Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.47750/jptcp.2023.30.11.045

The Level And Dynamics Of Morbidity By The Main Classes Of Diseases And Their Prediction In The Able-Bodied Population Of The Turkestan Region

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Submitted: 20 March 2023; Accepted: 19 April 2023; Published: 15 May 2023

ABSTRACT

The scientific article presents the results of a study of the incidence of the leading classes of diseases their prediction of the able-bodied population of the Turkestan region (per 100 thousand population).

The purpose of the Study. Analysis of morbidity indicators for the main classes of diseases and their prediction in the Turkestan region for the period 2011-2020.

Materials and Methods. The paper uses retrospective data for the period 2011-2020 for the Turkestan region.

Results. When studying the levels and dynamics of morbidity of neoplasms, diseases of the circulatory system, injuries and poisoning and other effects, diseases of the endocrine system, morbidity of the nervous system, morbidity of the eye and its appendages, morbidity of the ear and mastoid process of the able-bodied population of the Turkestan region (retrospective data for the period 2011-2020) with their forecast for 2021-2023 (per 100 thousand of the total population) is characterized by a weak and medium-pronounced self-oscillatory trend.

Conclusion. Thus, drawing conclusions from predictive models based on retrospective data on the incidence of the leading classes of diseases in the working-age population, it can be argued that there is an obvious visible decrease in the predicted levels in the short term. Whether this fact is related to certain reforms in the field of the healthcare system in terms of improving diagnostics, clinical and preventive work will depend on the results of deeper research in the industry.

Keywords: *morbidity, neoplasms, blood circulation, trauma, disease of the endocrine system*

INTRODUCTION

The Health 2020 Policy is based on the values laid down in the WHO Constitution, which are the possession of the highest attainable level of health and health as one of human rights [1].

According to UN forecasts, the world's population will grow over the next few decades and will increase from the current 7.7 billion to 8.5 billion people in 2030 and to 9.7 billion in 2050 [2]. WHO experts in the 80s of the XX century determined the approximate ratio of various factors of ensuring the health of modern man, identifying four groups of factors as the main ones:

lifestyle - 51-52%; environmental condition - 20-21% [3].

In 2017, there were 24.5 million cases of cancer worldwide (16.8 million non-melanoma skin cancers [NMSC]) and 9.6 million cancer deaths [4].

The first and second most important causes of death, heart disease (heart defects) and malignant neoplasms (cancer), respectively, accounted for 44.3% of all deaths in 2017. Accidents (unintentional injuries) rank third, Chronic lower respiratory tract diseases (CHD) rank fourth, and cerebrovascular diseases (stroke) rank fifth; together these three causes accounted for 16.9% of all deaths in 2017 [5].

In 2018, approximately 2.2 million infection-related cancers were diagnosed worldwide, which corresponds to an infection-related ASIR of 25.0 cases per 100,000 person-years. The main causes were Helicobacter pylori (810,000 cases, ASIR 8.7 cases per 100,000 person-years), human papillomavirus (690,000, 8.0), hepatitis B virus (360,000, 4.1) and hepatitis C virus (160,000, 1.7). Infection-related ASIR was highest in East Asia (37.9 cases per 100,000 person-years) and sub-Saharan Africa (33.1), and lowest in Northern Europe (13.6) and Western Asia (13.8). . China accounted for a third of the world's cancer cases associated with infection caused by high ASIR infection with H. pylori (15.6) and hepatitis B virus (11.7) [6].

Globocan estimates that in 2018, around 2.3 million new cases of cancer worldwide (excluding non-melanoma skin cancer) were aged 80 years or older (13% of all cancer cases). By 2050, 6.9 million new cases of cancer (20.5% of all cancers) will be diagnosed worldwide in adults aged 80 and older [7]. The document describes the trends of the last twenty years in terms of mortality and morbidity due to various diseases and injuries. These data clearly demonstrate the need to increase global attention to the problem of prevention and treatment of cardiovascular diseases, cancer, diabetes and chronic respiratory diseases, as well as injury prevention in all regions of the world in accordance with the goals of the UN Sustainable Development Agenda [8].

