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# Health system barriers to collaborative HIV/TB activities in Russia (health providers' opinion)

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# Барьеры системы здравоохранения при проведении совместных мероприятий по ВИЧ-инфекции и туберкулезу в России (мнение медицинских работников)

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**Summary**

**Introduction.** The increase in the number of HIV/TB coinfection cases along with the progression of the HIV epidemic requires strengthening of HIV/TB collaborative services, especially in providing the health care measures for PLWH. **Study objectives.** To determine health barriers in HIV/TB collaborative activities and to assess ways to overcome them according to the opinion of health providers of TB facilities. **Study design.** In the qualitative sociological study, surveys with open and closed questions were distributed amongst 284 health care workers of TB facilities in St. Petersburg, Leningrad, Arkhangelsk, and Kaliningrad oblasts during six months of 2018. The regions in the study have been selected based on the features of the HIV, TB and HV/TB coinfection epidemics. Statistically 95.0% confident interval of the obtained data was assessed. **Results.** According to the opinion of specialists of TB facilities, the main barriers to implementation of HIV/TB collaborative services are: low levels of stakeholder engagement, including penitentiary system (24.4%), increased migration (48,0%) and increase in the number of injecting drug users in some of regions (76.0%), insufficiency of legal policy caused mainly by its conflicting (56,0%) and limitation in funding for TB measures (56.0%). **Conclusion.** In the health providers' opinion enhancement of existing HIV/TB strategy should be done by strengthening stakeholder engagement, especially with the penitentiary system, fully financing of TB measures, improving work with migrants, injecting drug users, including the establishment of low-threshold centers.

**Key words:** HIV/TB collaboration, health barriers, TB specialists, health providers

**Резюме**

**Введение.** Рост числа случаев сочетанной инфекции ВИЧ/ТБ наряду с прогрессированием эпидемии ВИЧ-инфекции требует усиления совместных мероприятий по сочетанию туберкулеза и ВИЧ-инфекции, особенно при оказании медицинской помощи людям, живущим с ВИЧ. **Цель исследования:** определить барьеры и пути их преодоления в системе здравоохранения при проведении совместных мероприятий по сочетанной инфекции ВИЧ/ТБ согласно мнению медицинских работников противотуберкулезных медицинских организаций. **Дизайн исследования.** В качественном социологическом исследовании с открытыми и закрытыми вопросами проведено анкетирование 284 медицинских работников противотуберкулезных медицинских организаций Санкт-Петербурга, Ленинградской, Архангельской и Калининградской областей в течение 6 мес 2018 г. Выбор регионов для исследования был обусловлен особенностями распространения ВИЧ-инфекции, туберкулеза и сочетания ВИЧ-инфекции с туберкулезом в указанных субъектах Российской Федерации. Статистически был определен 95,0% доверительный интервал полученных данных. **Результаты.** По мнению специалистов медицинских противотуберкулезных организаций, основными ограничениями в реализации совместных мероприятий по сочетанной инфекции ВИЧ/ТБ являются: низкий уровень взаимодействия заинтересованных сторон, включая пенитенциарную систему (24,4%), рост миграции (48,0%) и увеличение числа потребителей инъекционных наркотиков (76,0%) в отдельных регионах, низкая эффективность выполнения требований нормативно-правовых актов, обусловленная их несоответствием к реальным условиям (56,0%) и ограниченным финансированием противотуберкулезных мероприятий (56,0%). **Заключение.** Улучшение существующей стратегии борьбы с сочетанной инфекцией ВИЧ/ТБ, согласно мнению медицинских работников, должно осуществляться путем усиления взаимодействия заинтересованных сторон, особенно с пенитенциарной системой, полноценного финансирования противотуберкулезных мероприятий, улучшения работы с мигрантами, потребителями инъекционных наркотиков, в том числе создавая низкопороговые центры.

**Ключевые слова:** сотрудничество в области ВИЧ/ТБ, барьеры системы здравоохранения, врачи-фтизиатры, медицинские работники

## Introduction

The increase in the number of HIV/TB cases, in combination with the HIV epidemic progression, requires improvement of tuberculosis (TB) care for people living with HIV (PLWH) [1–3].

