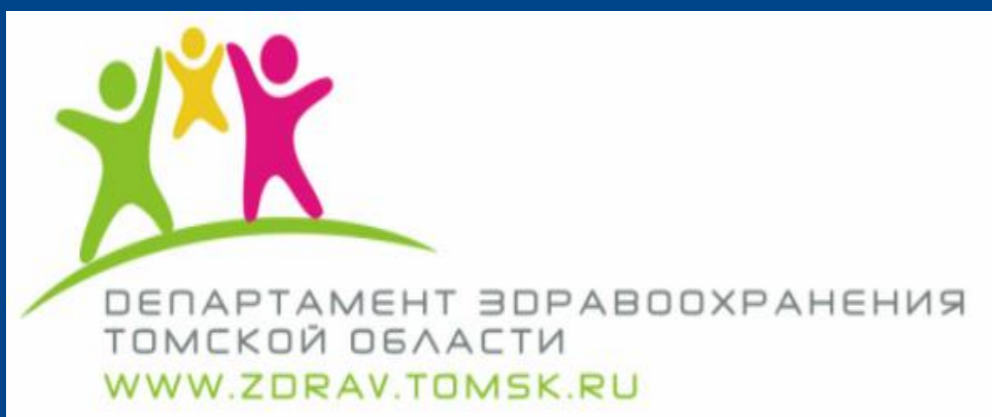


INFECTIOUS MORBIDITY THROUGH COVID-19 PANDEMIC IN TOMSK REGION

Yuliya Ermolaeva

Chief Infection Specialist, Tomsk Region Health Department



TOMSK REGION



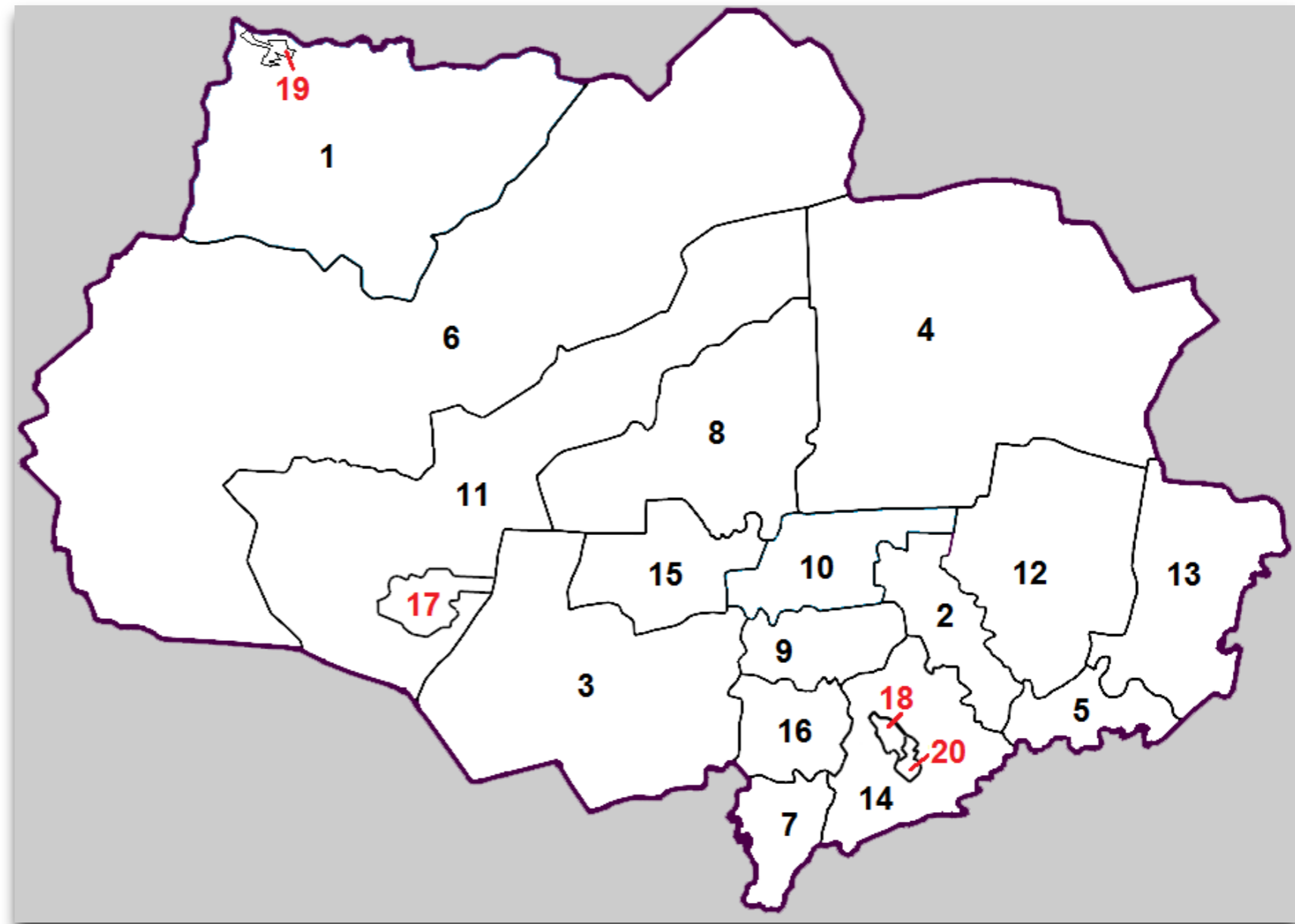
- Population - 1,077 thousand people (2022).
- Population density - 3.38 people/km².
- Urban population — 73.54 %.
- Average age - 38 years.

- Tomsk Region is one of Russia's regions, belongs to the Siberian Federal District.
- Region's length from North to South is about 600 km, from West to East — 780 km.
- Region's area is 314, 400 km².
- Capital is the City of Tomsk.
- Average temperature of July +24C, of January – 16C.

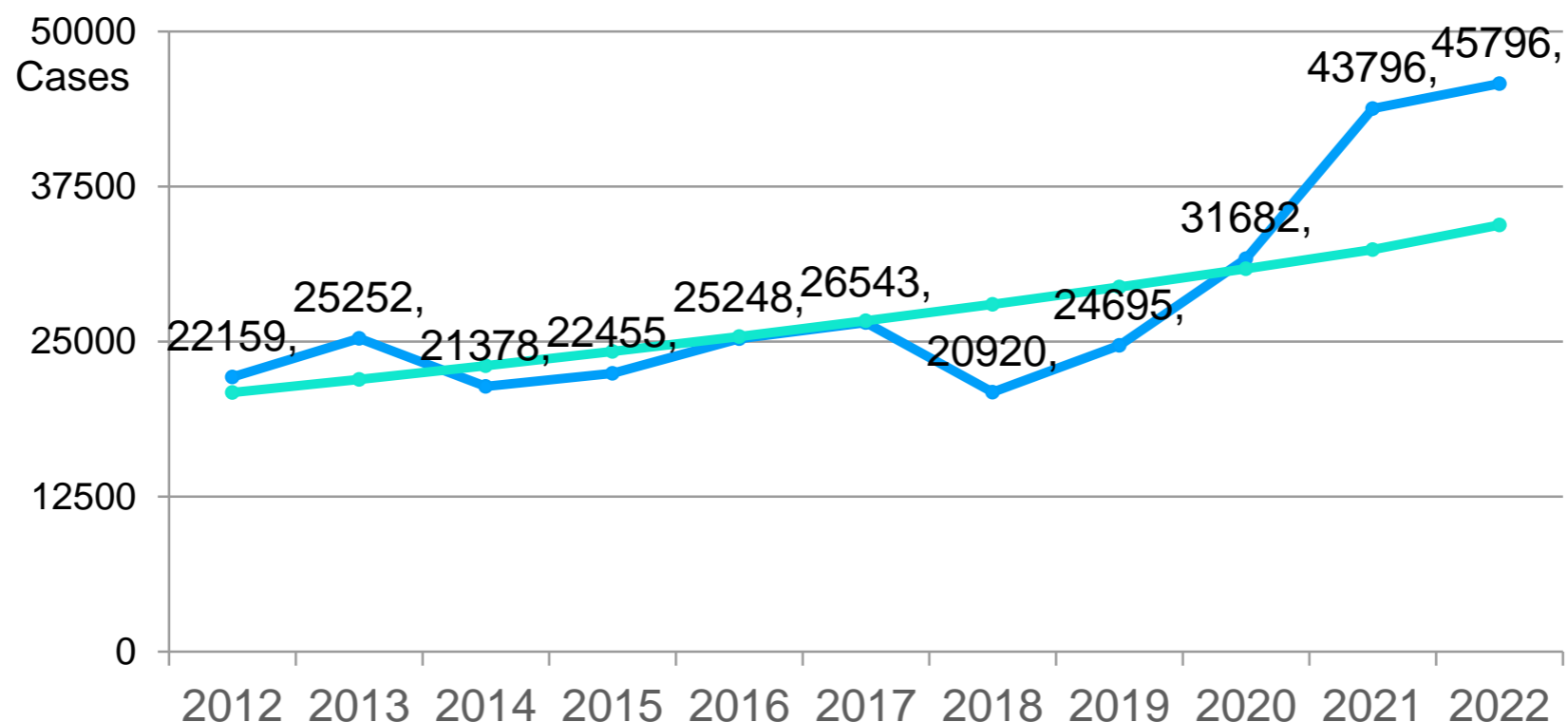
ADMINISTRATIVE and TERRITORIAL DIVISION of TOMSK REGION

16 administrative districts and 4 cities

- 1 Alexandrovsky district
- 2 Asinovsky district
- 3 Bakcharsky district
- 4 Chainsky district
- 5 Kargasok district
- 6 Kolpashevsky district
- 7 Kozhevnikovsky district
- 8 Krivosheinsky district
- 9 Molchanovsky district
- 10 Parabel district
- 11 Pervomaisky district
- 12 Shegarsky district
- 13 Teguldet district
- 14 Tomsk district
- 15 Verkhneketsky district
- 16 Zyryansky district
- 17 Kedrovoy city
- 18 Seversk city
- 19 Strezhevoy city
- 20 Tomsk city



DYNAMICS OF THE INCIDENCE OF INFECTIOUS DISEASES IN TOMSK REGION IN 2012-2021 (PER 100 THOUSAND POPULATION)



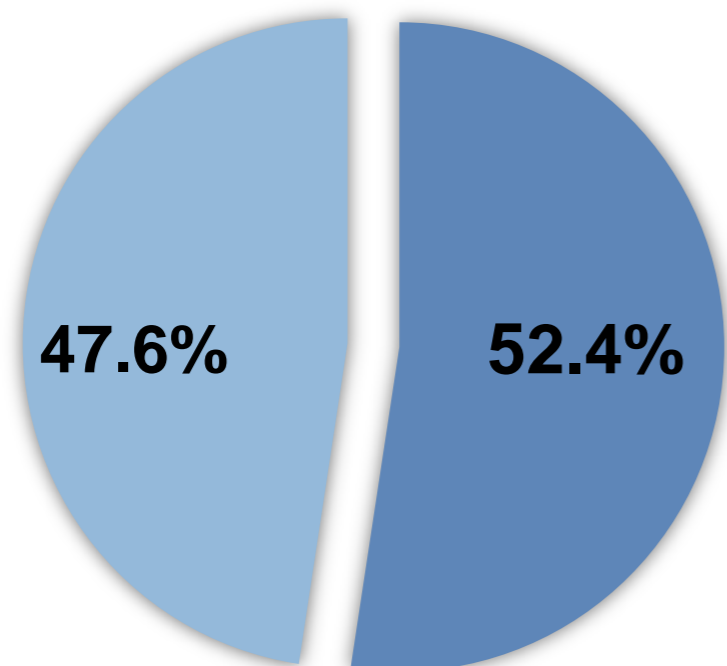
In 2022, 468,769 cases of infectious and parasitic diseases were registered in Tomsk Region, **intensive rate per 100 thousand**.

