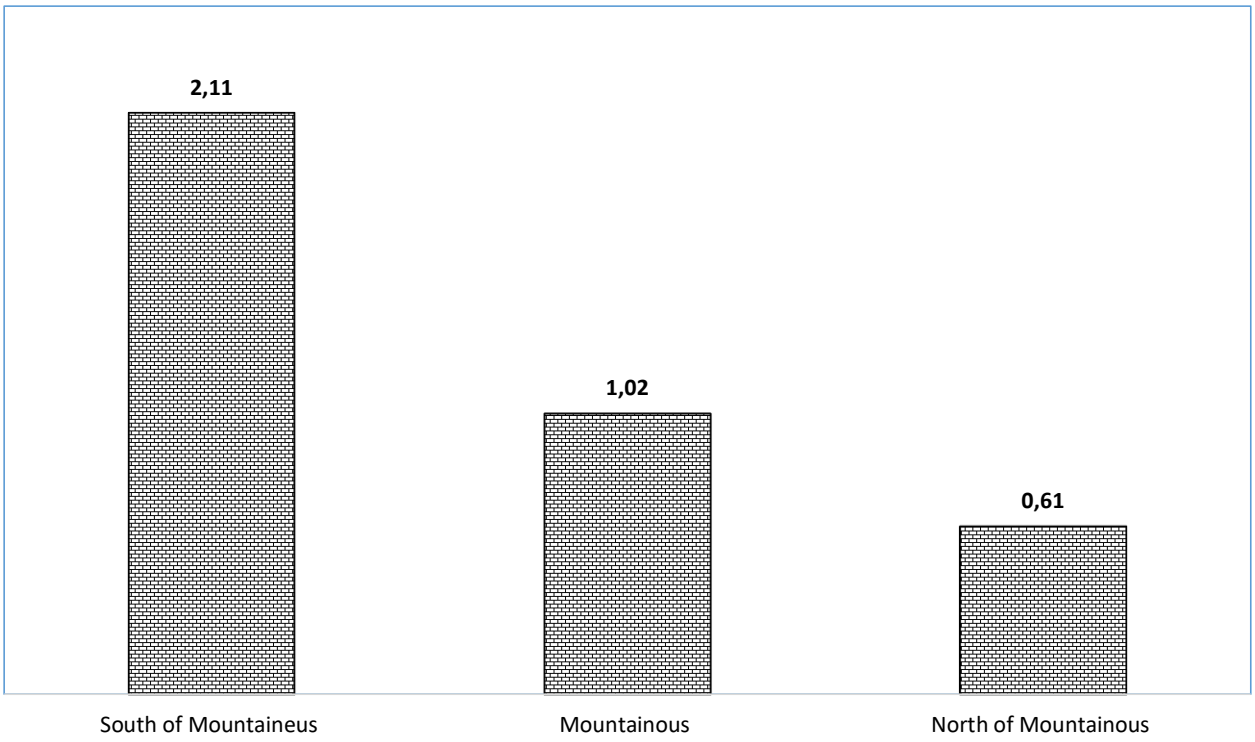

Figure 2. The ranked indicators of relative risk-2 deaths from MI of the female population of the mountainous ecozone of the RD countryside.

A detailed consideration of the relative risk-2 indicator in the high-altitude zones of the mountain ecozone indicates that the south of the mountain ehz is a territory of increased risk of death from myocardial infarction among the female population with a relative risk of 2 - 2.11 (z - 1.64), at the same time in the north of the mountain EZ, the similar indicator (0.61; z - 1.28) is statistically insignificantly lower than the death rate from heart attack in rural areas of the Republic of Dagestan (Fig. 2).

From the foregoing, it follows that in the territory of the mountain ecozone, the indicators of relative risk-2 differ in polar directions. Significant fluctuations in the relative risk-2 in the mountainous ecozone of rural areas indicate the need to study the relative risk at the level of areas of the mountainous ecozone of the rural areas of the republic.

Consideration of the relative risk of death from myocardial infarction at the level of administrative territories in rural areas is a fairly-informative indicator that objectively reflects the probability of death from infarction in individual areas.

The data presented in Figure 3 allow us to designate administrative territories of an increased risk of death from heart attack, which is an important aspect in planning and implementing a set of targeted measures to reduce death from heart attack.

In 9 out of 22 districts of the mountainous ecozone of rural areas, the relative risk of 2 deaths from heart attack among the female population exceeds that of the rural areas of the Republic of Dagestan, with the highest risk of death being noted in Akhty, Kulinsky, Rutul, Hunsakh areas. All of the above areas, except for Khunzakhsky, are located in the south of the mountain ecozone.

The maximum relative risk-2 of death from heart attack, registered in the Akhty region (3.27; z - 1.32), is 13.6 times higher than the minimum OR-2 in the Gergebil region (0.24; z – 0 26). In the Untsukulsky and Charodinsky districts of the mountain EZ of the countryside for the period 2002-2011 not a single case of death from heart attack among the female population.

The lowest rates of OR-2 deaths from heart attack among women were found in the Tsuntinsky, Gumbetovsky, Botlikhsky, Aku-Shinsky, Gergebilsky regions.