In the study of the global Burden of Disease (GBD), injuries and risk factors in 2013, 973 million people (uncertainty interval (UI) from 942 to 993) received injuries that required some type of medical care, and 4.8 million (UI from 4.5 to 5.1) died from injuries[9].

In 2017, the global estimated incidence of IP per 100,000 population was 140.92 (from 115.81 to 168.53). This corresponds to 11.5 million pedestrian injuries worldwide [10].

In the Global Burden of Disease study in 2017, the age-standardized incidence of hand and wrist fractures was 179 per 100,000 (95% uncertainty interval (UI) from 146 to 217), while less common thumb injuries and amputation of a finger other than the thumb were 24 (95% UI from 17 to 34) and 56 (95% UI from 43 to 74) per 100,000, respectively [11].

In 2019, the top 10 causes of death accounted for 55% of the 55.4 million deaths registered worldwide. The main causes of death in the world are associated with three large groups of diseases: cardiovascular (coronary heart disease, stroke), respiratory (chronic obstructive pulmonary disease, lower respiratory tract infections) and neonatal pathological conditions (asphyxia of newborns and birth trauma, sepsis and other infectious diseases of newborns, as well as complications of premature birth) (in descending order of the total number of deaths) [12].

Globally, in 2019, non-communicable diseases accounted for seven of the top ten causes of death. These seven causes accounted for 44% of the total number of deaths and 80% of the number of deaths caused by the ten main causes of death. At the same time, all non-communicable diseases combined accounted for 74% of the deaths registered in the world in 2019 [13].

In Europe, among people aged 30-69 years, premature mortality due to such diseases decreased from 421 cases per 100 thousand population in 2010 to 379 cases per 100 thousand population in 2014; similar progress was made in the indicator of total mortality (for all ages), which in the period from 2010 to 2015 decreased from 786 to 715 cases per 100 thousand population. However, this progress is uneven: a significant gap in mortality rates persists both

between men and women and between countries[14].

In Europe, between 1985 and 2011, the SDR for deaths associated with all diseases of the circulatory system decreased from 440.9 to 212.0 x 100,000 in the EU28, and a clear uniform decrease was observed [15]. In the United States, from 1991 to 2014, the overall cancer mortality rate decreased by 25%, which means about 2,143,200 fewer cancer deaths than would have been expected if mortality rates had remained at their peak [16]. In 2015, the top 10 causes of death accounted for 74.2% of all deaths in the United States. Title order of causes in 2015. Has not changed compared to 2014. Two main causes, heart disease (heart defect) malignant neoplasms (cancer) accounted for 45.3% of all deaths in 2015 [17].

In the USA from premature heart disease and cancer in 1999-2018 among women, AAMR decreased for both cancer (from 61.9 / 100,000 to 45.6/ 100,000) and heart disease (from 29.2/ 100,000 to 22.6 / 100,000). The mortality gap between cancer and heart disease is narrowing among women younger than 65 [18].

In 2016, a steady decline in the cancer mortality rate over two decades resulted in an overall decrease of 23%, as a result of which more than 1.7 million cancer deaths were prevented. Despite this progress, cancer is currently the leading cause of death for most of the U.S. population [19].

Mortality data (up to 2018) were collected by the National Center for Health Statistics. According to forecasts, 1898,160 new cases of cancer and 608,570 deaths from cancer will occur in the United States in 2021 [20].

CSD prevalence rates increased significantly from 2013 to 2018 among residents aged 20 years and older in Hunan Province, China. Hypertension was the most common CSD. The prevalence of CSD was significantly higher in 2018 among urban residents, women and older age groups [21].

In China, according to the results of the global burden of diseases In 2017, China had 77 · 1 million (95% uncertainty interval [UI] 72 · 5-81 · 6) new cases of injuries [22].

In Germany, almost a quarter of men and 20% of women die from cancer, and it is estimated that in Germany about 51% of men and 43% of women will get cancer during their lifetime [23].