The incidence amounted to 43796.3, which is 1.4 times higher than last year (2021 - 342,480 cases, 31681.8 per 100 thousand population).

Infectious morbidity in Tomsk Region tends to increase, the growth rate is 5%.

INFECTIOUS MORBIDITY

INFECTIOUS AND PARASITIC DISEASES

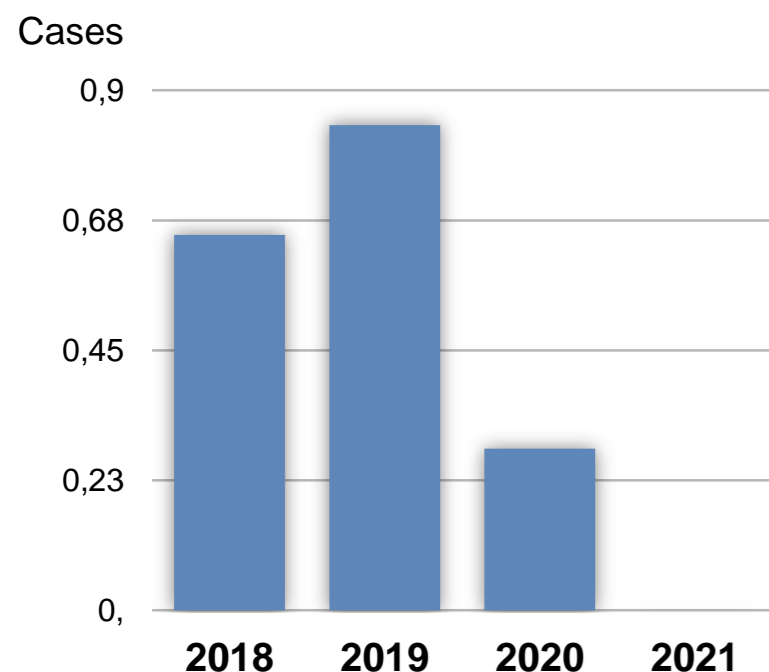


■ Adults ■ Children

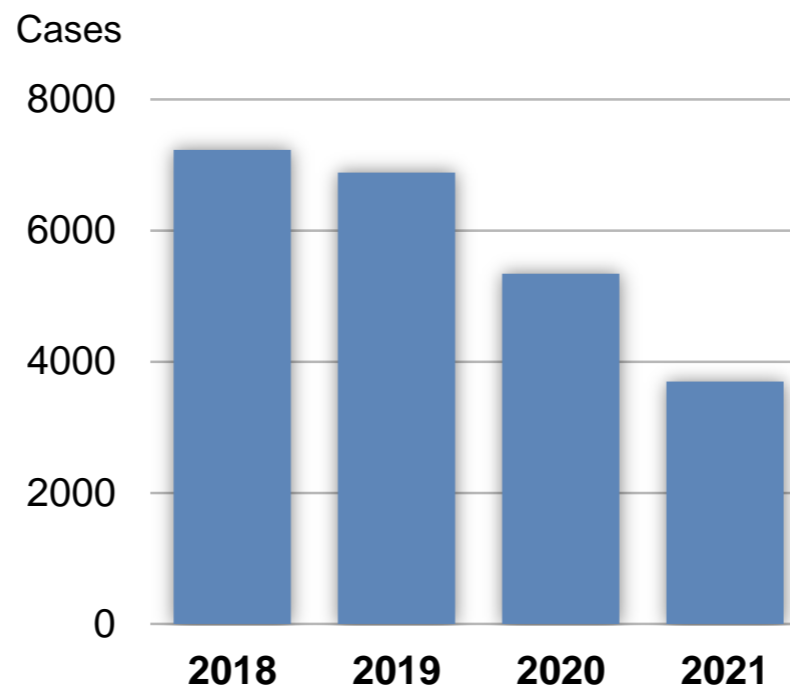
Among those infected with infectious and parasitic diseases, **47.6% are children** under the age of 17. The incidence among children was 98650.1 per 100 thousand population, which is 28 % higher than the year before.

AIRBORNE INFECTIONS

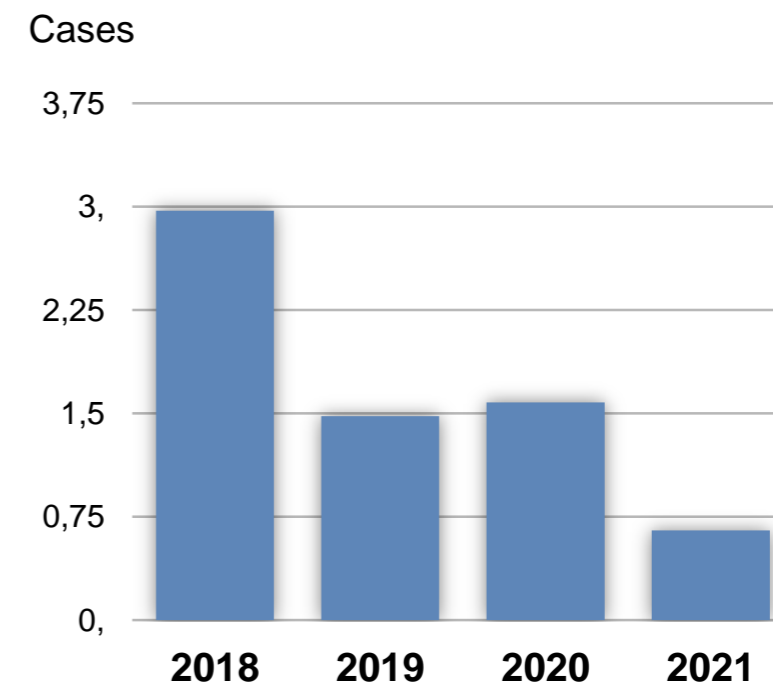
MENINGOCOCCAL INFECTION



CHICKENPOX



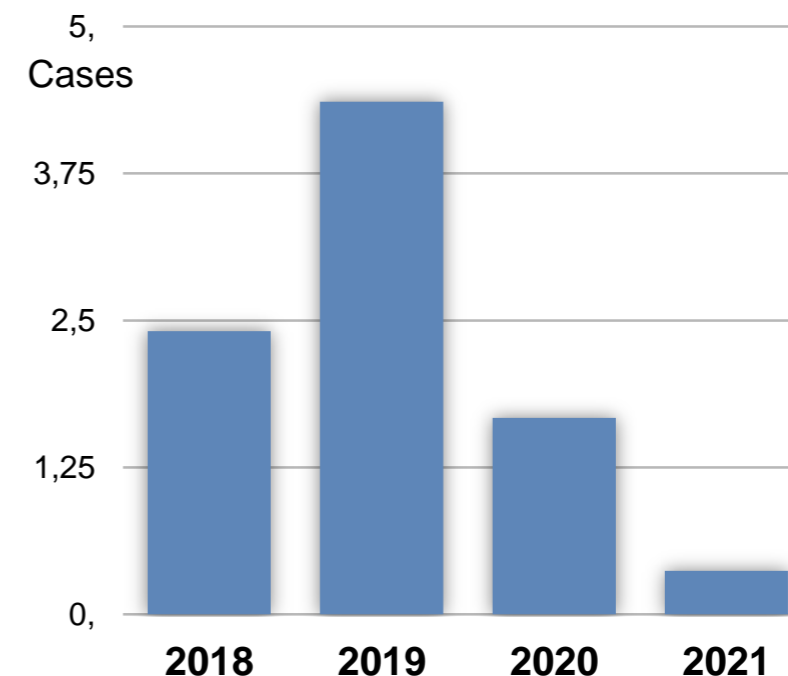
SCARLET FEVER



Diphtheria has not been registered in Tomsk Region since 2006.

Mumps, measles and rubella have not been registered in Tomsk Region in the last 5 years.

