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SOCIO-ECONOMIC CORRELATES OF TUBERCULOSIS IN JAMMU AND KASHMIR

(EVIDENCE FROM NFHS-5 DATA)

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ABBREVIATIONS

Abbreviation	Full Form
ACSM	Advocacy Communication and Social Mobilization
AIDs	Acquired Immune Deficiency Syndrome
ART	Anti-Retroviral Therapy
BPaLM	Bedaquiline, Pretomanid, Linezolid and Moxifloxacin
CBNAAT	Cartridge Based Nucleic Acid Amplification Test
CSR	Corporate Social Responsibility
CTD	Central TB Division
DBT	Direct Benefit Transfer
DOTS	Directly Observed Treatment Short-courses
DTC	District TB Centre
HIV	Human Immunodeficiency Virus
MDR-TB	Multi-Drug Resistant Tuberculosis
MOHFW	Ministry of Health and Family Welfare
MSG	Mission Steering Group
MTB	Mycobacterium Tuberculosis
NATBPS	National TB Prevalence Survey
NHM	National Health Mission
NPY	Nikshay Poshan Yojana
NSP	National Strategic Plan
NTEG	National Technical Expert Group
NTEP	National TB Elimination Program
NTF	National Task Force
NTP	National TB Programme
PMDT	Programme Management of Drug Resistant
PM-TBMBA	Pradhan Mantri TB Mukt Bharat Abhiyan
RKSK	Rashtriya Kishor Swasthya Karyakram
RMDT	Rapid Molecular Diagnostic Test
RNTCP	Revised National Tuberculosis Control Programme
RR-TB	Rifampicin-resistant TB
SDGs	Sustainable Development Goals
TB	Tuberculosis
UN	United Nations
WHO	World Health Organization

ACKNOWLEDGEMENT

India's efforts have resulted in reduction of TB incidence by 16 percent in 2022 (from 2015) almost double the pace at which global TB incidence is declining (which is 8.7 Percent). The mortality of TB has also reduced by 18 percent during the same period in India and globally. The World Health Organization has made a downward revision of the TB mortality rates from 4.94 lakhs in 2021 to 3.31 lakhs in 2022, a reduction of over 34 percent. The Pradhan Mantri TB Mukt Bharat Abhiyan has received a tremendous response across the country with over 1 lakh Ni-kshay Mitras from all walks of life coming forward to adopt over 11 lakh TB patients. Under Ni-kshay Poshan Yojana about Rs 2613 Cr have been disbursed to over 95 lakh TB patients since its launch in 2018. Newer patient centric initiatives like Family Care Giver Model and Differentiated Care have been introduced to ensure further reduction in mortality and improvement in treatment success rates. The TB-free award acknowledges accomplishments in decreasing the incidence of TB cases through four distinct categories, with 2015 as the base year. The districts and states/UTs that successfully reduce the incidence of TB cases by 80 percent, meeting the SDG target, are granted the highest level of recognition, which is the TB-free status. The other categories comprise the gold medal category, granted for a 60 percent reduction, the silver medal category for a 40 percent reduction and the bronze medal category for a 20 percent reduction in TB incidence. According to the India TB Report 2023, in Jammu and Kashmir, there are 11005 notified cases of TB patients, which constitutes 0.5 percent of the total cases in India (out of 2,13,5830 cases). Overall, a total of 93 percent of the TB patients were on treatment, while at the national level, it was 95 percent. The overall success rate of the treatment was 83 percent in Jammu and Kashmir, the cure rate was 74 percent, the mortality rate was around 3.6 percent, and the death rate among males was higher than females in Jammu and Kashmir. A meagre percentage of patients (1.3 percent) had lost their follow-up, and only 0.6 percent of patients had failed the treatment. Keeping in view the topography and climatic conditions (harsh winters, where people stay indoors together for a longer time and use some heating gadgets) of the UT, it was decided to take-up this study in the UT of Jammu and Kashmir based on National Family Health Survey-5 (NFHS-5) Data to ascertain the impact of Socio-Economic Correlates on the incidence of TB among the population. At the outset, I would like to thank Mr. Bashir Ahmad Bhat, coordinator at our PRC, for his continuous support and guidance for this study.

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1. INTRODUCTION

Tuberculosis (TB) is a communicable disease that causes major health problems and is one of the leading cause of death worldwide. TB is caused by several species of gram-positive bacteria known as tubercle bacilli or the Mycobacterium tuberculosis complex. Tuberculosis spreads through the air when infected people cough, sneeze or spit. About a quarter of the global population is estimated to have been infected with TB bacteria (WHO). About 5–10 percent of people infected with TB will eventually get symptoms and develop TB disease. Those who are infected but not (yet) ill with the disease cannot transmit it. People with latent TB infection don't feel sick and aren't contagious. Only a small proportion of people who get infected with TB will get TB disease and symptoms. Babies and children are at higher risk. Certain conditions can increase a person's risk for tuberculosis disease that include: diabetes (high blood sugar), weakened immune system (for example, HIV or AIDS), being malnourished, and tobacco use. At the time of infection, the patients develop some symptoms like: prolonged cough (sometimes with blood), chest pain, weakness, fatigue, weight loss, fever and night sweats. World Health Organization (WHO) recommends the use of Rapid Molecular Diagnostic Tests (RMDT) as the initial diagnostic test in all persons with signs and symptoms of TB. Rapid diagnostic tests recommended by WHO include the Xpert MTB/RIF Ultra and TruNat analysis. These tests have high diagnostic accuracy and will lead to major improvements in the early detection of TB and drug-resistant TB.

Drug resistance emerges when TB medicines are used inappropriately, through incorrect prescription by health care providers, poor quality drugs, or patients stopping treatment prematurely. Multi-Drug-Resistant Tuberculosis (MDR-TB) is a form of TB caused by bacteria that do not respond to Isoniazid and Rifampicin, the most effective first-line TB drugs. MDR-TB is treatable and curable by using second-line drugs. However, second-line treatment options require extensive medicines that are expensive and toxic. In some cases, more extensive drug resistance can develop. TB caused by bacteria that do not respond to the most effective second-line TB drugs can leave patients with very limited treatment options. MDR-TB remains a public health crisis and a health security threat. Only about 2 in 5 people with drug resistant TB accessed treatment in 2022. In accordance with WHO guidelines, detection

of MDR/RR-TB requires bacteriological confirmation of TB and testing for drug resistance using rapid molecular tests or culture methods.

In 2022, new WHO guidelines prioritize a 6-month regime– the BPaLM/BPa – as a treatment of choice for eligible patients. The shorter duration, lower pill burden and high efficacy of this novel regimen can help ease the burden on health systems and save precious resources to further expand the diagnostic and treatment coverage for all individuals in need. In the past, MDR-TB treatment used to last for at least 9 months and up to 20 months. WHO recommends expanded access to all-oral regimens. People living with HIV are 16 (uncertainty interval 14–18) times more likely to fall ill with TB disease than people without HIV. TB is the leading cause of death among people with HIV. HIV and TB form a lethal combination, each speeding the other's progress. Without proper treatment, 60 percent of HIV-negative people with TB on average and nearly all HIV-positive people with TB will die. In 2022, about 167 000 people died of HIV-associated TB. The percentage of notified TB patients who had a documented HIV test result in 2022 was 80 percent, up from 76 percent in 2021. The WHO African Region has the highest burden of HIV-associated TB. Overall in 2022, only 54 percent of TB patients known to be living with HIV were on Anti-Retroviral Therapy (ART). World Health Organization (WHO) recommends a 12-component approach of collaborative TB-HIV activities, including actions for prevention and treatment of infection and disease, to reduce deaths.

Tuberculosis mostly affects adults in their most productive years. However, all age groups are at risk. Over 80 percent of cases and deaths are in low- and middle-income countries. TB occurs in every part of the world. In 2022, the largest number of new TB cases occurred in WHO's South-East Asian Region (46 percent), followed by the African Region (23 percent) and the Western Pacific (18 percent). Around 87 percent of new TB cases occurred in the 30 high TB burden countries, with more than two-thirds of the global total in Bangladesh, China, Democratic Republic of the Congo, India, Indonesia, Nigeria, Pakistan and the Philippines.

Globally, about 50 percent of TB patients and their households face total costs (direct medical expenditures, non-medical expenditures and indirect costs such as income losses) that are catastrophic (greater than 20 percent of total household income), far from the WHO- "End TB

Strategy" target of zero. Those with compromised immune systems, such as people living with HIV, undernutrition or diabetes, or people who use tobacco, have a higher risk of falling ill. Globally in 2022, there were 2.2 million new TB cases that were attributable to under-nutrition, 0.89 million to HIV infection, 0.73 million to alcohol use disorders, 0.70 million to smoking and 0.37 million to diabetes.

