

ANNOTATION

**of the dissertation work Tolganbayeva Kamshat Akzhanovna
on the topic: "The use of technology for the formation of a preventive environment to
improve the health of the male population"
submitted for the degree of doctor (PhD) in the specialty
8D10101-"Public Health"**

Scientific consultants:

Kulzhanov M., professor

Kosherbayeva L.K., PhD., professor

Ergaliev K.A. PhD., professor

Foreign scientific consultant:

Vidmantas Vaiciulis, PhD, professor

Almaty, 2026

Relevance of the study

Men's health issues are becoming increasingly relevant in the context of the global public health agenda. According to international studies and reports from the World Health Organization, men in many countries of the world have lower life expectancy and higher rates of premature mortality compared to women [1,2]. A significant proportion of premature deaths among men are associated with behavioral risk factors, including tobacco and alcohol use, low levels of physical activity, poor nutrition, and late access to medical care. These factors are largely due to gender-specific social behavior, cultural attitudes, and insufficient attention to disease prevention among the male population [3].

The problem of inequality in the health indicators of men and women is also characteristic of the Republic of Kazakhstan. According to official statistics, in 2024, the life expectancy of the country's population was 75.4 years, and the difference in life expectancy between women and men is almost 8 years, since this indicator is 79.4 years for women and 71.3 years for men. The revealed disparity in the level of life expectancy between men and women indicates the existing potential in the implementation of medical care aimed at the male population [4]. Along with this, the results of recent studies also indicate that the country's mortality rates among men consistently exceed the corresponding rate among women. According to the data, mortality rates among men averaged 753 cases per 100,000 population, and over the period from 2014-2022, the growth rate of mortality rates among men is significant compared with those of women [5].

Behavioral and social factors that determine men's health are extremely important in this regard. By default, the context of men's health assumes to a greater extent issues associated with diseases of the genitourinary system or organs of the reproductive system. Meanwhile, the lack of awareness of complete physical, mental and social well-being as an integral component of the understanding of health does not correspond to the full characteristics of health.

The results of research conducted in the field of public health indicate the existing discrepancy in the level of health status between men and women, which is due not only to a biological reason, but also to differences in lifestyle, roles in society, cultural norms and responsibility for one's own health and activity in visiting medical organizations. Consequently, the development of scientific and evidence-based approaches to the preservation and promotion of men's health involves a holistic consideration of many characteristics of the male population, as well as the determinants of health behavior [6,7].

Considering the above, the problem of men's health promotion acquires special social and scientific significance. Reducing preventable mortality, increasing the level of preventive activity and promoting a healthy lifestyle among men are important areas for the development of the healthcare system and the implementation of strategic public health goals. Due to the relevance of the chosen topic, this work was planned.

The purpose of the study: To improve the mechanisms of prevention and reduction of the prevalence of behavioral risk factors for the development of diseases among the male population of Almaty.

Tasks

1. To assess the level of preventable mortality among the male population in the Republic of Kazakhstan in terms of preventable and treatable causes of death.
2. Analyze the prevalence of risk factors that determine men's lifestyle.
3. Determine men's knowledge and attitudes about their own health.
4. To study the perceptions of men and medical professionals about the use of PHC services by men, as well as barriers and factors contributing to their involvement in prevention programs.
5. Develop recommendations for improving the technology of preventive services provided to the male population.

Research methods

The work uses an integrated approach, including analytical, epidemiological, quantitative and qualitative research methods. The objects of research are the male population, indicators of preventable mortality, medical literacy, behavioral risk factors and medical activity of men, as well as the activities of primary health care organizations (PHC).

The subject of the study:

Gender and regional characteristics of preventable male mortality, the level of medical literacy and self-preservation behavior, factors influencing men's medical activity, as well as organizational mechanisms for improving preventive care in primary health care.

The analytical method was used in conducting an in-depth bibliographic analysis of domestic and foreign scientific data.

An epidemiological study was conducted to assess the preventable mortality of the population of the Republic of Kazakhstan for 2015-2021. Data from the Bureau of National Statistics of the Republic of Kazakhstan and the RSE at the Information and Computing Center were used. The analysis of preventable mortality was carried out using the OECD method, and absolute and relative changes and average annual rates of change were calculated.

A single-stage sociological quantitative study was conducted among men in Almaty in order to determine the level of literacy and self-preservation behavior of the male population aimed at maintaining health.

