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INDICATORS OF THE ASSESSMENT OF TERRITORIAL ENVIRONMENT IN THE WORK OF DISTRICT SERVICES OF OUTPATIENT MEDICAL ORGANIZATIONS

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ABSTRACT. The practical application by medical workers of various local services of existing mechanisms of interdisciplinary interaction to conduct a comprehensive assessment of the patient's problems is difficult due to lack of uniform approaches described in methodological recommendations containing routing and algorithms for interaction with non-medical specialists. The purpose of this study is to examine the possible influence of territorial objects and factors on the spread of tuberculosis infection in concern with the work of local services. From January 2021 to June 2022, a retrospective analytical descriptive study was conducted on the basis Anti-tuberculosis dispensary № 5. Based on the example of the territory of the Kalininsky and Krasnogvardeysky administrative districts, it was established that the incidence and prevalence of tuberculosis differed by several times in different municipalities. A comparative analysis of indicators states the heterogeneity of microterritories in municipalities according to a number of territorial factors and objects, as well as "points of attraction". According to the results of multivariate analysis, the independent factor that may cause presence of a focus of tuberculosis infection on a particular territory was density of the residents. It can be concluded that the higher the population density, the higher the likelihood that the TITR will not be "Clean" (aOR = 1.0002, p <0.001). Thus, in the work of local departments, when assessing the development of tuberculosis infection, it is necessary to take into account the influence of territorial objects and factors, especially population density. Creating a microterritorial profile based on dividing territories according to the principles of a geographic field allows for a more detailed assessment of the epidemic situation and work out effective organizational and management decisions (EMD) regarding the management of patients of various gender, age and social groups, including patients with socially significant diseases (SSD) and disabled persons.

KEYWORDS: boundaries of the territory, medical geography, International Classification of Functioning, Disability and Health (ICF), distribution, organization of health care, focus of tuberculosis, sanitary prevention, socially significant diseases, territory, territorial objects, tuberculosis, epidemiology

ПОКАЗАТЕЛИ ОЦЕНКИ ТЕРРИТОРИАЛЬНОЙ СРЕДЫ В РАБОТЕ УЧАСТКОВЫХ СЛУЖБ АМБУЛАТОРНЫХ МЕДИЦИНСКИХ ОРГАНИЗАЦИЙ

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РЕЗЮМЕ. Практическое применение медицинскими работниками различных участковых служб существующих механизмов междисциплинарного взаимодействия для проведения комплексной оценки проблем пациента затруднено ввиду отсутствия единых подходов и алгоритмов, описанных в методических рекомендациях, в том числе при взаимодействии со специалистами немедицинского профиля. Цель настоящего исследования — изучение влияния территориальных объектов и факторов на показатели распространения туберкулезной инфекции в работе участковых служб. С января 2021 г. по июнь 2022 г. проведено ретроспективное аналитическое описательное исследование на базе СПб ГБУЗ «Противотуберкулезный диспансер № 5» (ПТД № 5). На примере территории Калининского и Красногвардейского административных районов установлено, что показатели заболеваемости и распространенности туберкулеза отличались в несколько раз в разных муниципальных образованиях. Сравнительный анализ показателей свидетельствует о неоднородности микротерриторий в муниципальных образованиях по ряду территориальных параметров и объектов, а также мест регулярного скопления людей, являющихся «точками притяжения». По результатам многофакторного анализа независимым критерием, влияющим на вероятность наличия на территории очага туберкулезной инфекции, оказалась плотность проживающего населения. Можно сделать вывод, что чем выше плотность населения, тем выше вероятность того, что территория

инфекционного туберкулезного риска не будет «чистой» (aOR = 1,0002, p <0,001). Таким образом, в работе участковых подразделений при оценке развития туберкулезной инфекции необходимо учитывать влияние территориальных объектов и факторов, особенно плотности населения. Создание микротерриториального профиля на основании деления территорий по принципам географического поля позволяет более детально оценить эпидемическую ситуацию и принять эффективные организационно-управленческие решения в части ведения пациентов различных половозрастных и социальных групп, включая больных социально значимыми заболеваниями и лиц с инвалидностью.