The barriers of HIV/TB collaborative services identified by health providers and patients in peer-reviewed qualitative studies vary from country to country, but share common factors. In South Africa, primary health care workers indicate the main barriers of TB control strategy as lack of their own TB knowledge, conflicting policy guidelines, and lack of support from the authorities, which cause feelings of helplessness and hopelessness [4]. Among the barriers to HIV tests in HIV/TB patients, health workers in Cambodia indicated limitations in their own HIV/TB knowledge, lack in planning of testing measures, and medical stigma [5]. In Indonesia,

the main barriers perceived by health providers also were stigmatization and poor HIV knowledge [6]. Meanwhile, HIV-infected patients in the United States perceived a decrease of discrimination in healthcare settings from 24% in 1996 to 15% in 2011–2013 (confidence interval (CI) 95%: 6–12) [7].

Health providers in Uganda included poor planning of HIV/TB measures in their responses, as well as limited interclinic referral [8]. In India, the indicated health system barriers for poor antiretroviral therapy (ART) uptake among HIV/TB patients included limited human resources and lack of early ART due to clinician concern about immune reconstitution syndrome [9]. HIV-infected patients in Mozambique perceived limitations of the healthcare system as the absence of nutritional and comprehensive psychological support [10], in Western Kenya — as the lack of HIV care among students and prisoners [11]. Additionally, health providers faced difficulties in the tracing of lost to follow-up patients [12].

Evidently, the indicated barriers to HIV/TB collaborative strategies are very diverse: in a systematic review by *M.K. Benjamin and coauthors* the use of standardized tools was suggested for identifying adherence to ART in HIV/TB coinfected subjects, enabling the generation of valid conclusions [13].

Qualitative studies involving TB health providers addressing HIV/TB challenges in Russia are very limited. Only three publications were identified, and according to a questionnaire survey of patients and TB specialists in various regions of Russia, the functional activity and structure of most TB facilities did not meet required standards for TB services in PLWH [14, 15]. For drug users, barriers to ART access were systemic, including drug treatment policy and social marginalization [16].

Thus, with the aim to identify barriers to integrated HIV/TB services and ways to overcome them, the opinions of TB health providers were surveyed using a questionnaire in four regions of the Northwestern Federal District (NWFD) of Russia: St. Petersburg (SPT), Leningrad (Len), Kaliningrad (Klg) and Arkhangelsk (Arch) oblasts.

The research territories were chosen based on HIV and HIV/TB epidemic tendencies during the last decade [17, 18]. In St. Petersburg and Leningrad oblast, high densities of HIV and HIV/TB cases persisted. Kaliningrad oblast was the only region of the NWFD of Russia which has been excluded from the list of territories with high HIV and HIV/TB burden in the last decade. In Arkhangelsk oblast, the HIV and HIV/TB epidemics are progressing at a high rate, but at the same time, paradoxically, TB prevalence is dramatically decreasing.

The study objectives are to assess challenges of HIV/TB collaborative services and to determine ways to overcome them according to the opinions of TB health workers.

## Research methods

The total number of participants in the study, conducted from May to October 2018, consisted of 284 people: 180 in St. Petersburg, working at 17 city district TB dispensaries; 25 in the Leningrad oblast, working at the regional TB dispensary, which is situated in St. Petersburg; 35 in the Kaliningrad oblast regional dispensary and 44 in the Arkhangelsk oblast regional dispensary. Before participating in the study, informed consent was obtained from each respondent by the trained research assistants in each facility. The study was approved by the ethics committee of the St. Petersburg Research Institute of Phthisiopulmonology of Health Care Ministry of the Russian Federation on 02.14.2018, № 6. The survey toolkit was halfway an online questionnaire survey of respondents, also has done by them on paper followed by statistical processing of information based on SPSS 21, including calculation of 95,0% CI of findings.

The questionnaire consists of 19 structured questions, divided into blocks, of which 5 questions were open-ended, allowing for expression of the respondent's opinion, and 11 questions — closed with alternative answers for respondent choice. The first block of questions assessed human resources and the level of HIV/TB collaborative services, including interaction between different stakeholders. The second block of the survey identified factors affecting the HIV/TB situation in the specific territory. The third block requested respondent suggestions for improving the HIV/TB epidemic situation in the specific area, and in the fourth, there was a self-assessment of the respondent's own level of HIV, HIV/TB knowledge and need for their improvement, which is not included in the article. Additionally, socio-demographic information was collected from respondents: age, gender, occupation position (3 questions). The obtained results were compared between regions and evaluated integrally within the blocks.