A qualitative descriptive study was conducted using semi-structured in-depth interviews among men and primary health care workers in Almaty in order to examine stakeholders' views on the use of primary health care services by men and the availability of services, as well as identify gaps and opportunities to involve stakeholders in the implementation of programs that promote health.

Based on the results of the quantitative and qualitative stages, the results of the study are systematized, content analysis, analytical synthesis and expert assessment are carried out in order to develop a priority model for the formation of a preventive environment for men.

The study was also approved by the Local Ethics Commission of the National Academy of Sciences of the Kazakh National Medical University named after S.D.Asfendiyarov (IRB00011496) in accordance with Protocol No. 4 (140) dated May 3, 2023 (Application No. 1586).

Statistical data processing was carried out using descriptive, comparative and multifactorial statistics. Used:

- absolute and relative indicators;
- age-standardized mortality rates;
- 95% confidence intervals (95% CI);
- criterion χ^2 ;
- logistic regression analysis with OR and AOR calculations;
- Joinpoint Regression Program v.4.9.1.0.25 to calculate APC and AAPC.
- The differences at $p < 0.05$ were considered statistically significant.

Description of the main research results

The analysis of age-standardized indicators of preventable mortality in Kazakhstan for 2015-2021 revealed the main trends in its dynamics, gender characteristics and the impact of the COVID-19 pandemic on mortality rates. It was found that in 2015-2019, Kazakhstan experienced a steady statistically significant decrease in the level of preventable mortality among both sexes — from 505.37 to 432.55 per 100,000 population (APC -3.8%; $p=0.015$). However, during the COVID-19 pandemic in 2020-2021, there was a sharp increase in this indicator to 587.95 per 100,000 population, with an annual growth rate of 17.6% ($p=0.006$). The average annual percentage change over the entire study period was +2.9% ($p<0.001$), indicating an unfavorable final trend. The preventive component made the greatest contribution to the growth of the total preventable mortality. The preventive mortality rate decreased from 326.07 to 272.17 per 100,000 population in 2015-2019 (APC -5.3%; $p=0.0008$), however, in 2020-2021 it increased to 382.50 per 100,000 population (APC +19.5%; $p=0.006$). The average annual growth for the entire period was +2.4% ($p<0.001$). At the same time, the curable mortality rates did not show statistically significant changes, despite an increase from 160.38 to 215.87 per 100,000 population in 2020. Throughout the study period, the level of preventable mortality among men was significantly higher than among women. In 2015, the rate for men was 763.36 per 100,000 population compared to 321.49 for women. By 2019, there was a decrease to 671.91 and 277.85, respectively, but during the pandemic, the figures increased sharply again and in 2021 reached 830.08 among men and 413.46 per 100,000 population among women. Despite the higher absolute rates among men, women experienced higher rates of preventable mortality during the pandemic. The average annual increase among women was +4.7% ($p<0.001$), while among men it was +1.8% ($p<0.001$). A particularly pronounced increase among women was observed in the preventive component of mortality (AAPC +5.1%; $p<0.001$).

The most significant gender differences were found in diseases of the circulatory system, injuries, respiratory diseases, oncological diseases, as well as deaths related to alcohol and drug use. In 2021, mortality from injuries among men exceeded that of women by more than 4 times (96.27 versus 22.10 per 100,000

