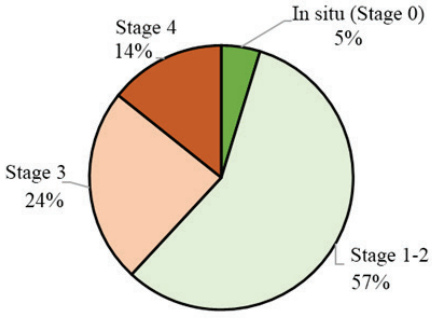

Malignant neoplasms detection stages during the Onkopoisk.Sakha screenings

to polyclinics at their places of residence with other pathologies. We have examined 511 patients at YROD, with 72 patients continuing with their examinations, while 73 patients have refused further examination.

As a result of screening, patients at risk of having or developing the discussed diseases in the future are singled out from an apparently healthy population for an earlier intervention to improve their health [4]. In the pilot project and out of 21 cases of malignant neoplasms identified during screening studies, 1 case was detected at stage 0 (in situ), 12 — at stages 1-2, 5 cases — at stage 3, and 3 cases — at stage 4 of disease (Fig. 1). The proportion of patients with a malignant process of stage 0-2 was 62%. Additionally, we have taken 51 patients under dispensary observation.

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HYGIENE, SANITATION, EPIDEMIOLOGY AND MEDICAL ECOLOGY

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CHARACTERISTICS OF PATHOLOGICAL LESION OF THE WORKING POPULATION OF THE SOUTHERN ZONE OF YAKUTIA

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A comprehensive survey of the working population of the Aldan district of the Republic of Sakha (Yakutia) was conducted. A total of 175 people of working age of non-indigenous nationality were examined. A high frequency of pathology on the part of the digestive, cardiovascular and endocrine systems, including the first identified, was revealed. Overweight and obesity had a high incidence, being a risk factor for the development of cardiovascular diseases. Every 10 respondents have registered oncopathology, 3 participants of the study were sent for further examination with suspicion of malignant neoplasms. The role of primary health care, including shop doctors, is of great importance in the early detection and prevention of risk factors for the most common chronic non-communicable diseases and timely effective medical care, as well as health schools for patients with hypertension, coronary heart disease, diabetes mellitus, gastritis, cancer, etc.

Keywords: pathological lesion, working population, South Yakutia.

The development of the socio-economic sphere of any country is largely determined by labor resources dependent on the health of the able-bodied population, which directly or indirectly depends on a number of factors. Considering that the Aldan district of the Republic of Sakha (Yakutia) is located on the territory of the Elkon uranium ore industry with a possible technogenic effect of uranium decay products, the relevance of the study of the working and living population is undeniable. The medical and demographic analysis according to the official data of the Federal State Social Service for the Republic of Sakha for 2000-2020 showed high mortality rates of the population of the Aldan district in comparison with the national indicators (13.4-15.3 versus 8.6-9.3 per 1000 people). In 2020, the mortality rate from diseases of the circulatory system (DCS) exceeded the national data by more than 2 times (815.8 vs. 404.9 per 100 thousand people). Mortality from neoplasms in the Aldan district in 2020 also exceeded by more than 1.5 times in comparison with the national data (215.5 and 131.6 per 100 thousand people, respectively). The indicators for the incidence of DCS in this area in 2020 were almost 2 times higher than the national ones (328.1 vs. 186.6 per 1000 people), and malignant neoplasms (MNP) by 32.2% (337.5 vs. 255.2 per 100 thousand people) [1].

Objective: To assess the health status of the working population of the Aldan district of the Republic of Sakha (Yakutia)

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based on the results of a comprehensive medical examination.

Materials and methods of research.

From March 27 to April 3 , 2022 , a singe-stage comprehensive medical examination of the working population of the mining cities of Aldan and Tommot of the Aldan district was conducted . The study was conducted by a visiting team of practicing medical specialists of the Yakut Science Centre of Complex Medical Problems which consisted of: a therapist, cardiologist, neurologist, ophthalmologist, oncologist, ultrasound diagnostics doctor and endoscopist. According to the list of employees, every 3rd employee of the institution was invited to the examination of specialists. The response was 75%.