## Results

More than half of the study participants were 51 years of age and older (51.1%), among them women prevailed (81.7%). The majority of doctors were phthisiatricians (42.6%), the share of other specialists was 9.9%, head and deputy doctors (health managers) — 14.1%, nurses — 33.4% (Table 1). Between regions there were neither disparities in gender, nor disparities in share of aged specialists and professional structure of respondents.

Table 2 shows respondent evaluation of concordance of human resources in TB facilities with standards established in Russia, levels of TB services provided for PLWH, support from local authorities and interaction between different stakeholders involved in the integrated HIV/TB system.

*Table 1*

**Age-gender and professional characteristics of respondents**

| Characteristics/regions | SPT N=180 (%) | Len N=25 (%) | Klg N=35 (%) | Arkh N=44 (%) | Total N=284 (%) |
|---|---|---|---|---|---|
| Men | 16.1 | 32.0 | 20.0 | 18.2 | 18.3 |
| Women | 83.9 | 68.0 | 80.0 | 81.8 | 81.7 |
| 21–30 years old | 6.1 | 16.0 | 0.0 | 11.4 | 7.0 |
| 31–40 years old | 17.2 | 28.0 | 20.0 | 13.6 | 18.0 |
| 41–50 years old | 23.3 | 12.0 | 28.6 | 29.5 | 23.9 |
| 51 and more years old | 53.4 | 44.0 | 51.4 | 45.5 | 51.1 |
| Health managers | 14.4 | 12.0 | 11.4 | 15.9 | 14.1 |
| Phthisiatricians | 44.4 | 48.0 | 34.3 | 38.6 | 42.6 |
| Other specialists | 5.6 | 12.0 | 31.4 | 9.1 | 9.9 |
| Nurses | 35.6 | 28.0 | 22.9 | 36.4 | 33.4 |

SPT — St. Petersburg, Len — Leningrad oblast, Klg — Kaliningrad oblast, Arch — Arkhangelsk oblast.

*Table 2*

**Evaluation of TB facilities role in HIV/TB collaborative services**

| Characteristics/regions | | SPT N=180 (%) | Len N=25 (%) | Klg N=35 (%) | Arkh N=44 (%) | Total N=284 (%) |
|---|---|---|---|---|---|---|
| Doctors number* | Sufficient | 48.9 | 48.0 | 42.9 | 52.3 | 48.6 |
| | 95.0% CI | [41.4–56.4] | [27.8–68.7] | [26.3–60.6] | [36.7–67.5] | [42.6–54.6] |
| | Insufficient | 20.6 | 36.0 | 48.6 | 45.5 | 29.2 |
| | 95.0% CI | [14.9–27.2] | [18.0–57.5] | [31.4–66.0] | [30.4–61.2] | [24.0–34.9] |
| Nurses number* | Sufficient | 50.3 | 40.0 | 51.4 | 47.7 | 49.3 |
| | 95.0% CI | [43.0–58.1] | [21.1–61.3] | [34.0–68.6] | [32.5–63.3] | [43.3–55.3] |
| | Insufficient | 17.8 | 32.0 | 40.0 | 45.5 | 26.1 |
| | 95.0% CI | [12.5–24.2] | [14.9–53.5] | [23.9–57.9] | [30.4–61.2] | [21.0–31.6] |
| TB services level* | High | 48.3 | 12.0 | 40.0 | 40.9 | 43.0 |
| | 95.0% CI | [40.8–55.9] | [02.5–31.2] | [23.9–57.9] | [26.3–56.8] | [37.1–48.9] |
| | Average | 32.2 | 44.0 | 45.7 | 29.5 | 34.5 |
| | 95.0% CI | [25.5–39.6] | [24.4–65.1] | [28.8–63.4] | [16.8–45.2] | [29.0–40.4] |
| | Low | 2.2 | 4.0 | 8.6 | 20.5 | 6.0 |
| | 95.0% CI | [0.7–5.3] | [00.1–20.4] | [01.8–23.1] | [09.8–35.3] | [03.5–09.4] |
| Local authorities support | Exist | 20.0 | 24.0 | 22.9 | 27.3 | 21.8 |
| | 95.0% CI | [14.4–26.6] | [09.4–45.1] | [10.4–40.1] | [15.0–42.8] | [17.2–27.1] |
| | Doubt | 28.4 | 4.0 | 28.5 | 25.0 | 25.7 |
| | 95.0% CI | [21.9–35.5] | [00.1–204] | [14.6–46.3] | [13.2–40.3] | [20.7–31.2] |
| | Notexist | 4.4 | 32.0 | 8.6 | 15.9 | 9.2 |
| | 95.0% CI | [1.9–08.6] | [14.9–53.5] | [1.8–231] | [06.6–30.1] | [06.1–13.1] |
| | Difficult to answer | 47.2 | 40.0 | 40.0 | 31.8 | 43.3 |
| | 95.0% CI | [39.8–54.8] | [21.1–61.3] | [23.9–57.9] | [18.6–47.6] | [37.5–49.3] |