population), and mortality from diseases of the circulatory system was 246.75 versus 110.88 per 100,000 population, respectively. Preventable deaths related to COVID-19 were of particular importance. In the general population, its level increased from 18.08 in 2020 to 83.91 per 100,000 population in 2021. Among men, this indicator increased from 25.11 to 95.76, and among women — from 14.12 to 76.07 per 100,000 population. The regional analysis revealed pronounced territorial differences. The most unfavorable situation was recorded in the East Kazakhstan region, where the level of preventable mortality among men increased from 803.95 in 2019 to 962.86 in 2021, remaining the highest among the studied regions. In Aktobe region, the indicator increased from 706.63 in 2019 to 899.28 in 2021, and in Almaty — from 617.99 to 763.03 per 100,000 population. In Astana, the dynamics was less pronounced: after a decrease to 485.8 in 2019, the indicator increased to 670.85 in 2021. Growth in all regions in 2020-2021 It was accompanied by an increase in the curable component, which indicates a significant influence of systemic factors related to the availability and quality of medical care during the pandemic period. Among the main causes of preventable mortality, diseases of the circulatory system made the greatest contribution. The analysis revealed that men's behavioral attitudes are influenced by age, with men in the youngest age group rating their health as "good" and "excellent" (63.5% aged 18-29), while 33.3% of those in the same age group responded similarly. Young people are less likely to smoke (22.7% versus 35.4%) and take alcohol (49.8% versus 7.1%). Despite the fact that men showed a sufficient level of awareness about screenings (74.8), they still remain prophylactically inactive: 28.2% have not visited a medical organization over the past year, 76.6% noted that they were not informed about the need for examinations and 82.4% did not receive invitations. All this points to the existing differences between awareness and actual interaction and confirms the expediency of using technologies to strengthen and preserve men's health, taking into account age characteristics. Professional affiliation is statistically significantly related to the education, income level and age of men ($p < 0.001$). The best indicators were among group 1 - managers and government and administrative workers (62% had higher education and 16.3% had high incomes), while men from group 4 (drivers, operators) showed less favorable results - only 9.1% had higher education and 22.7% had low incomes. Representatives of the 2nd group of men (employees of special, military and other structures) are characterized by low earnings (32.4%). Although the differences in occupational groups of men on the basis of smoking are insignificant ($p = 0.105$), in group 4 men reported earlier smoking (22.7% before the age of 13), which deserves attention and requires the use of targeted preventive measures.

An interview conducted with 13 men, general practitioners and 11 PHC nurses showed that the low involvement of men in preventive and curative services is due to a combination of individual, social and organizational factors. Irregular access to medical care prevailed among men: the majority of respondents applied to PHC only with severe symptoms of the disease. PHC doctors noted the high administrative burden that limits the time spent working with patients, as well as the low motivation of men to participate in preventive programs. The nurses additionally pointed to

men's fear of revealing a serious diagnosis, denial of the disease, employment at work, and lack of trust in medical recommendations.

In general, the results obtained confirm the relevance of improving preventive technologies aimed at men and substantiate the expediency of introducing intersectoral organizational solutions aimed at increasing men's activity in relation to their own health and increasing involvement in PHC organizations in order to preserve and strengthen health.

Scientific novelty

For the first time in Kazakhstan, an analysis of preventable mortality among men has been conducted with an assessment of the dynamics of preventive and curable mortality in terms of the main causes of death and regional characteristics.

For the first time, a study of behavioral risk factors, the level of medical literacy and preventive activity of men of working age has been conducted. It has been confirmed that men are prone to risky health behaviors and are characterized by insufficient involvement in screening and prevention programs.

For the first time, the opinion of primary health care workers on the problems of advising men on healthy lifestyle and prevention of chronic non-communicable diseases has been studied. The structural, organizational and motivational barriers limiting the effectiveness of preventive measures have been identified.

Based on the results of the study, an intersectoral risk-based model "Formation of a preventive environment for men" was developed for the first time, providing for the integration of the PHC organization, employers and men themselves into a single system of preventive support.

The main provisions submitted for defense

1. The analysis conducted to determine the level of preventable mortality in Kazakhstan revealed consistently high mortality rates among men, characterized by significant differences in sexes and regional heterogeneity, which indicates the structural vulnerability of the male population to correctable causes of death and justifies the expediency of promoting gender-oriented prevention strategies, taking into account regional characteristics.

2. With all the available acceptable level of formal knowledge of men about preventive examinations and screening programs, practical activity and involvement in preventive services do not increase, which indicates a discrepancy between the awareness of the population and the effectiveness of preventive services provided, especially among men engaged in work.

3. Men's weak commitment to PHC prevention measures is caused by both insufficient awareness of preventive programs and low confidence in the quality of medical services, organizational barriers to access and socio-cultural norms, as well as typical behavioral attitudes towards health, manifested by late treatment in medical organizations only with pronounced symptoms of the disease and complications.

4. Increasing the participation of men in health promotion programs requires adapting PHC activities to the characteristics of the male population, taking into account professional employment, the organization of preventive technologies in the workplace, improving medical literacy, improving the communicative competencies

of medical workers and involving close associates and family members in the formation of attitudes of responsible attitude to their own health.

Practical significance of the work

This study is of practical importance for optimizing the organization of primary health care and preventive services for the male population of the Republic of Kazakhstan. Established age and professional differences in health behavior contribute to identifying risky groups of men and substantiating the feasibility of implementing measures to strengthen and preserve men's health.

