Problems of developing a culture of treatment of intestinal infections in Tselinograd in the 1970s

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Abstract. The paper notes that after the establishment of the Virgin Lands area, specialists from all republics of the former Soviet Union came to the reclamation of virgin lands. Intestinal diseases, like other infectious diseases, were widespread among the local and arriving population. The authors have shown that large epidemic outbreaks of intestinal infections were possible in organized and unorganized collectives of residents of Tselinograd in case of violation of sanitary and hygienic regulations. Attempts, made by the city's health authorities, did not always lead to an improvement in the quality of medical care. The authors emphasize that the shortage of specialists and healthcare institutions, violation of the treatment regimen, and other reasons influenced the deterioration of the epidemiological situation. The authors pay attention to the main directions and specific actions of the city administration to carry out epidemic control measures on the example of the sanitary service of Tselinograd during the difficult period of reclamation of virgin lands in Kazakhstan in the 1970s.

1 Introduction

During the reclamation of virgin and fallow lands, Akmolinsk (named Tselinograd since 1961) became the administrative and cultural centre of the Virgin Lands area [1–12]. People of different professions voluntarily and forcibly came to the reclamation of virgin lands from every corner of the former Soviet Union, which radically affected the epidemic situation in the city [13]. Due to subjective and objective circumstances, pandemics of various infectious diseases arose in conditions of gathering of many people, which, in turn, led to a decrease in the values and culture of a healthy lifestyle [14].

2 Materials and Methods

The theoretical and methodological basis of the paper is a set of research methods, both special and general scientific. The methods of the project are based on the general principles of objectivity and scientific approach. The paper also uses several methods

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typical for scientific research: chronological, historical and retrospective, problematic, and perspective. The authors of the paper also relied on the most common methods in interdisciplinary research, such as method of system, method of analysis, deduction and induction, and method of synthesis.

3 Discussion of the results

3.1 The increase in the incidence of intestinal infections in 1971

So, 1379 cases of acute dysentery and 847 cases of other acute intestinal infections were registered in Tselinograd for 8 months of 1971.

The increase in incidence mainly occurred due to the increase in acute dysentery 2.3 times and the increase in gastroenterocolitis 3 times, the etiology of which had not been identified (intestinal infections of unclear etiology). During that time, 19 bacterial carriers of dysentery bacillus were taken into account. Compared with 1970, the number of cases of dysentery diseases increased by 38%, the number of cases of other intestinal diseases increased by 1.5 times, and the level of dysentery bacillus carrier state decreased by 4.5 times during that period.

The monthly dynamics of incidence indicated that there was a sudden epidemic increase in April (2 times, compared with March), after which a decrease was almost not observed, as it can be seen from the table [15]. See Table 1.

Table. 1. Monthly dynamics of dysentery incidence.

Months	I	II	III	IV	V	VI	I half of the year
The number of cases of acute intestinal infection	466	593	625	1188	1110	997	4979
% by half of the year	9.3	1.9	12.5	23.8	22.3	20.2	100.0

The specific share of dysentery in the total of intestinal diseases was 63.2% compared with 64.2% in 1970. The diagnosis was laboratory confirmed in 36.2% of patients. In 1970, that indicator was equal to 45.2%. The microbial landscape can be seen in Table 2.

Table 2. Comparative table of the incidence of intestinal infections.

	1971		1970	
	number	%	number	%
Flexner	163	37.7	134	37.4
Newcastle	69	15.3	6	1.7
Sonne	208	47.0	216	60.7
Total	440		356	

The incidence of intestinal infections remained at a high level throughout the whole year.

The regional centre continued to have the largest specific share according to the territorial distribution, as in previous years (31.5), and the adjacent Tselinograd district (12.1) replaced Atbasar district in the analysed period (1st half of 1970 – 8.5; 1st half of 1971 – 4.3) [15].

The incidence of acute intestinal infections by month is presented in the following Table 3.