175 residents of the Aldan district of working age of non-indigenous nationality were analyzed, including 66 men and 109 women (37.7% and 62.3%, respectively), whose average age was 43.4±1.08 years for men and 44.7±1.40 years for women.

The research program of the adult population included the following sections: informed consent of the respondent (according to the protocol of the Ethics Committee of the YSC CMP dated 10.03.2022 No.56, decision 3); questionnaire survey to assess the objective condition; anthropometric examination with measurement of height and body weight with calculation of body mass index, clinical examination and instrumental research.

For further analysis, the traditional indicator was used - body mass index (BMI) or Quetelet index, which was calculated by the following formula: BMI (kg / m²) = body weight (kg) / height (m²). Overweight was considered to be a BMI ≥ 25 and <30 kg/m², obesity was determined at a BMI of ≥ 30 kg/m² [National clinical guidelines for the treatment of morbid obesity in adults, 2018, 3rd revision].

Blood pressure (BP) was measured twice with an OMRON M2 Basic automatic tonometer (Japan) in a sitting position with calculation of average blood pressure with a margin of permissible measurement error of ± 3 mm Hg. (ESH/ESC, 2013) according to the instructions for the correct measurement of blood pressure, outlined in the European clinical guidelines for the diagnosis and treatment of hypertension. Hypertension is present at the 140/90 mmHg or taking antihypertensive drugs during the study or stopping them less than 2 weeks before the study (2017 ACC/AHA Guideline).

Nosological diagnosis was made by specialists according to the International Classification of Diseases X revision.

The incidence of disease was calculated by the following formula:

Incidence of disease = *(number of diseases registered in the population)/(number of population)* x100

Statistical analysis was carried out using the SPSS STATISTICS software package (version 26.0). Qualitative variables are described by absolute and relative frequency (percentages), quantitative variables are described using the mean value and the standard error of the mean value. When comparing the groups, Spearman's criteria were used χ2. The statistical significance of the differences (p) was assumed to be equal to 5%.

Research results and discussion.

A comprehensive medical examination of the adult population showed that only 23 people (13.1%) were recognized as practically healthy, i.e. not having one or another disease According to the results of the study, disease was detected in 152 out of 175 people (86.9%). The incidence of disease was 270.1 per 100 examined, i.e. 2-3 diseases per person on average. For the first time in their life, the diagnosis was made in 43 people. In the structure of disease incidence, the leading place was occupied by diseases of the digestive organs, which were registered in more than half of the study participants (57.7 per 100 examined, or 21.4% of all diseases) (Table 1). The second ranking position with a small difference was occupied by diseases of the circulatory system (DCS), which were also registered in more than half of the surveyed contingent (57.1 or 21.2%, respectively). Diseases of the endocrine system, eating disorders and metabolic disorders occupied the third position in the structure of diseases (51.4 or 19.1%). The total share of the most common disease among the study participants was more than half of the total. In addition to the above classes of diseases, diseases of the eye and its accessory apparatus, musculoskeletal system, connective tissue and genitourinary system occupied a significant share in the structure of pathological lesions.

The first rank position in terms of the frequency of pathological lesions was occupied by diseases of the digestive organs. The most common pathology from the gastrointestinal tract (GI) in the adult population was chronic cholecystitis - 54 cases, the proportion was 43.5% of the total pathology of the GI, chronic gastritis (n= 47, 37.9%, respectively). Perhaps this is due to poor-quality drinking water, because 35 ppl. or every fifth respondent indicated in the questionnaire that he drinks untreated water from water supply systems extracted from water intake wells, which does not properly undergo complex water treatment, where the presence of radon, a uranium decay product, is also not excluded.

The second most frequent occurrence was occupied by DCS, which were mainly represented by hypertension, coronary heart disease (CHD) and cerebrovascular diseases (CVD). More than half of the respondents had hypertension (AH) (n=98 or 56.0%), including 25 who were diagnosed for the first time, which was 14.3%. AH is mainly represented in the 2nd stage - 45 people, the 1st and 3rd stages are exhibited in 25 and 28 people, respectively. CHD was detected in 25 respondents or 14.4% of all study participants, more than half of them were diagnosed for the first time (n=14, 8.0%, respectively), including the subacute stage of myocardial infarction in 1 patient who was urgently referred for inpatient treatment to the cardiology department of the central district hospital. CVDs were mainly represented by dyscirculatory (hypertensive) encephalopathy and the consequences of ischemic stroke (n=32, 18.3%, respectively).