In 2014 and 2015, all the members of the World Health Organization (WHO) committed to end the tuberculosis epidemics by implementing the World Health Organization (WHO) Tuberculosis strategy for achieving the Sustainable Development Goals (SDGs 7 and 8). Among the different milestones of the WHO TB Strategy, one such goal is to reduce TB epidemic deaths to 75 percent by 2025 as compared to 2015 baseline. Also, to reduce the TB incidence rate (compared to baseline in 2015) by 50 percent by 2025. To achieve these milestones, there are well-established principles adopted by WHO, like government stewardship and accountability with monitoring and evaluation, strong coalitions with civil society organizations and communities, protection and promotion of human rights ethics and equity, and adaptation of strategy and targets at the country level with global collaboration. In September 2018, the United Nations (UN) General Assembly held its first ever meeting on TB, that was attended by heads of States and Governments as well as other leaders. It was committed to achieve the SDGs. The main outcome of the meeting was a political declaration that reaffirmed the existing commitment to end the TB epidemics from the globe.

A big fall in TB notification was witnessed at the global level during 2020 due to the COVID-19 pandemic with a large global fall in the number of people newly diagnosed patients with TB compared to 2019, with a reduction of 18 percent between 2019 and 2020 (WHO Report 2022). It was found that 90 percent of the global reduction of newly diagnosed TB cases occurred in only five countries, which include India, Indonesia, and the Philippines. Furthermore, it was found that the number of people with undiagnosed and untreated TB cases has grown, resulting in an increased number of TB deaths and more community transmission of infection, and then, with some lag time, an increased number of TB people developing TB (WHO 2022). A total of 1.4 million deaths were caused by TB in 2021, more than double the number of deaths caused by HIV/AIDS (0.65 million) during the same period,

and TB is the 13th leading cause of deaths worldwide. It was predicted that in 2020 and 2021, TB will rank as the second leading cause of deaths from a single infectious agent after COVID-19. From 2000 to 2019, there were 41 percent of global TB deaths. In 2022 alone, globally, 7.5 million people were newly diagnosed with TB and officially notified as TB cases; 1.30 million deaths were reported, including HIV (Global Tuberculosis Report 2023), but a declining trend has been witnessed since 2010. In the year 2022, 81 percent of the global deaths caused by TB among HIV-negative people occurred in the WHO African and South East Asian region, and India alone accounted for 29 percent of TB deaths (WHO, 2023). Regardless of age and sex, TB can affect anyone, and it was found that the highest incidence of TB was among adult men with an age greater than 15 years, with an estimate of 5.8 million cases, equivalent to 55 percent of the total cases. An estimate of 3.5 million cases of adult women, equivalent to 33 percent of total cases, and 1.3 million cases (12 percent) among children (aged 0–14 years). (WHO, 2023)

It was estimated that near about US$ 13 billion are needed annually for TB prevention, diagnosis, treatment and care to achieve global targets agreed- on at the UN high level-TB meeting. Also it was found that 80 percent of expenses on TB is out of pocket expenditure mostly from domestic sources in 2022. In low- and middle-income countries, international donor funding remains crucial. The main source is the Global Fund to fight AIDS, Tuberculosis and Malaria (the Global Fund). The United States Government is the largest contributor of funding to the Global Fund and also the largest bilateral donor. For research and development, according to the Treatment Action Group, only US$ 1 billion were available in 2022 of the US$ 2 billion required per year to accelerate the development of new tools. At least an extra US$ 1 billion per year is needed to accelerate the development of new tools.

2. INCIDENCE OF TUBERCULOSIS IN INDIA

The Government of India (GoI) launched the “National TB Programme (NTP)” in 1962 as District TB Centre model involved imparting BCG vaccination and TB treatment to fight tuberculosis, a major public health problem. The “Revised National Tuberculosis Control Programme” (RNTCP), based on the internationally recommended Directly Observed Treatment Short-course (DOTS) strategy, was launched in 1997 and expanded across the

country by 2006. In the year 2007, Government of India (GoI) introduced the “Programmatic Management of Drug Resistant TB” (PMDT) to combat the threat of drug resistance and subsequently achieved full geographical coverage by the year 2013. RNTCP is in line with other health sector strategies and global efforts, such as the ‘National Health Policy 2017’, World Health Organization's (WHO) ‘End TB Strategy’, and the Sustainable Development Goals (SDGs) of the United Nations (UN). The tuberculosis control programme has come a long way since then and has undergone major changes over the past few years. Much effort is being made to make the programme more patient-centric and provide comprehensive treatment care and support. The Ministry of Health and Family Welfare (MoHFW) has developed the “National Strategic Plan” for Tuberculosis Elimination (2017–25) which builds on the success and lessons learnt from the last NSP and encapsulates the bold and innovative steps required to eliminate TB in India by 2025, five years ahead of the global targets.

At all India level, National TB Elimination Programme (NTEP) was launched and managed by the Central TB Division (CTD) under the umbrella of f Ministry of Health and Family Welfare Government of India. Under NTEP various types of committees or forums were organised for the smooth implementation of the programme. A National Technical Expert Group (NTEG) under the NTEP was reconstituted as single group for diagnosis, treatment, LTBI and paediatric TB. Also a National Task Force (NTF) has been formed under NTEP in medical colleges for effective implementation of the programme. To execute the plan meaningfully involvement of community members and civil societies well engaged under National TB Forum (NTF) has been constituted to reach the unreached and support the TB patients in their course of their illness.

The Government of India is committed to supporting the nutritional requirements for the duration of treatment for all TB patients. Nikshay Poshan Yojana (NPY)- Direct Benefit Transfer (DBT) of INR 500/month to beneficiaries enables targeted delivery of benefits directly to citizens’ bank account(s), thus enhancing efficiency, the effectiveness of treatment services and, ultimately, treatment outcome in terms of morbidity and mortality.

In addition to the NTEP's provision of free diagnostics, free drugs and NPY benefits to all TB patients notified from both public and private sectors, The Government of India has launched "The Pradhan Mantri TB Mukt Bharat Abhiyan" (PM-TBMBA) envisioned to bring together all community stakeholders to support those on TB treatment and accelerate the country's progress towards TB elimination. By augmenting community involvement and leveraging Corporate Social Responsibility (CSR) in meeting India's commitment to end TB by 2025, the Abhiyan aims to provide additional patient support to improve the treatment outcomes of TB patients. It will be discussed in detail under the chapter on PMTBMBA.

Key Action Points Suggested to the states/UTs for appropriate action for gearing up to 2025 were as follows:

- Strengthening the cascade of care of TB Preventive Therapy across the country.
- Development and implementation of models of sample collections and transportation system.
- Ensuring the entry of all "Presumptive TB testing" across the health facilities in Nikshay irrespective of methodology of testing.
- Development and implementation of systems to reduce TB mortality through audit with lessons from new states/Us already implementing the same.
- Strengthening the engagement with private sector with emphasis on "Quality of TB care services" being provided to patients and families.
- Expanding models of patient support system being developed and implemented across the geographies under "Pradhan Mantri TB Mukt Bharat Abhiyan (PM-TBMBA)"

In 2017, India introduced the first-line treatment of TB on a daily basis in both the public and private sectors, harnessing universal access to TB care. The tracking of TB patients with the help of Nikshay has helped in improving the treatment outcomes of all types of patients, including those who otherwise would be lost to follow-up. Also, screening of large sections of the vulnerable and general population has helped with early diagnosis, thereby making preventive measures for further transmission.

The year 2022 marks a milestone year for TB surveillance efforts in India, with a high record of TB notifications of about 24.2 lakh cases, an increase of over 13 percent as compared to 2021, which depicts about 172 cases per lakh population. It was further found that about 95 percent of TB-notified cases had initiated treatment. In India, the highest TB notification cases were found in Delhi (546 per lakh population), and the lowest among states was seen in Kerala (67 per lakh population). In India, it has been estimated that there are five main causes of TB cases: undernutrition (7,38000), harmful use of alcohol (2,58000), smoking (1,10,000), diabetes (1,05,000), and HIV (93,000), and these risk factors contribute for more than 44 percent of the total TB cases in India. Further, it was found that a higher prevalence of pulmonary TB was among the older age population, males, undernourished, smokers, alcoholics, and known diabetics (NATBPS 2019–20). Further, it was found that 64 percent of TB-symptomatic individuals did not seek any health care, with 68 percent ignoring the TB symptoms, 18 percent not recognizing the TB symptoms, and 12 percent availing themselves of self-treatment (NATBPS 2019–20).

