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PREMATURE MORTALITY FROM INJURIES IN REGIONS OF KAZAKHSTAN

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Introduction. Many countries, including Kazakhstan, aim to achieve universal health coverage and reduce health disparities, focusing on promoting healthy lifestyles, preventing injuries, and ensuring sustainable healthcare financing. This study seeks to analyze regional differences in premature mortality from injuries across six regions of Kazakhstan to better understand the impact of injuries, which remain a leading cause of death despite a slight decrease in overall injury-related fatalities.

Materials and methods. We calculated premature mortality rates (PMR) for individuals under 75 years of age using data from the National Scientific Center for Health Development, covering 2014 to 2021, and categorized by sex and aligned with ICD-10 focusing on accidents and injuries. Absolute and relative changes in PMR were computed to assess both the overall change in mortality rates and the rate of change over the defined period.

Results and discussion. North Kazakhstan experienced the highest premature mortality rates, rising from 148.15 in 2014 to 188.80 in 2021, while Atyrau had the lowest, with fluctuations from 69.54 in 2014 to 111.17 in 2021. East Kazakhstan recorded the highest relative change in mortality (63.3%), with males at 62.5% and females at 63.4%, while Atyrau showed a notable male increase of 74.6% but a smaller female increase of 23.5%, resulting in a combined total of 59.9%. In terms of total absolute changes, East Kazakhstan led with 83.76, followed by Akmola at 55.22 and West Kazakhstan at 53.96, while Zhambyl had the lowest at 26.26.

Conclusion. The data highlights significant regional and gender disparities in premature mortality in Kazakhstan, emphasizing the need for targeted healthcare interventions and policies that address these specific differences.

Key words: premature mortality; injuries; trauma; health policy; public health; Kazakhstan

INTRODUCTION

Many countries aim for universal health coverage, ensuring that all individuals have access to necessary health services without facing financial hardship [1]. This is a central goal of global health policy, as reflected in the United Nations Sustainable Development Goal 3[2]. Health policies emphasize reducing disparities in healthcare access and outcomes based on socioeconomic status, geography, gender, and other factors. Additionally, policymakers generally agree on the importance of promoting healthy lifestyles, preventing diseases and injuries, reducing risk factors like smoking, poor diet, and physical inactivity, while ensuring sustainable healthcare financing, improving public health and safety, and developing a skilled healthcare workforce to address both general health needs and emergencies, including injuries [3, 4].

Injuries represent a significant global public health challenge due to their high rates of prevalence, disability, and mortality, severely impacting individuals' health and quality of life. According to the World Health Organization (WHO), approximately 4 million deaths are related to injuries every year [4]. The Global Burden of Disease studies identify injuries as one of three broad categories of causes of disease burden, which occurs in low- and middle-income countries (LMIC) [5, 6]. Road traffic accidents are the leading cause of death worldwide [7]. In addition, falls and drowning are the leading causes of premature death in LMIC. Annually over 700,000 people worldwide die by suicide, making it the fourth leading cause of death among individuals aged 15-29 years, in China, suicide is the fifth leading cause of death overall [8,9], whereas in South Korea suicide rates among younger populations have risen since 2017, highlighting the need for further research and targeted prevention strategies [10]. In the United States, the percentage of preventable premature deaths increased from 2010 to 2022 due to unintentional injuries (e.g., unintentional poisoning, including drug overdose, unintentional motor vehicle crashes, unintentional drowning, and unintentional falls) and stroke, where the rate was higher among rural residents [11].

According to the authors, there has been a slight decrease in deaths from injuries in Kazakhstan, but despite this, it remains the leading cause of

death. Traffic fatalities in Kazakhstan are predicted to decrease slowly in the coming years, with a 6.4% decrease for men and 5.8% for women in the 0-19 age group, and 5.1% for the 20-64 group [12]. Working-age men will have three times higher mortality rates than women [13]. Moreover, it was identifying that of the 10 types of injuries, one in three requires surgical intervention, with higher rates in Astana and Almaty [14]. The authors of this research could not find studies on premature mortality from injuries by regions of Kazakhstan.

The aim of the study was to analyze premature mortality from injuries across six regions of Kazakhstan (west, south, east, and north) to identify regional differences.

MATERIALS AND METHODS

We applied the methodology for calculating premature mortality as outlined by OECD experts. The premature mortality rate, defined as mortality under 75 years of age, was calculated as the frequency of deaths among individuals under 75, expressed per 100,000 population. To compute this rate, we used data from the National Scientific Center for Health Development, covering the period from 2014 to 2021. The data were categorized by sex and aligned with the International Classification of Diseases, 10th revision (ICD-10), specifically focusing on accidents and injuries. Age groups were defined as 0-4, 5-9, ..., 60-64, 65-69, and 70-74 years. The formula used for the calculations is as follows:

$$PMR = \frac{\text{Number of deaths under 75}}{\text{Total population under 75}} \times 100,000 \quad (1),$$

where:

PMR = Premature Mortality Rate;

Number of deaths under 75 = Number of deaths from injuries or accidents in people under 75 years of age;

Total population under 75 = Total population under 75 years of age in the given region.