Endocrine system diseases, eating disorders and metabolic disorders were next in frequency of occurrence among respondents. Taking into account the high frequency of overweight and obesity in the adult population, respectively, exogenous constitutional obesity prevailed among diseases of the endocrine system (77 cases, the proportion was 85.5% of the total pathology of the endocrine system). Type 2 diabetes mellitus was registered in 7 study participants (7.8%).

Among the diseases of the eye and its accessory apparatus, the most frequent pathology is mainly represented by retinal angiopathy (n=38 or 65.5% of the total pathology of the visual organs).

The most frequent pathology among diseases of the genitourinary system is represented by diseases of the female genital organs, among which cervical dysplasia was the leader (n=25 or 53.2% of all existing pathology of the genitourinary system).

Diseases of the musculoskeletal system and connective tissue were mainly represented by osteochondrosis of the spine (n=26), the proportion of all pathology in this structure was 72.2%.

Neoplasms occupied the VII rank position in the structure of pathological lesions, and were found in almost every 10th participant of the study (n=18 or 10.3 per 100 examined). Malignant neoplasms (MNP) were registered in 4 study participants: 2 women with cervical can-

Table 1

The structure of pathology of the adult population of the Aldan district

Class of diseases (ICD – 10)	Rank	Pathological lesions (per 100 examined)	Specific gravity (per 100 diseases)
A00-B99 Infectious and parasitic diseases	XIII	0.6	0.2
C00-D48 Neoplasms	VII	10.3	3.9
D50-D89 Diseases of the blood, hematopoietic organs and individual disorders involving the immune mechanism	XII	1.1	0.4
E00-E90 Diseases of the endocrine system, eating disorders and metabolic disorders	**III**	51.4	19.1
G00-G99 Diseases of the nervous system	VIII	4.0	1.5
H00-H59 Diseases of the eye and its accessory apparatus	IV	33.1	12.3
I00-I99 Diseases of the circulatory system	**II**	57.1	21.2
J00-J99 Respiratory diseases	IX	2.3	1.0
K00-K93 Diseases of digestive organs	**I**	57.7	21.4
M00-M99 Diseases of the musculoskeletal system and connective tissue	VI	20.0	7.4
N00-N99 Diseases of the genitourinary system	V	26.8	9.9
Q00-Q99 Congenital anomalies (malformations), deformities and chromosomal disorders	X	2.3	1.0
S00-T98 Trauma, poisoning and some other consequences of exposure to external causes	XI	1.7	0.7
All diseases		270.1	100.0

Table 2

The structure of pathology of the adult population of the Aldan district depending on gender

Class of diseases (ICD – 10)	Number per 100 men examined	Number per 100 examined women	χ^2	p
A00-B99 Infectious and parasitic diseases	0	0.9	0.609	>0.05
C00-D48 Neoplasms	7.6	11.9	0.843	>0.05
D50-D89 Diseases of the blood. hematopoietic organs and individual disorders involving the immune mechanism	0	1.8	1.225	>0.05
E00-E90 Diseases of the endocrine system. eating disorders and metabolic disorders	50.0	52.3	0.086	>0.05
G00-G99 Diseases of the nervous system	3.0	4.6	0.259	>0.05
H00-H59 Diseases of the eye and its accessory apparatus	27.3	36.7	1.647	>0.05
I00-I99 Diseases of the circulatory system	62.1	54.1	1.072	>0.05
J00-J99 Respiratory diseases	3.0	1.8	0.263	>0.05
K00-K93 Diseases of digestive organs	57.5	57.8	0.008	>0.05
M00-M99 Diseases of the musculoskeletal system and connective tissue	18.1	21.1	0.219	>0.05
N00-N99 Diseases of the genitourinary system	9.1	37.6	17.026	0.000
Q00-Q99 Congenital anomalies (malformations). deformities and chromosomal disorders	0	3.7	2.478	>0.05
S00-T98 Trauma. poisoning and some other consequences of exposure to external causes	1.5	1.8	0.025	>0.05
All diseases	239.2	286.1	0.303	>0.05