Table 3. The incidence of acute intestinal infections.

	I		II		III		IV		V		VI	
	1970	**71**	**70**	**71**	**70**	**71**	**70**	**71**	**70**	**71**	**70**	**71**
Acute dysentery	100	159	53	208	72	136	74	165	144	211	137	188
Intestinal infections	49	75	39	47	40	38	43	142	59	113	88	162
Bacterial carrier of dysentery bacillus	20	5	10	1	4	1	7	2	15	3	3	4

Concerning the incidence of acute dysentery, the regional centre also had the highest specific share (47.0), and Alekseevsky district, which previously took the 2nd place, lost it to Tselinograd district (10.5).

3.2 Epidemiological features of outbreaks of acute intestinal infections in Tselinograd

In 1971, the incidence of acute intestinal infections repeatedly showed the features of large epidemic outbreaks in Tselinograd, Ermentau, Kurgaldzhinsky, Krasnoznamensky, Balkashinsky, and Alekseevsky districts. Outbreaks were also registered in some medical and children's institutions of Tselinograd (maternity hospital, mental hospital, city hospital No. 2, infant orphanage, nursery schools No. 14 and No. 16, and others) [16].

The analysis indicated that along with sanitary and hygienic factors there were the following significant reasons for the sudden increase in the incidence of acute intestinal infections: unsatisfactory organization of diagnostics, violation of the terms of hospitalization, violation of the regulations of medical examination and release of patients, violation of the regulations of enrolment in dispensary care, poor quality of epidemiological examination, and unsatisfactory organization of anti-epidemic measures.

If the specific share of dysentery in the total of acute intestinal infections was 65.3 in Tselinograd, then it was 6.4 in Balkashinsky district, 14.7 in Vishnevsky district, as well as 18.1 in Kurgaldzhinsky district, which indicated a poor quality of diagnostics.

Only the lack of attention to diagnostic issues could explain the frequent diagnosis of "bacterial carrier of dysentery bacillus", which occurred without proper examination and out of connection with the epidemiological situation (Balkashinsky, Ermentausky, and Makinsky districts). See Table 4.

Table 4. The specific share of dysentery in the districts of the Tselinograd region.

Districts	Specific share	total amount	Acute dysentery
Alekseevsky	55.3	369	204
Astrakhansky	37.2	239	89
Atbasarsky	28.2	216	61
Balkashinsky	6.4	528	34
Vishnevsky	14.7	115	17
Ermentausky	36.7	384	141
Krasnoznamensky	49.7	167	83
Kurgaldzhinsky	18.1	232	42
Makinsky	28.6	366	105

Tselinograd district	53.4	604	323
Tselinograd	65.3	1570	1025
Shortandinsky	28.0	189	53
total	43.7	4979	2177

The situation became obvious when compared with the fact that sigmoidoscopy and coprology were not carried out in a number of places, and some patients were not examined, not only according to the form No. 30, but also for pathogens of bacterial dysentery (over 15.0% of the number of patients with acute intestinal infections were not examined in the Ermentausky district) [17].

Due to the untimely and poor-quality sampling and delivery of the biological materials to the bacteriological examination, the percentage of bacteriological confirmation of dysentery was low, for example, it was 4.5 in Astrakhansky district, 6.5 in Tselinograd district, and 14.7 in Alekseevsky district.

At the same time, in the Balkashinsky district, the specified percentage was over 50.0 and, according to the explanation of the chief medical officer, was associated not with the successful activity of bacteriological laboratories, but with the fact that the diagnosis, as a rule, was made only with bacteriological confirmation.

Untimely and poor-quality diagnostics of acute intestinal infections led to untimely and poor-quality epidemic control measures.

Hospitalization of patients with acute intestinal infections was carried out late (10 days or more), and their release was carried out early, as a result of which the sources of infection remained at home and created the focal infection area of the epidemic process.