КЛЮЧЕВЫЕ СЛОВА: границы территории, медицинская география, международная классификация функционирования, распространение, организация здравоохранения, очаг туберкулеза, санитарная профилактика, социально-значимые заболевания, территория, территориальные объекты, туберкулез, эпидемиология

INTRODUCTION

Article 7 of the Constitution of the Russian Federation and Federal Law No. 323-F3 of 21.11.2011 “On the Fundamentals of Health Protection of Citizens in the Russian Federation” state that the Russian Federation (RF) is a social state and one of its priorities is the protection of human health. It has a complex and systemic character, and includes sanitary and anti-epidemic measures, which are carried out to preserve the mental, physical, social and territorial well-being of citizens on the territory of their residence. Territorial well-being can be understood as various components of the environment balanced in the local measurement, which contribute to self-fulfillment of a healthy, safe, spiritual, value-rich and peaceful way of life for people living on a certain territory permanently and/or temporarily. Territorial well-being is based on the normative and legal acts which are valid in the country and/or the region. Outpatient medical organizations (OMOs) can attribute these functions to activities of district units and OMO epidemiologists. For example, a district phthisiologist is a key figure in tuberculosis control activities and is actively involved in both various responsibilities of inpatient work, as well as focuses on outpatient sections of tuberculosis (TB) care. Work in tuberculosis hotspots (TBH) has always remained the section of TB care in the public health system. Within the framework of this work, interdepartmental cooperation with other territorial and district services was both possible and necessary, and its mandatory nature was legally stipulated.

Analysis of literature data highlights several key points that are relevant for urban areas and important for the effectiveness of current and prognostic assessments of TB spread and anti-epidemic activities.

1. Specialists from different fields, administration, and population should understand the importance of common values, goals and objectives in a shared territory, in order to increase the trust which is necessary for effective and timely implementation of preventive and anti-epidemic measures.

2. It is advisable to identify geographical territorial boundaries, parameters and objects (schools, stops, medical organizations, population density, etc.) that form the unique profile of a micro-territory/territory during TB development, which reflect the spatial and temporal features of the population’s environment and may change, for example, when TB patients move between territories.

Accordingly, a passport of district physicians should include a comprehensive spatial and temporal territorial assessment of the epidemic situation and characteristics of tuberculosis infection hotspots within certain boundaries, because otherwise further outpatient work of district phthisiologists remains insufficient.

According to the Procedure for Organizing Medical Rehabilitation of Adults (No. 788n, Approved by Order of the Ministry of Health of the Russian Federation on the 31 July 2020), the use of the International Classification of Functioning, Disability and Health (ICF) is mandatory in rehabilitation work [1]. Environmental factors, including territorial objects, are a component of the ICF and refer to all aspects of the surrounding (or external) world, which forms the living conditions of an individual and thus affects his or her functioning. For example, demographic changes, population density, professional health

care workers also belong to environmental factors. To standardize the description of functional ability, health and disability of patients with different diseases, different tools based on the ICFs are being developed. They include the ICF Core Sets (ICF CSs), a short list of the ICF categories which are considered to be the most appropriate for describing the functioning of people with different health conditions, in a particular situation and a territory of residence. Patient's health status is assessed across all domains of the Core Sets and implemented into an individualized functioning profile. At present, the ICF CS is not available in phthisiology and requires further development.

AIM

To study the way territorial objects and micro-territorial distribution principal influence on TB infection rates in a metropolis. This influence is observed taking into account the interaction of district phthisiologist service with specialists of the general medical network (GMN), population, municipal and administrative services.

MATERIALS AND METHODS

A retrospective analytical descriptive study was conducted between January 2021 and June 2022. The data obtained were analyzed on the basis of tuberculosis early treatment and prevention center (TETPC) No. 5.

