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REGIONAL SPECIFICS OF THE LEVEL AND STRUCTURE OF MORTALITY CAUSES AMONG WOMEN OF REPRODUCTIVE AGE IN AZERBAIJAN

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The observation was carried out in 11 districts. The frequency (level) was determined mortality of 100,000 women of the corresponding ages and the proportion of causes of death (per 100 deaths from all causes).

In the regions of Azerbaijan, the indicator ranges from 44.4±7.4 to 79.2±7.8‰ and differs from each other (p=0.05). The lowest mortality rate was observed in the Absheron and Mountainous-Shirvan economic regions. When comparing the indicators of the regions with the lowest mortality rate, Shirvan-Salyan (79.2±7.8‰), Ganja-Dashkesan (72.5±6.8‰), Gazakh-Tovuz (67.4±6.2‰), Karabakh (67.5±7.3‰), Central Arran (57.6±5.6‰), Mil-Mugan (62.8±6.9‰) and Astara-Lankaran (59.0±4.9‰) economic regions. With the age of women, the risk of mortality increases, its lowest level was at the age of 15–19 years (22.9±3.5‰ total by region, 9.05±5.2–34.6±1.31‰ the range of fluctuations is in certain regions), and the largest is at the age of 40–49 years (respectively 118.9±5.9‰; 80.5±11.2–172.9±23.1‰).

Key words: regional specificities, level, structure, cause of mortality, women of reproductive age.

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РЕГІОНАЛЬНІ ОСОБЛИВОСТІ РІВНЯ ТА СТРУКТУРИ ПРИЧИН СМЕРТНОСТІ ЖІНОК РЕПРОДУКТИВНОГО ВІКУ В АЗЕРБАЙДЖАНІ

Спостереження проводилося в 11 районах. Визначалися частота (рівень) смертності на 100 тис. жінок відповідного віку та частка причин смертності (на 100 випадків смерті від усіх причин). У регіонах Азербайджану показник коливається в інтервалі від 44,4±7,4 до 79,2±7,8‰ і відрізняється один від одного (p=0,05). Найменший рівень смертності спостерігався в Абшеронському та Гірсько-Ширванському економічних районах. При парному порівнянні показників регіонів з найменшим рівнем показника смертності високим рівнем відрізнялися Ширван-Сальянський (79,2±7,8‰), Гянджа-Дашкесанський (72,5±6,8‰), Газах-Товузький (67,4±6,2‰), Карабахський (67,5±7,3‰), Центрально-Арранський (57,6±5,6‰), Міл-Муганський (62,8±6,9‰) та Астара-Ленкоранський (59,0±4,9‰) економічні райони. З віком жінок збільшується ризик смертності, найменший рівень її становив у віці 15–19 років (22,9±3,5‰ загальний по регіонах, 9,05±5,2–34,6±1,31‰ інтервал коливання в окремих регіонах), а найбільший у віці 40–49 років (відповідно 118,9±5, 9‰; 80,5±11,2–172,9±23,1‰).

Ключові слова: регіональна особливість, рівень, структура, причина смертності, жінка репродуктивного віку.

The death of women of reproductive age has serious consequences for society. Modern achievements in the field of medicine do not contribute to reducing the burden of this problem even in economically developed countries. In the USA, from 1999 to 2019, the mortality rate of women aged 15–44 years increased from 86.5 to 89.4‰ [3]. Accidents, suicides and homicides occupy the leading places in the structure of causes of death. Maternal mortality in this country is unusually high compared to other rich countries [7]. Underdeveloped countries are characterized by a high risk of both maternal and reproductive mortality from all causes [2, 8]. Many researchers believe that this situation is primarily due to the influence of socio-economic factors [4, 7]. Legislation on abortion, which provides for certain restrictions in certain states of America, has a significant impact on the risk of mortality in the reproductive age [5]. Factors of female reproductive function, especially the young age of menopause, also increase the risk of mortality [8]. These problems are particularly worrisome for the rural population [9]. The uneven mortality risk of women of reproductive age occurs in the United States of America [3, 10]. In recent decades, inequality in access to health care has been deepening in the post-Soviet countries, including Azerbaijan. Suffice it to note that according to the State Statistics Committee in Azerbaijan, the provision of healthcare resources to the population in the capital (Baku) is more than 3 times higher than in the regions. Therefore, studying the consequences of such a disparity in the availability of health care is important for determining health priorities.