Complete surveillance is an important public health function in the prevention and control of diseases. During 2018, an approval was made by the Mission Steering Group (MSG) of National Health Mission (NHM) for TB. A district or a state or UT will be recognized for "Progress Towards TB Free Status" based on certain outlined criteria, and accordingly, districts or states will be awarded with monetary and non-monetary benefits (TB free certificate). As per this criteria, three states, UTs, and 67 districts across the country submitted their claims under these guidelines in 2020. In the first round, Kerala, Lakshadweep, Pondicherry, and 35 districts successfully achieved this target. From Jammu and Kashmir, Budgam district was declared the first district in Jammu and Kashmir to achieve more than 80 percent reduction in TB incidence. Another 10 states/UTs, and 201 districts across the country submitted the claim in the 2nd round of 2021. Accordingly, 91 districts were awarded in various categories, including eight districts that received gold medals, 27 districts received silver medals, and 56 districts were given bronze medals, on the basis of reduction in the incidence of TB cases (India TB Report 2023). In 2022, it was found that there was an increase of 89 percent in the Presumed TB Examination Rate (PTBER) from 676 per lakh of population in 2020 to 1281 per lakh population in 2022, and during 2022, the highest number of TB notifications were recorded with a total of 24.2 lakh notifications.

In India, childhood tuberculosis remains a staggering problem, contributing to approximately 31 percent of the global burden. Over the last decade, consistently, children constitute 6–7 percent of all the patients treated under National Tuberculosis Eradication Programme (NTEP) annually, pointing to a gap of 4–5 percent in total notification against the estimated incidence. To that end, inter-sectoral coordination is critical for ensuring wide-reach of the programme to remedy this gap. To establish pathways of early detection of children with TB symptoms and track them for early diagnosis and treatment initiation, the programme, in collaboration with the Rashtriya Bal Swasthya Karyakram (RBSK) and Rashtriya Kishor Swasthya Karyakram (RKSK), launched the "Collaborative Framework to Address the Burden of TB among Children and Adolescents." This integrated framework endeavours to enhance community awareness of childhood TB, generate demand, and promote disease prevention and early health seeking.

In India during 2021, among a total of 21,35,830 patients diagnosed, 20,30,509 (95 percent) were put on treatment (61 percent were male and 39 percent were female among the patients put on treatment). Among the total notifications, 6 percent of patients were in the paediatric age group. Among a total of 17,51,437 TB patients notified in 2020, 83 percent were successfully treated, while 4 percent died during treatment. The disaggregated treatment success rates of patients notified from the public and private sectors was 83 percent and 82 percent, respectively. In 2021, overall 48,232 MDR/RR-TB patients were diagnosed with the ailment, and 43,380 (90 percent) were put on treatment. As per the estimates in the India TB report 2023, on the basis of demographic characteristics, about 39 percent were females, 5.6 percent belonged to the paediatric age group, and 23.6 percent of patients were 55 years of age or older. Also, a gradual increase in the proportion of notified TB cases older than 55 years and a simultaneous decrease in the proportion of younger people below the age of 25 years were found in India.

3. OVERVIEW OF TUBERCULOSIS IN JAMMU AND KASHMIR

According to the India TB Report 2023, in Jammu and Kashmir, there are 11005 notified cases of TB patients, which constitutes 0.5 percent of the total cases in India (out of 2,13,5830 cases). Among the total notified TB cases in Jammu and Kashmir, 58 percent were males and 42 percent were females. Furthermore, it was found that 93 percent of the TB patients were

on treatment, while at the national level, it was 95 percent. The overall success rate of the treatment was 83 percent in Jammu and Kashmir, the cure rate was 74 percent, the mortality rate was around 3.6 percent, and the death rate among males was higher than females in Jammu and Kashmir. On the gender scale, it was found that the treatment success rate among females was found higher (84 percent) than that of males (82 percent). A meager percentage of patients (1.3 percent) had lost their follow-up, and only 0.6 percent of patients had failed the treatment.

Further, it was found that 92 percent of the patients with known HIV status had a distribution of 92 percent from public health facilities and 90 percent from private hospitals, and 73 percent of the patients were known for their tobacco status. Overall, there were 7 percent of the patients who were tobacco users. Also, 70 percent of the TB patients were known to be alcoholic, and among them, only one percent were found to be alcohol users. In Jammu and Kashmir, in 2016 a total of 4027 TB patients had cured, but in 2017 and 2018, it declined to 3478 and 2708 respectively. Also during 2016, a total of 292 deaths were reported due to TB, which increased to 316 deaths in 2017 and 342 in 2018. From 2018 to 2019, there was a 17 percent reduction in TB notification rate in Jammu and Kashmir.

3.1. INFRASTRUCTURE IN JAMMU AND KASHMIR

Jammu and Kashmir is the youngest Union Territory (UT) of the country and came into existence on 5th of August 2019. Population of J & K is 1.43 Crores (2019 RGI). RNTCP was launched in Jammu and Kashmir in April 2004 and then was extended to all districts of J& K by September 2005. There are 12 District TB Centres (DTCs), 104 Treatment Units (TUs), 164 Designated Microscopic Centres (DMCs), 1 STDC in Srinagar, 1 IRL in GMC Jammu, 12 CBNAAT Machines and 2 CBNAAT Mobile Vans in Jammu and Kashmir. As of now in Jammu and Kashmir, there are three Nodal DR-TB centers and nine district DR-TB centers. Out of the total district/nodal DR-TB centers, 25 percent of them have air-born infection control compliant. There are 92 beds designated for TB patients in the union territory of Jammu and Kashmir. In seven medical colleges of UT, five of them had DR-TB centre established there. In the UT also there are 25 TrueNat machines and 14 CBNAAT machines for the purpose of different kinds of TB tests.

National TB Elimination Programme (NTEP) is implemented by two Directorate of Health Services through State TB Officer at Division level and District TB Officer at District Level. The target under this programme is to eliminate TB by 2025. Chest Disease(CD) Hospital Jammu and CD hospital Srinagar are two major hospitals providing treatment to TB patients. All the diagnosis i.e. Direct Microscopy, X-Rays, CBNAAT/TRUNAT tests are free of cost. Diagnosed TB patients are provided with free medicines and nutritional support under NPY (Nikshay Poshan Yojana) @ Rs 500 per month for during treatment. The status of all TB patients with regard to diabetes and HIV is also provided. TB Elimination programme is one of the priority areas of GOI and UT Govt. In UT of J&K, District Budgam was declared as TB free in 2020-21, District Anantnag, Pulwama, Kupwara got gold medal and District Baramulla got Bronze medal for Sub National Certification by GoI.

Strategies for TB Elimination

TB Elimination Strategies are built on Sustainable Development Goal [SDG]. These are reduction of TB deaths by 90 percent, reduction of incidence by 90 percent and ending catastrophic expenditure due to TB.

TB Elimination Strategy (10 Components)

1. Generation of awareness and demand through Advocacy, Communication, and Social Mobilization (ACSM). Locals will be involved for Planning for TB Elimination by creating awareness about TB and generating data base of vulnerable populations. Formation of TB Elimination Task Forces at Panchayat level will create demand for TB Elimination services.
2. Airborne infection control in health facilities, households and community will stop TB transmission and will bring behavior change in community to cover cough.
3. Active case finding by identification and referral of chest symptomatic, collection and transportation of samples to nearest DMCs. Additional TB cases detected will be treated as per programme policy.
4. Establish robust TB surveillance and link surveillance to action. Ensure compliance to H1 registers by all chemists/hospital pharmacies. Keep close liaison with Drug Controller Authority.

5. Complete treatment of all forms of TB including drug resistant TB as per National TB Control Guidelines. Early diagnosis and prompt treatment is the key.
6. Universal access to drug susceptibility testing and DST guided treatment will ensure better treatment outcomes, less adverse drug reactions, less defaults and less deaths.
7. Screening for comorbidities including Diabetes &HIV and linking them with the National Programmes for their management.
8. Private Hospital Consortium for TB Notification and management of TB as per 'Standards of TB Care in India'.
9. Addressing TB and other health issues among migrant workers by mapping of migrant workers and active search of TB symptoms in them. Diagnosed TB patients will be given all benefits of TB Control Programme.
10. Addressing TB and other health issues among Tribal populations, reducing delays between onset of symptoms, diagnosis and start of treatment.

4. OBJECTIVES OF THE STUDY

The main objectives of this study are as under:

1. To study the impact of different social indicator (education, housing, and environment) on prevalence of tuberculosis.
2. To evaluate the impact of different economic indicators (wealth income, employment and food consumption) on incidence of tuberculosis.

The aim of these objectives is to provide a better understanding of the complex factors involved in the occurrence of TB.