Inclusion criteria. Adult patients aged 18 years and older with active tuberculosis (A 15.0 — A 19.0) and children and adolescents diagnosed with latent tuberculosis infection (R 76.1), enrolled for outpatient care at the TETPC No. 5 between 2012 and 2021. All patients lived in the Kalininsky and Krasnogvardeysky districts of St. Petersburg (SPb). The study was based on geo-spatial, geo-situational, comparative-geographical and problem-program scientific approaches, methods of statistical analysis, thematic mapping and on GIS-technologies.

We have developed and used a biomedical geographical approach (BMGA) to bring knowledge and skills to a "common denominator" (Fig. 1). BMGA development was based on the common interests of residents, agencies and professional community in the territory to ensure territorial well-being [2, 3].

Implementation of labour functions by the medical and non-medical territorial community, which are part of the BMG team, is based on common work of phthisiologists and primary care physicians when they deal with socially significant diseases (SSDs) in accordance with the List of socially significant diseases and diseases that pose a danger to others, which includes tuberculosis, approved by the Russian Government Decree No. 715 dated 01.12.2004, as well as with the provisions of professional standards (PS) and other regulatory legal acts (RLAs).

It was necessary to define optimal spatial and temporal boundaries that could be easily identified and used for the work of various types of neighbourhood services when using the BMGs in the micro-territory.

The first stage involved field research of the territory in the studied districts. They were divided according to the actual administrative

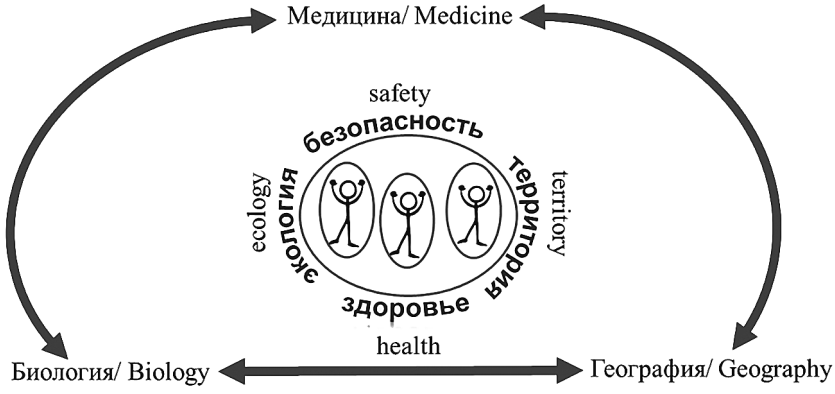

Fig. 1. Interaction scheme in accordance with the BMG approach

Рис. 1. Схема взаимодействия в рамках БМГ-подхода

division into 12 municipal districts (MD), for which there are statistical data and defined and consistent boundaries [4–6]. These boundaries were established by the Federal Law No. 131-FZ, dated 06.10.2003 "On General Principles of Organization of Local Self-Government in the Russian Federation". The total area of the research covered 96.5 km^2, the population amounted to 943,927 people living in 2,889 residential buildings by the moment of the research. The information about the places of public and social attraction in small areas, marked on the city map, was verified and supplemented by volunteer schoolchildren from St. Petersburg State Budgetary Educational School No. 214 and No. 192. The pupils were supervised by the authors of the article, and the collected materials were processed. The administration of the municipal district (MD) provided additional information on the demographic situation, the number and employment of the population, vertical and horizontal parameters of houses, infrastructural, social and engineering conditions of the territory, including squares and streets; if necessary, it was clarified in management companies (MC), homeowners' associations (HOA), housing and communal services (HCS).

At the second stage, an analysis of epidemiological indicators was conducted, characterizing the TB epidemic situation (morbidity, mortality, prevalence, etc.) for each MD.

The TETPC No. 5. provided data on children and adults with tuberculosis, as well as children and adolescents with latent tuberculosis infection (LTI), the information included places of their residence. The number of all active TB cases for 10 years (from 2012 to 2021) and the number of active TB cases and LTI at the end of the first half of 2022 were analyzed.

