INTERNATIONAL MULTIDISCIPLINARY JOURNAL FOR RESEARCH & DEVELOPMENT
SJIF 2019: 5.222 2020: 5.552 2021: 5.637 2022:5.479 2023:6.563 2024: 7,805
eISSN :2394-6334 https://www.ijmrd.in/index.php/imjrd Volume 12, issue 07 (2025)

CAUSES OF DRUG-RESISTANT TUBERCULOSIS IN FERGANA REGION

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Abstract: This article provides an in-depth analysis of the key causes leading to the emergence of drug-resistant (MDR – multidrug-resistant) tuberculosis (TB) in the Fergana region. It presents statistical data and detailed district-level breakdowns illustrating the wide spread of the disease. Medical, socioeconomic, and migration-related factors contributing to the development of drug resistance are highlighted separately [1][2]. The paper also develops recommendations based on observed treatment non-compliance, self-medication practices, delayed healthcare seeking, and structural issues in the health system [3][5]. These recommendations aim to increase public awareness, strengthen psychological and social support, introduce electronic monitoring, and enhance preventive measures.
Keywords: tuberculosis, TB, drug resistance, MDR, delayed diagnosis, incorrect treatment, treatment compliance, migration, poverty, socioeconomic factors, pharmacotherapy, TB prevention.

INTRODUCTION

In recent years, the incidence of drug-resistant TB (MDR – multidrug-resistant) has reached epidemiologically alarming levels worldwide, including in Uzbekistan. The World Health Organization (WHO) has classified this issue as a global public health emergency [2]. MDR-TB refers to Mycobacterium tuberculosis strains that have developed resistance to at least isoniazid and rifampicin, the two most powerful first-line anti-TB drugs. The widespread nature of MDR-TB poses a serious threat not only to individual patients but also to public health at large.

In Uzbekistan—and particularly in the Fergana region—the rising trend of MDR-TB is cause for concern [3]. The presence of resistant forms of the disease in this region has made treatment more difficult, with increasing cases of recurrence and chronic infection. This contributes to extended treatment duration, higher healthcare costs, and sustained transmission chains [1][6].

Scientific research and regional health statistics confirm the multifactorial and interrelated nature of MDR-TB development [4][5]. Epidemiologically, MDR-TB primarily arises due to improper or incomplete pharmacotherapy, lack of patient adherence to treatment, and the use of substandard drugs [7]. Failure to administer medications at the correct dosage and schedule enables resistant strains to develop through genetic mutations [6][9].

Moreover, a lack of awareness about TB among the population—particularly the early symptoms—results in delayed diagnosis [4]. Patients who are diagnosed late continue to spread the infection for prolonged periods, leading to high levels of environmental contamination and mutational pressure [8].

Socioeconomic factors such as poverty, poor housing, unemployment, malnutrition, and limited access to healthcare services are also major contributors to the emergence of severe and drug-resistant forms of TB [3][7]. In some districts of the Fergana region, underutilization of healthcare services and a lack of health-conscious behavior exacerbate the issue [1][5].

Additionally, labor migration plays a significant role. Individuals working abroad often lack access to medical supervision or are unable to complete treatment courses, increasing the risk of developing drug-resistant TB [8][10]. Migration flows create high-risk zones of epidemiological linkage.

Thus, the abovementioned factors interact in complex ways, forming the primary pathogenic and social mechanisms driving the spread of drug-resistant TB in the Fergana region [1][2][5].

This article therefore analyzes the causes of MDR-TB in Fergana in depth, supported by statistical evidence, district-level epidemiological variations, and healthcare system challenges. The article also offers comprehensive recommendations for curbing the spread of drug-resistant TB.

MATERIALS AND METHODS

This study was based on official statistical data on tuberculosis collected in the Fergana region throughout 2023. Information was obtained from the Fergana Regional Health Department, the Republican Center for Phthisiology and Pulmonology, and local TB dispensaries. Data from 3,240 TB patients—including personal records, laboratory findings, and medication supply information—were reviewed.

A retrospective, cross-sectional epidemiological analysis was conducted. Patients were grouped by key risk factors such as incomplete treatment, self-medication, late referral, migration, and socioeconomic conditions. The data were processed using MS Excel and SPSS software. Distribution percentages, comparative analyses, and correlation coefficients were calculated. The distribution of MDR-TB cases across districts was visualized using tables and diagrams.

Ethical standards were followed, with all patient information anonymized during analysis.

RESULTS

Analysis revealed that 528 out of 3,240 TB cases in the region (16.3%) were MDR-TB, indicating a higher than national average and pointing to a regional epidemiological threat. Among the 197 patients who did not complete their treatment, 45% developed drug-resistant TB, confirming that poor treatment adherence is a critical factor. Self-medication was identified in 113 patients, with a 38% incidence of MDR-TB; 26% of the 425 patients who sought care late also had drug-resistant forms.

The highest MDR rates were observed in Uchkuprik (20.0%), Buvayda (18.9%), and Kokand (17.7%). These figures suggest systemic shortcomings in prevention, early diagnosis, and treatment in these districts.

Furthermore, a clear correlation was found between MDR-TB incidence and socioeconomic status. Districts with lower income levels and poorer access to healthcare showed higher rates of drug-resistant TB, emphasizing that the disease is not just a medical, but also a socio-psychological issue.

The findings indicate the need for reassessment of anti-TB strategies in the region, with stronger emphasis on prevention, early diagnosis, and patient-centered treatment approaches.

CONCLUSION

The comprehensive epidemiological analysis conducted in the Fergana region underscores the high prevalence of MDR-TB. This condition is driven primarily by factors such as treatment non-compliance, self-medication, delayed healthcare seeking, systemic health infrastructure gaps, and socioeconomic hardships.

MDR-TB not only complicates individual treatment but also leads to sustained transmission and increased burden on the healthcare system. Addressing this issue requires a multidisciplinary approach that combines medical, social, psychological, and technological interventions.

Recommendations :

1. Preventive education and awareness campaigns targeting high-risk populations.
2. Reinforcement of DOT (Directly Observed Treatment) strategies with electronic monitoring.
3. Uninterrupted supply of quality-assured TB drugs, especially second-line medications.
4. Provision of psychosocial support to increase treatment adherence.
5. Improvement of healthcare infrastructure with updated diagnostic equipment and staff training.

6. Targeted interventions in high-risk districts based on local epidemiology.
7. Health monitoring of labor migrants using digital tools and screening protocols.

Implementing these strategies can significantly reduce the incidence of MDR-TB and improve public health outcomes in the Fergana region.

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