In Sweden, the epidemiology of injuries has changed in recent years: injury mortality has decreased in the working-age group and increased among people aged 64 and older. Mortality per 100,000 person-years in the able-bodied age group (18-64 years) decreased significantly (coefficient -0.40, r 2 = 0.37; p = 0.020), mainly due to a decrease in mortality from road accidents (coefficient -0.34, r 2 = 0.85; p <0.001). The frequency of injury deaths among elderly patients (65 years and older) increased due to an increase in falls (coefficient 1.71, r 2= 0.84; p <0.001) and poisoning (coefficient 0.13, r 2 = 0.69; p <0.001) [24]. According to cancer morbidity and mortality forecasts, 95,961 deaths among women and 116,585 deaths among men are predicted for 2035. It is predicted that by 2035 there will be 243,690 cases of cancer in women and 270,261 cases of cancer in men [25].

In England, it is estimated that in the period from 2015 to 2035, the prevalence of multiple morbidity will increase, the proportion of 4+ diseases will almost double (2015: 9,8%; 2035: 17,0%), and two-thirds of people with 4+ diseases will have mental illnesses. health (dementia, depression, cognitive impairment without dementia). The prevalence of multiple morbidity among new cohorts aged 65-74 years will increase (2015: 45.7%; 2035 : 52.8%). The increase in life expectancy (men - 3.6 years, women: 2.9 years) will occur mainly with 4+ diseases (men: 2.4 years, 65.9%; women: 2.5 years, 85.2%), which is the result of more frequent, rather than longer survival with multiple diseases. morbidity [26].

In Russia in 2016, compared with 2010, the overall morbidity of the elderly population increased for the following diseases: the number of diseases associated with metabolic disorders, eating disorders and diseases of the endocrine system increased by 46.5%; the number of neoplasms increased by 35.9%; the number of

diseases of the blood, hematopoietic organs, as well as diseases associated with the immune mechanism increased by 29%; the number of diseases of the genitourinary system increased by 15.4%; the number of diseases of the digestive system increased by 12.9%; diseases of the musculoskeletal system and connective tissue increased by 12.6%; skin diseases and diseases of subcutaneous tissue increased by 11.6%; cases of mental disorders and behavioral disorders were recorded by 7.3% more; the number of diseases of the circulatory system increased by 6.8% [27].

In Russia, diseases of the circulatory system in 2019 in the structure of the primary morbidity of the adult population occupy the 4th place (8%), the general morbidity – the 1st place (21%). The indicator of primary morbidity of the adult population with diseases of the circulatory system for 13 years (2007-2019) increased by 42%, the total morbidity - by 24% [28].

Mortality from diseases of the circulatory system, which traditionally account for the largest share of deaths in Russia, increased by 11.6% (or 97.3 thousand cases) in 2020 after a decrease of 1.7% in 2019 and 0.8% in 2018, according to the final annual data of Rosstat. Additional mortality in 2020 from circulatory diseases (including coronary heart disease and stroke) accounted for about 29% of excess mortality in general for this year. This is the second place after mortality from coronavirus infection (144.7 thousand cases, or 42.5% of the total increase in mortality in 2020) [29].

On average, in 2005-2018, the incidence rate from injuries, poisoning and some other effects of external causes in the Russian Federation amounted to 9225.4 cases per 100 thousand population. In the structure of the main causes of morbidity of the country's population in 2005-2018, external causes accounted for 5.8% of cases [30].

In Kazakhstan during the period of implementation of the State Program for the development of healthcare of the Republic of Kazakhstan "Salamatty Kazakhstan" for 2011-2015 (hereinafter - the State Program "Salamatty Kazakhstan") marked: reduction of tuberculosis morbidity by 30.3% (2010 - 95.3 per 100,000 population, 2014 - 66.4) and mortality by more than 2 times (2010 - 10.6 per 1,000 population, 2014 - 4.9); In the structure of total mortality, the leading cause is diseases of the circulatory system (22.3%), the most frequent are coronary heart disease, vascular brain damage, from which about 30 thousand people die annually. The increase in the primary incidence of diseases of the circulatory system is almost 15% (2010 - 2086.7 per 100 thousand population, 2014 - 2394.7).

The second reason is the mortality from malignant neoplasms (12.1%), from which about 17 thousand people die annually, of which 16.9% is lung cancer. The incidence of malignant neoplasms increased by 9.7% (2010 - 181.2 per 100 thousand population, 2014 - 198.7).