PERTUSSIS

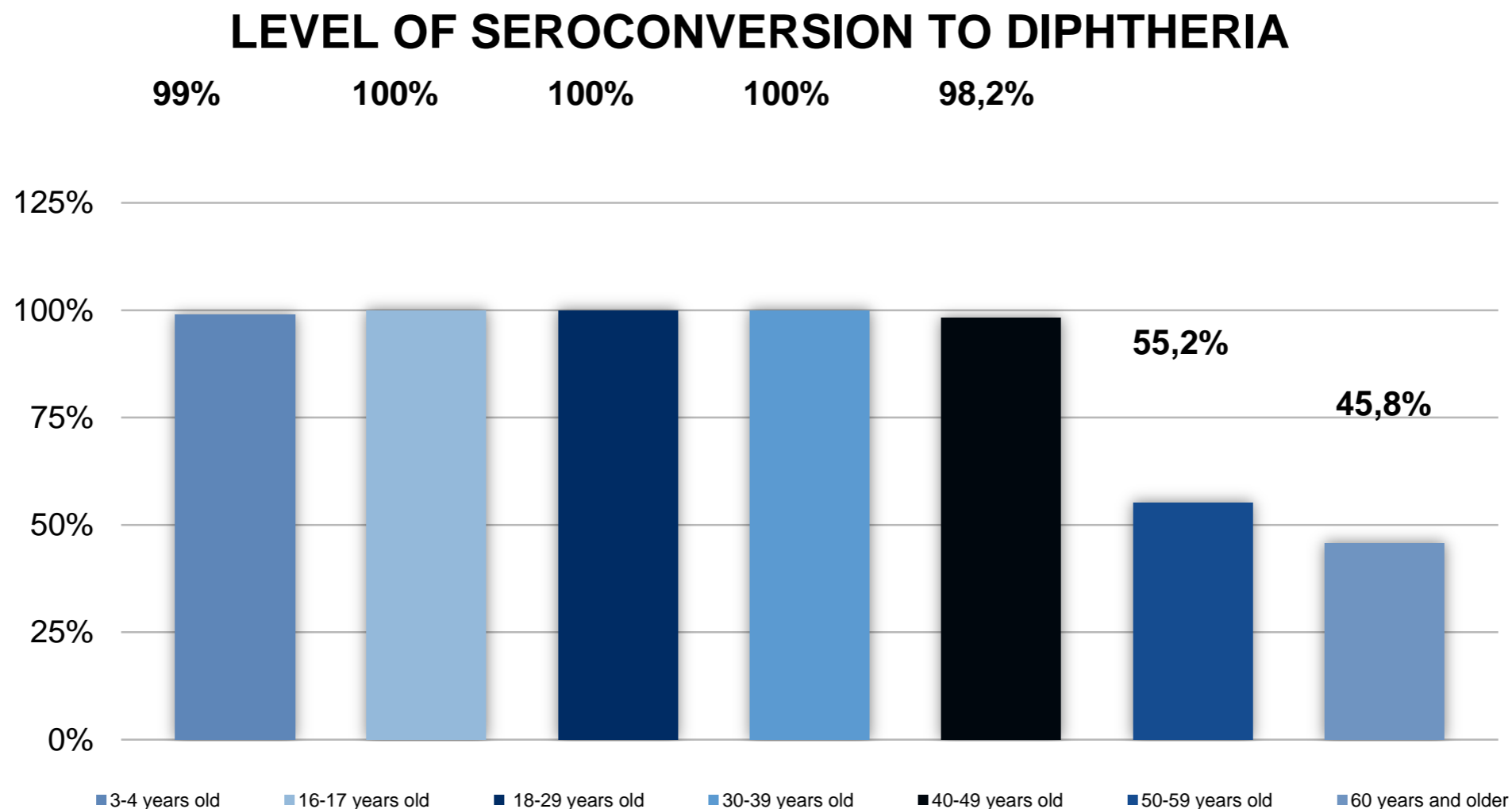


ANTITOXIC IMMUNITY TO DIPHTHERIA

The **diphtheria vaccination** coverage rate for adults aged 18 and older was **97.5%**.

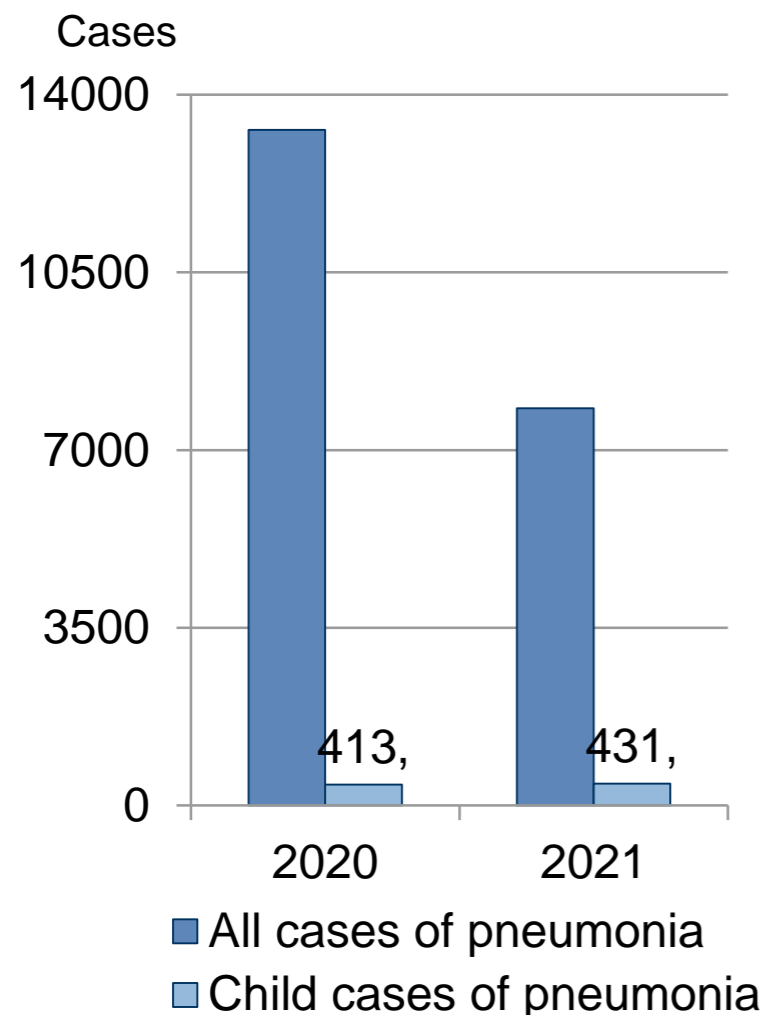
In total, **700 people** in the recommended age groups of the population were examined in 2021. The intensity of immunity to the causative agent of diphtheria, was revealed that **98.1%** of the surveyed population of Tomsk Region had a sufficient level of immunity (1:20 and higher) against diphtheria.

The highest rate of seronegative individuals was observed in the groups of **50-59 years, 60 years and older**.



COMMUNITY-ACQUIRED PNEUMONIA

INCIDENCE OF PNEUMONIA



In 2021 - **7827 cases of community-acquired pneumonia were registered in Tomsk Region** (IP - 731.3 per 100 thousand population, **in 2020 13306 cases, IP - 1232.9**).

In 2021, there was a decrease in the incidence of community-acquired pneumonia in comparison to 2020, the rate of decline - 40.6%.

Morbidity rate in Tomsk Region is 1.5 times lower than the Russia's average (1854.04).

The proportion of children was 5.5% (431 cases, 368.8 per 100 thousand population) versus 3.1% in 2020 (351.1).

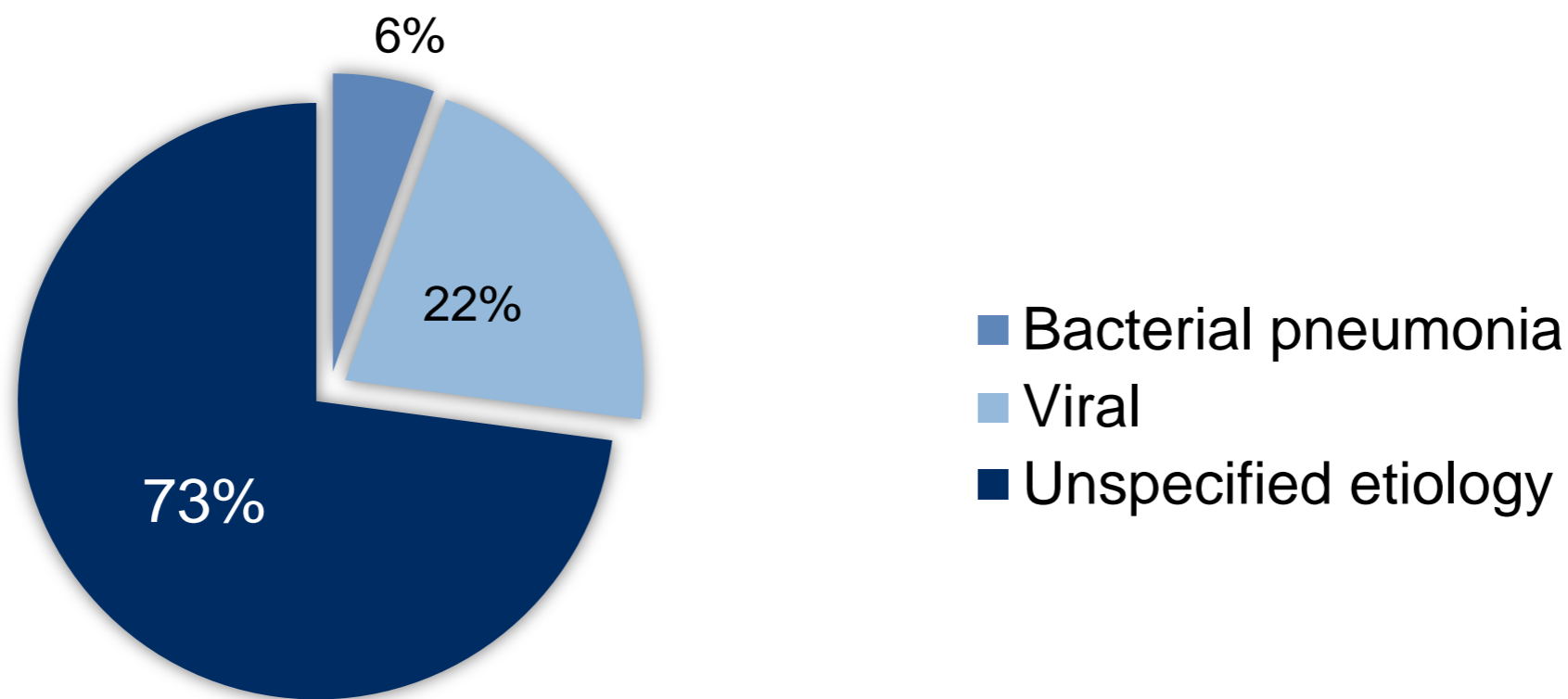
The highest incidence rates were registered **among children under one year of age and from 1 to 2 years of age.**

COMMUNITY-ACQUIRED PNEUMONIA

The incidence rate was 748.8 and, respectively, 1014.0 per 100 thousand population.