*End of table 2*

| Characteristics/regions | | SPT N=180 (%) | Len N=25 (%) | Klg N=35 (%) | Arkh N=44 (%) | Total N=284 (%) |
|---|---|---|---|---|---|---|
| Prison system | High | 15.0 | 0.0 | 5.7 | 36.4 | 15.8 |
| | 95.0% CI | [10.2–20.6] | [3.8–3.8] | [0.6–15.7] | [23.0–51.0] | [11.8–20.3] |
| | Average | 47.8 | 52.0 | 54.3 | 47.7 | 49.0 |
| | 95.0% CI | [40.5–55.1] | [32.8–71.0] | [37.9–70.3] | [33.3–62.4] | [43.2–54.8] |
| | Low | 37.2 | 48.0 | 40.0 | 15.9 | 35.2 |
| | 95.0% CI | [30.3–44.4] | [29.1–67.2] | [24.6–56.5] | [6.7–28.0] | [29.8–40.9] |
| AIDS Center | High | 48.9 | 28.0 | 40.0 | 63.6 | 48.2 |
| | 95.0% CI | [41.6–56.2] | [12.5–46.8] | [24.6–56.5] | [49.0–77.1] | [42.5–54.1] |
| | Average | 45.6 | 72.0 | 48.6 | 25.0 | 45.1 |
| | 95.0% CI | [38.4–52.9] | [53.2–87.5] | [324–64.9] | [13.5–38.7] | [39.3–50.9] |
| | Low | 5.5 | 0.0 | 11.4 | 11.4 | 6.7 |
| | 95.0% CI | [2.7–9.4] | [3.8–3.8] | [3.2–23.9] | [3.8–22.3] | [4.1–9.9] |
| Narcological dispensary | High | 6.1 | 0.0 | 5.7 | 11.4 | 6.3 |
| | 95.0% CI | [3.1–10.1] | [3.8–3.8] | [0.6–15.7] | [3.8–22.3] | [3.8–9.5] |
| | Average | 40.0 | 40.0 | 62.9 | 52.2 | 44.7 |
| | 95.0% CI | [33.0–47.2] | [22.0–59.5] | [46.4–77.9] | [37.7–66.7] | [39.0–50.5] |
| | Low | 53.9 | 60.0 | 31.4 | 36.4 | 49.0 |
| | 95.0% CI | [46.6–61.1] | [40.5–78.0] | [17.3–47.5] | [23.0–51.0] | [43.2–54.8] |
| NGO | High | 12.2 | 0.0 | 8.6 | 63.6 | 18.7 |
| | 95.0% CI | [1.9–17.4] | [3.8–3.8] | [1.7–20.0] | [49.0–77.1] | [14.4–23.4] |
| | Average | 50.0 | 72.0 | 54.3 | 25.0 | 48.6 |
| | 95.0% CI | [42.8–57.3] | [53.2–87.5] | [37.9–70.3] | [13.5–38.7] | [42.8–54.4] |
| | Low | 37.8 | 28.0 | 37.1 | 11.4 | 32.7 |
| | 95.0% CI | [30.9–45.0] | [12.5–46.8] | [22.1–53.6] | [3.8–22.3] | [27.4–38.3] |

*The response «it is difficult to answer» has not been included in the table.
SPT — St. Petersburg, Len — Leningrad oblast, Klg — Kaliningrad oblast, Arch — Arkhangelsk oblast, TB — tuberculosis, AIDS — acquired immunodeficiency syndrome, NGO — Non-governmental organization.