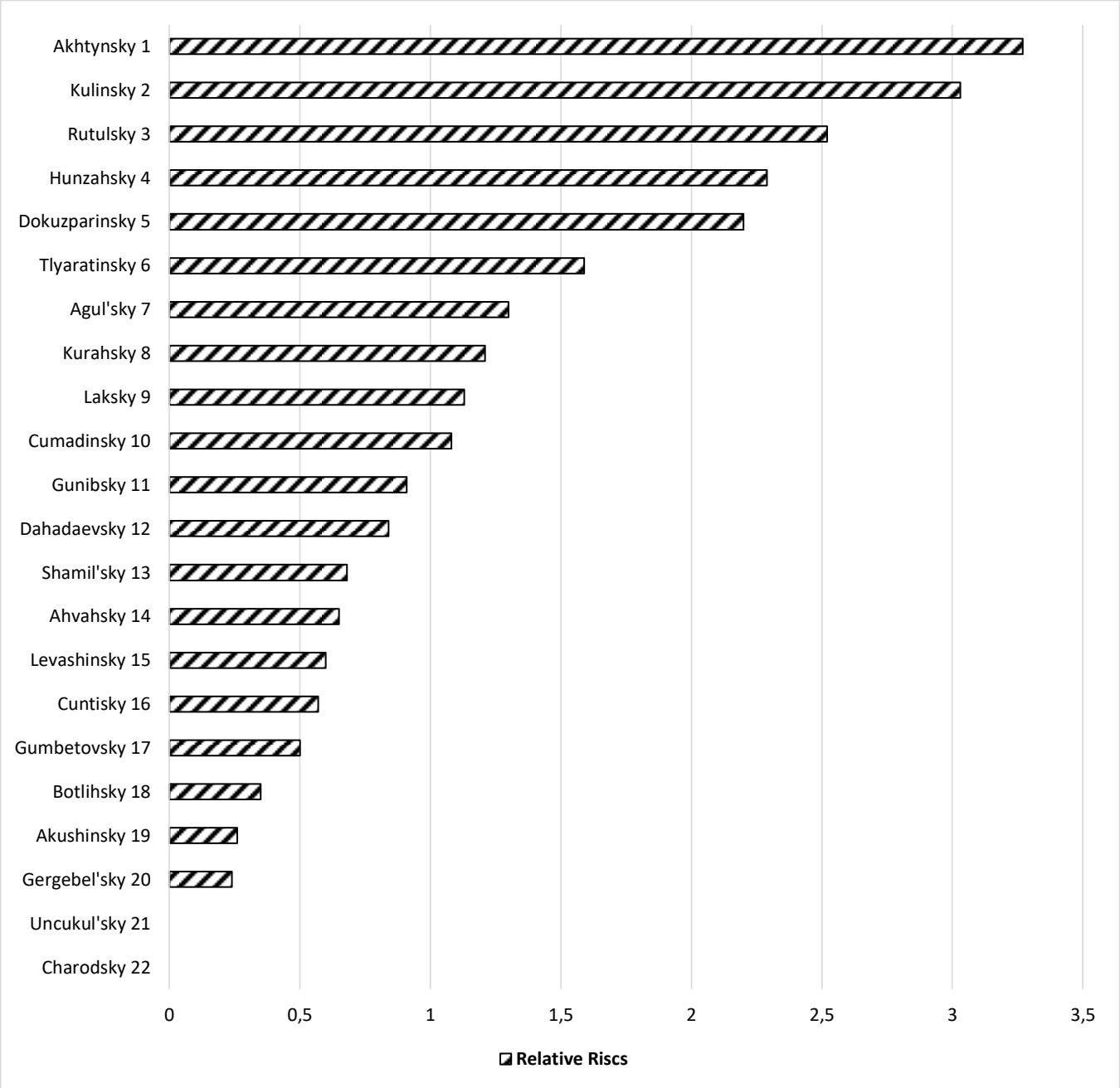

Figure 3. Ranked indicators of relative risk-2 deaths from a heart attack of the female population of the administrative districts of the mountainous ecozone of the RD countryside.

Conclusions

1. The risk of death from heart attack among the female population of the entire rural area of RD is less than that of RD.

2. Indicators of the relative risk of death from heart attack among the female population are characterized by significant fluctuations in the ecological zones of the rural area of the Republic of Dagestan.

3. The south of the mountain ecozone is a territory of increased relative risk of death from heart attack among the female population of the rural districts of the Republic of Dagestan, which is explained by ecological and hygienic features of this ecozone. The south of the plain ecozone, the north of the mountainous ecozone, the plain ecozone is relatively safe in terms of relative death from heart attack among the female population.

4. On the territory of the mountainous ecozone of the rural area of the Republic of Dagestan administrative districts of increased risk of death from heart attack among the female population are the Ahtynsky, Kulinsky, Rutulsky, Khunzakhsky, Dokuzparinsky districts.

Information on financing and conflict interest

The authors declare the absence of overt and potential conflicts of interest related to the publication of this article.

The conducted search and analytical work on the preparation of the manuscript was carried out on the personal funds of the authors of the team.

Participation of the authors: the concept and design of the research – S.S Ibrahimov; collection and processing of materials – U.. Magomedov; analysis of the data, writing a text, text editing - S.S. Ibragimova.

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