Also, we calculated absolute and relative changes, which allow understanding both the absolute and relative changes in premature mortality rates over the defined period.

To calculate the **absolute change** in the premature mortality rate, the following formula was used:

$$\text{Absolute change} = PMR_{\text{end}} - PMR_{\text{start}} \quad (2),$$

where:

PMR_end = Premature mortality rate at the end of the period;

PMR_start = Premature mortality rate at the start of the period.

To calculate the **relative change** in the premature mortality rate, we used the formula:

$$\text{Relative change} = \left(\frac{PMR_{\text{end}} - PMR_{\text{start}}}{PMR_{\text{start}}}\right) \times 100 \quad (3),$$

where:

PMR_end = Premature mortality rate at the end of the period;

PMR_start = Premature mortality rate at the start of the period.

These calculations allow understanding both the absolute and relative changes in premature mortality rates over the defined period.

All statistical analyses were thoroughly conducted using Microsoft Excel for data organization and SPSS version 13 for advanced statistical processing and analysis, developed by IBM Corporation.

RESULTS

The highest premature mortality rates over time were observed in North Kazakhstan, with the rate increasing from 148.15 in 2014 to 188.80 in 2021. Conversely, Atyrau had the lowest premature mortality, with fluctuations in the data, rising from 69.54 in 2014 to 111.17 in 2021 (table 1).

For males, East Kazakhstan recorded the highest premature mortality rate in 2021 (363.59), followed by North Kazakhstan (311.81). For females, East Kazakhstan again had the highest mortality rate (84.93), with North Kazakhstan in second place (76.54), table 1.

Males consistently experience higher premature mortality rates than females across all regions. This is a common trend in mortality studies, reflecting gender differences in health risks, lifestyle, and other factors. However, female mortality rates are rising in several regions, particularly in East Kazakhstan, where the gap between male and female mortality is narrowing. In 2021, female mortality in East Kazakhstan (84.93) was significantly higher compared to many other regions (table 1).

Combined, the regions show an average annual percentage change in premature mortality from injuries ranging from **5.3% to 8.8%.** On average, the male population across most regions has seen moderate to significant annual percentage changes in premature mortality, with the highest increase in **West Kazakhstan** (8.6%) and the lowest in **Zhambyl** (5.4%). Female mortality rates show slightly lower average annual changes than males, with **West Kazakhstan** showing the highest at **8.9%,** and **Akmola** the lowest at **4.4%. East Kazakhstan** stands out for both males (8.1%) and females (7.4%), indicating noticeable changes in premature mortality from injuries in the region. **West Kazakhstan** also exhibits significant changes, particularly in female mortality (8.9%), which is the highest among all regions for females. **Atyrau** and **Zhambyl** show the lowest rates for males and females, respectively, suggesting rel-

Table 1 – Premature mortality from injuries per 100000 populations

Year	Gender	Regions					
		Akmola	Atyrau	East-Kazakhstan	Zhambyl	West-Kazakhstan	North-Kazakhstan
2014	male	217,60	109,82	223,79	153,46	176,20	248,73
	female	51,21	32,71	51,97	32,93	32,34	58,87
	total	130,23	69,54	132,22	89,59	99,66	148,15
2015	male	190,90	113,16	225,21	148,04	168,85	221,72
	female	55,05	28,82	51,90	34,25	32,04	43,59
	total	119,84	68,85	132,47	87,80	95,54	127,05
2016	male	178,64	117,94	208,63	137,44	148,15	215,18
	female	41,00	21,10	48,33	33,38	27,33	47,23
	total	106,46	66,07	122,75	82,39	84,61	126,66
2017	male	193,01	96,88	204,06	123,58	152,43	191,93
	female	46,37	17,94	45,39	31,18	32,79	39,33
	total	116,86	55,11	119,03	74,87	88,83	111,52
2018	male	305,51	195,28	394,07	252,30	303,39	350,70
	female	58,42	49,55	87,35	50,38	61,51	90,92
	total	177,21	120,17	230,85	144,77	174,82	215,01
2019	male	180,90	94,18	222,74	127,63	175,89	253,98
	female	40,05	17,15	50,67	32,31	35,42	68,12
	total	107,41	53,85	130,65	77,59	100,61	155,11
2020	male	312,49	173,35	338,61	214,42	279,09	360,25
	female	64,87	35,39	68,43	45,00	53,88	72,22
	total	184,44	102,94	193,45	125,05	160,19	209,08
2021	male	310,44	191,72	363,59	195,68	268,78	311,81
	female	69,61	40,41	84,93	43,21	50,54	76,54
	total	185,45	111,17	215,98	115,85	153,62	188,80