In third place is mortality from accidents, injuries and poisoning (11.3%), from which about 16 thousand people die annually. Every year, more than 3,000 people die from intentional self-harm, outstripping deaths from road accidents (hereinafter referred to as accidents) [33].

When analyzing official statistical data in Kazakhstan for the period 1990-2017, 6 trends in the primary incidence of ZNO were revealed with a maximum level in 2015 (207.8 per 100 thousand) and with the latest trend of gradual decline in 2015-2017, while the level of 2017 is approaching the "baseline" of 1990 (192.5 versus 188.5 per 100 thousand). Mortality from ZNO has 3 trends: stabilization of the indicator in 1990-2000. decrease in the level over a 15-year period (2000-2015), growth and stabilization of the indicator at the same level (2015-2017).Early detection of ZnS 2005-2017. It has improved (in stage I-II it has increased by 19.8%), but the growth rate has stabilized over the past 3 years [34].

In Kazakhstan, despite the positive dynamics of population health indicators, the life expectancy of Kazakhstanis is almost 10 years less than in the OECD member countries. There is still a significant difference between the life expectancy of men and women (2014 - 8.82 years), mortality in men of working age is 24% higher than in women [35].

According to the analytical material of the expanded Board of the Ministry of Health of the Republic of Kazakhstan dated March 3, 2017 (hereinafter referred to as the Board), the incidence rate of BSK in 2016 amounted to 2413.0 per 100 thousand population against 2429.7 in 2015. The incidence rate of malignant neoplasms was 207.7 per 100 thousand of the population against 191.1 in 2016. In 2016, the number of accidents, injuries and poisonings amounted to 3224.7 per 100 thousand of the population compared to 3270.4 in 2015 [36]. The incidence of lung cancer among men before standardization was lower, while among women it was higher [37]. In Kazakhstan, the absolute number of cancer cases in 2005-2014 varied. According to the average data, every year the number of malignant neoplasms increased by 578 cases or by 1.84% (average annual absolute increase and growth rate) [38]. According to the incidence rate in the Republic of Kazakhstan, respiratory diseases are on the 1st place for 100,000 people, and diseases of the circulatory system are on the 4th place. In terms of mortality from diseases, the circulatory system is in first place, and respiratory diseases are in second place. But in 2020, this figure increased by 14.4%. Detailed data from the BNS (Bureau of National Statistics) allows us to conclude that the entire increase relates, in particular, to mortality from influenza, acute respiratory infections (ARI) and pneumonia [39].

The number and structure of labor potential, its economic activity, quantitative and qualitative components are largely determined by the specifics of the region [40].

The incidence of BSC in the Turkestan region remains fairly stable, with a small increase annually for certain nosologies, on average per 100 per 100 thousand population. The peaks of the fluctuations noted in 2010 and 2016 did not have a directional trend and smoothed out in subsequent years to the national average values [41]

MATERIALS AND METHODS

The paper uses retrospective data for the period 2011-2020 for the Turkestan region.

RESULTS

When studying the levels and dynamics of morbidity of neoplasms of the able-bodied population of the Turkestan region (retrospective data for the period 2011-2020) with their forecast for 2021-2023 (per 100 thousand of the total population), it is characterized by a weak and medium-pronounced self-oscillatory trend with high values of the epidemic process in 2012, 2014, 2016-2018 for both the entire able-bodied population and individual men and women. The multiplicity of the relationship between the upper and lower values of the levels was 1.1-1.5 times. The obtained levels of the forecast values for 2021-2023 according to the equation below are characterized mainly by weak and medium-expressed binding strength (R2 = 0.35-0.80 $p<0.05$) and also tend to decrease.