The registration of patients with acute intestinal infections was carried out so unsatisfactorily in the consulting rooms for the patients with infectious diseases that not even all people who had been treated in a hospital were taken into account. Among the epidemic control measures poorly performed in the focal area of acute intestinal infections, we should mention the unsatisfactory coverage of bacteriological examination, as well as a low percentage of identifying the sources and routes of infections.

The factors that could and certainly had a negative impact on the incidence of acute intestinal infections undoubtedly included the downsides that existed in the sphere of state sanitary control for water supply, food, working and living conditions, and recreation of the population related to the conduct of the sanitary and epidemic control service.

The epidemic feature of 1971 was the involvement of older age groups of people into the epidemic process. For example, if the incidence among children increased by 1.2 times in comparison with the indicators of 1970, then among adults it increased by 1.7 times [18].

The specific share of dysentery in the total of intestinal infections was 61.9% in 1971. The diagnosis of dysentery was laboratory confirmed in 36.9% of patients. The etiological characteristics of pathogens were as follows: Sonne – 47%, Flexner – 37.4%, Newcastle – 15.3%. All age groups of people were involved in the epidemic process.

About 60% of the total incidence occurred in children under the age of 15, of which 85% were preschool children, and the latter indicator was 7% less than the same period in 1970. Among the sick children, 54.9% attended preschool institutions, 14.5% attended schools, and 29.9% of them were unorganized.

The indicator for 1000 children attending preschool institutions was 30.5%; it was 3.8% for schoolchildren, and amounted to 10.4% for unorganized children, that is, the indicator remained at the level of last year among organized children, decreased by 7% among unorganized children, and increased by 1.4% among other schoolchildren. Among other contingents, a high incidence was noted among food workers, where the rate per 1000 employees was 11.2%, as well as among urban transport workers – 4.8%, construction workers – 22.5%, and medical workers – 7.9% [19].

Focal infection area in the families was 4%. Generally, the number of cases in the focal infection areas did not exceed 3 people. Focal infection area was more pronounced in preschool institutions. Those collectives showed 31% of the total incidence during the period under review and their focal infection amounted to 62%.

The formation of focal infection areas occurred with insufficient observance of the regulations of personal and public hygiene. During the examination of such focal infection areas, it was found that there were overcrowding, lack of isolation between groups, untimely isolation of the first cases, as well as carrying of infection from the families of children. In some children's institutions, there were 40–45 children in nursery groups instead of 25 ones, just one nanny looked after them, who practically could not ensure the compliance with all the requirements that were imposed on her.

In children's groups, where the focal infection areas were found, 68% of diseases occurred mainly after 3–7 days in chain order, which is typical for the contact-household route of infection. In other cases, those were new sources of infection, unrelated to one another [18].

The incidence took on the character of epidemic outbreaks in children's day care centres No. 14, No. 16, and No. 6, in the infant orphanage, in the maternity hospital, as well as the neuropsychiatric hospital. Among the sick, 384 people attended preschool institutions, as well as there were 110 schoolchildren and 172 unorganized ones. See Table 5.

Table 5. The number of disease cases in children's institutions.

	The number of disease cases	**%**
Nursery schools	40	8.0
Kindergartens	21	4.3
Children's day care centres	323	65.3
Schools	110	22.4
total	494	100

10 children and 2 nannies fell ill during the outbreak in the infant orphanage from January 15 to February 17. During the epidemiological examination of that institution, it was revealed that one of the nannies suffered from periodic bowel disorder, which she did not inform anyone about, as well as she did not apply to the hospital for medical help. On January 27, Newcastle dysentery bacillus was cultured in her analysis, and mucosal changes characteristic of dysentery were detected during sigmoidoscopy.

Even after that, she tried to hide her illness. Working as a substitute nanny in the senior and middle groups, she brought the infection to both groups. The further situation was aggravated by the untimely diagnosis and isolation of the first patients with that infection.