4.1. METHODOLOGY

The study is based on the secondary source of data. The data used for the analysis is from Demographic and Health Surveys (DHS), conducted by the Ministry of Health and Family Welfare (MoHFW) since 1992-93-2015-16. As noted, our choice of data is guided by the objective of establishing comparability with the factors associated with the increase in the risk of tuberculosis. National Family Health Survey-5 (NFHS-5) data of Jammu and Kashmir has been taken for the analysis. The primary purpose of the NFHS is to provide policymakers and planners with detailed information on the status of the population on a range of indicators in mortality, morbidity, fertility, nutrition and other demographic and health aspects. The survey

also collect data on educational attainment, labour market outcomes, and physical features of the household and other areas of social and material wellbeing. NFHS is nationally representative surveys using a two-stage probability sample and with specific questionnaires for the household women (aged 15-49) and men (aged 15-54). The NFHS data is available for all districts of India with different social groups as well as religion-wise. For this study we have estimated different types of socio-economic correlates associated with prevalence of tuberculosis in Jammu and Kashmir. During NFHS-5, a total of 129 cases of TB patients in Jammu and Kashmir were found in the sample. We have tried to analyze as to how different socio-economic indicators like, region, religion, education, marital status, housing structure, family size, economic setup etc. are influencing on the incidence of tuberculosis among the sampled population.

In this study, binary logit regression model has been used to predict the discrete outcome of an event. Generally, the dependent or response variable in such regression model is dichotomous i.e. whether any member of the household is the victim of tuberculosis or not. Thus, in the presence of categorical dependent variable, logit regression is preferred. However, the dependent variable in the logit regression is usually dichotomous i.e. it can take the value of 1 with a probability of being any member of the household as tuberculosis patient or the value of 0 with the probability that any member of the household is not as tuberculosis patient. The purpose of logit regression is to exactly predict the category for individual cases using the most parsimonious model and to accomplish this goal a model is created that includes quantitative or qualitative variables or mixture of the both, which are useful in predicting the response variable. However, in a binary logistic distribution, response variable is a binary variable (1,0) and method is based on the logistic proportion (Gujrati, 2005):

$$logit\ (Pi) = \ln \frac{Pi}{1 - Pi} = \ \beta 0 + \sum_{j=i}^{k} \beta i\ Xij + \ Ui$$

Where as $logit\ (Pi)$ is probability log of odd ratio

$\beta 0$ = intercept of the model

$\beta 1$ = slope of the parameters

Xi = Explanatory variables consisting of both quantitative and binary qualitative variables.

Ui = Error term

The Wald test which has also been used in by us is used to assess the individual statistical significance of the slope coefficients in logistic estimation. However, the Wald-statistic has a chi-square distribution with degree of freedom equal to total number of covariates in the model to test the null hypothesis: whether the slope coefficient for each predictor is statistically significantly different from zero (H0: βj = 0) i.e. there is no relationship between the respected predictor and response variable. The slope coefficients in the logistic model represent the change in log odds for an increase in one unit in respected predictor.

$$wald = \left(\hat{\beta}\middle|s.e.\hat{\beta}\right)^2$$

$wald$ = Wald test and β is the coefficient of an estimator and S.E β is standard error of a respective estimator.

5. REVIEW OF THE LITERATURE

Putto Nabi A. (2022) conducted a cross-sectional study on the prevalence of TB in Kashmir, in which they found that the prevalence of tuberculosis was higher in the age group of 15–30 years, and that the male population is more victimized than females. It is pertinent to mention that the urban cluster of Kashmir Valley had a higher proportion of TB burden than the rural one. They highlighted the fact that an insignificant correlation was observed between demographic characteristics and the prevalence of tuberculosis.

Yates A. Tim et al. (2018) conducted an empirical study to describe the association between socio-economic status and the prevalence of tuberculosis by using large-scale data sets from Zambia and South Africa. They estimated an association between socio-economic status and the prevalence of tuberculosis and found that urban socio-economic status had more association than rural one with the prevalence of tuberculosis. Though an association was between economic setup and TB, poor educational setup is more strongly associated than the economic set of the household.

Alexander T. C. (2013) had submitted the Ph.D. thesis entitled “Determinants of Tuberculosis of Risk-Lacking Behavior," and it was found that overcrowding in working and living conditions has increased the TB mortality rate. The main determinants of the increasing mortality rate due to TB are overcrowding at homes, poor standards of living, urbanization, and industrialization. It was found from this study that GDP per capita, TB morbidity, and TB mortality follow the inverted U-shaped Kuznet’s curve. Also, a significant association was found between calorie intake and the prevalence of tuberculosis.

Guerrin F. Roert et al. (1965) found in their study that low economic setup, size of population, cultural deprivation, and family standards had associations with TB morbidity. It was found from the study that high socio-economic status and TB morbidity have a (-0.47) correlation coefficient. They also found a correlation between high illiteracy and TB, and it was found that the correlation coefficient between high illiteracy and TB morbidity was 0.75, while in case of high literacy and TB, it was -0.6. C.

E. French et al. (2009) conducted a study to evaluate the influence of socio-economic deprivation on tuberculosis treatment delays in England, and it was found from their study that TB patients in England experienced a median interval of 67 days of delay from the onset of symptoms to starting treatment. It was found that cultural norms, perceived stigma, and access to a source of treatment are the main causes of delay.

Banerji, D. (1965), has considered that the tuberculosis problem is a function of the overall economic and socioeconomic problems of the country. He highlighted the fact that there was a trade-off between investment in the tuberculosis control programme and the development of other socio-economic indicators, by which increasing investment in tuberculosis would reduce investment in other socio-economic indicators, so it is therefore necessary to control tuberculosis through desired social changes in society.

Vecchiato L. Norbert (1997) conducted an empirical study on sociocultural aspects of tuberculosis control in Ethiopia and it was found that symtomological concept coincide with biomedicine. The lack of prevalence of TB related knowledge, local cultural practices, window-less homes, single rooms and cooking fosters the transmission of tuberculosis.

Yousif K. (2021) had conducted a quasi-experimental study by using pre and post-tests. It was found from their study that proportion of male TB patients was much higher than females with the mean age of 36.5 years, which is considered most productive age of the population. Furthermore, it was found from their study that 86 percent of the patients had some education, but knowledge regarding the different aspects of TB was very poor. Prior to the educational only 55 percent of the respondents knew that TB was a bacterial function.

Chopra K.K. et.al. (2021), has analysed the impact of Covid-19 and Tabaco on TB control and it was found that a decline of 26 percent was reported in the TB cases during January to June 2020 either due to some precautionary measures that reduced the transmission rate or due to under-reporting of the TB cases. In was suggested in the study that by using a model that during 2020-2025 -a five-year period, an additional 1.4 deaths could be registered as a

consequence of Covid-19. Both TB and Covid-19, are respiratory infectious with same mode of transmission, but the incubation period of covid-19 is shorter than TB.

Jiamsakul. A. et.al. (2018), conducted a case control study on socio-economic status and risk of tuberculosis and a sample of 340 patients was evaluated. It was found from their study that the lower socio-economic status is associated with an increasing risk of tuberculosis in Asia. Furthermore, it was found from their study that those who have not the university education and are burning wood or coal inside their houses are more likely to be vulnerable to become the victim of tuberculosis.

Courtwright A. et.al. (2010), has reviewed more than 100 research articles for analysing the tuberculosis and stigmazation and it was found that fear of infection was the main cause of TB stigma, even those who had the knowledge of TB transmission, also have the fear of TB stigma. As a result, there were different socio-economic consequences of TB stigma particularly among women.

Wani Ajaz et.al, (2022) conducted a study on challenges and status of tuberculosis with special focus on Jammu and Kashmir, in which they found that poor socioeconomic setup and living conditions were considered strongly associated with tuberculosis infection in addition to the malnutrition. Also due to TB, family losses income and employment, with a result get trapped into the poverty. Furthermore, a social stigma was attached with the TB patients.

Balwan K. W. et. al, (2020) conducted an empirical on socio-economic determinants of TB, in which they found that unemployment, malnutrition, and crowding has the significant role in increasing the prevalence tuberculosis.