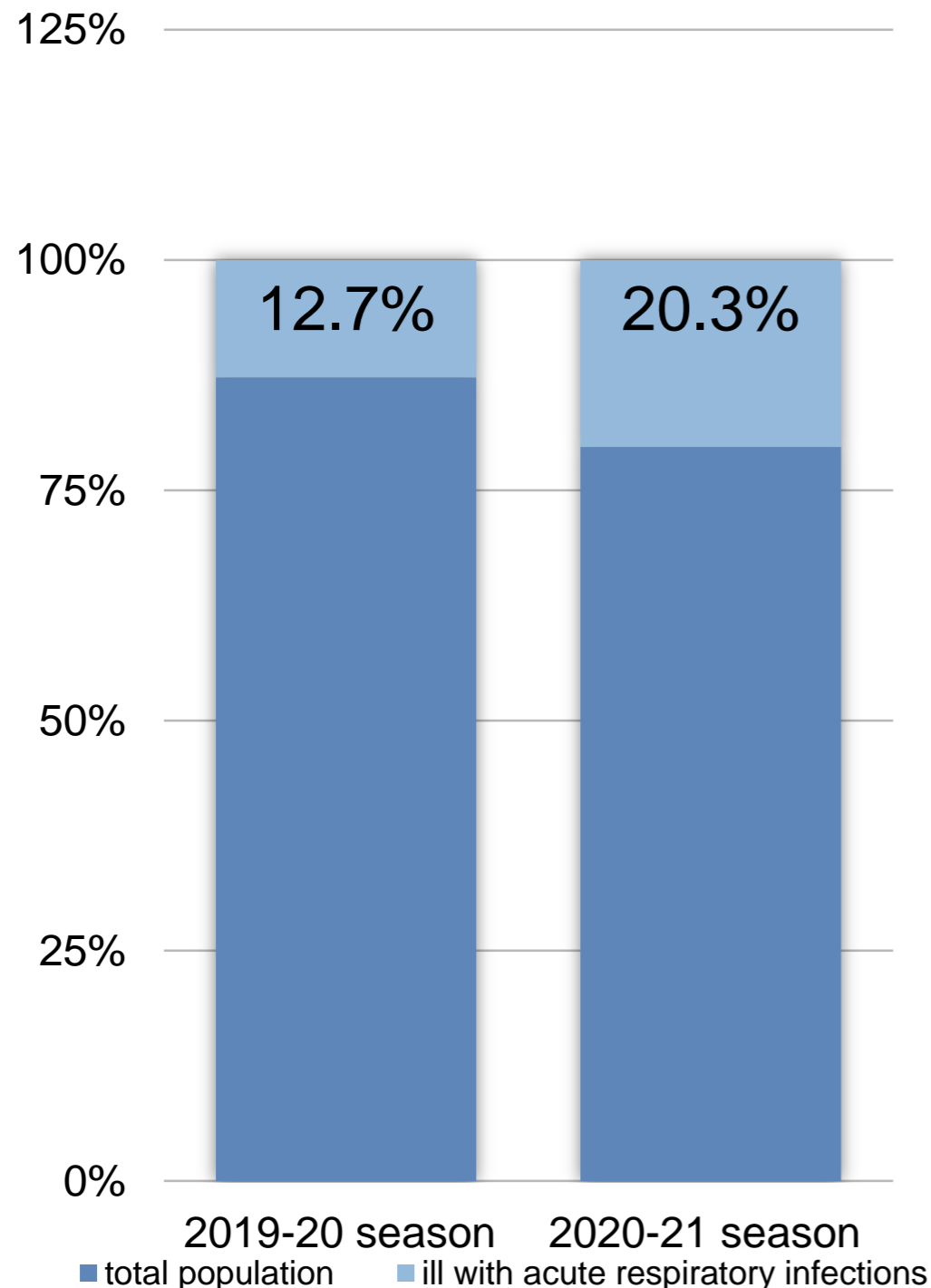
Among the examined cases in 5.5% (430 cases) bacterial pneumonia was registered, in 21.6% (1695 cases) – viral.

ETIOLOGY OF PNEUMONIA



ACUTE RESPIRATORY INFECTIONS

ACUTE RESPIRATORY INFECTIONS



In Tomsk Region, **219,536 people (20.3 % of the population)** were ill with acute respiratory infections, including influenza, in the **2020-2021 epidemic season.**

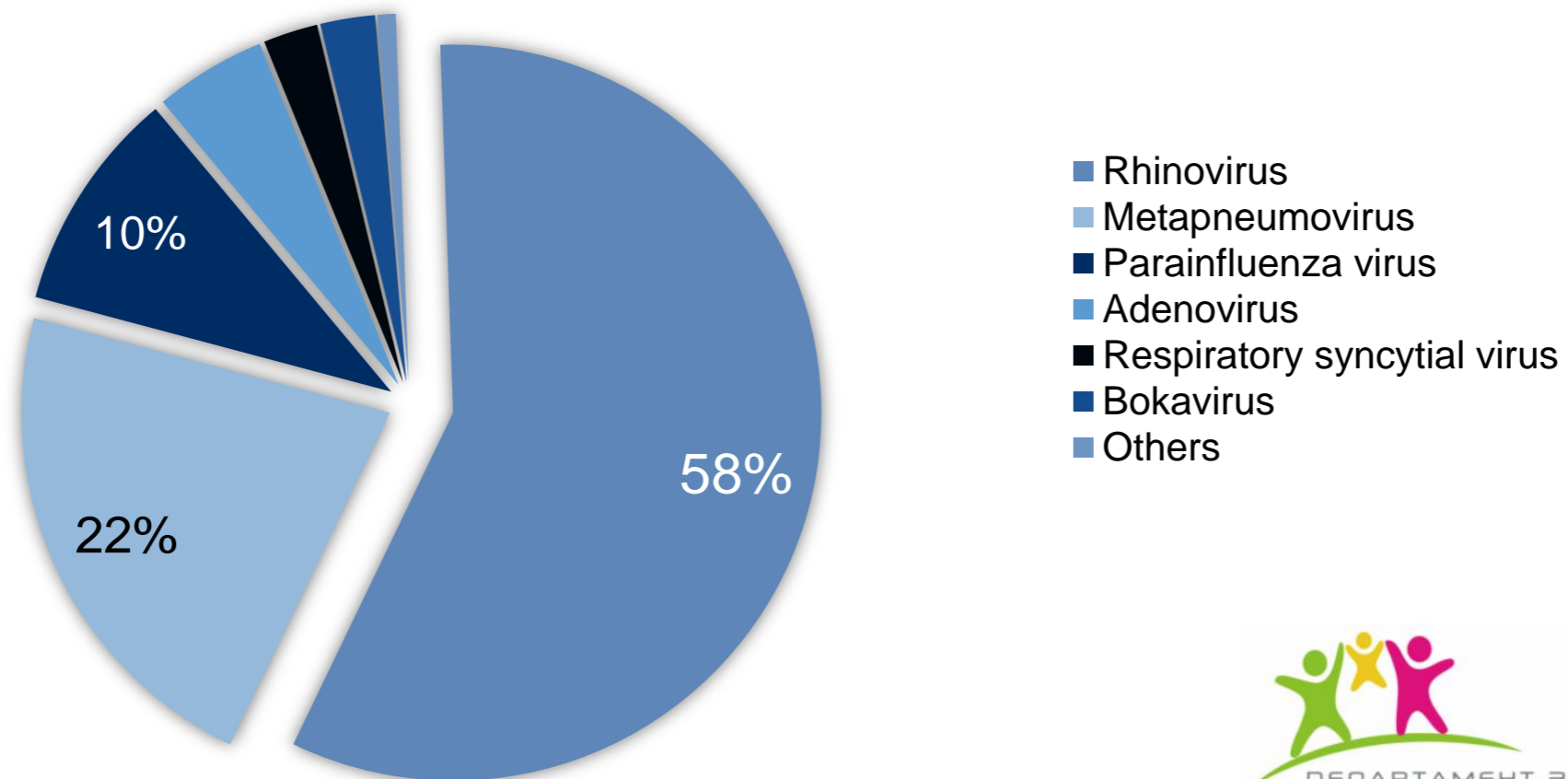
The incidence rate was 2034.5 per 10 thousand population, **which is 37.2% higher compared to the 2019-2020 epidemic season (1482.7).**

ETIOLOGY OF ACUTE RESPIRATORY INFECTIONS

Among respiratory viruses of **non-influenza etiology**, the prevalence of rhinoviruses (57.7%), metapneumoviruses (22%), and parainfluenza virus (9.8%) was registered during the epidemic season.

According to departmental monitoring, there were no cases of influenza (laboratory confirmed) among people vaccinated against influenza in the 2021-2022 epidemic season.

ETIOLOGY OF ACUTE RESPIRATORY INFECTIONS



FLU VACCINATION

According to molecular genetic studies and sequencing conducted by the State Research Center of Virology and Biotechnology VECTOR of Rospotrebnadzor, **circulating influenza viruses were homologous to vaccine strains, resistance to antiviral drugs was not detected.**

The assessment of the immunological effectiveness of influenza vaccination in Tomsk Region in 2021 showed that the **level of protection corresponds to the vaccination effectiveness indicator above 60% for all influenza viruses** (A/H1N1 - 90%, A/H3N2-93.3%, B – 68%).

Complaints of individuals with a history of SARS-CoV2 infection:

- **neurological** – 45% (n=18), in the form of dizziness, taste perversion, memory disorders, pain in the joints and back,
- **cardiological** – 30% (n=12), manifesting tachycardia and cardiopathy,
- **shortness of breath on the part of the respiratory system** – 5% (n=2),
- **hair loss and dry skin** – 95% (n= 38),
- **gastrointestinal disorders** - 55% (n=22), in the form of gastric or intestinal dyspepsia.

THE LEVEL OF ANTIBODIES TO SARS-COV 2 AFTER COVID-19

Antibodies to SARS-CoV2 were detected in all subjects, regardless of the presence or absence of the history of coronavirus infection.

The level of antibodies to SARS-CoV2 was 1.8 times higher compared to those who were not ill.

The level of antibodies did not differ among vaccinated and non-vaccinated patients and amounted, respectively, to 827.50 (698.80; 900.20) and 878.25 (840.10; 895.00) BAU/ml.

THE LEVEL BIOCHEMICAL PARAMETERS AFTER COVID-19

Changes in the state of proteolysis in individuals with the presence of antibodies to SARS-CoV 2 were revealed, regardless of being vaccinated or infected.