The data obtained on the insufficient level of men's involvement in preventive services proves the need to improve the mechanisms of notification and awareness, organization of support in the provision of preventive care at the PHC level. Certain barriers, including the overburdening of medical specialists, confirm the need to improve the organization of PHC medical organizations and the implementation of proactive forms of preventive care. The application of the research results in the practical activities of the PHC organization can help reduce the rates of preventable mortality, improve the quality and life expectancy of the male population.

The personal contribution of the doctoral student. The presented work is the author's work of Kamshat Akzhanovna Tolganbayeva, where she independently reviewed the modern literature on the topic of the dissertation, planned and conducted all stages of the research. As a result of the work, the author adapted, validated and automated a specialized questionnaire in Russian and Kazakh languages for men in Almaty. A structured checklist has been developed for a comprehensive assessment of men's health risk factors, which is used in the practice of a secondary medical worker in a primary health care organization. The calculations of preventable mortality in the context of curable and preventive mortality according to the main nosologies in four regional regions of the Republic of Kazakhstan have been carried out.

Conclusions

1. During the study period (2015–2021), the COVID-19 pandemic had a significant impact on the level of avoidable mortality in Kazakhstan, despite the positive trends achieved in previous years. From 2015 to 2019, the overall avoidable mortality rate decreased from 505.37 to 432.55 per 100,000 population; however, by 2021, it had risen to 587.95 per 100,000 population. The largest contribution to this increase came from preventable mortality, which rose from 272.17 to 382.50 per 100,000 population. In all regions analyzed, men consistently demonstrated higher avoidable mortality rates than women, with the most unfavorable situation observed in East Kazakhstan Region, where the male mortality rate reached 962.86 per 100,000 population in 2021. Relatively stable trends were recorded in the capital city of Astana, whereas Almaty and Aktobe Region experienced marked increases in mortality during 2020–2021. The study findings indicate the substantial impact of the pandemic on the accessibility and effectiveness of preventive and healthcare interventions and highlight the need for public health measures that take into account regional and gender-specific patterns of avoidable mortality.

2. Among the 721 surveyed men, a relatively high level of awareness regarding the harmful effects of smoking (75.9%) and the purpose of screening programs

(74.8%) was identified. However, preventive health behavior remained low: nearly one-third of respondents had not visited a physician during the previous year, 76.6% had not been informed about screening examinations, and 82.4% had never received an invitation to undergo screening. The prevalence of smoking increased with age, from 22.7% among men aged 18–29 years to 35.4% among those aged 45–59 years.

3. Men's responsible health-related behavior was significantly influenced by their occupational status and level of qualification. Among managers, administrators, and office employees, 62.2% had higher education, whereas only 9.1% of unskilled workers had attained this level of education ($p < 0.001$). The main barriers to seeking medical care included difficulties in obtaining appointments with specialists (32.5%), inconvenient working hours of healthcare organizations (31.8%), and a preference for managing health problems independently (25.1%).

4. The interview findings identified several barriers that hinder men from utilizing primary healthcare (PHC) services, including insufficient awareness of preventive programs (10 of 13 interviews), distrust of the healthcare system (9 of 13), a tendency toward self-medication (8 of 13), and prolonged waiting times for medical care (7 of 13). Most men sought medical attention only after the onset of pronounced symptoms, whereas family support, particularly from spouses, facilitated timely healthcare-seeking behavior.

5. Based on the study findings, an intersectoral, risk-oriented model for creating a preventive environment for men was developed and integrated into the existing primary healthcare delivery system. The model includes early identification of risk factors, risk stratification of men, personalized preventive interventions, and active involvement of employers, family members, and healthcare professionals. Unlike the existing disease-oriented approach, which focuses primarily on the detection of diseases, the proposed model emphasizes the identification of risky behaviors, enhancement of men's engagement with healthcare services, and the promotion of personal responsibility for health. Its implementation is expected to contribute to reducing the burden of noncommunicable diseases and lowering avoidable mortality rates.

Approbation of practical results.

The results and conclusions of the dissertation material were presented and reported at the following Conferences:

- with a poster presentation under the number P158 at the 10th National Congress and the 3rd International Iranian Congress of Epidemiology. «Preventable mortality of men from endocrinological diseases in Kazakhstan».

- with a report entitled "Preventable mortality in the West Kazakhstan region of the country" at the 2nd International Conference "Modern Scientific Method" (February 23-24, 2023, Vienna, Austria).