atively smaller or more stable changes in mortality. The range values highlight the **volatility** in changes over the years. For example**, Atyrau** for females has a large range (from -8.3% to 19.5%), suggesting that while the average change is modest (4.7%), year-to-year fluctuations have been more extreme. In contrast, regions like **Zhambyl** have smaller ranges, indicating that changes in mortality over time have been more stable (table 2).

East Kazakhstan leads in total absolute changes in premature mortality from injuries, with a value of 83.76, followed by Akmola (55.22) and West Kazakhstan (53.96). In contrast, Zhambyl has the lowest total absolute change (26.26), indicating more stability in mortality rates in this region. For males, East Kazakhstan again shows the highest absolute change in premature mortality from injuries (139.80), followed by Akmola (92.84) and West Kazakhstan (92.58). Similarly, East Kazakhstan leads for females with the highest absolute change (32.96), followed by Akmola (18.40) and West Kazakhstan (18.20). Atyrau has the lowest absolute change for females (7.70), suggesting less fluctuation in mortality rates for women in this region (table 2).

East Kazakhstan shows the highest relative change in mortality, with males at 62.5% and females at 63.4%, totaling 63.3%. Atyrau has a notable male increase (74.6%) but a smaller female increase (23.5%), resulting in a combined total of 59.9%. West Kazakhstan shows high changes for both genders, with males at 52.5% and females at 56.3%, totaling 54.1%. Zhambyl has lower changes (males at 27.5%, females at 31.2%), totaling 29.3%, while North Kazakhstan has the lowest (males at 25.4%, females at 30.0%), totaling 27.4%. In most regions, males show higher relative changes, except in Atyrau, where males outpace females. East and West Kazakhstan show similar trends for both genders, with females in East Kazakhstan experiencing slightly higher changes than males (table 2).

DISCUSSION

In our study, we found that the premature mortality rates from injuries show significant regional var-

Table 2 – Absolute, relative and average annual percentage changes of the premature mortality from injuries

Gender	Akmola	Atyrau	East-Kazakhstan	Zhambyl	West-Kazakhstan	North-Kazakhstan
Average annual percentage changes						
male	7,3 (-0,6; 15,9)	8,4 (-1,5; 19,4)	8,1 (-0,7; 17,7)	5,4 (-4,4; 16,1)	8,6 (-0,7; 18,9)	6,4 (-1,0; 14,3)
female	4,4 (-2,2; 11,5)	4,7 (-8,3; 19,5)	7,4 (-1,3; 16,8)	4,7 (-1,9; 11,7)	8,9 (-1,0; 19,7)	7,2 (-2,3; 17,7)
total	6,9 (-0,6; 15,0)	7,8 (-2,9; 19,6)	8,0 (-0,8; 17,6)	5,3 (-3,7; 15,2)	8,8 (-0,7; 19,1)	6,7 (-1,0; 15,0)
Absolute changes per 100000 populations						
male	92,84	81,89	139,80	42,22	92,58	63,08
female	18,40	7,70	32,96	10,28	18,20	17,67
total	55,22	41,63	83,76	26,26	53,96	40,65
Relative changes (%)						
male	42,7%	74,6%	62,5%	27,5%	52,5%	25,4%
female	35,9%	23,5%	63,4%	31,2%	56,3%	30,0%
total	42,4%	59,9%	63,3%	29,3%	54,1%	27,4%

iation. In the Iranian context, premature mortality due to injuries (including road traffic accidents, homicides, and suicides) is notable high, particularly in active age groups (30-69 years), with mortality rates higher in provincial areas. Road traffic deaths in rural areas have been found to be associated with poor safety practices such as wearing seat belts [15]. Many risk factors for falls are modifiable, meaning that many falls are preventable [16].