About half of participants (represented by TB clinicians and nurses) perceived that human resources in TB facilities were sufficient compared to required standards: 48.6% and 49.3%, respectively. Nevertheless 63 study participants (doctors — 49.2%, nurses — 50.8%) were not sure in their opinion and preferred to say «it is difficult to answer» whether the number of healthcare workers in TB facilities meets the standards or not (data not shown).

The respondents rather highly assessed the level of TB services provided by TB facilities for PLWH (43.0%), except in Leningrad oblast where the «high» level is indicated only in 12.0%. Most respondents found it difficult to answer if regional authorities support TB facility activities (43.3%), more than a quarter of participants were doubtful that such support existed (25.7%), about a quarter of respondents recognized support from local authorities (21.8%). The interaction level between civil TB facilities and medical facilities in the penitentiary system was assessed by the majority of respondents as «average» (49.0%), and as «low» by more than 1/3 of respondents (35.2%). In the Leningrad oblast, 40.0% of participants considered interaction with prisons as «low».

Cooperation with AIDS Centers is considered «high» by most TB providers (48.2%), especially in the Arkhangelsk oblast (63.6%). In the Leningrad oblast, participants predominantly gave a modest assessment of interaction between the AIDS Center and TB facilities, in which the majority answered «average level» (72.0%).The cooperation level between TB and narcological dispensaries in most cases was noted as «low» (49.0%), especially in the Leningrad oblast (60.0%).The level of interaction with non-governmental organizations (NGO) is highly evaluat-

ed in the Arkhangelsk oblast (63.6%), whereas in general, evaluation of this criteria prevailed as «average» (48.6%).

The respondent opinion on the main factors affecting HIV/TB epidemic progression were varied across regions (Table 3).

In St. Petersburg (62.8%) and Leningrad oblast (76.0%), the majority of respondents believe that HIV/TB epidemic progression has been perpetuated by an increase in the number of injecting drug users (IDUs), and in Kaliningrad oblast — by an increase in migration (48.0%). The impact of the prison system on the HIV/TB epidemic on civil society in general was estimated as a factor by 15.5% of participants, insufficiency of legal policy in the TB control system — by 13.7%. In Leningrad oblast, the region's economic constraints (64.0%), migration (36.0%), and limitations in TB regulation policy (36.0%) are noted to have significant impacts on the HIV/TB situation.

More than half of the respondents considered that the reason for insufficient TB legal policy is it conflicts with reality (5.1%), funding limitations for required standard TB measures were indicated by more than a third (34.2%) of participants, in Leningrad oblast — by 56.0% of participants. The lack of TB health providers, according to respondent opinion, has not had a significant impact on the insufficiency of legal policy (15.1%). Respondents indicated that the HIV/TB epidemic can be mainly improved by the following factors: an increase in ART coverage in PLWH (52.5%), adequate treatment of TB (48.9%) and public awareness of HIV and TB (47.9%) (Table 4).

Population welfare growth was suggested by more than 1/3 of health providers (32.4%) as an influential factor, as well as enhancing TB chemoprophylaxis in PLWH (30.6%).

In Arkhangelsk oblast, respondents are conservative in their recommendations for improving the HIV/TB situation; especially regarding the role of TB chemoprophylaxis in PLWH (9.1%) and adequate treatment of active TB among PLWH (9.1%).

Regarding recommendations for improving the acceptability of TB services for PLWH, providers have different opinions. In the Leningrad oblast, 40.0% of health workers believe that it is necessary to improve access to transportation. Most respondents propose the opening of low-threshold centers (36.6%), except in Arkhangelsk oblast (13.6%), where the participants consider the strengthening of intersectoral interactions to be paramount (40.9%). However, all of the participants agreed that the working schedules of TB dispensaries and AIDS Centers are adequate for patients (1.8%).

