



# Status of multidrug resistant tuberculosis (MDR-TB) among the Sahariya tribe of North Central India



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## KEYWORDS

Sahariya tribe;  
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## Summary

**Background:** The incidence/prevalence of tuberculosis (TB) is reported to be high in the Sahariya tribe of North Central India. The outbreaks of different drug-resistant isolates of *Mycobacterium tuberculosis* emphasized the need for continuous monitoring of resistance to anti-tuberculosis drugs. This study aimed to assess the profile of multidrug resistant TB among the Sahariya tribe and their non-tribal neighbors for first line drugs through field-based investigations.

**Methodology:** A total of 274 sputum positive pulmonary TB individuals were enrolled and studied for their drug susceptibility profile by the proportion method.

**Results:** A total of 21 cases from Sahariya and 6 from non-tribes were identified with MDR-TB. Thus Sahariya tribe showed a 1.95-fold increased risk of developing

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drug resistance than non-tribes. Significant differences were observed for developing drug sensitivity between Sahariya males and females when analyzed for resistance developed to any drug and overall drug resistance vs. sensitive isolates, respectively. A 4.46-fold risk was found for MDR-TB among the smokers of Sahariya tribe, whereas, the non-tribes did not show any significant association.

**Conclusion:** The drug susceptibility profile developed in the present study indicates that drug-resistant tuberculosis is emerging as a serious public health concern in Sahariya tribe. Urgent and effective control measures and better management policies are needed for the prevention of MDR-TB in the tribe.

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## Introduction

Globally, tuberculosis (TB), caused by *Mycobacterium tuberculosis* remains a major cause of death. Each year, approximately 8.6–9.4 million people develop TB (incident cases) and approximately 1.5 million deaths occur due to TB among HIV negative individuals, whereas, 0.4 million deaths occur from HIV associated TB throughout the world. In 2013, the approximate proportion of TB cases from Asia was 56%, while, it was only 29% from Africa. India is at the top among six high burden countries with maximum number of incident cases (2.0–2.3 million) [1]. In Sahariya tribe, the overall prevalence of tuberculosis is 1518/100,000 people [2]. Multidrug resistant (MDR-TB) and extensively drug-resistant (XDR-TB) tuberculosis are emerging as a greater threat and causing higher mortality rates. The MDR-TB is defined as resistance against the two most potent anti-tuberculosis drugs, namely, isoniazid (INH) and rifampicin (RIF). XDR-TB is attributed to the clinical isolate that is multidrug resistant and has also developed resistance to fluoroquinolones and to one of the injectable drugs, such as amikacin, kanamycin or capreomycin. Polydrug resistance refers to *M. tuberculosis* isolates that are resistant to more than one of the first line drugs, other than isoniazid and rifampicin. Monodrug resistance specifies the isolates that are resistant to at least one anti-tuberculosis drug [3]. Detection of drug-resistant tuberculosis is of major importance to determine the ill effects of these strains on the health of affected individuals [4]. Several studies have reported an increase in the number of drug-resistant TB cases in India [4–7]. In this study, our aim was to investigate the status of multidrug resistant tuberculosis in a primitive

tribe of Central India, the Sahariya tribe, which is reported to have a very high incidence and prevalence of pulmonary tuberculosis [2,8–10]. This can be attributed to various social determinants of TB, such as mal-nutrition, overcrowding, indoor air pollution, young age, and clinical risk factors, like diabetes mellitus, smoking, alcohol consumption, immunosuppressive conditions, and socio-economic as well as behavioral factors, all play an important role [11]. Development of drug resistance in *M. tuberculosis* isolates may worsen the TB scenario and its management. Therefore, this study aimed to determine the situation of MDR-TB in the Sahariya tribe and their non-tribal neighbors in order to develop future strategy for the effective control of TB.

## Materials and methods

### Study population and study design

A total of 274 individuals, 185 from the Sahariya tribe and 89 from the non-tribal population, were screened through field-based investigations from the Gwalior and Sheopur districts of Madhya Pradesh. The participants were first screened for symptoms. Sputum sampling was conducted under the supervision of a clinician. The individuals who had a confirmed diagnosis of TB, based on Ziehl-Neelsen (ZN) staining, were recruited in the study after obtaining their informed consent. The sampling methods and protocols employed in the study were approved by the Institutional Ethics Committee, Jiwaji University, Gwalior. The power of the study was calculated to be 90–95%, using a power and sample size calculator

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