Similarly, in Kazakhstan research revealed that males are disproportionately affected by injury-related premature mortality [17, 18]. In China, a decline in injury-related deaths from 2012 to 2021 (excluding unintentional falls) is attributed to economic growth, improved healthcare, and urbanization. However, other studies highlight an increase in deaths from road traffic accidents and falls, leading to an increase in preventable premature deaths from unintentional injuries [19]. In Korea, poor socioeconomic conditions, isolation (e.g., low pension, deprivation), and higher smoking rates were linked to higher trauma and injury rates, while greater religious activity and access to recreational opportunities (e.g., parks) were associated with lower rates [20]. For Kazakhstan, addressing socioeconomic disparities, improving social connections, promoting physical activity, and increasing access to recreational spaces could help reduce injury-related deaths. In Mongolia, injury-related mortality has steadily increased, with road injuries, falls, and suicides being significant contributors. Suicides, especially among the young, have become a major public health issue, exacerbated by limited mental health resources. Additionally, injuries from falls and domestic violence, particularly among children, are leading causes of death, resulting in substantial economic costs, including a loss of $134.5 million due to falls alone, highlighting the urgent need for preventive measures and improved healthcare systems [21]. The economic burden of these injuries is significant, with the total cost of lost productivity due to premature death in 2018 estimated at $4.58 million, primarily affecting men [22]. Eventually injury-related deaths, particularly those caused by trauma, self-harm, assault, and drowning, disproportionately affect males, with the most impacted age group being 20-44 years. It was highlighting the need for improved injury classification, better enforcement of road safety laws, and stronger measures to address gender-based violence and workplace safety, especially in high-risk sectors. To address injury-related mortality and its socioeconomic burden, policymakers must take a multifaceted approach. Reducing socioeconomic inequalities, improving access to healthcare, and strengthening social support systems are key to mitigating injury-related deaths, especially among vulnerable populations. Investing in mental health services, including community-based programs and early interventions, is essential to address the rising rates of suicide and self-harm. Improving road safety through stricter law enforcement, better infrastructure, and public education campaigns is crucial, particularly in rural areas. Expanding public health campaigns on fall prevention and enhancing workplace safety in high-risk sectors like fishing will further reduce preventable injuries. Additionally, addressing gender-based violence through stronger laws, support systems, and societal changes will reduce violence-related deaths. Finally, enhancing injury surveillance systems and digitizing health data will enable better monitoring and quicker responses to emerging injury trends. By focusing on these strategies, policymakers can effectively reduce injury-related mortality, improve public health, and

address the underlying socioeconomic factors contributing to preventable deaths.

Limitations. The data used in this study is limited to the period from 2014 to 2021, which may not fully capture long-term trends or the impact of recent health interventions and policy changes. The study also relies on regional data, which may overlook local disparities within each region, potentially masking smaller-scale variations in mortality rates. Future research should focus on examining the interplay between socioeconomic, environmental, and healthcare access factors at a more granular level to better understand the root causes of regional and gender disparities. Expanding the scope to include other causes of premature mortality could provide a more comprehensive view of public health challenges in Kazakhstan. Moreover, longitudinal studies examining the effectiveness of health policies and interventions over time would be beneficial in guiding future health strategies. Finally, improving the accuracy and granularity of data collection could lead to more targeted interventions for reducing premature mortality from injuries across different regions and gender groups.

CONCLUSION

The analysis of premature mortality rates from injuries across six regions of Kazakhstan highlights significant regional and gender disparities. Males generally face higher premature mortality rates than females, although in regions such as East Kazakhstan, the gap is narrowing as female mortality rates rise. The data further shows that regions like Zhambyl and Atyrau exhibit more stable changes in mortality, whereas areas like West Kazakhstan and East Kazakhstan experience more volatile shifts. These findings underscore the importance of developing targeted public health strategies that address the unique needs of each region and gender group in Kazakhstan. Such disparities necessitate further exploration, particularly concerning healthcare access, lifestyle factors, and regional health policies. To effectively reduce premature mortality, tailored efforts focusing on specific regions and gender groups will be crucial.

Author contributions:

K. Tussupkaliyeva, N. Alekenova – conceptualization, formal analysis data curation, writing – review and editing, supervision, project administration.

K. Tussupkaliyeva, N. Alekenova, A. Zhexenova – methodology, validation, resources, writing (original draft preparation).

L. Aliyeva, N. Alekenova, A. Zhexenova, D. Yegizbayeva, A. Zhanabayeva investigation.

K. Tussupkaliyeva, N. Alekenova, L. Aliyeva, D. Yegizbayeva – visualization.

K. Tussupkaliyeva – funding acquisition.

Conflicts of interest:

The authors declare no conflict of interest.