*Table 3*

**Main factors affect the HIV/TB epidemic progression in the study areas**

| Characteristics/regions | SPT N=180 (%) | Len N=25 (%) | Klg N=35 (%) | Arkh N=44 (%) | Total N=284 (%) |
|---|---|---|---|---|---|
| Insufficiency of legal policy | 0.6 | 36.0 | 8.6 | 18.2 | 13.7 |
| 95.0% CI | [0.0–2.16] | [18.7–55.4] | [1.7–20.0] | [8.3–30.8] | [10.0–18.0] |
| Penitentiary system | 24.4 | 16.0 | 17.1 | 13.6 | 15.5 |
| 95.0% CI | [18.5–31.0] | [4.6–32.6] | [6.7–31.2] | [5.2–25.2] | [11.6–20.0] |
| Economic constraints | 25.6 | 64.0 | 25.7 | 27.3 | 29.2 |
| 95.0% CI | [19.5–32.2] | [44.6–81.3] | [12.8–41.3] | [15.3–41.2] | [24.1–34.6] |
| IDUs | 62.8 | 76.0 | 20.0 | 25.0 | 52.8 |
| 95.0% CI | [55.6–69.7] | [57.7–90.3] | [8.6–34.6] | [13.5–38.7] | [47.1–58.6] |
| Migration | 9.4 | 36.0 | 48.6 | 6.8 | 16.2 |
| 95.0% CI | [5.6–14.1] | [18.7–55.4] | [32.4–64.9] | [1.35–16.0] | [12.2–20.7] |
| *Reasons for insufficiency of legal policy* | | | | | |
| Conflicting legal policy | 53.9 | 56.0 | 28.6 | 54.5 | 51.1 |
| 95.0% CI | [46.6–61.1] | [36.6–74.5] | [15.0–44.4] | [39.9–68.9] | [45.3–56.9] |
| Limitations of funding | 36.7 | 56.0 | 20.0 | 22.7 | 34.2 |
| 95.0% CI | [29.8–43.8] | [36.6–74.5] | [8.6–34.6] | [11.7–36.1] | [28.8–39.8] |
| Lack of human resources | 17.8 | 4.0 | 17.1 | 9.1 | 15.1 |
| 95.0% CI | [12.6–23.7] | [0.0–15.0] | [6.7–31.2] | [2.5–19.2] | [11.2–19.5] |

SPT — St. Petersburg; Len — Leningrad oblast; Klg — Kaliningrad oblast; Arkh — Arkhangelsk oblast; IDUs — injecting drug users.

*Table 4*

**Suggestions for improvement of the HIV/TB epidemic in the specific region**

| Characteristics/regions | SPT N=180 (%) | Len N=25 (%) | Klg N=35 (%) | Arkh N=44 (%) | Total N=284 (%) |
|---|---|---|---|---|---|
| *Factors affecting improvement of the HIV/TB epidemic in the specific area** | | | | | |
| Population welf are growth | 36.7 | 16.0 | 22.9 | 31.8 | 32.4 |
| 95.0% CI | [29.8–43.8] | [4.6–32.6] | [4.9–27.6] | [19.0–46.2] | [27.1–38.0] |
| Public awareness of HIV and TB | 51.7 | 64.0 | 48.6 | 22.7 | 47.9 |
| 95.0% CI | [44.4–58.9] | [44.6–81.3] | [32.4–64.9] | [11.7–36.1] | [42.1–53.7] |
| ART coverage increase | 55.6 | 76.0 | 60.0 | 20.5 | 52.5 |
| 95.0% CI | [48.3–62.7] | [57.7–90.3] | [43.5–75.4] | [10.0–33.5] | [46.7–58.2] |
| TB chemoprophylaxis increase in PLWH | 36.7 | 28.0 | 28.6 | 9.1 | 30.6 |
| 95.0% CI | [29.8–43.8] | [12.5–46.8] | [15.0–44.4] | [2.5–19.2] | [25.4–36.1] |
| Adequate active TB treatment in HIV | 62.8 | 28.0 | 42.9 | 9.1 | 48.9 |
| 95.0% CI | [55.6–69.7] | [12.5–46.8] | [27.2–59.3] | [2.5–19.2] | [43.2–54.8] |
| *Recommendations for enhancing TB service acceptability for PLWH* | | | | | |
| Improve transportation access | 10.6 | 40.0 | 11.4 | 9.1 | 13.0 |
| 95.0% CI | [6.5–15.5] | [22.0–59.5] | [3.2–23.9] | [2.5–19.2] | [9.4–17.2] |
| Change schedule of TB dispensaries and AIDS Centers | 1.7 | 0.0 | 0.0 | 4.5 | 1.8 |
| 95.0% CI | [0.32–4.1] | [3.8–3.8]] | [2.7–2.7] | [0.5–12.6] | [0.6–3.6] |
| Establishment of low–threshold centers | 42.8 | 32.0 | 37.1 | 13.6 | 36.6 |
| 95.0% CI | [5.7–50.1] | [15.5–51.2] | [22.1–53.6] | [5.2–25.2] | [31.1–42.3] |
| Strengthen stakeholder interactions | 16.7 | 20.0 | 25.7 | 40.9 | 21.8 |
| 95.0% CI | [11.6–22.5] | [15.5–51.2] | [12.8–41.3] | [27.0–55.6] | [17.2–26.8] |

*Responses «it is difficult to answer» have not been included in the table.