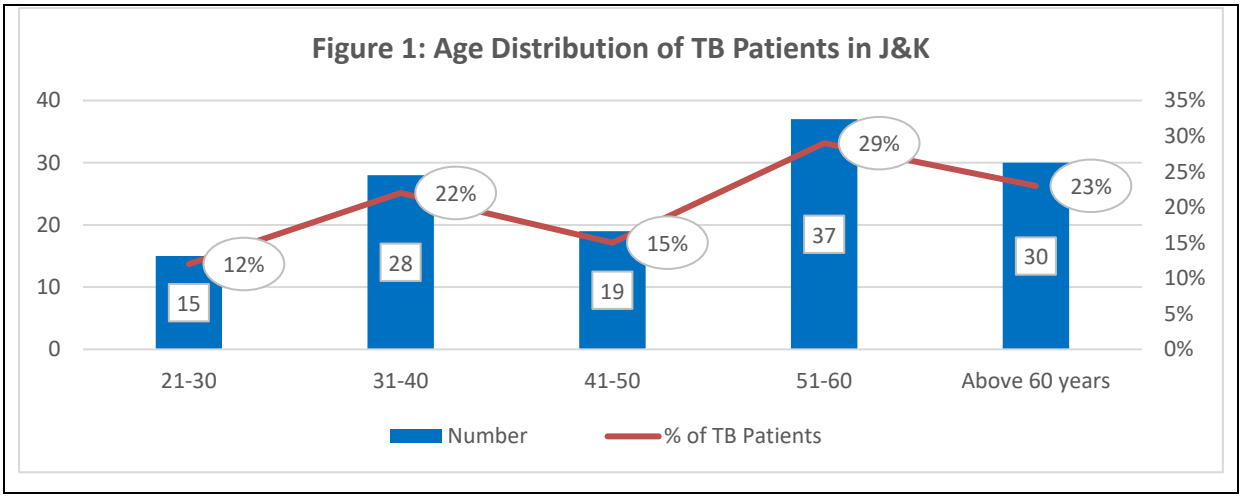
6. RESULTS AND DISCUSSION

6.1. Socio-economics Characteristics of the Tuberculosis Patients in Jammu and Kashmir

The tuberculosis (TB) epidemics is highly influenced by social and economic development and health-related risk factors like undernourishment, housing, age, income, type of fuel used for cooking, diabetes, HIV infection, alcohol use, and smoking. Achieving global targets for reductions in TB disease burden requires progress in addressing these determinants. For example, numbers of TB cases and deaths started to decline in Western Europe, North America, and some other parts of the world around the turn of 20th century as incomes grew, levels of poverty fell, and housing and nutritional status improved. The fastest decline in TB incidence and TB mortality in western Europe occurred during 1950s and 1960s, in the context of progress towards universal health coverage (UHC), rapid social and economic development, and the availability of effective drug treatments (WHO). The World Health Organization (WHO) has developed a framework for monitoring the Sustainable Development Goals (SDGs) related to TB. The framework comprises 14 indicators for which a relationship with TB incidence could be established under seven SDGs. Five of them are health-related risk factors for TB, and six are broader socioeconomic determinants; the other three indicators are for UHC and current health expenditures.

6.2. Age of the Tuberculosis Patients

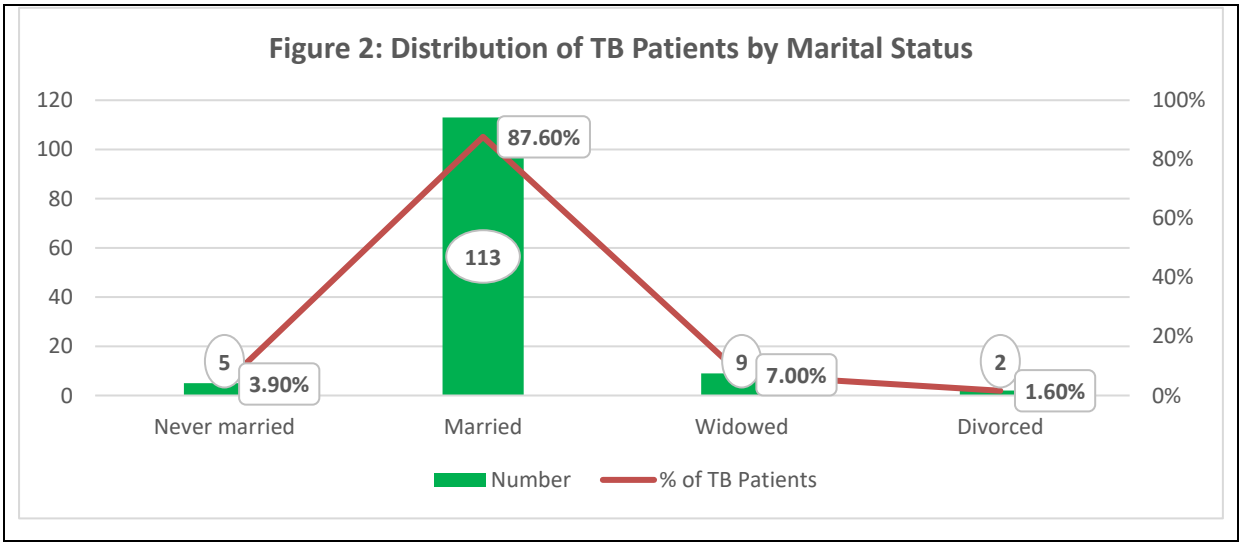
Age is one of the important determinants that influences the prevalence of tuberculosis because the elderly population is more vulnerable to tuberculosis and Respiratory Tract Infections (RTIs) and suffer greater morbidity and mortality compared to the young population. In this regard, the analysis of the NFHS-5 data for Jammu and Kashmir shows that 29 percent of tuberculosis patients fall in the age group of 51–60 years of age, which is the highest; 23 percent of the patients were in the age group of more than 60 years; and 22 percent of the patients were in the age group of 31–40 years. It is important to mention here that 12 percent of the total patients fall in the age group of 21–30 years. From this analysis, it was clearly depicted that with the increase in the age of the population, the risk of TB occurrence is high, and the elderly population is more vulnerable than the young (Table: 1, Fig 1).



6.3. Current Marital Status of Tuberculosis Patients

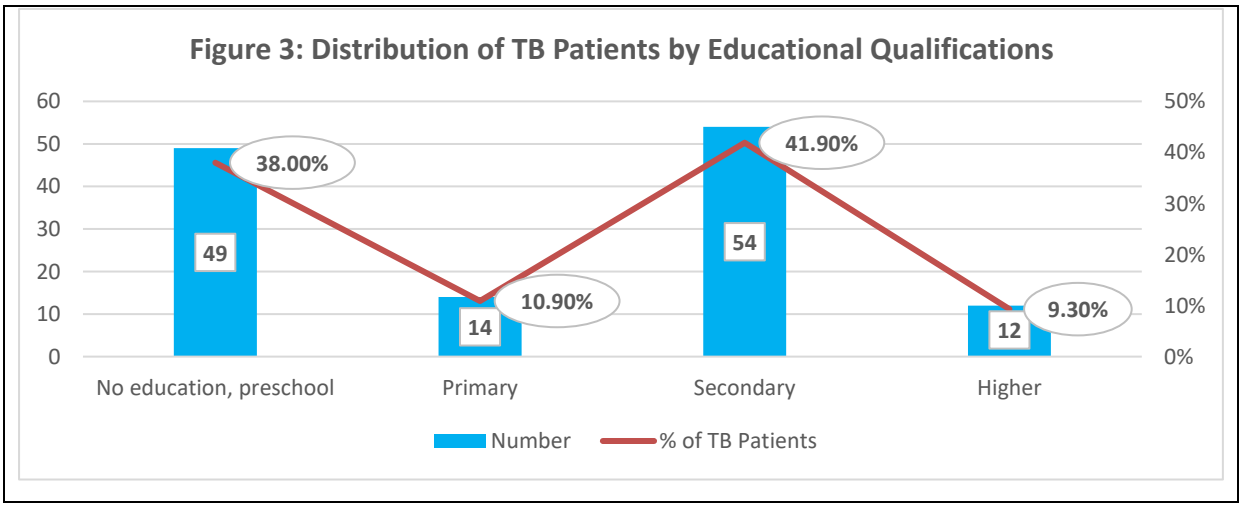
In some developing countries, huge discrimination was found against tuberculosis patients. In the Indian state of West Bengal, it was found during a survey that almost 80 percent of the respondents would not negotiate the marriage of their son or daughter to an ex-TB patient (Geeta krishnan et al., 1988). Also, it was found in India and Pakistan that women with TB stigma were more likely to be divorced (Khanna et al., 1977).

In Jammu and Kashmir, 88 percent of the patients were found married, seven percent were found widowed, and 2 percent were divorced. It is also important to mention that approximately four percent of the patients had never married. From this analysis, it is clear that the occurrence of TB had took place after the marriage as most of the respondents belonged to older age groups and currently married (Table 1, Fig 2).