REFERENCES

1. Kieny M.P., Bekedam H., Dovlo D., Fitzgerald J., Habicht J., Harrison G., Kluge H., Lin V., Menabde N., Mirza Z., Siddiqi S., Travis P. Strengthening health systems for universal health coverage and sustainable development. *Bulletin of the World Health Organization*. 2017; 95 (7): 537-539. https://doi.org/10.2471/BLT.16.187476

2. Royston G., Pakenham-Walsh N., Zielinski C. Universal access to essential health information: accelerating progress towards universal health coverage and other SDG health targets. *BMJ Glob Health.* 2020; 5 (5): e002475. https://doi.org/1136/bmjgh-2020-002475

3. Ranabhat C.L, Acharya S.P, Adhikari C, Kim C.B. Universal health coverage evolution, ongoing trend, and future challenge: A conceptual and historical policy review. *Front Public Health.* 2023; 11: 1041459. https://doi.org/10.3389/fpubh.2023.1041459

4. Hajjar K., Lillo L., Martinez D.A., Hermosilla M., Risko N. Association between universal health coverage and the disease burden of acute illness and injury at the global level. *BMC Public Health.* 2023; 23 (1): 735. https://doi.org/10.1186/s12889-023-15671-2

5. James S.L., Castle C.D., Dingels Z.V., Fox J.T., Hamilton E.B., Liu Z., Roberts N.L.S., Sylte D.O., Bertolacci G.J., Cunningham M., Henry N.J., LeGrand K.E., Abdelalim A., Abdollahpour I., Abdulkader R.S., Abedi A., Abegaz K.H., Abosetugn A.E., Abushouk A.I., Adebayo O. M., Vos T. Estimating global injuries morbidity and mortality: methods and data used in the Global Burden of Disease 2017 study. *Injury prevention.* 2020; 26 (1): i125-i153. https://doi.org/10.1136/injuryprev-2019-043531

6. Alberdi F., García I., Atutxa L., Zabarte M.; Trauma and Neurointensive Care Work Group of the SEMICYUC. Epidemiology of severe trauma. *Med. Intensiva.* 2014; 38 (9): 580-588. https://doi.org/:10.1016/j.medin.2014.06.012

7. Wang L.J, Ning P.S, Yin P, Cheng P.X, Schwebel D.C, Liu J.M, et al. Road traffic mortality in China: analysis of national surveillance data from 2006 to 2016. *Lancet Public Health.* 2019; 4: e245-255. https://doi.org/10.1016/S2468-2667(19)30057-X

8. Alibudbud R. Suicide among the youth and school-based suicide prevention: Exemplar and reflections from the Philippines. *Asian J. Psychiatr.* 2023; 83: 103538. https://doi.org/10.1016/j.ajp.2023.103538

9. Chen F.N, Yang Y, Liu G.Y. Social change and socioeconomic disparities in health over the life course in China: a cohort analysis. *Am. Sociol. Rev.* 2010; 75: 126-150. https://doi.org/:10.1177/0003122409359165

10.Kang D.H, Marques A.H, Yang J.H, et al. Suicide prevention strategies in South Korea: What we have learned and the way forward. *Asian J. Psy-*

chiatr. 2025; 104: 104359. https://doi.org/:10.1016/j.ajp.2025.104359

11. García M.C., Rossen L.M., Matthews K., Guy G., Trivers K.F., Thomas C.C., Schieb L., Iademarco M.F.; Preventable Premature Deaths from the Five Leading Causes of Death in Nonmetropolitan and Metropolitan Counties, United States, 2010-2022. Morbidity and mortality weekly report. *Surveillance summaries.* 2024; 73 (2): 1-11. https://doi.org/10.15585/mmwr.ss7302a1

12. Kosherbayeva L., Akhtayeva N., Tolganbayeva K., Samambayeva A. Trends in Avoidable Mortality in Kazakhstan From 2015 to 2021. *International journal of health policy and management*. 2024; 13: 7919. https://doi.org/10.34172/ijhpm.2024.7919

13. Igissinov N., Aubakirova A., Orazova G., et al. Prediction Mortality Rate Due to the Road-Traffic Accidents in Kazakhstan. *Iran J. Public Health.* 2020; 49 (1): 68-76.

14. Pliska N. Epidemiology of traumatic injuries and associated infectious complications in the Republic of Kazakhstan. *J. Med. Life.* 2022; 15 (4): 509-514. https://doi.org/:10.25122/jml-2021-0377

15. National Highway Traffic Safety Administration. US Census Bureau American Community Survey. Fatality Analysis Reporting System (FARS), 2016-2020. https://www-fars.nhtsa.dot.gov/Main/index.aspx

16. Stevens J.A, Lee R. The potential to reduce falls and avert costs by clinically managing fall risk. *Am. J. Prev. Med.* 2018; 55: 290-297. https://doi.org/10.1016/j.amepre.2018.04.035

17. Bhalla K., Harrison J., Shahraz S., Abraham J., Bartels D., Yeh P.-H., et al. *Burden of road injuries in Sub-Saharan Africa*. 2014; 6 (2): 103. http://pubdocs.worldbank.org/en/356861434469785833/Road-Safety-Burden-of-Injuries-in-Africa.pdf.