11 people fell ill during the outbreak in the children's day care centre No. 14 from April 19 to June 1. That outbreak was associated with a general outbreak of dysentery at the Brick Factory No. 2 [18].

There was the following situation: in the first half of April of 1971, an accident of water supply and sewerage occurred almost in nearby places in the houses No. 1 and No. 3 on Kirpichnaya Street. Despite the accident, the water supply system continued to be periodically connected to the network, which created conditions for penetration of sewage into the places of the broken water pipes. The accident was eliminated within 10 days. In addition, the pipes were not chlorinated after eliminating the break on the water supply. Bacteriological examinations of water samples taken from the taps of the apartments of the above-mentioned houses confirmed that the water quality was not satisfactory, and the coli titer amounted to 56 on May 17.

12 cases of acute dysentery were registered in those 2 houses. Besides, when interviewing residents, it was revealed that many of them had liquid bowel movements, but they did not seek medical treatment and were treated by themselves.

All residents of those houses (99 people) were subsequently examined in the laboratory, but dysentery bacillus was detected only in one resident who had diarrhea at home.

The sanitary and epidemiological station was not informed about the accident of the water supply and sewerage system. The bacillus spread to the children's day care centre No. 14 from those houses.

15 children, a child-minder and a nanny of the middle group of the kindergarten fell ill with dysentery in the children's day care centre No. 6 during the period from April 20 to May 3. During the investigation of the outbreak, it was revealed that the child-minder of the middle group hid her illness and continued to do her usual work for 3 days. Another source acted simultaneously with her – that was a patient with a chronic form of dysentery that had not been isolated in a timely manner from the children's day care centre. As a result of timely measures taken, the outbreak was quickly stopped.

At the end of March and in April, a wave of gastroenterocolitis of unknown etiology took place in the maternity hospital and the regional neuropsychiatric hospital. During those outbreaks, 26 people fell ill in the maternity hospital, and simultaneously 6 patients were clinically diagnosed with acute dysentery in a psychiatric hospital.

There was a contact-household route of infection in both institutions, which was favoured by untimely diagnosis and isolation of the first patients from the departments. That was also facilitated by the fact that 3 sick parents hid their illness in the maternity hospital.

Among the total number of dysentery cases, 91.5% of patients were hospitalized, as well as the share of hospitalized patients with other intestinal infections amounted to 69% of the total number of cases. Among those not hospitalized, 30% were not hospitalized because of their refusals, and the rest because of lack of places due to quarantines or concomitant droplet infections and others [18].

In order to increase the rate of hospitalization, in September 1971, it was decided not to admit children, who refused hospitalization, to children's institutions. However, unfortunately, it was impossible to take other measures to other contingents of people, apart from persuasion. The infectious diseases hospital was almost constantly overcrowded, as a result of which it was difficult to maintain the required sanitary and hygienic regime, proper care for children, as well as comply with the regulations for step-by-step accomodation of patients in wards.

Due to the lack of a convalescent department, the stages of treatment of patients were not observed and there were cases when children admitted to the children's collective had recrudescence of the disease. The issue of providing premises for a convalescent department had been repeatedly raised before local executive bodies. However, it was not possible to solve the issue for a long time, what also affected the way of treatment of infectious diseases [18].

The appeal for medical help among the population continued to be delayed. See Table 6.

Table 6. Terms of the appeal for medical help.

People, appealed for medical help starting from the day of the disease	1 day	2 day	3 day	4 day	5 day	6 day	7 day	8 day	9 day	10 day	Later than 10 days
Number	399	298	187	109	77	54	38	10	5	9	27
%	32.9	24.7	15.5	6.3	4.9	3.6	0.9	0.5	0.8	2.3	

95.5 thousand people were examined for dysentery during 8 months of 1971. Detectability was 0.9% from contact, and 0.3% from planned contingents. During the same time, about 6000 swabs for colibacillus, more than 6000 samples of products and swabs for pathogenic flora, and about 2000 water samples were examined. Due to the lack of laboratories in medical institutions, the laboratory of the sanitary and epidemiological station carried out more than 4.5 thousand diagnostic tests.