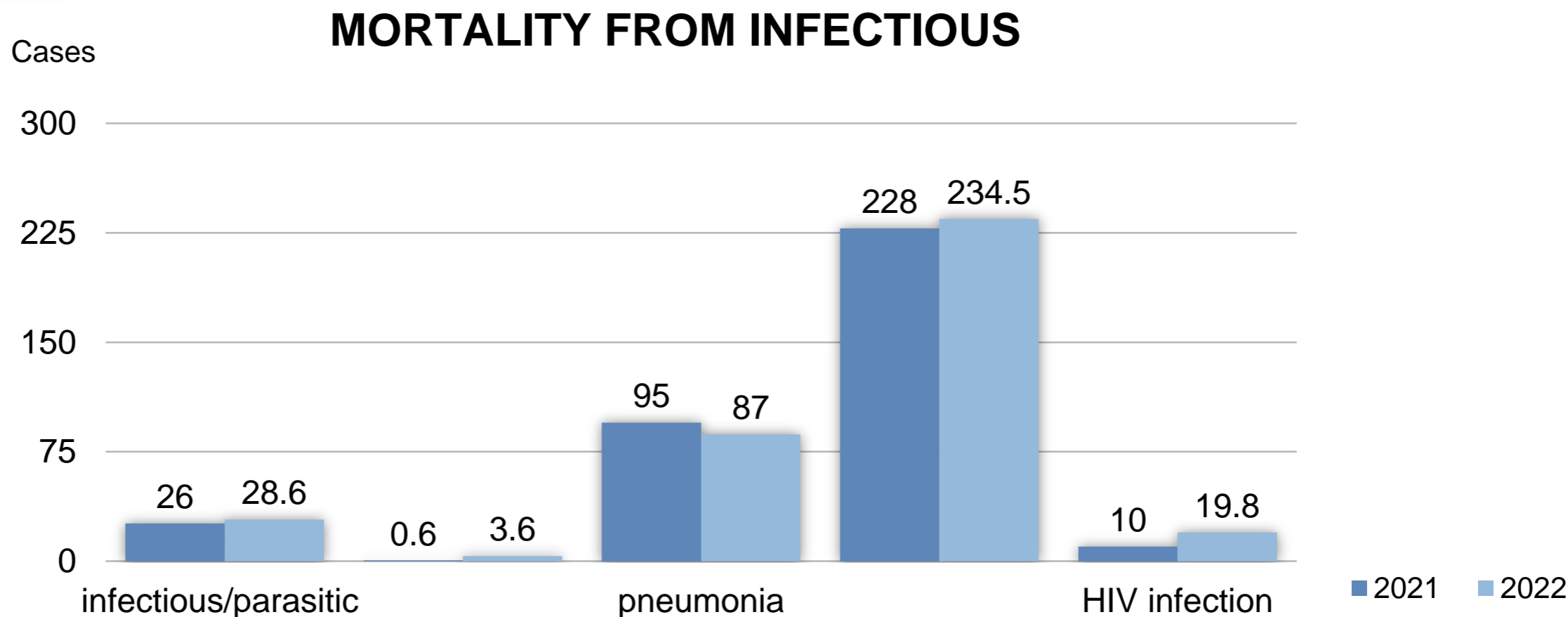
High activity of trypsin-like, elastase-like proteinases, an increase in the content of malonic dealdigide and the amount of oxidative modification of proteins in blood serum with low catalase activity were typical to all examined individuals.

An increase in the activity of α 1-proteinase inhibitor is noted for people with confirmed disease.

People with obesity, which is an aggravating factor for COVID-19, who were vaccinated or showed no signs of coronavirus infection, had antibodies to the virus.

There were no signs of chronic inflammation in this category of patients. This is associated with high activity of trypsin - like proteinases and deficiency of α 1-proteinase inhibitor and, probably, may indicate a high risk of manifestation of pathological processes.

MORTALITY FROM INFECTIOUS AND PARASITIC DISEASES



In 2022, the mortality rate from **infectious and parasitic diseases** in Tomsk Region amounted to **28.6 per 100 thousand population**, which is 2.1% higher than in 2021.

The mortality rate from **tuberculosis** in 2022 was **3.6 per 100 thousand population**, which is 16.1% higher than in 2021. The mortality rate from **pneumonia** in 2021 was **87.0 per 100 thousand population**, which is 7.0% lower than in 2021.

The mortality rate from **coronavirus infection caused by COVID - 19** in 2022 was **234.5 per 100 thousand population**, which is 8.9 times higher than in 2021. The mortality rate from **HIV infection** in 2022 was **19.8 per 100 thousand population**, which is 9.1% higher than in 2021.

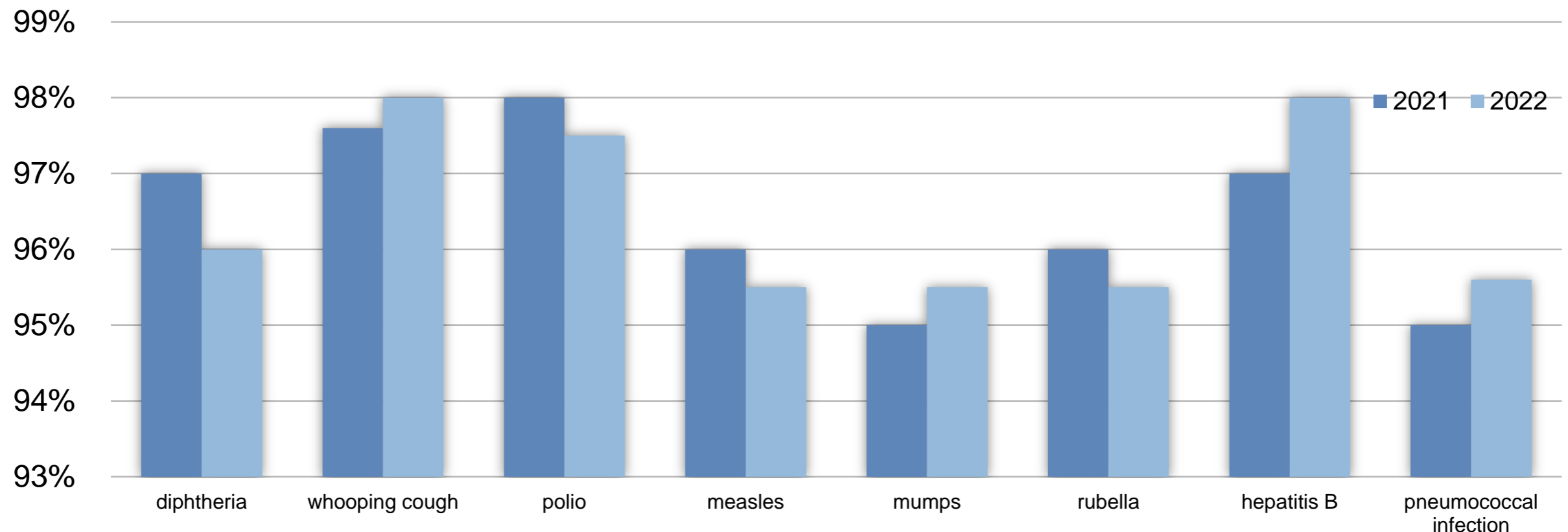
The hospital mortality rate from HIV infection in 2022 was 31.0%, which is 9.5% higher than in 2021.

LEVEL OF PREVENTIVE VACCINATIONS

The recommended (**95% or more**) level of coverage of preventive vaccinations against diphtheria, whooping cough, polio, measles, mumps, rubella, viral hepatitis B and pneumococcal infection has been maintained for a number of years in the Region in all decreed ages.

The diphtheria vaccination coverage rate for adults aged 18 and older was 97.5%.

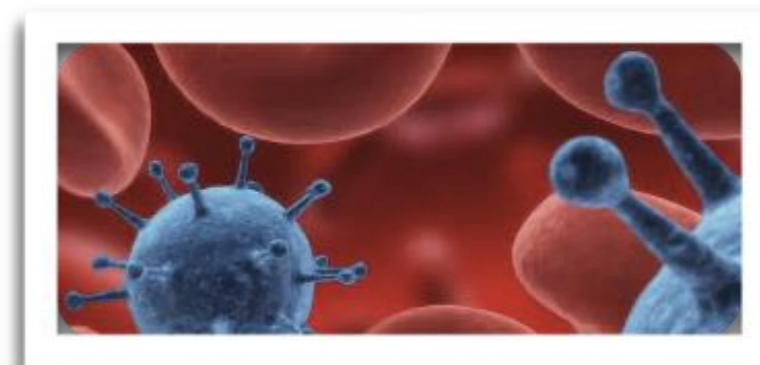
LEVEL OF PREVENTIVE VACCINATIONS



ORGANIZATION OF PRIMARY HEALTH CARE FOR THE TREATMENT OF INFECTIOUS DISEASES

Primary specialized medical and sanitary care is provided in **37 infectious diseases** units of city polyclinics and polyclinic departments of central district and city hospitals. Among them **28 work for adults** and **9 - for children**.

HIV INFECTION



In Tomsk Region, the assistance to HIV-infected people is carried out in accordance with **clinical recommendations (protocols of dispensary observation and treatment)**, the implementation of which is provided by the order of the Tomsk Regional Center for the Prevention and Control of **AIDS and Other Infectious Diseases** of 27.01.2021 No. 03/1-etc.

«On the use of clinical recommendations (treatment protocols) on the following issues providing medical care for a disease caused by the human immunodeficiency virus»

HIV INFECTION

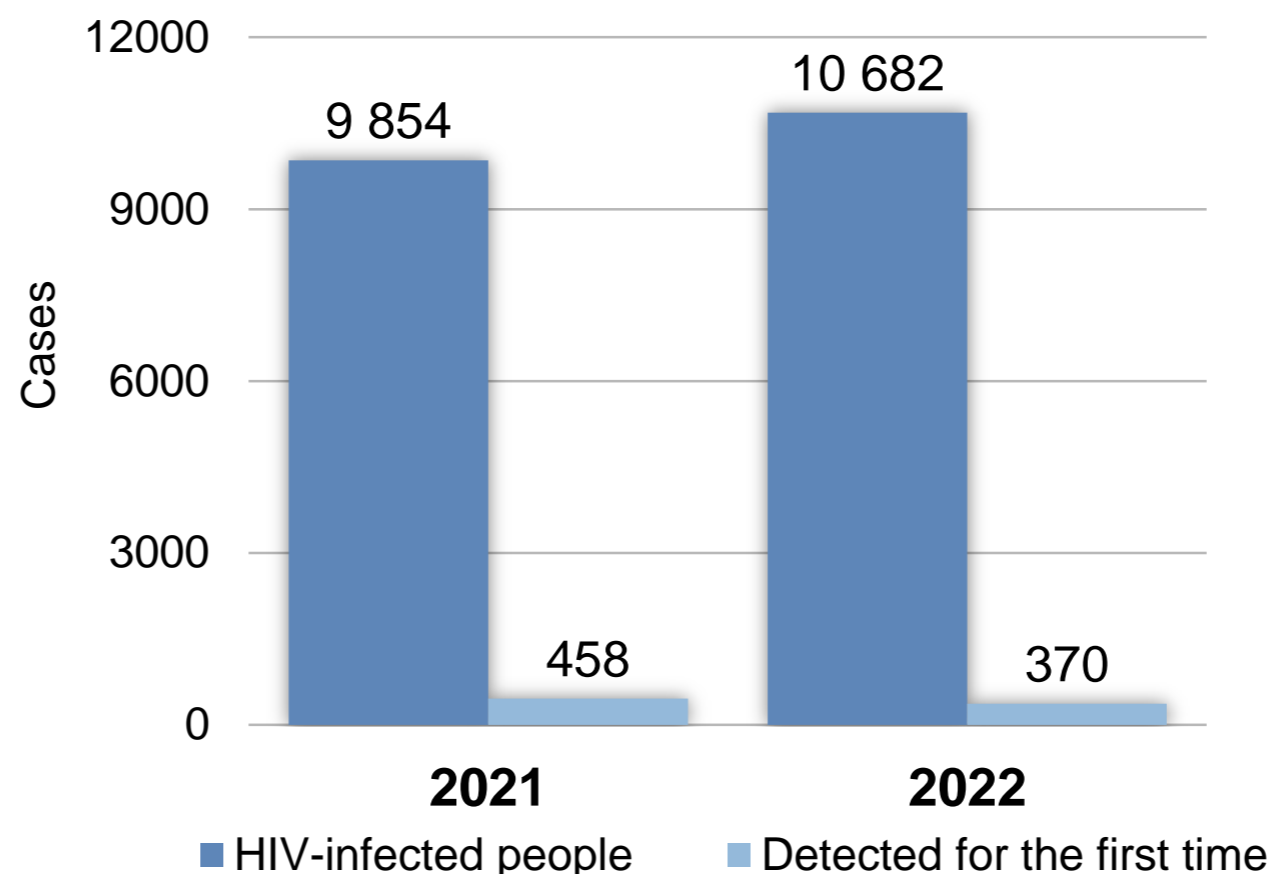


The data on the need for antiretroviral drugs in Tomsk Region is accumulated by The Tomsk Regional Center for Prophylactics and Control of AIDS and Other Infectious Diseases (RCAIDPC). The drugs **are purchased centrally by the Russia's Ministry of Health and delivered to the Regional Pharmacy Warehouse.** Then they are distributed to the pharmacy of the RCAIDSPC.