18. Matzopoulos R., Prinsloo M., Pillay-Van Wyk V., Gwebushe N., Mathews S., Martin L.J., et al. Injury-related mortality in south africa: A retrospective descriptive study of postmortem investigations. *Bull World Health Organ*. 2015; 93 (5): 303-313. https://doi.org/doi: 10.2471/BLT.14.145771

19. *CDC. WISQARS fatal injury data visualization*. https://wisqars.cdc.gov/data/lcd/home

20.Jang H., Lee W., Kim Y.O, Kim H. Suicide rate and social environment characteristics in South Korea: the roles of socioeconomic, demographic, urbanicity, general health behaviors, and other environmental factors on suicide rate. *BMC Public Health.* 2022; 22 (1): 410. https://doi.org/10.1186/s12889-022-12843-4

21. Altangerel P., Damdinbazar O., Borgilchuluun U., Batbayar D., Erdenebat B., Purevdorj T., Yundendorj G. An Exploration of Productivity Costs and Years of Potential Life Lost: Understanding the Impact of Premature Mortality From Injury in Mongolia. *Health services insights.* 2023; 16: https://doi.org/10.1177/11786329231212295

22.Fernandes N.M., Mendonça M.D.L.L., Gomez L.F. The burden of mortality due to injury in Cabo Verde, 2018. *PLoS One.* 2023; 18 (3): e0278589. https://doi.org/10.1371/journal.pone.0278589

TRANSLITERATION

1. Kieny M.P., Bekedam H., Dovlo D., Fitzgerald J., Habicht J., Harrison G., Kluge H., Lin V., Menabde N., Mirza Z., Siddiqi S., Travis P. Strengthening health systems for universal health coverage and sustainable development. *Bulletin of the World Health Organization*. 2017; 95 (7): 537-539. https://doi.org/10.2471/BLT.16.187476

2. Royston G., Pakenham-Walsh N., Zielinski C. Universal access to essential health information: accelerating progress towards universal health coverage and other SDG health targets. *BMJ Glob Health.* 2020; 5 (5): e002475. https://doi.org/1136/bmjgh-2020-002475

3. Ranabhat C.L, Acharya S.P, Adhikari C, Kim C.B. Universal health coverage evolution, ongoing trend, and future challenge: A conceptual and historical policy review. *Front Public Health.* 2023; 11: 1041459. https://doi.org/10.3389/fpubh.2023.1041459

4. Hajjar K., Lillo L., Martinez D.A., Hermosilla M., Risko N. Association between universal health coverage and the disease burden of acute illness and injury at the global level. *BMC Public Health.* 2023; 23 (1): 735. https://doi.org/10.1186/s12889-023-15671-2

5. James S.L., Castle C.D., Dingels Z.V., Fox J.T., Hamilton E.B., Liu Z., Roberts N.L.S., Sylte D.O., Bertolacci G.J., Cunningham M., Henry N.J., LeGrand K.E., Abdelalim A., Abdollahpour I., Abdulkader R.S., Abedi A., Abegaz K.H., Abosetugn A.E., Abushouk A.I., Adebayo O. M., Vos T. Estimating global injuries morbidity and mortality: methods and data used in the Global Burden of Disease 2017 study. *Injury prevention.* 2020; 26 (1): i125-i153. https://doi.org/10.1136/injuryprev-2019-043531

6. Alberdi F., García I., Atutxa L., Zabarte M.; Trauma and Neurointensive Care Work Group of the SEMICYUC. Epidemiology of severe trauma. *Med. Intensiva.* 2014; 38 (9): 580-588. https://doi.org/:10.1016/j.medin.2014.06.012

7. Wang L.J, Ning P.S, Yin P, Cheng P.X, Schwebel D.C, Liu J.M, et al. Road traffic mortality in China: analysis of national surveillance data from 2006 to 2016. *Lancet Public Health.* 2019; 4: e245-255. https://doi.org/10.1016/S2468-2667(19)30057-X

8. Alibudbud R. Suicide among the youth and school-based suicide prevention: Exemplar and reflections from the Philippines. *Asian J. Psychiatr.* 2023; 83: 103538. https://doi.org/10.1016/j.ajp.2023.103538

9. Chen F.N, Yang Y, Liu G.Y. Social change and socioeconomic disparities in health over the life course in China: a cohort analysis. *Am. So-*

ciol. Rev. 2010; 75: 126-150. https://doi.org/: 10.1177/0003122409359165

10. Kang D.H, Marques A.H, Yang J.H, et al. Suicide prevention strategies in South Korea: What we have learned and the way forward. *Asian J. Psychiatr.* 2025; 104: 104359. https://doi.org/:10.1016/j.ajp.2025.104359