6.4. Educational Level of the Tuberculosis Patients

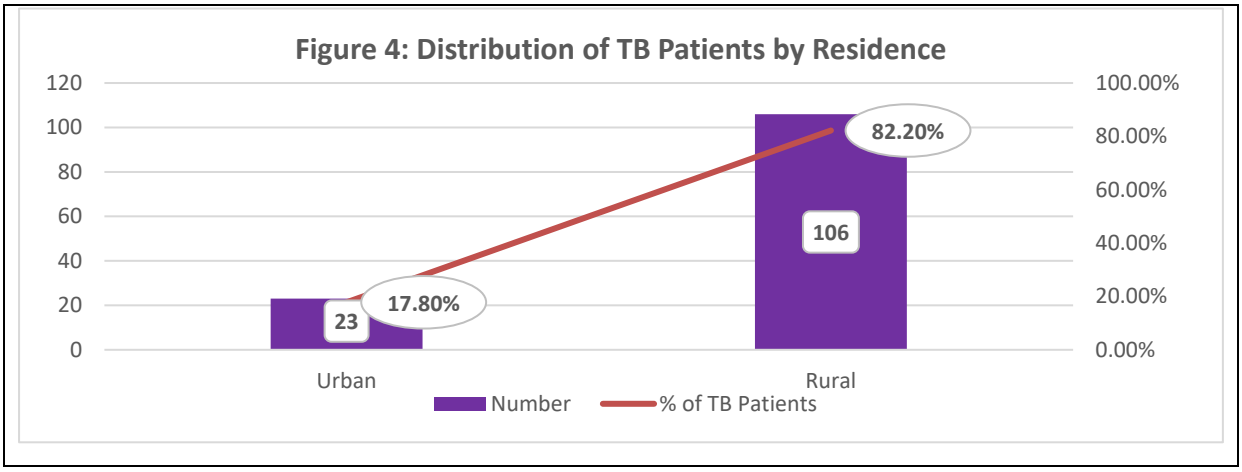
Education is one of the influencing factors that determines knowledge and awareness about the incidence of any chronic ailment including tuberculosis. The low level of educational standard of an individual lacks knowledge on the transmission of tuberculosis diseases and their preventive means; therefore, this influences the knowledge of the factors related to tuberculosis. It has been found that the knowledge about common symptoms of pulmonary TB was alarmingly low among patients prior to any educational programme/awareness programme. The analysis of NFHS-5 data for Jammu and Kashmir shows that the majority of TB patients had attained educational level up to secondary, which constitutes 42 percent. This is because the majority of the population of Jammu and Kashmir had attained the educational level up to secondary. It is important to mention that 38 percent of the TB patients were found illiterate (without any level of education), and only nine percent of the patients had a higher level of education. From this analysis, it is inferred that with the increasing level of educational standards the incidence of TB is low and thus overall, the burden of TB declines (Table: 1, Fig: 3).



6.5. Type of Residence of the TB Patients

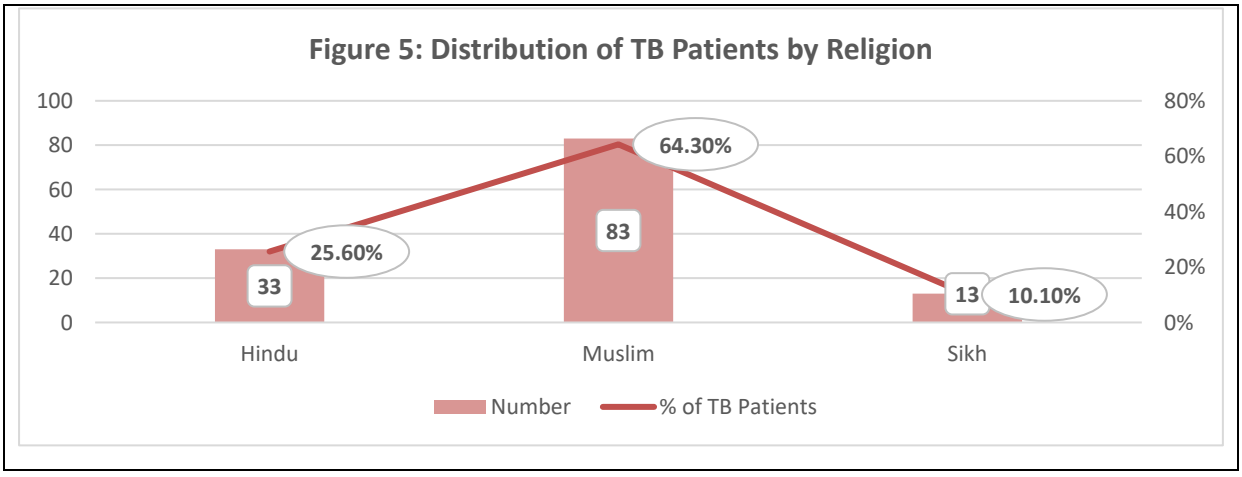
From the data set of NFHS-5, it was found that only a small percentage of the TB patients in Jammu and Kashmir were from urban areas, with only 18 percent of the total patients, while 82 percent of the TB patients belonged to rural areas. Because more than 80 percent of the population in Jammu and Kashmir lives in rural areas, there is no visible regional factor associated with the burden of tuberculosis. It was also found from the logit model that there

was an insignificant impact of rural-urban differences on the prevalence of TB in Jammu and Kashmir. Because of low Wald value and high P value, regional factor does not fit very well in the model (Table: 1, Fig: 4).



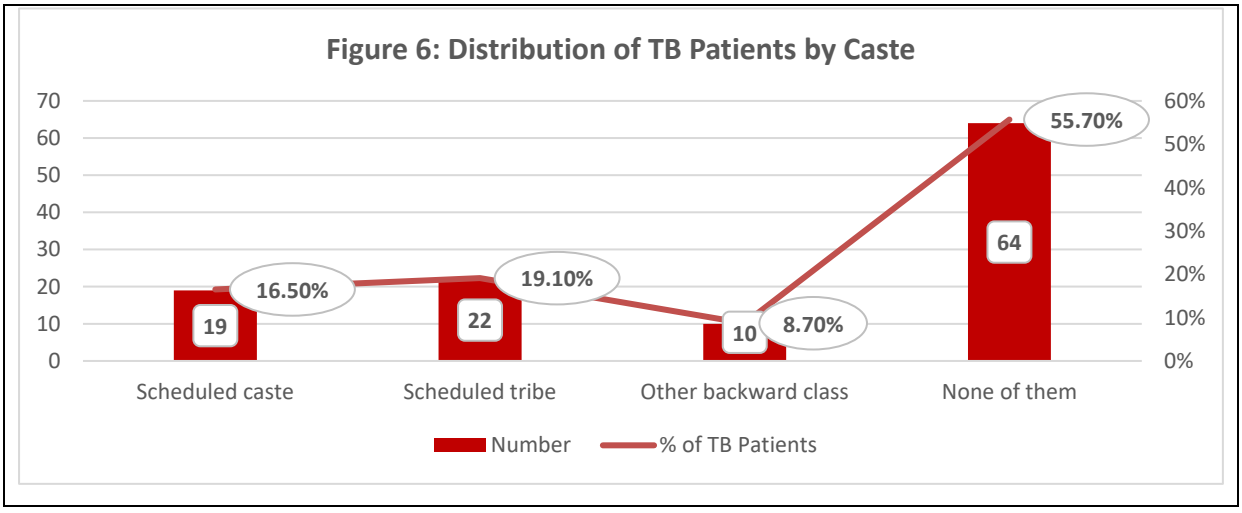
6.6. Religion of the Tuberculosis Patients

Tuberculosis can influence anyone, irrespective of creed, color, or religion. The data analyzed in this regard shows that in Jammu and Kashmir, 64 percent of the TB patients were Muslim, 26 percent were Hindu, and 10 percent were from the Sikh community. This analysis shows that there was no religious influence on the transmission/prevalence of tuberculosis in Jammu and Kashmir. But as per census 2011, the Sikh community constitutes only around three percent of the total population of Jammu and Kashmir, but the analysis of NFHS-5 shows that the TB prevalence is much higher than the share of their population in Jammu and Kashmir(Table: 1, Fig: 5).