SPT — St. Petersburg; Len — Leningrad oblast; Klg — Kaliningrad oblast; Arch — Arkhangelsk oblast; HIV — human immunodeficiency virus; TB — tuberculosis; ART — antiretroviral therapy; PLWH — people living with human immunodeficiency virus; AIDS — acquired immunodeficiency virus.

Freely written respondent suggestions on improving TB care for PLWH can be divided into several categories (Table 5). There is an abundance of suggestions for optimizing inpatient care for HIV/TB coinfected patients. In Saint-Petersburg, in order to ensure timely hospitalization for those in need, an expansion of the city in-patient hospital for the treatment of TB in HIV patients is proposed. Also, specialists point to the formality of measures for forced treatment of smear positive patients, who evade hospitalization, and recommend strengthening these measures on juridical bases. Additionally, in Saint-Petersburg, respondents suggested the establishment of departments for differential diagnosis in TB hospitals. Providers suggested to avoid supply disruptions of TB and antiretroviral medicines (especially in Saint-Petersburg), increase patient controllability during receiving ART and TB treatment, trace the occurrence and timely correction of adverse events associated with TB chemotherapy, as well as enhance the diagnostic capacity of TB facilities by equipping them with mobile computer tomographs (CT) and expanding the availability of CT examinations of patients.

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Study participants emphasize the importance of patient-centered interventions in PLWH, solving not only medical, but also socio-psychological challenges and increasing their adherence to treatment using various incentives (covering travel expenses, giving food packages) and individually considering the level of adaptation to society of each patient.

*Table 5*

**Recommendations for enhancing HIV/TB collaborative services**

| | |
|---|---|
| Patient-centered approaches | • Provide psycho-social and narcological support for HIV/TB coinfected inpatients;<br>• free of charge use of public transportation to and from TB facilities for patients during the entire treatment period;<br>• increase TB treatment adherence in outpatients belonging to vulnerable groups, providing them with food packages;<br>• involve charitable organizations to participate in TB case finding amongst vulnerable groups;<br>• differentiated approach to patients with different social adaptations in society |
| Enhancing of interaction between different TB facilities and their departments | • Improve outpatient clinic preparation of patients for admission to TB hospitals for inpatient treatment (Leningrad oblast);<br>• enhance interactions inside the TB services system: between out- and in-patient facilities, TB dispensaries, municipal TB doctors, TB labs, TB hospitals, etc. (Leningrad oblast) |
| Enhancement of inpatient care in HIV/TB coinfected subjects | • Increase the number of wards in TB hospitals for patients with HIV (Saint-Petersburg);<br>• ensuring timely hospitalization of HIV/TB coinfected patients in TB hospitals without waiting in hospitalization queues (St. Petersburg);<br>• strengthen the forced hospitalization of smear-positive patients evading hospitalization;<br>• open departments or wards in TB hospitals for providing differential diagnosis for patients with HIV in compliance with the requirements of TB infectious control;<br>• increase the diagnostic capacity of head TB dispensaries and regional infectious diseases hospitals by provision of mobile CT and widening of availability of CT examinations;<br>• avoid supply disruptions of TB, antiretroviral, pathogenetic and symptomatic medicines;<br>• provision for treatment of comorbidities in patients with HIV/TB;<br>• timely prevention of occurrence and correction of side effects;<br>• ensure the controllability of ART and TB treatment in TB facilities |
| Increase motivation of healthcare workers in different medical facilities to enhance TB care in PLWH | • Recognize healthcare workers in the primary healthcare system for each timely TB case discovery (cash bonuses, certificates, thanks);<br>• recognize health providers in TB facilities for each positive TB outcome;<br>• carry out measures to reduce emotional burnout in TB healthcare workers;<br>• motivate specialists at AIDS Centers to control patient adherence to ART and increase the coverage and involvement of patients in TB prevention therapy;<br>• increase duration of standard doctor's appointment time for HIV/TB coinfected patients |

HIV — human immunodeficiency virus; TB — tuberculosis; ART — antiretroviral therapy; CT — computer thomography; AIDS — acquired immunodeficiency virus; ART — antiretroviral therapy; PLWH — people living with human immunodeficiency virus.