Patients who are registered with the dispensary of the RCAIDSPC receive antiretroviral drugs directly at the pharmacy of the Center. To increase the availability of treatment for patients with HIV infection in the remote districts of the Region, medical organizations receive required drugs at the pharmacy of the RCAIDSPC according to the submitted application and give them to patients during medical appointments.

HIV-POSITIVE POPULATION IN TOMSK REGION

NUMBER OF PATIENTS DIAGNOSED WITH HIV INFECTION AND NEWLY DIAGNOSED CASES



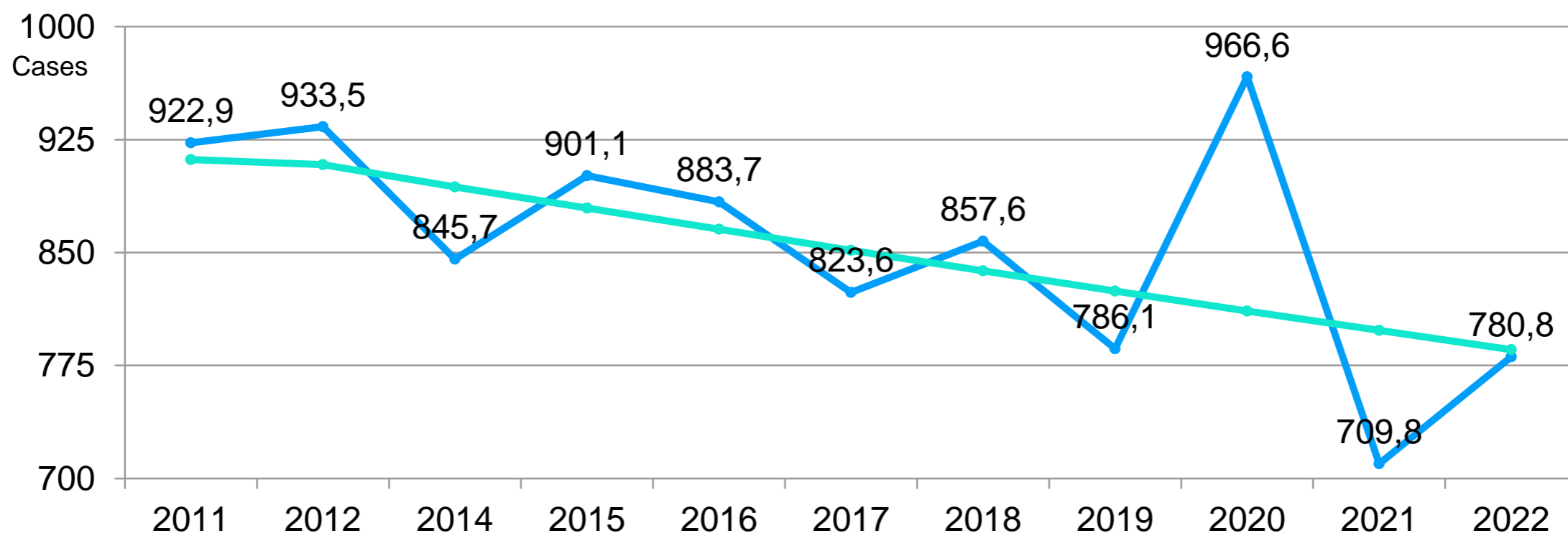
More than 10 thousand HIV-infected people live in Tomsk Region as of May 1, 2022. Regional department of Rospotrebnadzor: “The incidence rate as of May 1 is **1,062 people per 100,000 people**”.

For the first four months of 2022, **370** cases of HIV infection were detected for the first time, which is 9.8% lower than the last year’s figure.

In 2021, 9,854 HIV-infected people were registered in Tomsk Region. **458** people were identified with the virus for the first time.

INTESTINAL INFECTIONS

INCIDENCE OF INTESTINAL INFECTIONS

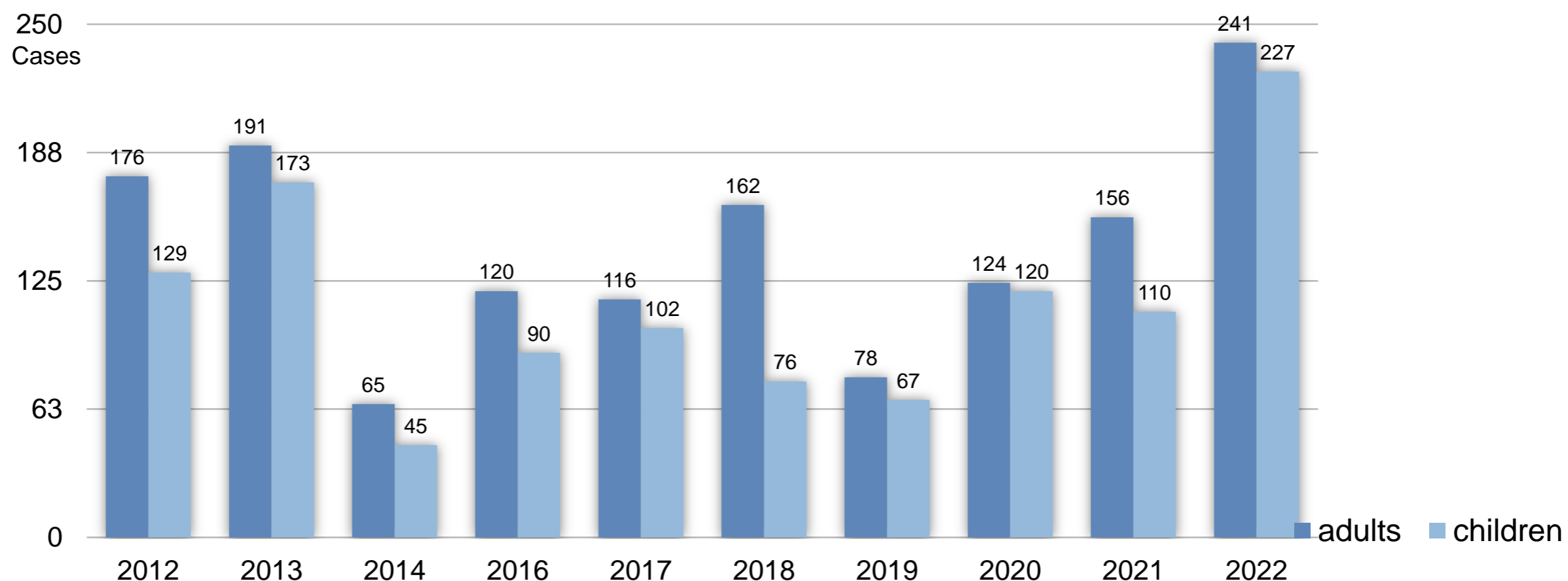


In 2022, **8,357 cases** of intestinal infections were registered in the Region, the incidence rate was **780.8 per 100 thousand population, which is 1.1 times higher than in 2021** (2021 IP-709.8). The incidence of intestinal infections tends to decrease, the rate of decline is - 1.6%

INTESTINAL INFECTIONS

In Tomsk Region in 2022, **20 outbreaks of intestinal infections were registered with 241 victims, including 227 children** under 17 years old. In 2021 there were 12 outbreaks of intestinal infections: 156 victims, including 119 children.

INCIDENCE OF INTESTINAL INFECTIONS IN TOMSK REGION



The analysis of morbidity outbreaks has shown that the leading modes of transmission were **contact and household**.

In the examined foci with sporadic morbidity **food** was the main source of transmission – **77.8%**. The contact-household transmission accounted only for **22.2%**

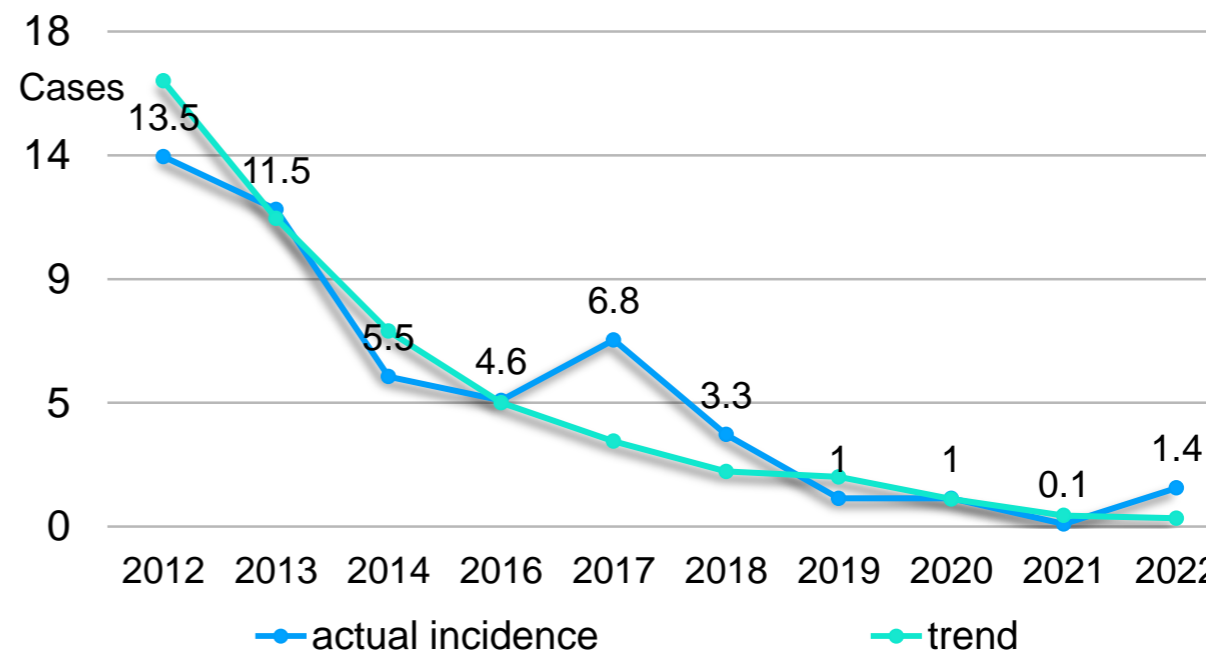
INTESTINAL INFECTIONS

Morbidity rates in Tomsk Region are 1.1 times lower than morbidity rates in Russia (1.50 per 100 thousand population).