6.7. Caste of Tuberculosis Patients

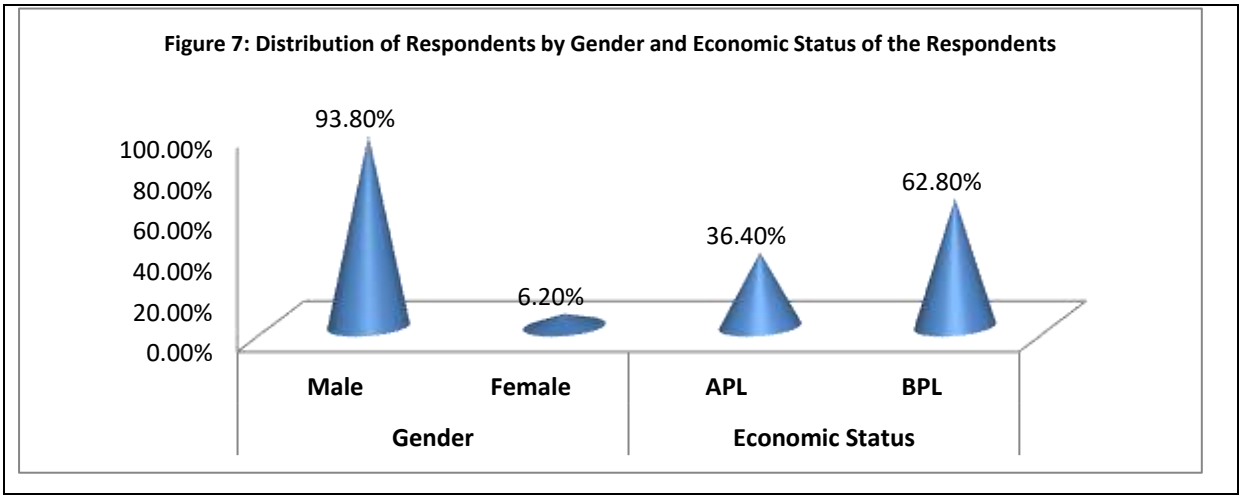
As per census 2011 in Jammu and Kashmir, out of the total population, 11.91 percent belong to the Scheduled Tribe (ST) category and 7.38 percent belong to the Scheduled Caste (SC) category, while the remaining population falls into the general category. The analysis of NFHS-5 data with regard to the caste of the TB patients shows that the total share of the SC population is below 10 percent, but the prevalence of tuberculosis among them was 16 percent out of the total TB patients. Similarly, in case of scheduled tribes, the prevalence of TB was 19 percent, which gives us an idea of the fact that the chance of prevalence of tuberculosis among backward sections of society is greater than the general category of the population. In the general population, it was found that 55 percent of the TB patients fall into this category (Table: 1, Fig: 6).



6.8. Economic Status of the Tuberculosis Patients

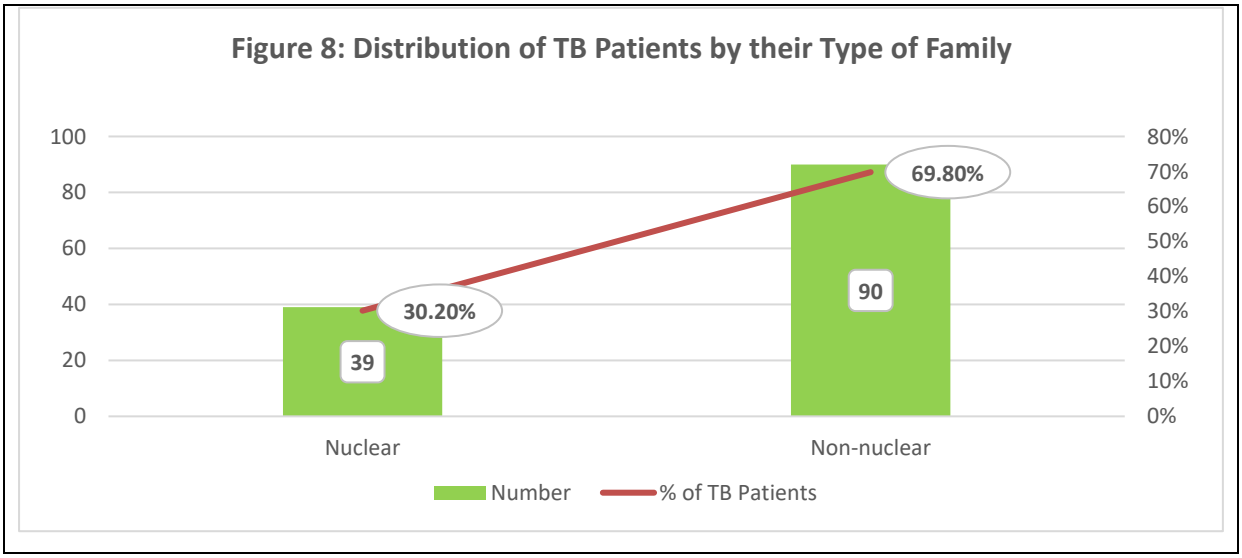
The economic status of the household is categorized as APL (above poverty line) or BPL (below poverty line) based on certain well-defined criteria. There is a close link between poverty and tuberculosis, which has led many to think that TB is exclusively a disease of the poor. Given the often crowded conditions in which poor populations live, they are more likely to contract tuberculosis. Both the probability of becoming infected with the disease and the probability of developing clinical disease are associated with malnutrition, crowding, poor air circulation, and sanitation—factors also associated with poverty. A vicious cycle is established: poor people are malnourished and live in crowded, unhygienic conditions, and then tuberculosis flourishes (WHO, 2000). In Jammu and Kashmir, it was found that 63 percent of the total

patients were in the category below the poverty line (BPL), and only 36 percent of the patients were from richer sections of society. This shows that poverty and the prevalence of tuberculosis have a positive association (Table: 1, Fig: 7).



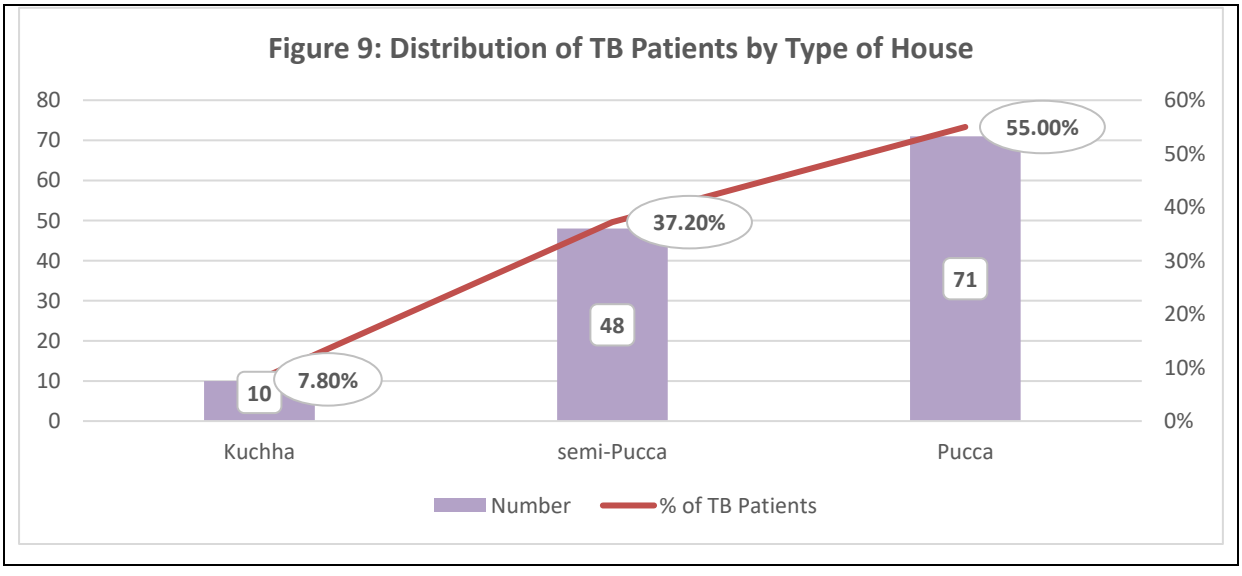
6.9. Family type of the Tuberculosis Patients

It was found in a number of studies that there was a positive association between the risk of tuberculosis transmission and the number of family members. As the family size increases, there is a greater chance of becoming a victim of tuberculosis. As per the analysis of NFHS-5 data, the same has been found in the Union territory of Jammu and Kashmir, where the tuberculosis prevalence was higher in non-nuclear families than nuclear families. It was found that 70 percent of TB patients had a non-nuclear family system, while as only 30 percent had a nuclear family system (Table: 1, Fig: 8).



6.10. Type and Ownership of House

The United Nations declared adequate housing "key for development and social equality" as Goal 11 of the Sustainable Development Goals (SDG). Inadequate housing is associated with TB, with TB syndemics (typically HIV), and with TB comorbidities (e.g., diabetes and alcohol abuse). The WHO End TB Strategy, included in SDG Goal 3, stipulates the need for action on social protection, and adequate housing equals social protection. Based on the housing conditions defined as adequate by the UN International Covenant on Economic, Social, and Cultural Rights, inadequate housing means unmet needs for freedoms and entitlements, not just four walls and a roof. Overcrowding directly affects TB exposure, transmission, incidence, and drug resistance and is also associated with lack of sunlight, dampness, and improper ventilation (Lee Y.J. 2022). Jammu and Kashmir has hilly terrain, with harsh cold winters as well. As a result, it compels people to construct concrete houses with rooftops. As per the analysis of NFHS-5 for Jammu and Kashmir, majority of TB patients had semi-pucca houses, with 55 percent, followed by pucca houses for 30 percent of the TB patients, and only 8 percent TB patients had kuchha houses. Further, it was also found that more than 90 percent of the males (91.3 percent) owned the house, less than 5 percent of ownership was with the females, and 4 percent of ownership was with both males and females in the households (Table: 1, Fig: 9).