For instance, the Kalininskiy administrative district has approximately homogeneous infrastructure and time of construction. It was established that tuberculosis incidence and prevalence rates differed multiply in different municipal districts and did not reflect reasons for the spread of tuberculosis infection (Table 1).

According to the principles of geographic field definition [7, 8], boundary lines were identified in naturally existing borders of administrative territories: streets, squares, parks, rivers, railway tracks. These borders were used to draw the boundaries of micro-territories with approximately the same statistical MD surface for further study. Such territorial units were called territories of infectious tuberculosis risk (TITR) [4, 5]. They corresponded to residential neighborhoods, including residential and non-residential buildings, and differed from them by having non-residential buildings and/or designated park areas. The characteristics of the TITRs are presented in Table 2.

Stage 3 involved implementation of an organizational and management solution (OMS) to align the boundaries of TB sites according to the district boundaries in order to improve interdisciplinary collaboration [4–6]. The staffing ratios recommended by the Order on the Provision of Medical Care to Patients with Tuberculosis, approved by Order No. 932n of the Ministry of Health of the Russian Federation of 15 November 2012 (the Order), could be met by several TB sites or by several small micro-territories managed by a single phthisiologist in large MDs. Territorial facilities and indicators were divided into 4 groups (demographic, epidemic, community and social) and included: population density/households/apartments, presence and density of medical organizations, schools, kindergartens, recreational areas, public transport stops, number of patients with latent tuberculosis, TB hotspots and others.

Differences between the three described TITR groups ("null" groups were excluded) were determined using the Kraskell–Wallis test, since the distribution of all comparable characteristics differed from the normal distribution; the critical p value was taken as 0.142 for the three groups, corresponding to a 5% chance of statistical error of the first kind [9]. When the null hypothesis was rejected for the chosen level of statistical significance, the Mann–Whitney test with the same critical level of significance p was additionally performed between the groups.

At the fourth stage, we analyzed the legislation regulating functional responsibilities of district service doctors. These responsibilities include sanitary and epidemiological monitoring of the supervised territories, interdepartmental cooperation, compilation of a "site passport", and implementation of the ICF in practice. A set of domains for contextual factors that can limit or facilitate the process of treatment and rehabilitation of TB patients was developed. It was based on the analysis of tuberculosis risk factors, social anamnesis and epidemiological studies of tuberculosis hotspots in the analyzed districts.

Table 1

Tuberculosis incidence and prevalence data of municipal Kalininsky district of St. Petersburg at June 30, 2022

Таблица 1

Данные заболеваемости и распространенности туберкулеза по муниципальным округам Калининского района СПб на 30.06.2022 г.

Показатели / Indicators	Муниципальный округ / Municipal district						
	Северное / Severnoe	Академическое / Akademicheskoye	МО 21/ MD 21	Пискаревский / Piskarevskiy	Финляндский / Finlandskiy	Прометей / Prometey	Гражданка / Grazhdanka
Заболеваемость (на 100 тыс. населения) / Incidence (per 100 000 population)	4,1	9,3	1,3	7,8	9,9	10,2	10,9
Распространенность (на 100 тыс. населения) / Prevalence (per 100 000 population)	39,4	36,0	16,9	15,7	25,4	35,8	27,2
ЛТИ (число случаев на 1 км²) / LTBI (number per 1 km²)	3	1,3	1,8	1,4	0,9	3,5	2,9
Очаги туберкулеза (число очагов на 1 км²) / TB hotspots (number per 1 km²)	9	5	3,3	1,5	1,8	7	4,9

Table 2

Characteristics of AITR

Таблица 2

Характеристика ТИТР

Название / Name	Определение / Definition	Число / Number	Площадь / Area
Нулевые / Zero	Территории, свободные от жилой застройки / Areas free from residential buildings	25	30,6
«Чистые» / «Clean»	Территории, свободные от ОТБ / Areas free from tuberculosis patients	33	21,6
Чувствительные / Sensitive	Территории с долей ОТБ с множественной и широкой лекарственной устойчивостью (МЛУ и ШЛУ) микобактерий туберкулеза менее 70% / Areas where MDR and XDR tuberculosis patients are less than 70%	47	25,2
Резистентные / Resistant	Территории с долей ОТБ с МЛУ и ШЛУ микобактерий туберкулеза 70% и более / Areas where MDR and XDR tuberculosis patients are 70% and more	36	19,1

Note: AITR — areas of infectious tuberculosis risk.