- with a report at the International Conference "Health Literacy: challenges and prospects" "Knowledge, attitudes and attitudes of men related to medical literacy" (Almaty, April 16, 2025).

- made a presentation at the International Forum "ANaMedUniForum, the new generation-2025" on the topic "Accessibility of medical and preventive care to the

male population of Almaty" for the presentation" (Public Health section: history, achievements and new horizons, Almaty, June 5, 2025).

As part of the dissertation work, an author's certificate was issued (Certificate of entry into the State Register of Copyrighted Objects No. 70453 dated April 20, 2026), and implementation acts were registered (Temir Prom XXI, SABA Group Construction Company, Almaty Su State Enterprise, Tartip company, Polyclinic at the Regional Military Hospital of the National Security Committee of the Republic of Kazakhstan in Almaty, Polyclinic at the City Clinical Hospital No. 5 UOZ of Almaty), confirming the practical applicability of scientific results.

Publications on the topic of the dissertation:

Based on the materials of the dissertation, 4 articles have been published, 2 of them in journals indexed in the international databases Web of Science Core Collection and Scopus:

- "Trends in avoidable mortality in Kazakhstan from 2015 to 2021" (International Journal of Health Policy and Management, included in the first quartile of Q1 by impact factor according to the Journal Citation Reports).

- "Men's Access to Medical and Preventive Care in Almaty: A Cross-Sectional Study by Occupation" (American Journal of Men's Health, a journal included in the second Q2 quartile by impact factor).

and 2 articles in journals included in the list of publications recommended by the Committee for Quality Assurance in Science and Higher Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan:

- "Men's Health Policy" (Pharmacy of Kazakhstan).

- "Treatable mortality in genitourinary system disease" (Science and Healthcare).

and theses:

- in the proceedings of the International Scientific Conference of Students and Young Scientists "FARABI ALEMI", Almaty, Kazakhstan, April 6-8, 2023. – Almaty: Al Farabi Kazakh National University, 2023. – 190 p. ISBN 978-601-04-6274-8

- in the proceedings of the 2nd International Scientific Conference "Modern Scientific Methods" Vienna, Austria ISBN 978-9-6745-7628-8. DOI 10.5281/zenodo.7679346.

Scope and structure of the dissertation

The dissertation is presented in a 141-page text and includes normative references, definitions of terms, a list of abbreviations and designations, an introduction, a literature review, a description of materials and methods, the results of his own research, conclusions, conclusions and a list of references. The work combines 24 tables and 11 figures. The bibliographic lists include 118 sources.

List of References

1. Baker P. Tim Shand. Men's health: time for a new approach to policy and practice? J. Glob. Health. 2017;7(1):010306–010306. [DOI] [Europe PMC free article] [Abstract] [Google Scholar]

2. World Health Organization. (2018). The health and well-being of men in the WHO European Region: Better health through a gender approach.

<https://www.euro.who.int/en/publications/abstracts/the-health-and-well-being-of-men-in-the-who-european-region-2018>

3. Tan, H. M., Ng, C. J., Hom, C. C. K. & Teo, C. H. Asian men's health report. Malaysian Men's Health Initiative http://menshealthmalaysia.org/wp-content/uploads/2016/03/Asian_Mens_Health_Report.pdf (2013).

4. Bureau of National Statistics of the Republic of Kazakhstan. (2024). Life expectancy at birth of the population of the Republic of Kazakhstan for 2023. Agency for Strategic Planning and Reforms. <https://stat.gov.kz/en/industries/social-statistics/demography/publications/157663/>

5. Aimyshev, T., Zhakhina, G., Yerdessov, S. et al. Mortality trends in Kazakhstan: insights from a million of deaths from 2014 to 2022. BMC Public Health 25, 2312 (2025). <https://doi.org/10.1186/s12889-025-23346-3>

6. Hyun JS. Vision and Strategies for Men's Health Research in an Aging Society. World J. Mens Health. 2018;36(3):173–175. [DOI] [Europe PMC free article] [Abstract] [Google Scholar]

7. Reis de Sousa, A., de Carvalho Félix, N. D., Rosendo da Silva, R. A., de Santana Carvalho, E. S., & Pereira, Á. (2023). Men's health care: concept analysis. Investigación y educación en enfermería, 41(1), e14. <https://doi.org/10.17533/udea.ice.v41n1e14>