In the 1970s, the laboratory performed 700–800 analyses per day only for the intestinal infections, which significantly exceeded the load of maintenance personnel and equipment [19].

As a result, there was not enough time to boil and sterilize the medical utensils, since the capacity of the equipment was not designed for that large amount of medical utensils. Therefore, there were refusals to examine contact people and dispensary patients. In 1971, due to the disease outbreak, there was an urgent need to open bacteriological laboratories in medical institutions.

It should also be noted that 52 residential institutions worked in the city in 1971 (not including residential institutions from the districts), which made a lot of mistakes in diagnosis, the treatment of patients left at home, and even the provision of emergency notices. Sources of infection were detected in 27.3% of patients with dysentery, as well as the routes of that infection were detected in 11.3% of cases. The main routes of infection related to unwashed vegetables and fruits, and the route of infection through water in the district of Brick Factory No. 2.

A certain role in the route of infection was played by food industry workers, among whom a high percentage of incidence was noted. Other factors might have played a role in the route of infection, but it was not possible to confirm that with either water or food analyses.

3.3 Incidence of infections by work activities

As a result of epidemiological examination, the sources of infection were identified in 20% of patients, and routes of infection were identified in 3.9% of cases and were mainly connected with food factor [20]. See Table 7.

Table 7. Incidence of infections by social groups.

	Number of diseases	%	Indicator per 1000 workers
Workers of industrial enterprises	264	21.7	7.5
Employees	47	3.8	1.5
Urban transport workers	27	2.2	3.8
Railway station workers	6	0.5	0.3
Food industry workers	44	3.6	1.2

Health workers	18	1.4	7.2
Pensioners	29	2.4	1.5
Students	42	3.4	3.8
People who arrived from rural areas	26	2.1	
Organized children	384	31.5	27.3
Unorganized children	172	14.3	15.9
Schoolchildren	110	9.0	3.9
Others	44	3.6	

The impact of the water factor was identified in the district of the Brick Factory, where there was a break of water supply and sewerage network in April and May, which caused sewage to penetrate into the domestic drinking water supply system. By interviewing residents, it was found that many were ill, but did not seek medical help [20]. Diagnostics of dysentery was also carried out untimely. See Table 8.

Table 8. Terms of diagnostics.

Determining a diagnosis	**1 day**	**2 day**	**3 day**	**4 day**	**5 day**	**6 day**	**7 day**	**8 day**	**9 day**	**10 day**	**Later than 10 days**
Since the day of the disease	388	251	227	96	89	54	40	14	15	17	12
%	31.9	20.1	18.3	7.9	7.4	4.5	3.5	1.1	1.2	0.6	1.6
Since the date of the appeal for medical help	399	296	194	107	77	51	35	10	6	9	29
%	32.9	24.7	16.3	8.8	6.3	4.2	2.8	0.8	0.4	0.7	2.3

The city authorities and bodies of sanitary and epidemiological services took measures to prevent outbreaks of epidemics of intestinal diseases. However, the current difficult social and economic situation with the organization of infrastructure activities prevented the solution of health problems associated with increasing the level of culture of treatment of patients with intestinal and other infections.

4 Conclusion

There was hard work to maintain a favourable sanitary situation among the population in Tselinograd in the 1970s. Despite the large amount of work done by the staff of sanitary and epidemiological services, significant downsides, both objective and subjective, regularly occurred. The work of healthcare organizations was complicated by an acute shortage of medical centres and medical personnel who could not fully provide medical services to the entire population of the city. We should also mention the low level of culture of treatment and health education, which led to the regular occurrence of pandemics of intestinal and other diseases in the city. According to the authors of the paper, health institutions did not fully implement decisive measures to combat intestinal infections and other social diseases in the city. At the same time, work in that direction was still implemented.

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