11. García M.C., Rossen L.M., Matthews K., Guy G., Trivers K.F., Thomas C.C., Schieb L., Iademarco M.F.; Preventable Premature Deaths from the Five Leading Causes of Death in Nonmetropolitan and Metropolitan Counties, United States, 2010-2022. Morbidity and mortality weekly report. *Surveillance summaries.* 2024; 73 (2): 1-11. https://doi.org/10.15585/mmwr.ss7302a1

12. Kosherbayeva L., Akhtayeva N., Tolganbayeva K., Samambayeva A. Trends in Avoidable Mortality in Kazakhstan From 2015 to 2021. *International journal of health policy and management*. 2024; 13: 7919. https://doi.org/10.34172/ijhpm.2024.7919

13. Igissinov N., Aubakirova A., Orazova G., et al. Prediction Mortality Rate Due to the Road-Traffic Accidents in Kazakhstan. *Iran J. Public Health.* 2020; 49 (1): 68-76.

14. Pliska N. Epidemiology of traumatic injuries and associated infectious complications in the Republic of Kazakhstan*. J. Med. Life.* 2022; 15 (4): 509-514. https://doi.org/:10.25122/jml-2021-0377

15. National Highway Traffic Safety Administration. US Census Bureau American Community Survey. Fatality Analysis Reporting System (FARS), 2016-2020. https://www-fars.nhtsa.dot.gov/Main/index.aspx

16. Stevens J.A, Lee R. The potential to reduce falls and avert costs by clinically managing fall risk. *Am. J. Prev. Med.* 2018; 55: 290-297. https://doi.org/10.1016/j.amepre.2018.04.035

17. Bhalla K., Harrison J., Shahraz S., Abraham J., Bartels D., Yeh P.-H., et al. *Burden of road injuries in Sub-Saharan Africa*. 2014; 6 (2): 103. http://pubdocs.worldbank.org/en/356861434469785833/Road-Safety-Burden-of-Injuries-in-Africa.pdf.

18. Matzopoulos R., Prinsloo M., Pillay-Van Wyk V., Gwebushe N., Mathews S., Martin L.J., et al. Injury-related mortality in south africa: A retrospective descriptive study of postmortem investigations. *Bull World Health Organ*. 2015; 93 (5): 303-313. https://doi.org/doi: 10.2471/BLT.14.145771

19. CDC. WISQARS fatal injury data visualization. https://wisqars.cdc.gov/data/lcd/home

20. Jang H., Lee W., Kim Y.O, Kim H. Suicide rate and social environment characteristics in South Korea: the roles of socioeconomic, demographic, urbanicity, general health behaviors, and other environmental factors on suicide rate. *BMC Public Health.* 2022; 22 (1): 410. https://doi.org/10.1186/s12889-022-12843-4

21.Altangerel P., Damdinbazar O., Borgilchuluun U., Batbayar D., Erdenebat B., Purevdorj T., Yundendorj G. An Exploration of Productivity Costs and Years of Potential Life Lost: Understanding the Impact of Premature Mortality From Injury in Mongolia. *Health services insights.* 2023; 16: https://doi.org/10.1177/11786329231212295

22.Fernandes N.M., Mendonça M.D.L.L., Gomez L.F. The burden of mortality due to injury in Cabo Verde, 2018. *PLoS One.* 2023; 18 (3): e0278589. https://doi.org/10.1371/journal.pone.0278589

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ПРЕЖДЕВРЕМЕННАЯ СМЕРТНОСТЬ ОТ ТРАВМ В РЕГИОНАХ КАЗАХСТАНА

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Введение. Многие страны, включая Казахстан, стремятся к достижению всеобщего охвата услугами здравоохранения и сокращению неравенства в области здоровья, уделяя особое внимание формированию здорового образа жизни, профилактике травматизма и обеспечению устойчивого финансирования системы здравоохранения.

Цель. Анализ региональных различий преждевременной смертности от травм в шести регионах Казахстана для более глубокого понимания влияния травм, которые остаются одной из ведущих причин смерти, несмотря на незначительное общее снижение смертности, связанной с травмами.

Материалы и методы. Были рассчитаны показатели преждевременной смертности (PMR) среди лиц в возрасте до 75 лет на основе данных Национального научного центра развития здравоохранения за 2014 – 2021 гг. с распределением по полу и в соответствии с МКБ-10 (раздел «несчастные случаи

и травмы»). Были вычислены абсолютные и относительные изменения показателя преждевременной смертности для оценки как общего изменения уровня смертности, так и темпов его изменения за указанный период.