Примечание: ОТБ — очаги туберкулеза; ТИТР — территории инфекционного туберкулезного риска.

RESULTS

Comparison of TITR types by a number of indicators revealed the following reliable statistically significant differences:

a) "clean" TITRs and TITRs of other types differed by density of adult and child population living in the area, density of houses and flats in houses, density of shops, educational and medical institutions, recreation areas;
b) the density of public transport stops in "clean" and multidrug-resistant tuberculosis areas also varied (p=0.004);
c) the density of latent tuberculosis infection between "clean" TITR and sensitive tuberculosis differed (p <0.0001).

The hypothesis on the influence of houses age and floor size was not confirmed; this can be interpreted as epidemiological insignificance of Mycobacterium tuberculosis inhabitation in environmental objects.

Thus, the given data testify to heterogeneity of micro-territories of the modern megapolis within the allocated boundaries. According to the results of multivariate analysis, an independent variable influencing the probability of tuberculosis infection on a certain territory turned out to be the population density in a micro-territory. Taking into account the transformation of megacities into urban agglomerations and the absence of generally accepted principles of territorial development, it is possible to assume that further growth of housing construction rates and "densification" of urban

development will increase risks of TB spread. It can be concluded that higher population density will raise the chances of making "clean" TITRs infected (aOR=1.0002, p <0.001). The ROC analysis performed established a high predictive ability of the model, the area under the curve accounted for 90.3%. The optimal cut-off point, at which the probability of having a center of TB infection was higher than its absence, corresponded to an adult population density of 8460 per km^2. The influence of other microgeographic field factors was relatively low in relation to population density.

According to the data from statistical forms (f-033, f-8), in 2020–2022 organizational and management solutions (OMS) together with a biomedical geographical approach (BMGA) were aimed at improving the interaction and subsequently allowed to: reduce the number of patients evading examination and necessary treatment by 3.2 times (from 92 people to 29); increase the coverage of examined patients in contact with TB patients by 82% per one detected patient; to achieve bacteriological cessation in 72.6% of all patients detected with TB for the first time, taking into account MDR (multiple drug-resistant tuberculosis) and XDR (extensively drug-resistant tuberculosis) (56.8% in St. Petersburg); to increase medical literacy of the population starting from school age ("Health Relay Race" in district schools), which resulted in a 25% reduction in parental refusal to examine children for TB.

In addition, the approaches used made it possible to significantly reduce the territorial TB incidence rate (Table 3) compared to the similar rate in St. Petersburg (per 100,000, 2018–2021).

Table 3

Comparision Tuberculosis incidence in TB Dispensary N 5 and St. Petersburg

Таблица 3

Сравнение заболеваемости туберкулезом ПТД № 5 и СПб

Территория / Area	Годы			
	2018	2019	2020	2021
Санкт-Петербург / Saint Petersburg	29,1	25,8	24,7	21,2
СПбГБУЗ «ПТД № 5» / Antituberculosis dispensary № 5	28,1	20,2	19,2	15,4

DISCUSSION

The professional standard "Phthisiologist", approved by the order of the Ministry of Labor of Russia from 31.10.2018 No. 684n, indicates the obligation to carry out sanitary and anti-epidemic (preventive) measures in tuberculosis hotspots, taking into account their epidemic danger, as well as to assess the effectiveness indicators of anti-tuberculosis measures. These activities should be based on interdepartmental and interdisciplinary cooperation in a certain territory in order to detect tuberculosis in adults and children as early as possible. In addition, mandatory Labor actions and skills include conducting health education to prevent the spread of tuberculosis among the population, informing the population about possible risks of tuberculosis, and monitoring of tuberculosis patients and individuals at high risk in a certain district.