The purpose of the study was to establish the level and nosological structure of the causes of mortality of women of reproductive age in the regions of Azerbaijan.

Materials and methods. The study was conducted in accordance with the requirements of the Helsinki Declaration, its program and plan were approved by the Ethics Committee of the Azerbaijan State Advanced Training Institute For Doctors named after A.Aliyev (Protocol No. 7 of November 20, 2019). The unit of observation was a medical death certificate, and all deaths of women aged 15–49 for 2020, 2021, 2022, and 2023 were analyzed comprehensively. The total number of analyzed documents was 5,968,

which were distributed by economic regions (Absheron, Astara-Lankaran, Shirvan-Salyan, Sheki-Zakatala, Gazakh-Tovuz, Mil-Mugan, Guba-Khachmaz, Mountainous Shirvan, Ganja-Dashkesan, Karabakh, Central Aran), by age groups (15–19, 20–29 30–39, 40–49, 15–49) and for causes of death (in accordance with ICD-10 classes). The frequency (level) was determined mortality of 100,000 women of the corresponding ages and the proportion of causes of death (per 100 deaths from all causes). The standard error was calculated for these intensive and extensive indicators. The regional mortality rate was assessed by the Pearson criterion (chi-squared). The critical value of statistical significance was assumed to be $p \geq 0.05$. The relevant observations were carried out in the city of Baku and these data were used for comparison with the regions. The relative mortality risk was determined by the ratio of mortality rates in the regions to the total mortality rate by region (conditional non-exposed group). The standard error was also determined for the relative risk.

Results of the study and their discussion. The mortality rate of women of reproductive age was 63.5±2.2 per 100,000. The indicator was lower in adolescents (19 years and less) (22.9±3.5 per 100,000). The maximum mortality rate was observed at the age of 40–49 years (118.9±5.9 per 100,000). The mortality rate of women of reproductive age is shown in Table 1.

Table 1

Mortality rate of women of reproductive age in the regions of Azerbaijan (per 100,000 women)

Age, years / Regions	15–19	20–29	30–39	40–49	15–49
Absheron	11.7±5.8	16.4±5.4	48.8±7.5	80.5±11.2	44.4±4.3▼
Astara-Lenkoran	9.0±5.2	38.9±7.7●	59.7±8.6●	105.1±12.9	59.0±4.9●
Shirvan-Salyan	34.1±13.9	27.1±9.0	67.9±12.2●	172.9±23.1●	79.2±7.8▲●
Shaki- Zakatala	34.6±13.1	19.2±6.8	50.3±9.5	103.3±15.9	53.7±5.8
Gazakh-Tovuz	17.6±8.8	36.8±8.9	64.4±10.3●	128.8±17.1●	67.4±6.2●
Mil-Mugan	27.0±12.1	28.9±9.1	70.7±12.7●	107.0±17.8	62.8±6.9●
Guba-Khachmaz	25.3±11.3	27.6±8.7	46.4±9.9	139.5±20.1●	61.2±6.6●
Mountainous Shirvan	24.9±14.3	36.0±12.7	29.3±10.4	86.9±21.1	44.4±7.4▼
Ganja-Dashkesan	24.2±10.8	57.2±12.2●	65.2±11.0●	121.5±17.3●	72.5±6.8●
Karabakh	21.3±10.6	41.3±11.0	81.4±13.7●	104.5±18.2	67.5±7.3●
Central Arran	18.9±8.5	31.4±8.1	49.8±8.8	116.1±15.6	57.6±5.6●
General by region	22.9±3.5	35.1±3.2	60.5±3.6	118.9±5.9	63.5±2.2
Baku	31.8±6.5	30.2±4.6	50.5±4.7	107.1±7.6	60.1±3.1

Note: ▲ – $p<0.05$ ((higher compared to the region-wide indicator), ▼ – $p<0.05$ (less than the region-wide indicator). ● – $p<0.05$ (compared to the lowest indicator)

In the regions of Azerbaijan, the indicator ranges from 44.4±7.4 to 79.2±7.8‰ and differs significantly from each other ($p=0.05$). The lowest mortality rate was observed in the Absheron and Mountainous-Shirvan economic regions. The highest mortality rate occurred in the Shirvan-Salyan economic region. Paired comparison of the regions with the lowest mortality rate, the statistically high level was distinguished by Shirvan-Salyan (79.2±7.8‰), Ganja-Dashkesan (72.5±6.8‰), Gazakh-Tovuz (67.4±6.2‰), Karabakh (67.5±7.3‰), Central Arran (57.6±5.6‰), Mil-Mugan (62.8±6.9‰) and Astara-Lankaran (59.0±4.9‰) economic regions.