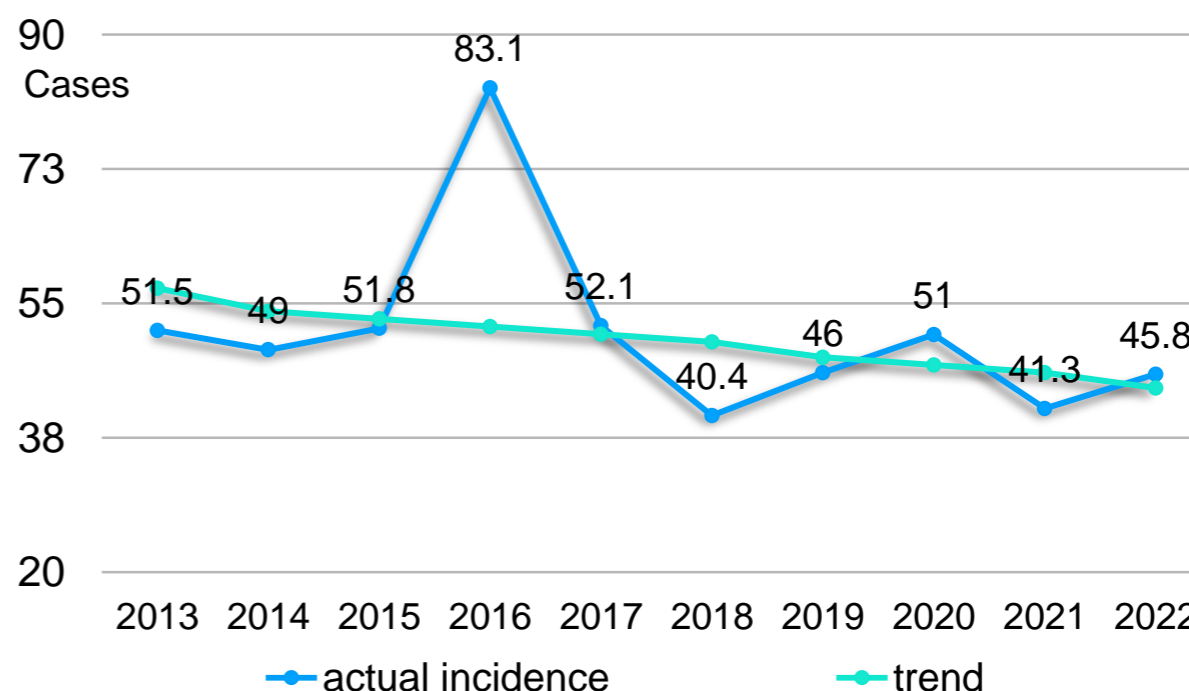
The incidence of dysentery tends to decrease, the rate of decline is 33.3%.

In 2022, in comparison to 2021, there is a 1.1 increase in the **incidence of salmonellosis**. 490 cases were registered, the incidence rate was 45.78 per 100 thousand population.

INCIDENCE OF DYSENTERY IN TOMSK REGION



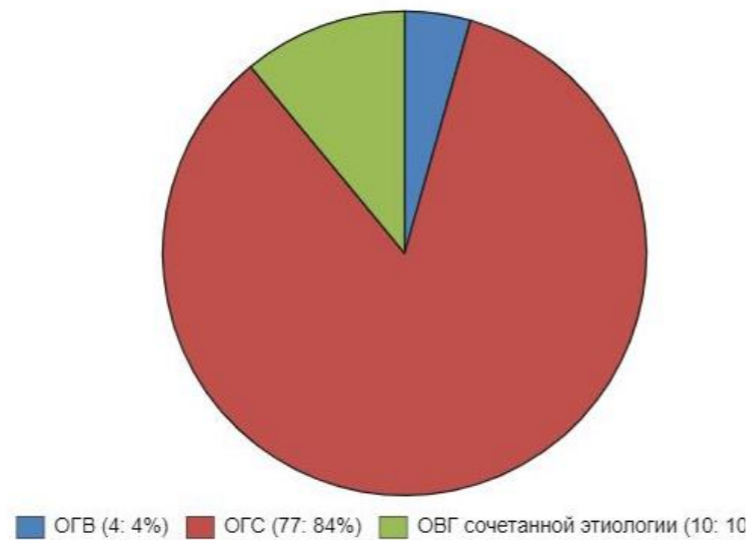
INCIDENCE OF SALMONELLOSIS IN TOMSK REGION



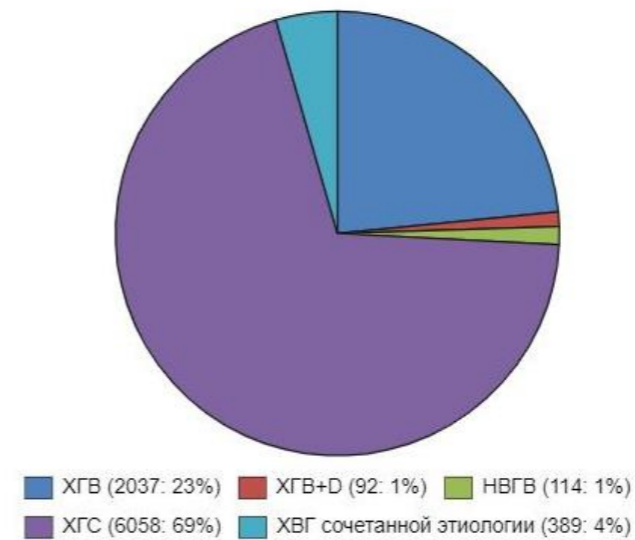
INCIDENCE OF CHRONIC VIRAL HEPATITIS B AND C

In Tomsk Region, 7200 patients are registered with the dispensary as diagnosed with chronic viral hepatitis.