Labor functions of district specialists are common when dealing with prevention of socially significant diseases. Preventive and rehabilitation measures are based on the district principle (DP) as well as on the interdisciplinary interaction of general practitioners, physicians, pediatricians, phthisiologists [2, 6, 10, 11]. Their responsibilities are based on the provisions of professional standards: Draft Order of the Ministry of Labor and Social Protection of the Russian Federation 'On approval of the professional standard "General practitioner" (prepared by the Ministry of Labor of Russia on 27.11.2018) — for general practitioner; Order of the Ministry of Labor of Russia dated 31.10.2018, No. 684n 'On approval of the professional standard "Physician-phthisiologist" for phthisiologists; Order of the Russian Ministry of Labor of 27.03.2017, No. 306n "On approval of the professional standard 'District pediatrician' — for pediatricians; and Order of the Ministry of Health and Social Development of the Russian Federation of 07.12.2005, No. 765 "On organization of the activity of district therapist" — for district therapists.

However, the level of medical service may significantly differ between various tuberculosis early treatment and prevention centers (TETPCs) and even within the same TETPC, since there are no generally accepted criteria for determining the territorial boundaries of TETPCs. This fact is reflected in the Annex No. 2 of the Order which specifies recommended staffing levels for urban and rural areas based on the number of population (1 district TB doctor per 25,000 urban residents and 13,300 rural residents). It allows heads of medical organizations to determine the workload of district physicians freely enough and do

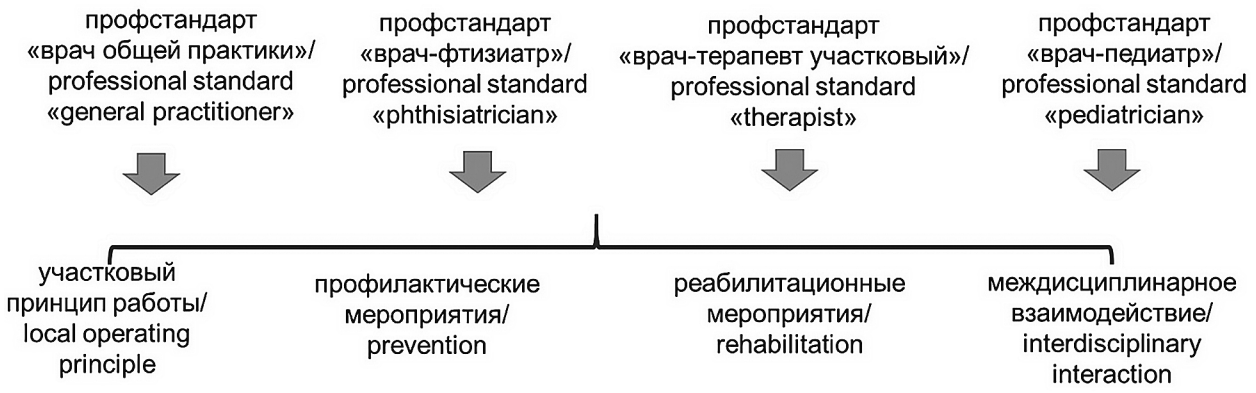

Fig. 2. Principles of the multidisciplinary interaction of medical territorial specialists