cer, 1 man with stomach cancer and 1 man with chronic lymphocytic leukemia. All patients are under the supervision of a therapist and oncologist, have no signs of disease progression. Three study participants with suspected urogenital tract infection were recommended to be examined at the Yakutsk Republican Oncological Dispensary. In the studies of P.M. Ivanov, the leading positions in the prevalence of the digestive and reproductive system in the industrial zone of Yakutia are shown, which causes cancer in patients with precancerous diseases [2; 5]. Other neoplasms are mainly represented by benign uterine fibroids.

For a more detailed analysis, we conducted a gender comparison of disease incidence (Table 2). In a comparative analysis of pathological lesions per 100 examined women, the incidence of one or another pathology was significantly higher compared to men, there were almost three diseases per woman. This is due

to the statistically significantly high incidence of pathology of the genitourinary system, mainly represented by diseases of the female genital organs. In the work of Semenova I.N. [1], the high incidence of genitourinary disease in working women compared with the male population of the mining province of Russia was also confirmed. In the gender comparison, men (n=41 or 62.1 per 100 examined) had significantly more DCS than women (n=57 or 54.1, respectively) (p=0.228). Otherwise, there were no statistically significant differences in pathological lesions. Diseases of the digestive system, endocrine system, eating disorders and metabolic disorders were registered equally often.

According to anthropometric indicators, such as the average BMI, no significant gender differences were obtained, in men it was 28.79 ±0.50 and 28.96±0.57 in women. According to the BMI values, 56 ppl. or 32.2% of the total number of study participants were overweight, obesity was registered in 77 people (44.2%). In a gender comparison, 27 men or 40.9% and 29 women had excess weight (26.9%) (χ^2=3.70 p=0.05). Obesity by BMI was relatively equally common in both men (n=29 or 43.9%) and women (n=48 or 44.4%), and did not differ significantly (χ^2=0.004, p=0.948).

Thus, in the non-indigenous population of the Aldan district of the Republic, overweight and obesity had a high incidence, being a risk factor for the development of cardiovascular diseases. The high pathological incidence of diseases of the digestive tract, cardiovascular system and endocrine pathology may be due to unfavorable exogenous factors, the nature of nutrition and lifestyle. Also, previously conducted comprehensive biomedical studies confirmed the high frequency of these nosologies [3].

Conclusion. Indicators of incidence of disease of the working population of the southern zone of Yakutia, being an additional link of social and hygienic monitoring, presented a real picture of disease prevalence among the population, making it possible to form forecasts of the prevalence of diseases. The high frequency of pathology on the part of the digestive, cardiovascular and endocrine systems in the able-bodied population of South Yakutia shows an unfavorable picture of the state of health, possibly due to the negative influence of both external and internal factors, as evidenced by statistical data on morbidity and mortality of the population of this region. And considering that the surveyed contingent belonged to a non-indigenous or "alien" population, the syndrome of chronic adaptive overstrain can be assumed. The newly identified pathology, including the suspicion of newly diagnosed malignant neoplasms, is alarming. Special attention should be paid to the high frequency of detection of pathology of the cardiovascular system during the comprehensive medical examination, which, if not diagnosed in time, could lead to fatal consequences. Perhaps the reason for this is the low level of medical care, low coverage of medical examinations or the lack of highly qualified specialists in the field.

In this article, we did not detail the influence of lifestyle factors of respondents and their work safety. The role of primary health care, including front-line doctors, is of great importance in the early detection and prevention of risk factors for the most common chronic non-communicable diseases and timely effective medical care, as well as organization of health schools for patients with hypertension, coronary heart disease, diabetes mellitus, gastritis, cancer, etc.

The work was carried out within the framework of the research of the YSC CMP "Regional peculiarities of biochemical, immunological and morphological indicators in the indigenous and alien population of the Republic of Sakha (Yakutia) in norm and pathology" (FGWU-2022-0014) and the research of the Academy of Sciences of the Republic "Assessment of the levels of exposure of the population of the Aldansky district due to natural sources of radiation and recommendations to carry out protective measures to reduce them."

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