Interregional differences in mortality rates are statistically significant at the ages of 20–29, 30–39, 40–49 years. For women aged 15–19, the mortality rate is low in all regions and varies within a narrow range. (11.7±5.8–34.6±13.1‰; $p>0.05$).

At all ages, the mortality rate of women in the Absheron economic region. The age-related mortality rates of women in the Shaki-Zakatala, Mountainous-Shirvan, and Central Arran regions do not significantly differ from those in the Absheron region.

The overall regional mortality rate at all ages is close to that in Baku. The regions can be divided into three groups according to the mortality rate of women of reproductive age:

– regions with mortality rates significantly lower than the general regional mortality rate (63.5±2.2‰);

– regions with mortality rates significantly higher than the general regional mortality rate;

– regions where the mortality rate does not differ significantly from the general regional indicator.

The first group includes Shirvan-Salyan, the second group includes Absheron and Mountainous-Shirvan, and the third group includes the rest of the regions. Taking the average mortality rate by region as

a conditionally non-exhibiting indicator, the size of the relative mortality risk of women for all regions was calculated.

The relative risk of mortality for women aged 15–19 years is low in Astara-Lankaran (0.39±0.59), high in Shirvan-Salyan and Sheki-Zakatala regions (1.49±0.43 and 1.51±0.41, respectively). The minimum and maximum mortality risks differ at the age of 20–29 years in Absheron and Ganja-Dashkesan regions, at the age of 30–39 years in Mountainous-Shirvan and Karabakh regions, and at the age of 40–49 years in Absheron and Shirvan-Salyan regions, respectively.

Thus, the regions of Azerbaijan differ significantly from each other in terms of the mortality risk of women of reproductive age, which is most likely a consequence of the existing inequality in the medical and social situation.

The causes of death of women of reproductive age in the regions and in the capital of Azerbaijan are shown in Table 2. The similarity of the leading causes of death is noteworthy, both in the regions and in Baku, the top three leading causes of death include the same classes of diseases, but there is a difference in their sequence. In the regions, diseases of the circulatory system occupy the first place in the structure of causes of death (25.3±1.0 %), and in the city of Baku neoplasms (32.2±2.4 %). In the regions, neoplasms are in second place in the structure of causes of death (22.7±1.0 %), and in Baku, diseases of the circulatory system are in second place (23.9±2.2 %). Injuries, poisoning and some effects of external causes both in the regions and in Baku occupy the third place in the ranking of causes of death for women of reproductive age. There is a discrepancy in the rating of diseases of the nervous system (fourth place in Baku, fifth in the regions), respiratory diseases (fourth place in the regions, sixth in Baku).

Table 2

Nosological structure of causes of mortality in women of reproductive age (%)

Naming of causes of death (ICD-10)	Regions	Baku
Some infectious and parasitic diseases	3.0±0.4	0.8±0.4
Neoplasms	22.7±1.0	32.2±2.4
Diseases of the endocrine system, eating disorders and metabolic disorders	0.8±0.2	0.3±0.3
Diseases of the nervous system	6.6±0.6	8.0±1.4
Diseases of the circulatory system	25.3±1.0	23.9±2.2
Respiratory diseases	8.1±0.6	4.8±1.1
Diseases of the digestive system	3.7±0.4	4.5±1.1
Diseases of the genitourinary system	2.7±0.4	2.7±0.8
Pregnancy, childbirth, and the postpartum period	4.7±0.5	0.8±0.4
Symptoms, signs, and abnormalities identified in clinical and laboratory studies	6.0±0.6	5.6±1.2
Injuries, poisoning and some other consequences of exposure to external causes	15.6±0.8	16.4±1.2
Other	0.8±0.2	—
All	100.0	100.0

There is a more noticeable difference in the proportion of pathologies and conditions related to reproductive function. their share in the structure of causes of death was 4.7±0.5 % in the regions and 0.8±0.4 % in Baku. This is primarily due to the lack of efficiency of maternity services.