Результаты и обсуждение. В Северо-Казахстанской области были отмечены самые высокие показатели преждевременной смертности – увеличение с 148,15 в 2014 г. до 188,80 в 2021 г., тогда как в Атырауской области были зафиксированы самые низкие показатели с колебаниями от 69,54 в 2014 г. до 111,17 в 2021 г. Восточно-Казахстанская область продемонстрировала наибольший относительный прирост смертности (63,3%): 62,5% среди мужчин и 63,4% среди женщин. В Атырауской области был отмечен значительный рост среди мужчин (74,6%), но более умеренный рост среди женщин (23,5%), что в совокупности составило 59,9%. По абсолютным изменениям лидировала Восточно-Казахстанская область (83,76), далее следовали Акмолинская (55,22) и Западно-Казахстанская области (53,96), тогда как наименьшие изменения были зарегистрированы в Жамбылской области (26,26).

Выводы. Полученные данные свидетельствуют о значительных региональных и гендерных различиях преждевременной смертности в Казахстане, что подчеркивает необходимость разработки целевых мер здравоохранения и политики, направленных на устранение выявленных различий.

Ключевые слова: преждевременная смертность; травмы; травматизм; политика здравоохранения; общественное здравоохранение; Казахстан

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ҚАЗАҚСТАН ӨҢІРЛЕРІНДЕ ЖАРАҚАТТАРДАН БОЛАТЫН МЕРЗІМІНЕН БҰРЫНҒЫ ӨЛІМ-ЖІТІМ

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Кіріспе. Көптеген елдер, соның ішінде Қазақстан да, денсаулық сақтау қызметтерімен жалпыға бірдей қамтылуға қол жеткізуді және денсаулық саласындағы теңсіздікті азайтуды мақсат етеді. Бұл ретте салауатты өмір салтын қалыптастыруға, жарақаттанудың алдын алуға және денсаулық сақтау жүйесін тұрақты қаржыландыруды қамтамасыз етуге ерекше көңіл бөлінеді.

Мақсат. Қазақстанның алты өңірінде жарақаттардан болатын мерзімінен бұрынғы өлім-жітімнің өңірлік айырмашылықтарын талдау. Бұл жарақаттардың жалпы өлім көрсеткішінің аздап төмендеуіне қарамастан, өлімнің жетекші себептерінің бірі болып қала беретінін тереңірек түсінуге мүмкіндік береді.

Материалдар және әдістер. 2014 – 2021 жылдар аралығындағы Денсаулық сақтауды дамытудың ұлттық ғылыми орталығының деректері негізінде 75 жасқа дейінгі тұлғалар арасында мерзімінен бұрынғы өлім-жітім көрсеткіштері (PMR) есептелді. Талдау жыныс бойынша бөлініп, АХЖ-10 (жазатайым оқиғалар мен жарақаттар бөлімі) жіктемесіне сәйкес жүргізілді. Көрсеткіштердің жалпы өзгерісін және зерттелген кезең ішіндегі өзгеру қарқынын бағалау мақсатында мерзімінен бұрынғы өлім-жітімнің абсолюттік және салыстырмалы өзгерістері есептелді.

Нәтижелер және талқылау. Солтүстік Қазақстан облысында мерзімінен бұрынғы өлім-жітімнің ең жоғары көрсеткіштері тіркелді: 2014 жылғы 148,15-тен 2021 жылы 188,80-ге дейін өскен. Ал Атырау облысында ең төмен көрсеткіштер байқалды, олар 2014 жылғы 69,54-тен 2021 жылы 111,17-ге дейін ауытқыған. Шығыс Қазақстан облысында өлім-жітімнің ең жоғары салыстырмалы өсімі (63,3%) тіркелді: ерлер арасында – 62,5%, әйелдер арасында – 63,4%. Атырау облысында ерлер арасында айтарлықтай өсім (74,6%) байқалса, әйелдер арасында өсім төменірек (23,5%) болды, жалпы көрсеткіш 59,9%-ды құрады. Абсолюттік өзгерістер бойынша Шығыс Қазақстан облысы (83,76) көш бастады, одан кейін Ақмола (55,22) және Батыс Қазақстан облыстары (53,96) орналасты, ал ең төмен өзгеріс Жамбыл облысында тіркелді (26,26).

Қорытынды. Алынған деректер Қазақстанда мерзімінен бұрынғы өлім-жітімнің өңірлік және гендерлік айырмашылықтарының айтарлықтай екенін көрсетеді. Бұл анықталған айырмашылықтарды азайтуға бағытталған мақсатты денсаулық сақтау шаралары мен саясатты әзірлеу қажеттігін айқындайды.

Кілт сөздер: мерзімінен бұрынғы өлім-жітім; жарақаттар; жарақаттану; денсаулық сақтау саясаты; қоғамдық денсаулық сақтау; Қазақстан