Challenge for the Cities Cup

HEALTH: DIGITAL SYSTEM FOR PREVENTION AND ACCESS TO MEDICAL CARE

Focus area
Solutions in the field of quality of life and healthcare.

Objective
To create a realistic digital solution that improves the quality and accessibility of medical care in small and medium-sized cities in Russia.

Context and relevance

Many Russian cities continue to face issues related to the accessibility and effectiveness of medical care, particularly in small and medium-sized industrial centers.
Residents experience long waiting times, shortage of qualified specialists, and the lack of modern digital services that facilitate timely access to medical care and preventive programs.

One example of such a city is Nazarovo (Krasnoyarsk Territory) — the center of the Nazarovsky District, with a population of more than 44,000 people. The city faces challenges with patient routing, a shortage of medical personnel, and limited healthcare resources.

Similar challenges are observed in other municipalities where infrastructure and social services are actively developing.

Participants may also choose comparable cities where SUEK, SGK, or EuroChem operate: Barnaul, Biysk, Rubtsovsk (Altai Territory), Kotelnikovo (Volgograd Region), Leninsk-Kuznetsky, Polysaevo, Prokopyevsk, Myski (Kemerovo Region – Kuzbass), Borodino, Nazarovo, Sharypovo (Krasnoyarsk Territory), Kovdor (Murmansk Region), Kingisepp (Leningrad Region), Berezniki (Usolye, Perm Territory), Abakan, Chernogorsk (Republic of Khakassia), Reftinsky (Sverdlovsk Region), Chegdomyn (Khabarovsk Territory).

Problem

There is insufficient access to medical care and preventive services, and a lack of digital tools that would allow citizens to receive consultations, make appointments with specialists, and monitor their health status.
At the same time, medical institutions are overloaded, while city administrations lack data necessary for forecasting medical demand and planning the development of healthcare systems.

Task for participants

Develop a digital solution (service, application, or prototype system) that will allow residents of the selected city to:

● receive medical assistance faster and more conveniently;
● participate in preventive programs;
● track their personal health indicators;
● enable healthcare administrators to analyze patient requests and plan the development of the healthcare system.

Possible development directions

1. Mobile application or web platform providing:
   o appointment scheduling and patient routing among medical facilities;
   o notifications about preventive examinations and vaccinations;
   o integration with EMIAS and regional public service platforms.
2. Digital devices and sensor-based solutions monitoring:
   o fatigue and stress among industrial workers;
   o air pollution, temperature, pressure;
   o individual physiological indicators (pulse, blood pressure).
3. Analytical module for administrations and medical institutions, which:
   o collects data on citizen requests;
   o forecasts the load on polyclinics;
   o identifies zones of increased morbidity and generates preventive recommendations.

Input data (for example, for Nazarovo)

● Population: 44,261 people (as of 01.01.2025).
● Main healthcare institutions:
o Regional State Budget-Funded Healthcare Institution “Nazarovo District Hospital” has a capacity of 1,596 visits per shift, having 267 beds;
o Ambulance Station manages up to 20,523 calls per year;
o Tuberculosis Dispensary No. 1 (Branch No. 7) with 50 beds;
o Gerontology Center “Tonus” — rehabilitation of elderly persons and people with disabilities.

For other cities, participants may use open data (population, healthcare networks, demographics, etc.) and adapt the project to the characteristics of the selected territory.

Economic parameters

● Pilot project budget — up to 3 million rubles.
● Approximate implementation cost — about 1.5 million rubles.

Restrictions

● Shortage of IT specialists and medical staff in the region.
● Limited resources of municipal medical institutions to support the platform.
● Mandatory compliance with the Russian Federation’s legislation on personal data protection.

Expected results from participants

1. Description of the concept and architecture of the solution.
2. A prototype or demo model of the system (web, mobile application, or device).
3. Economic justification of the project: cost estimates, possible funding sources, implementation stages.
4. Forecast of the social impact: improved accessibility of medical care, reduced waiting times, increased participation in preventive programs.

Additional materials

Appendix 1. Information on medical institutions and morbidity structure.
Appendix 2. Maps of medical facilities in the city; information on morbidity structure.

Appendix 1. Information on medical institutions and morbidity structure

List of Medical Institutions

1. Regional State Budget-Funded Healthcare Institution “Nazarovo District Hospital”
   The total capacity of outpatient and polyclinic departments is 1,596 visits per shift; the inpatient capacity is 267 beds.
2. Emergency Medical Service Station and Substation in the Bor Settlement
   Capable of handling 20,523 calls.
3. Regional Tuberculosis Dispensary No. 1
   Branch No. 7 with 50 beds.
4. Regional Gerontological Center “Tonus”
   An institution providing rehabilitation and health improvement services for elderly citizens, including persons with disabilities.