Thus, the level and structure of causes of death of women of reproductive age in the regions of Azerbaijan have features that require special attention from the health authorities.

In the literature, information about the mortality rate of women of reproductive age is alarming in both developed and developing countries [3, 7]. In the United States, the mortality rate of women aged 15–44 years is high and has a growing trend (86.5‰ in 1999, 89.4‰ in 2019) [11]. It was found that the reproductive age mortality rate is higher for women born in low-income countries (84.4‰) and in high-income countries (83.7‰). The rate for women born in middle-income countries (57.5‰) is lower than for women born in Sweden (68.1‰). The mortality rate of women of reproductive age in the regions of Azerbaijan (44.4±4.3‰ lowest value, 79.2±7.8‰ highest value) is lower than in the United States and non-indigenous residents of Sweden. In general, the regional indicator in Azerbaijan (63.5±2.2‰) and in Baku (60.1±3.1‰) is lower than in Sweden for indigenous people (68.1‰). This positive fact testifies to the correctness of the public health protection system in a post-Soviet country with an average income level. The existence of differences in mortality risk in the regional aspect shows the uneven use of local resources to achieve more positive results. A comparison of the structure of causes of death of women of reproductive age in Azerbaijan and the USA [1, 3, 6] reveals facts that are important for the organization of prevention of premature mortality. In the USA, the death rate due to injuries, poisoning and some effects of external causes (230‰ or 40.4 % of all causes) is noticeably higher than in Azerbaijan (16.4±1.2 % of

all causes or 9.6‰ in Baku, 15.6±0.8 % of all causes or 9.9‰ in the regions). At the same time, mortality from complicated pregnancy, childbirth and the postpartum period in the United States (1.08‰ or 1.9 % of all causes) is significantly lower than in the regions of Azerbaijan (2.98 ‰ or 4.7 % of all causes). A similar conclusion can be seen when comparing the mortality risk of women of reproductive age due to diseases of the circulatory system (11 % in the USA, 25.3% according to our materials). It is obvious that in the regions of Azerbaijan, the role of controlled factors (diseases of the circulatory system and complications of pregnancy, childbirth and the postpartum period) of the mortality risk of women of reproductive age is high.

Conclusions

1. The mortality rate of women of reproductive age in Azerbaijan was 63.5±2.2 per 100,000. The indicator was lower in adolescents (19 years and less) (22.9±3.5 per 100,000). The maximum mortality rate was observed at the age of 40-49 years (118.9±5.9 per 100,000).

2. In the regions of Azerbaijan, the indicator ranges from 44.4±7.4 to 79.2±7.8‰ and differs significantly from each other (p=0.05). The lowest mortality rate was observed in the Absheron and Mountainous -Shirvan economic regions. The highest mortality rate occurred in the Shirvan-Salyan economic region.

3. In the regions and in Baku, the top three leading causes of death for women of reproductive age include the same classes of diseases (neoplasms, circulatory system diseases, and injuries), but there is a difference in their sequence. In the regions, diseases of the circulatory system occupy the first place in the structure of causes of death (25.3±1.0 %), and in the city of Baku neoplasms (32.2±2.4 %). In the regions, neoplasms are in second place in the structure of causes of death (22.7±1.0 %), and in Baku, diseases of the circulatory system are in second place (23.9±2.2 %).

4. The most important features of the mortality rate of women of reproductive age in the regions of Azerbaijan are its relatively high level in some regions and the predominance in the structure of its causes of diseases of the circulatory system, respiratory organs and complications of pregnancy, childbirth and the postpartum period.

5. With the age of women, the risk of mortality increases, its lowest level was at the age of 15–19 years (22.9±3.5‰ total by region, 9.05±5.2–34.6±1.31‰ the range of fluctuations is in certain regions), and the largest is at the age of 40–49 years (respectively 118.9±5.9‰; 80.5±11.2–172.9±23.1‰).

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