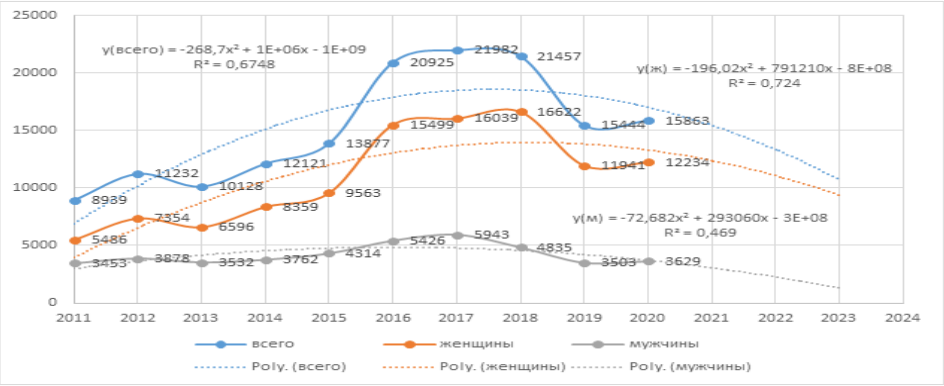

FIGURE 1: Levels and dynamics of the incidence of neoplasms of the able-bodied population of the Turkestan region and their forecast for 2021-2023 (per 100 thousand population) (according to retrospective data for 2011-2020, $p<0.05$)

J Popul Ther Clin Pharmacol Vol 30(11):e431–e441; 15 May 2023.

The level and dynamics of morbidity from diseases of the circulatory system of the able-bodied population of the Turkestan region (retrospective data for the period 2011-2020) with their forecast for 2021-2023 (per 100 thousand population) are marked by a weak and medium-pronounced self-oscillatory trend with high values of the epidemic process in 2012, 2014, 2017-2018 both for the entire able-bodied population and for the individual male and female population. The multiplicity of the relationship between the upper and lower values of the levels was 1.1-1.6 times. The obtained levels of forecast values for 2021-2023 according to the equation below are characterized mainly by weak and medium-expressed binding strength (R2 = 0.25-0.85, p<0.05) and also tend to decrease.

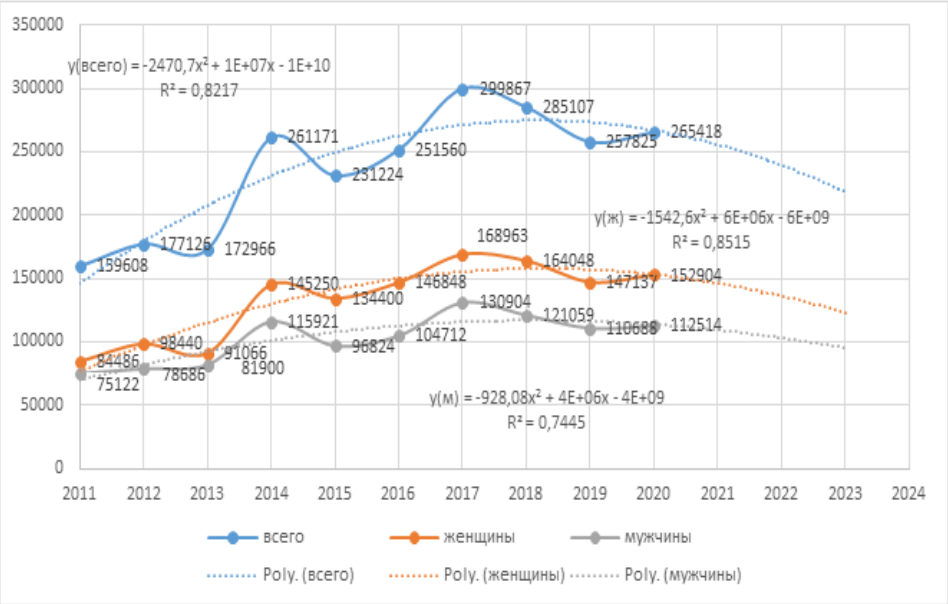

FIGURE 2 : Levels and dynamics of diseases of the circulatory system of the able-bodied population of Turkestan region and their forecast for 2021-2023 (per 100 thousand population) (according to retrospective data for 2011-2020, p<0.05)

The level and dynamics of the incidence of injuries and poisoning and other impacts of the able-bodied population of the Turkestan region (retrospective data for the period 2011-2020) with their forecast for 2021-2023 (per 100 thousand population) are marked by a weak and medium-pronounced self-oscillatory trend with high values of the epidemic process in 2012, 2014, 2016-2018 both for the entire able-bodied population and for the individual male and female population (Fig. 12-14). The multiplicity of the relationship between the upper and lower values of the levels was 1.1-1.4 times. The obtained levels of forecast values for 2021-2023 according to the following equations are characterized mainly by weak and medium-expressed binding strength (R2 = 0.28-0.74, p<0.05) and also tend to decrease. However, the level of predicted values of the incidence of injuries and poisoning and other impacts in several presented curves in 2021-2023 tends to zero, which is explained by the forecast error and the improbability of implementation in full-scale conditions.