Respondents additionally pointed out the importance of interactions not only between different stakeholders, but also between various TB facilities (TB hospitals, dispensaries, polyclinics, municipal TB doctors, TB labs, etc). In Leningrad oblast, there is a need to improve the interaction between municipal TB doctors, regional TB dispensaries and TB hospitals, especially between the outpatient and inpatient units for preparation of patient hospitalization.

## Discussion

The qualitative study was conducted in the NWFD of Russia, which contains 11 federal entities. According to HIV/TB incidence data from 2019, the NWFD ranked second for incidence among 8 federal districts (4.6 per 100,000 population), after the Central Federal District (3.6 per 100,000 population). Meanwhile in the NWFD, the HIV/TB prevalence is very uneven, so the authors selected four different regions guided by features of the HIV/TB, HIV, and TB epidemics, which were mentioned in our previous studies [17–19]. The barriers identified by our respondents were similar to those indicated in other countries; they are related to geographical and economic constraints, as well as to health system barriers [20–23].

Of the four regions included in the study, the most compact, after St. Petersburg, is the Kaliningrad oblast. Adequate availability of medical care is most difficult to achieve in the regions of Arkhangelsk and Leningrad, due to the vastness of the territories and the scattering of settlements. But in the Kaliningrad oblast, migration flow has increased in recent years in comparison to the other regions which was noted by respondents based in one.

Economic development throughout the NWFD regions is also very uneven, which influences HIV/TB collaborative measures: it is highest in St. Petersburg and the Leningrad oblast, but in Kaliningrad and Arkhangelsk oblasts, relatively weak.

Intersectoral collaboration in tackling TB in HIV is crucial, especially cooperation between TB dispensaries and AIDS Centers [24]. In Russia, TB dispensaries were established at the beginning of the 20th century and were well-funded during the Soviet period. AIDS Centers appeared a century later due to the progression of the HIV epidemic. Historically, cooperation between these two establishments presented with difficulties, mainly due to the conservatism and inflexibility of the TB control system. Presently, however, strong collaboration exists between TB and HIV/AIDS institutions in all regions. So, we believe that the opposite opinion of respondents in the Leningrad oblast does not correspond to reality: in the oblast, the Regional AIDS Center was established much later than in other regions. In the absence of a Regional AIDS Center, there was a strong contact and collaboration between TB facilities and infectious diseases doctors in all municipalities, which were not lost after the appearance of the Regional AIDS Center.

Cooperation between NGOs and TB facilities has remained unresolved, which was indicated by most respondents. TB dispensaries are traditionally inflexible to strong collaboration with NGOs in comparison to AIDS Centers, which have worked closely with NGOs from the beginning of their establishment.

Another rather serious obstacle is the weak engagement of TB dispensaries and AIDS Centers with narcological dispensaries, which was also indicated by respondents. In fact, in the Russian Federation, narcological dispensaries interact infrequently with other medical or non-medical facilities, especially with AIDS Centers, TB dispensaries and the prison system.

Respondent suggestions reflect shortcomings in the provision of TB measures in general, which ultimately accumulate and significantly reduce the effectiveness of TB services in PLWH in the whole NWFD of Russia. Interestingly, the recommendations mentioned increasing healthcare worker motivation to improve TB measures not only in the TB facilities, but also in the primary healthcare system, encouraging and recognizing polyclinic specialists, family doctors, and medical assistants for each identified TB case. This approach is justified, because according to our data, the majority of TB cases in PLWH are found in primary health care facilities [19]. Also, participants suggested recognizing TB doctors for each positive TB outcome, which would be a strong motivator for TB specialists. It was also suggested to increase the motivation of infectious disease physicians in the AIDS Centers to better control ART and improve TB chemoprophylaxis coverage in PLWH.

## Conclusion

Thus, according to the health providers' opinion the current provisions of TB services for PLWH are imperfect. In order to enhance the TB system, there would need to be strengthened stakeholder intersectoral collaboration, including penitentiary system, improved the work with migrants and injecting drug users, the provision of full ART and TB chemoprophylaxis, effective and affordable TB treatment in patients with HIV, as well as the establishment of low-threshold centers and full funding of TB measures.

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