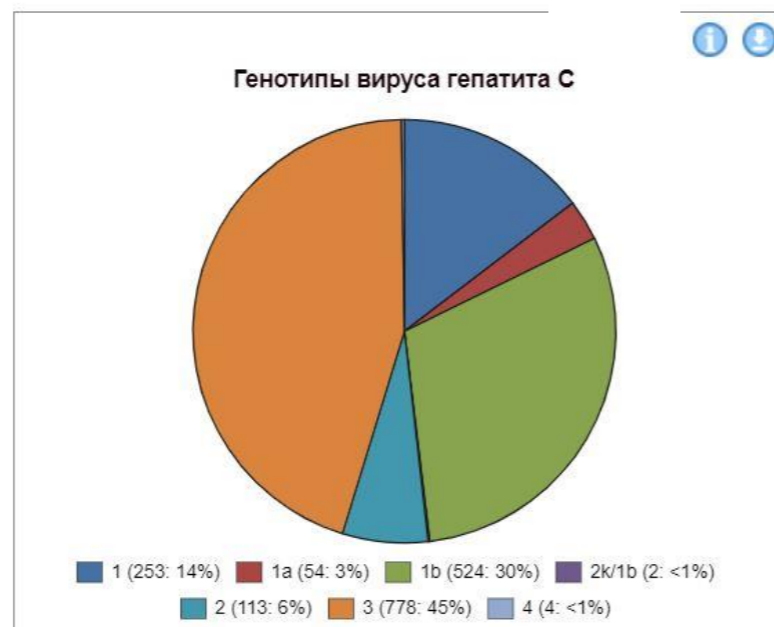
ACUTE VIRAL HEPATITIS



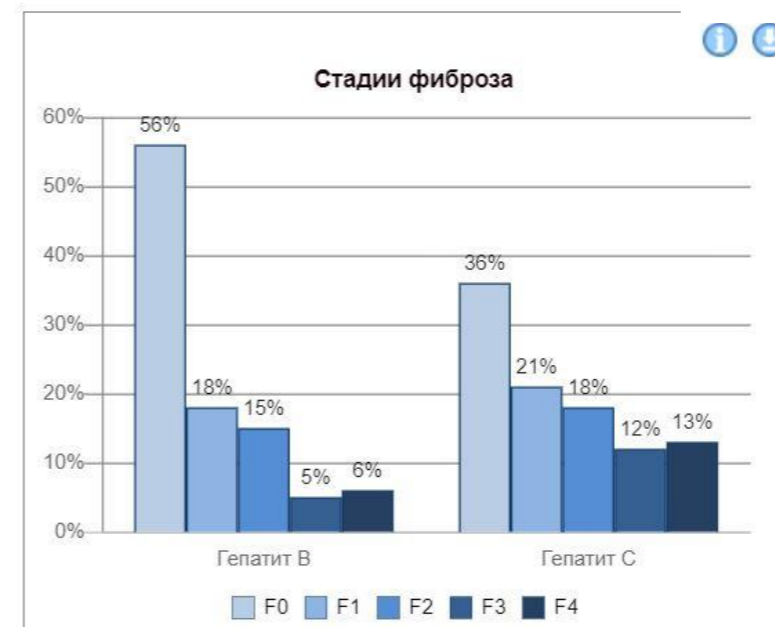
CHRONIC VIRAL HEPATITIS



HEPATITIS C VIRUS GENOTYPES



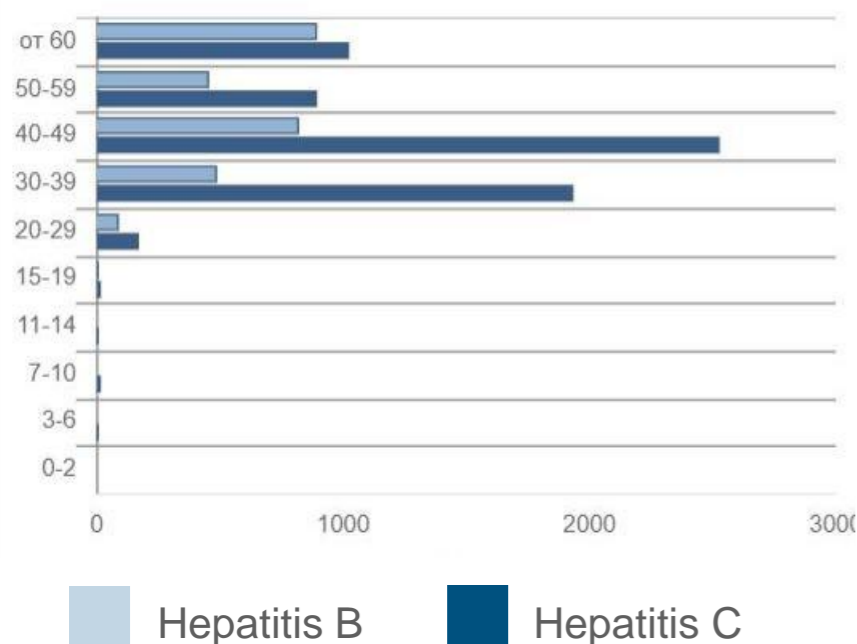
FIBROSIS STAGES



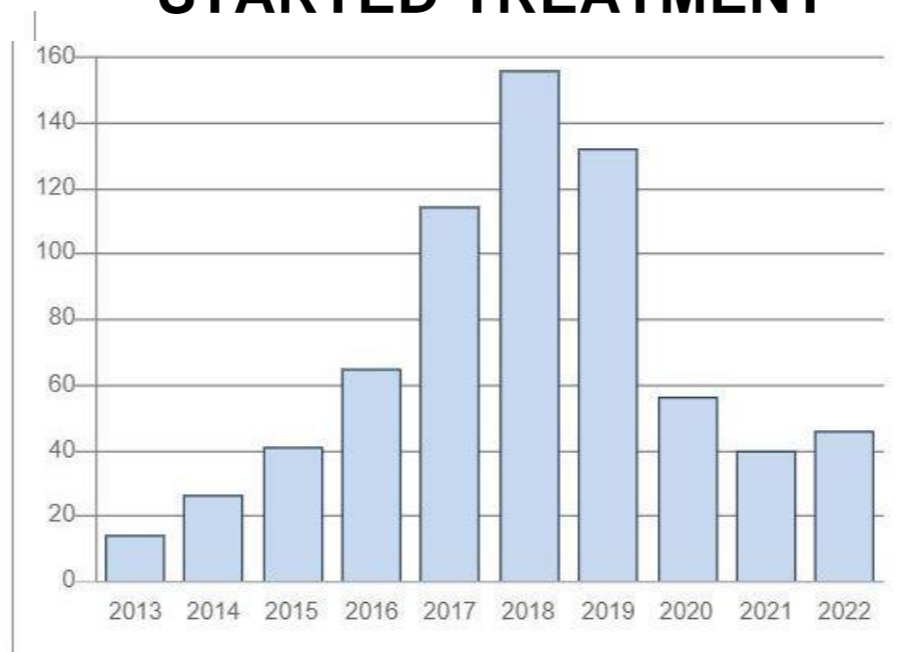
INCIDENCE OF CHRONIC VIRAL HEPATITIS B AND C

Treatment of patients with chronic viral hepatitis is carried out at the expense of federal funding. In 2022 - 126 patients, in 2021 - 78 adult patients.

AGE GROUPS



HEPATITIS C, PATIENTS WHO STARTED TREATMENT



TREATMENT OUTCOMES



In 2022, a children's form of antiviral drugs was registered in the Russian Federation, which will hopefully lead to the elimination of hepatitis C virus among children.

STAFFING OF INFECTIOUS DISEASE DOCTORS

Doctor/patient ratio in primary health care for infectious disease physicians is 2.59 per 10 thousand population.

There are **39 full-time positions of infectious disease doctors** in respective outpatient departments of primary health care, of which **27.75 are employed**. The standard is 1 infectious disease doctor per 20,000 population, therefore, 53.4 full-time positions are required.

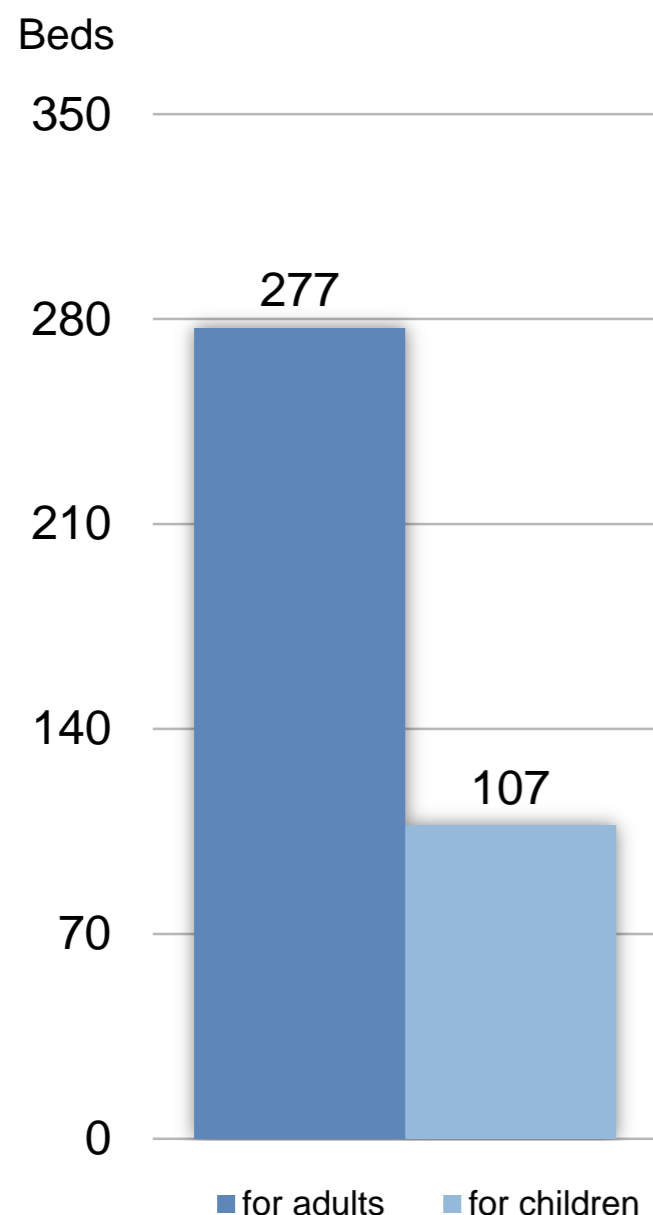
The actual number of physicians working for infectious diseases outpatient departments of primary health care in Tomsk Region is 22 people.

The working load on 1 outpatient infectious diseases doctor is 3,946 visits, which is **3.8% higher than the recommended standard**.

The shortage of staff is 27%. In accordance with the new methodology of the Russia's Ministry of Health **the shortage of specialists in the outpatient unit is 9 doctors or 29%**.

PROVISION OF INFECTIOUS BEDS PER 10 THOUSAND POPULATION

BEDS FOR INFECTIOUS PATIENTS IN TOMSK REGION



The provision of beds per 10 thousand population is 3.6.

Specialized medical care is provided in inpatient facilities - infectious diseases departments of central district and city hospitals. These are **18 medical organizations with 384 beds** (277 for adults and 107 for children).

Estimated need is 327 beds (no shortage).

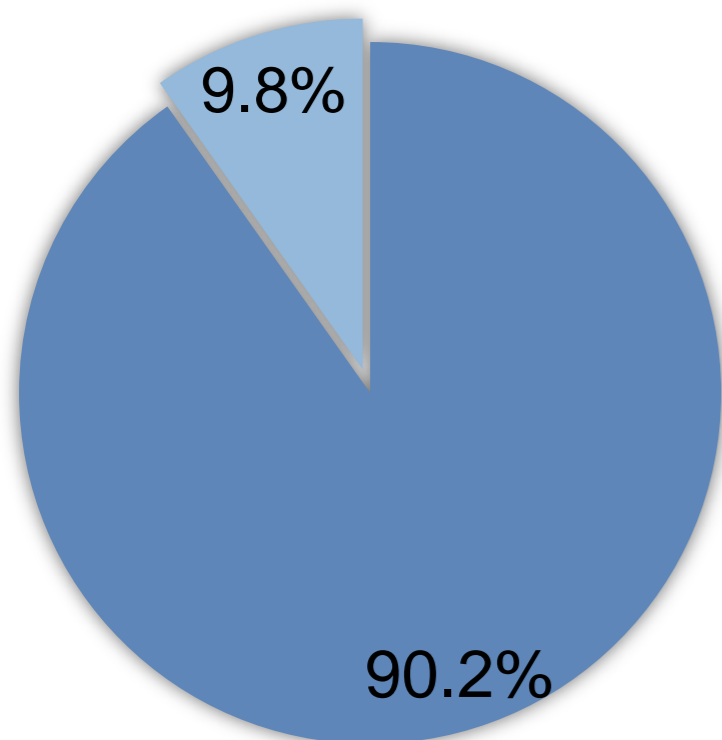
Average annual bed occupancy - 288 days.

SPECIALIZED MEDICAL CARE DOCTOR/PATIENT RATIO, PER 10 THOUSAND POPULATION

STAFFING OF HOSPITALS WITH DOCTORS

Doctor/patient ratio in primary health care for infectious disease physicians is **5.89 per 10 thousand population.**

There are **74.25 full-time positions of infectious diseases doctors in inpatient departments.** Currently only **63 positions are occupied by 43 doctors working for one and a half shifts.**



- Doctors work in infectious diseases
- The shortage of specialists

In accordance with the new methodology of the Russia's Ministry of Health **the shortage of specialists for inpatient treatment is 4 doctors or 9.8% of the demand.**

MAIN TAKE-AWAYS

- Construction of a new infectious diseases hospital in Tomsk, renovation and upgrade of the existing infectious diseases facilities, opening of advisory centers, creation of a day patient facility for infectious diseases will improve the quality of medical care in Tomsk Region.
- The number of trainees in the clinical residency in infectious diseases is to be increased by 20-30% in order to deal with the shortage in outpatient clinics.
- Elimination of chronic viral hepatitis requires additional funding of treatment programs on both national and regional levels.
- The prevalence of HIV infection requires further expanding of HIV testing:
 - to detect the disease early,
 - to continue active interaction with obstetric and gynecological service,
 - to expand the coverage of preventive work among pregnant women and women of childbearing age to increase their adherence to antiretroviral therapy.



THANK YOU FOR YOUR ATTENTION!