A noticeable increase has been observed in the demand for rehabilitation services for oncology patients. In this regard, a small rehabilitation department was opened within the Nazarovo District Hospital; however, the building currently in use is in unsatisfactory condition and has a limited area. The expansion of the rehabilitation department will be an important step toward meeting this demand, enabling the provision of higher-quality and more diverse services.

In 2024, educational programs for medical staff — “Paramedic” and “Nurse” — were launched at a local school. This became a starting point for training specialists who are in high demand in the city.

Prevention of Infectious and Parasitic Diseases

In September 2024, 969 cases of infectious and parasitic diseases were registered in Nazarovo.
The morbidity rate among the population amounted to 2,164.83 per 100,000, which is 5.2% lower than the rate for the same period in 2023 — 2,284.43 per 100,000 (1,118 cases).

Among the child population, the morbidity rate in September 2024 was 7,397.65 per 100,000 (674 cases), which is 2.4% lower than the rate for the same period in 2023 — 7,576.48 per 100,000 (800 cases).

Among all registered cases, the leading positions are occupied by:
• acute upper respiratory tract infections — 83.3%;
• community-acquired pneumonia — 9.2%;
• parasitic infections — 2.6%.

Analysis of Morbidity Increase/Decrease

September 2024				September 2023				Increase / Decrease	
Total		Children under 17		Total		Children under 17		Total	Children under 17
Abs.	Rate	Abs.	Rate	Abs.	Rate	Abs.	Rate	case diff	case diff
Coronavirus infection (COVID)									
3	6,70			2	4,09	1	9,47	+1 case	-1 case
Pneumonia caused by the COVID virus									
1	2,04			1	9,47			-1 case	-1 case
Chickenpox									
15	33,51	14	153,66	11	22,48	10	94,71	4 cases	4 cases
Acute intestinal infections (AII)									
8	17,87	2	21,95	8	16,35	3	28,41		-1 case
Acute upper respiratory infections (AURI)									
807	1802,91	609	6684,23	1036	2116,88	773	7320,77	-14,8%	-8,7%
Community-acquired pneumonia (CAP)									
89	198,83	38	417,08	23	47,00	4	37,88	x4,2 times	x11 times
Scabies									
1	2,23	1	10,98					+1 case	+1 case
Viral hepatitis									
8	17,87			10	20,43			-2 cases	
Human immunodeficiency virus (HIV)									
2	4,47			6	12,26			-4 cases	
Tuberculosis (newly diagnosed)									
1	2,23			2	4,09			-1 case	
Parasitic infections									
25	55,85	7	76,83	13	26,56	8	75,76	x2,1 times	-1 case
Herpes zoster									
	2,23			4	8,17			-3 cases	
Streptococcal infection (newly detected). Scarlet fever									
	2,23	1	10,98					+1 case	+1 case
Animal bites, scratches, or exposure									
5	11,17	3	32,93	9	18,39	4	37,88	-4 cases	-1 case
Gonococcal infection									
4	8,94			1	2,04			+3 cases	
Tick bites									
1	2,23			9	18,39			-8 cases	
Tick-borne borreliosis (Lyme disease)									
				1	2,04			-1 case	
Syphilis (newly detected)									
2	4,47							+2 cases	
Dermatophytosis caused by Microsporum fungi									
2	4,47	2	21,95	1	2,04	1	9,47	+1 case	+1 case

As seen from the table, in September 2024 compared to the same period in 2023, a decrease in morbidity was observed for the following nosologies:
viral hepatitis, human immunodeficiency virus (HIV), tuberculosis (newly diagnosed), tick-borne borreliosis (Lyme disease), acute upper respiratory tract infections, pneumonias caused by the COVID virus, acute intestinal infection (AII), tick bites, herpes zoster, animal bites/salivation/scratches.

An increase in morbidity was registered for the following nosologies:
coronavirus infection (COVID), chickenpox, streptococcal infection (newly diagnosed), scarlet fever, community-acquired pneumonia (CAP), scabies, gonococcal infection, parasitic infections, syphilis (newly diagnosed), dermatomycosis caused by fungi of the *Microsporum* genus.

Appendix 2. Maps of medical facilities in the city; information on morbidity structure.