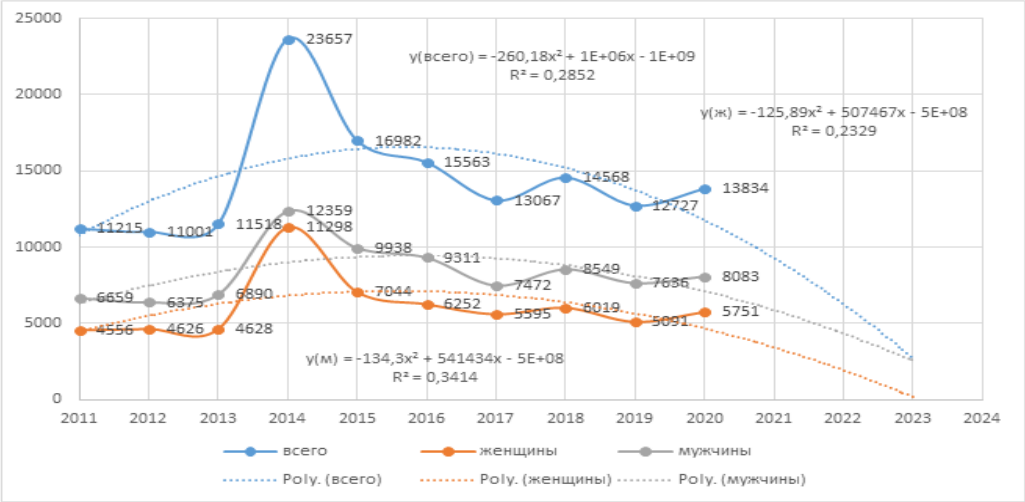

FIGURE 3 : Levels and dynamics of morbidity of injuries and poisoning and other impacts of the able-bodied population of Turkestan region and their forecast for 2021-2023 (per 100 thousand population) (according to retrospective data for 2011-2020

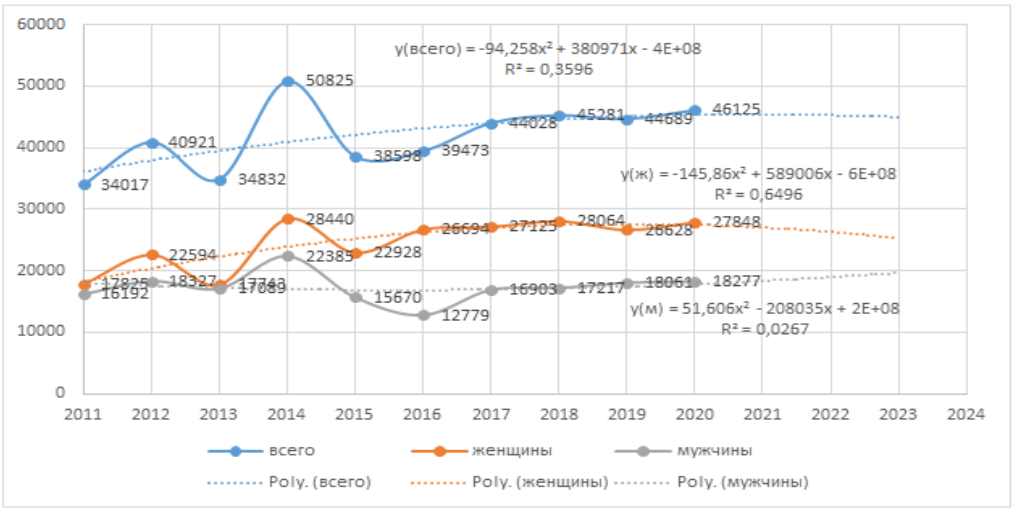

FIGURE 4 : Levels and dynamics of the incidence of the endocrine system and metabolic disorders of the able-bodied population of Turkestan region and their forecast for 2021-2023 (per 100 thousand population) (according to retrospective data for 2011-2020, $p<0.05$)