Рис. 2. Принципы междисциплинарного взаимодействия участковых специалистов

not take into account the population density of the area served. Accordingly, the Provisions of Order of the Ministry of Health and Social Development of the Russian Federation No. 543n, dated 15.05.2012 'On Approval of Regulations concerning Organization of Primary Health Care for Adults' do not have generally accepted approaches to territorial assessment. The Provisions require to consider the population density when providing specialized primary health care in outpatient medical organizations. Unfortunately, this provision is not widely implemented. Thus, a simple division of TB sites based on the number of attached population according to the Order does not comply with provisions of regulatory and legal documentation and requires the use of population density indicators by medical organizations, since there are modern conditions of urban agglomerations, migration turbulence, and dense construction. The impact of population density on the spread of tuberculosis should be taken into account as well. Under the Order No. 932n of the Ministry of Health of the Russian Federation dated 15.11.2012, the number of attached population of a district phthisiologist corresponds to the attached population of more than ten district physicians (pediatricians) or family physicians/general practitioners in accordance with the Order No. 543n of the Ministry of Health and Social Development of the Russian Federation dated 15.05.2012. Consequently, timely and well-coordinated interdisciplinary interaction of the district service in outpatient medical organizations becomes extremely important.

Another important factor in the work of TB district services is the absence of the most generally accepted concept of "site passport" among phthisiologists, in contrast to the "passportisation" of district general practitioners "On the organization of district general practitioner activity" issued 07.12.2005 by the Order No. 765 of the Ministry of Health and Social Development of the Russian Federation) and pediatricians ("On the passport of the medical district (pediatrician") issued 09.02.2007 by the Order No. 102 of the Ministry of Health and Social Development of the Russian Federation). The passport of a doctor's area is designed to obtain information on the attached contingent, gender, age and social composition. For example, the passport of a district general practitioner indicates that a general practitioner carries out detection of early and latent forms of diseases, which should be performed taking into account territorial assessment and interaction with other district services.

The principle of site formation based on the number of attached population is imperfect in modern conditions.

Existing discrepancies with regard to served territories may be the cause of inefficient interdisciplinary and interdepartmental cooperation. There is a requirement to specify only the name of an urban locality when describing the "location" of a therapeutic area, while a pediatric area must include both the name of a locality and addresses of houses, as well as the availability of transport. These discrepancies do not contribute to interaction with the TB service in hotspots. For example, the Housing Code of the Russian Federation dated 29.12.2004, No. 188-FZ, Article 36 "Ownership of the common property of owners of premises in an apartment building" defines the adjacent territory as "...the land plot on which the building is located, with

elements of landscaping, other objects intended for maintenance, operation and improvement of the building and objects located on the land plot". The boundaries and size of the land plot on which an apartment building is located are determined in accordance with requirements of land legislation and legislation on town-planning activities. Accordingly, when defining the territory of the "common yard", which can be formed by a group of apartment buildings with different adjacent territories and, possibly, with different organizational forms of management of this territory (HOA, MC, etc.) different assessments and approaches can be used. They depend on representatives of homeowners and, as a consequence, they are financed by owners and certain anti-epidemic measures become dispensable. These facts have been encountered in the course of our work. Besides, organizing activities for people with disabilities, including children with disabilities, is often difficult for both social and territorial reasons. In most cases, only a small proportion of children with disabilities are observed by a phthisiologist. These children need a special approach to examination and medical check-ups due to the insufficiency of regular screening tests, parental refusal of preventive treatment, and poor tolerance of drugs. Therefore, district pediatricians should pay closer attention to such children in order to individualize diagnosis and treatment, as well as to monitor their coverage with TB interventions. For children with contraindicated or uninformative skin tests, routine screening with IGRA tests should be provided [6].

Another important area of any district specialist's activity is working with patients with socially significant diseases [12, 13]. For phthisiologists, these are patients with comorbid and combined pathology [14] of different groups of regular medical monitoring, approved by the order of the Ministry of Health of Russia from 13.03.2019 No. 127n "On approval of the order of regular medical monitoring of patients with tuberculosis...". First of all, chronic non-infectious diseases include chronic obstructive pulmonary disease (COPD), cerebrovascular and cardiovascular diseases. In accordance with Order No. 765 of the Ministry of Health and Social Development of the Russian Federation dated 07.12.2005 "On the organization of the activity of the district physician", the district physician can refer a patient to other medical institutions for consultation or inpatient treatment, with subsequent supervision of a patient after his treatment has been finished. Currently, a unified state information health care system (USIHCS) is being actively implemented, which allows to maintain continuity between a hospital and polyclinic in accordance with the Decree of the Government of the Russian Federation No. 140 of 09.02.2022 "On a unified state information system in the sphere of health care".