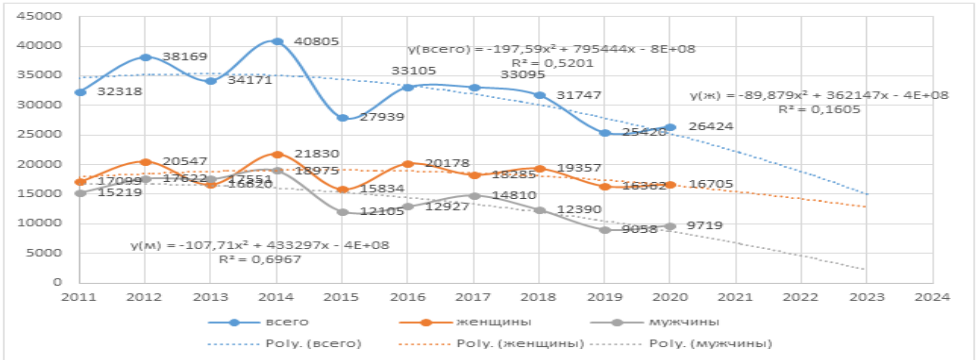

FIGURE 5 : Levels and dynamics of morbidity of the nervous system of the able-bodied population of the Turkestan region and their forecast for 2021-2023 (per 100 thousand population) (according to retrospective data for 2011-2020, $p<0.05$)

J Popul Ther Clin Pharmacol Vol 30(11):e431–e441; 15 May 2023.

The level and dynamics of morbidity from classes of diseases (diseases of the eye and its appendages, ear and mastoid process, circulatory system and respiratory organs) of the able-bodied population of the Turkestan region (retrospective data for the period 2011-2020) with their forecast for 2021-2023 (per 100 thousand of the total population) are marked by a weak and medium-pronounced self-oscillatory trend with high values of the epidemic process in 2012, 2014, 2017-2018 both in the entire able-bodied population and separately male and female population (Fig . 6-9). The multiplicity of the relationship between the upper and lower values of the levels was 1.1-1.6 times. The retrospective data are well generalized by the polynomial model, which better smooths the upper and lower extremes of the levels of epidemiological indicators over time, in contrast to the linear regression model. The obtained levels of forecast values for 2021-2023 according to the following equations are characterized mainly by weak and medium-expressed binding strength (R2 = 0.25-0.85, $p<0.05$) and also tend to decrease. However, the level of predicted morbidity values of the ear and mastoid process and respiratory organs in several presented curves in 2021-2023 tends to zero, which is explained by the forecast error and the improbability of implementation in full-scale conditions (Fig. 7.9).

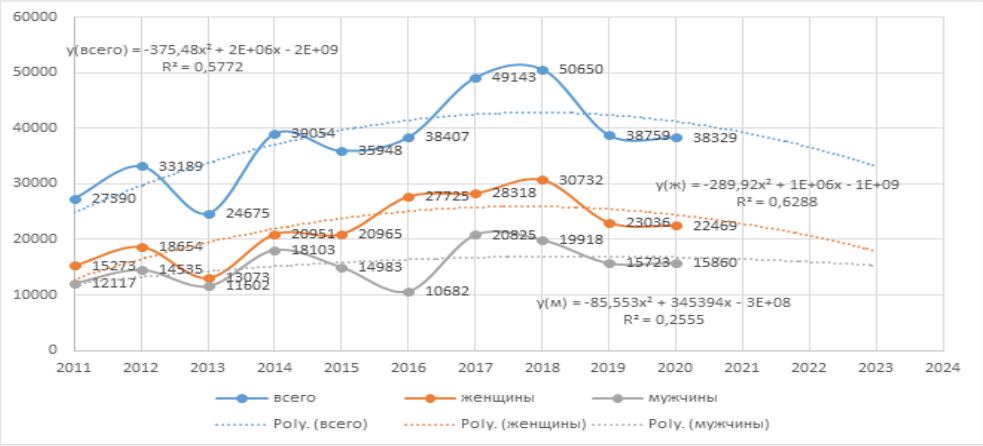

FIGURE 6 : Levels and dynamics of morbidity of the eye and its appendages of the able-bodied population of Turkestan region and their forecast for 2021-2023 (per 100 thousand population) (according to retrospective data for 2011-2020, $p<0.05$)

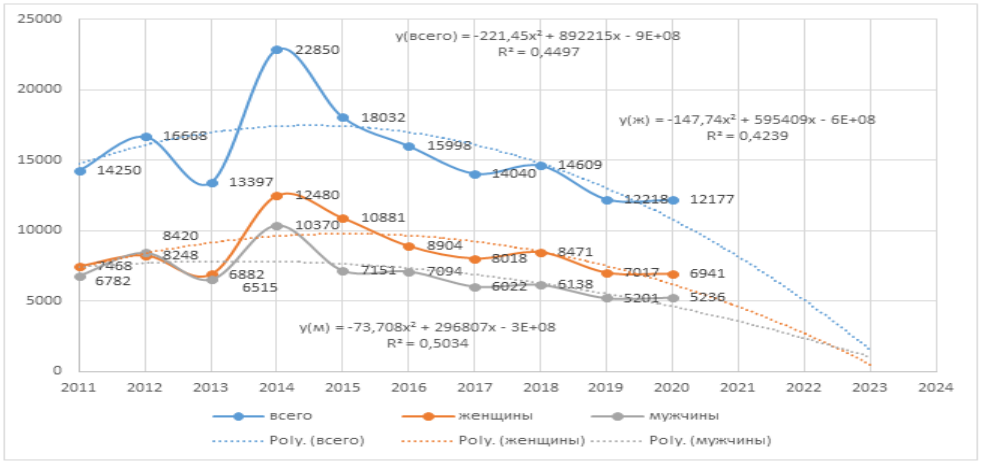

FIGURE 7 : Levels and dynamics of ear and mastoid process morbidity of the able-bodied population of Turkestan region and their forecast for 2021-2023 (per 100 thousand population) (according to retrospective data for 2011-2020, $p<0.05$)

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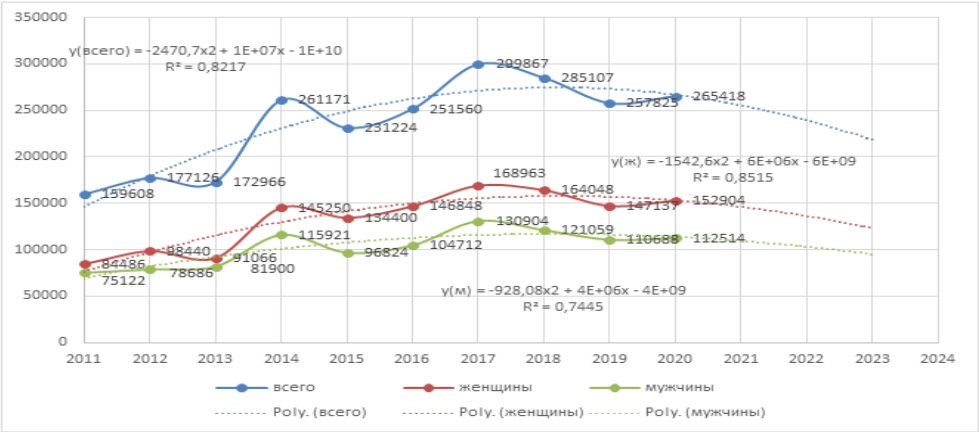

CONCLUSION

Thus, drawing conclusions from predictive models based on retrospective data on the incidence of leading classes of diseases in the able-bodied population of the Turkestan region, it can be argued that there is an obvious visible decrease in the forecasted levels in the short term. Whether this fact is connected with certain reforms in the field of the healthcare system in terms of improving diagnostics, clinical and preventive work will depend on the results of deeper research in the industry.

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