Special attention should be paid to the territories where houses and residential homes for the elderly and disabled are located when issues of sanitary and epidemiologic well-being are considered at the level of regions and local communities. High average age, limitations in self-care and independent movement of residents, as well as high comorbidity index, crowdedness/density of residence are the main predisposing factors to the development of hazardous socially significant diseases, including tuberculosis [15]. This fact was widely confirmed by the pandemic of coronavirus infection. For instance, according to WHO data from 23.04.2020, up to half of deaths from coronavirus in Europe occurred in nursing homes [16]. Since collective immunity is not formed in tuberculosis, and the vaccine does not fully protect against infection, the main ways to eliminate the disease are active detection and treatment of patients [17]. According to the Order of the Ministry of Health of Russia from 02.05.2023 No. 202n "On approving the list of medical contraindications, ..., as well as the form of authorized medical organization on the presence (absence) of such contraindications", tuberculosis of any organs and systems with bacterial excretion is a contraindication for provision of social services at home, in semi-stationary and stationary forms. Accordingly, the interaction of district services in the territories of boarding houses and residential homes for the elderly and disabled should be as effective as possible, which will prevent outbreaks of tuberculosis infection.

Many authors note the necessity to increase TB vigilance and strengthen TB work of physicians [6, 18, 19], which is also reflected in the Decree of the Chief State Sanitary Doctor of the Russian Federation No. 4 of 28.01.2021 [9], but the specific reasons for the decrease in TB vigilance are not specified, although they directly depend on the quality of out-of-discharge work performed by district phthisiologists. Seminars and lectures on tuberculosis prevention and early diagnosis have a positive role [18–20]. Nevertheless, absence or insufficiency of systematic interaction

between services and non-performance / poor quality of routine outpatient monitoring of district phtisiologists is accompanied by low awareness. Psychological unavailability of specialists hinders implementation of measures to prevent and detect tuberculosis. It also influences on the joint work in TB hotspots which may be related to the lack of unified principles and approaches to TB prevention and early diagnostics.

The distribution of epidemic processes in a territory may be different and uneven, which requires a more detailed assessment of the micro-territorial epidemiologic situation and definition of principles, approaches and workload depending on these features. Accordingly, every pediatric and adult district phthisiologists faces a specific epidemic picture of tuberculosis in each TB district in his/her daily practice. This view is also reflected in a number of scientific papers that point to the underestimation of territorial contacts [19]. Perhaps, the creation of an individual profile of micro-territories in the city may be an integral part of effective interaction between the population, administrations of different levels and medical organizations and serves as a basis for the development of information vertical in decision-making to achieve results in timely TB control activities in different territories. It is necessary to introduce the ICF [1], which is implemented in other areas of medicine. The ICF will make it possible to supervise patients both by a district phthisiologist and other specialists on the basis of an individual program.

CONCLUSION

According to the above mentioned, it is necessary:

- to use the presented predictive model for planning the development and resettlement of tuberculosis patients in micro-territories involving phthisiologists;
- to form unified approaches to carry out preventive and anti-epidemic measures in one TB district, which will be based on the BMGA and involve phthisiologists, general medical network, administration and population, taking into account the heterogeneity of tuberculosis infection spread in the territories;
- to assess the risk of TB infection spread, taking into account the influence of territorial facilities and factors, including population density, as well as ICF barriers as a tool for describing and dynamically controlling medical, social, psychological, community and territorial characteristics of the population served;
- to create a micro-territorial profile based on the division of territories according to the principles of geographic field, which will allow to assess the epidemic situation in detail and adopt effective organizational and management solutions for the management of patients of different groups, including patients with SSDs and disabilities;
- to have common quantitative and qualitative benchmarks, including territorial ones, to prevent the development of tuberculosis infection.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

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