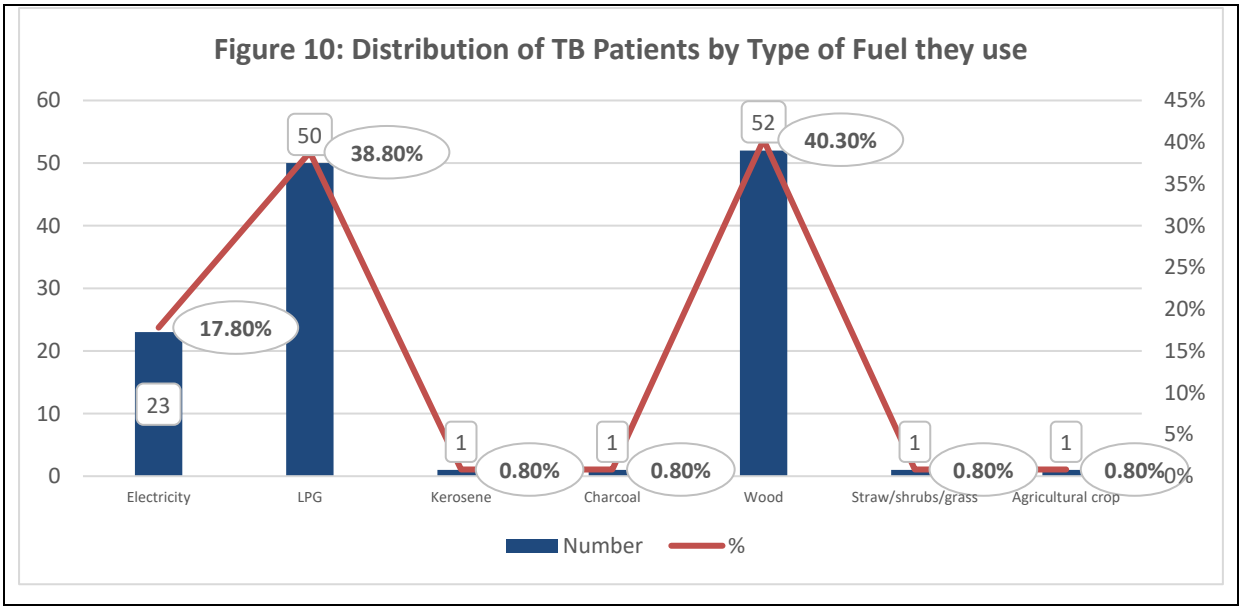


6.11. Number of Rooms Used for Sleeping

WHO defines crowding as a lack of space within a “dwelling for living, sleeping, and normal family/household life." It has found a dose-response relationship between housing and health outcomes. Crowding measures, the relationship between the number of residents in a space and the amount of residential space (i.e., rooms or floor area) available (Lee Y.J. 2022). In this regard NFHS-5 data for Jammu and Kashmir shows that more than half (60 percent) of the TB patients had 3–4 rooms for sleeping while as only three percent of the patients had more than five rooms to live-in. Further, the data shows that more than one-third (37 percent) of the TB patients had 1-2 rooms in their households (Table: 1).

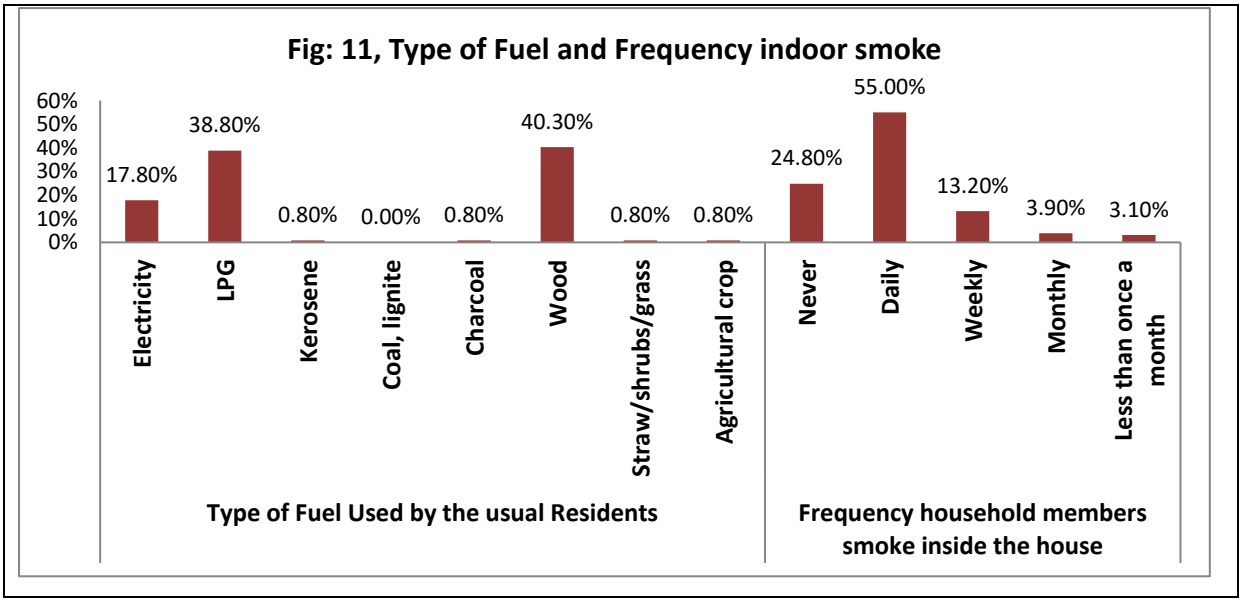
6.12. Type of Fuel Used by Households

Indoor air pollution (IAP) from the use of solid fuels (cow dung and coal) is a potential risk factor for TB, given the negative impact it has on the airway defense mechanism. A majority of health-related exposure to air pollution from solid fuels occurs around households in low- and middle-income countries. According to figures captured by the NFHS-5, in Jammu and Kashmir, the majority of households (40 percent) of the TB patients use wood as the main source of cooking fuel, followed by LPG, which is used by 39 percent of the households, and electricity, which is used by 17.8 percent of the households. A positive type of association was seen between the type of solid fuel and the tuberculosis prevalence in Jammu and Kashmir (Table: 1, Fig: 10).



6.13. Separate Kitchen of the Tuberculosis Patients

The physical environment risk factors, such as smoke inside the house, type of fuel used for cooking, separate kitchen, the material used for floors, roof and walls, number of persons sleeping in a room, sharing of toilets with other households, and potable water are strongly associated with TB. In Jammu and Kashmir, it was found that the majority of the tuberculosis patients had 2-3 rooms for the purpose of living, so therefore they also had a separate kitchen for cooking purposes. It is important to mention here that the same kitchen is also used for dining purposes in the household. In this background, the analysis of NFHS-5 data shows that 95 percent of the tuberculosis patients had a separate kitchen used both for cooking and dining purposes in their households. Furthermore, it was found from the logit model that there was a significant impact of availability of kitchen on the tuberculosis. The probability of TB prevalence is to be high among those who have not the separate kitchen (Table: 2, Fig: 11).



6.14. Frequency of Household Members Smoke inside House

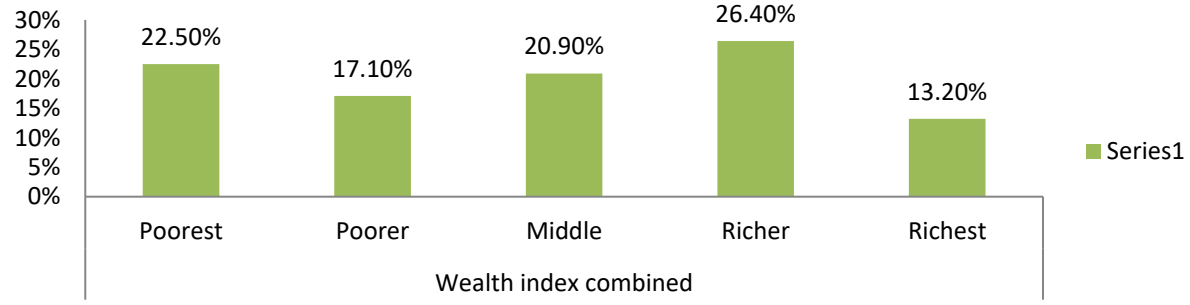
Indoor air pollution is not only dependent on the combustion of solid fuel, but it is also affected by overcrowded housing conditions and exposure to second hand smoke inside the house. Persons who are regularly (daily) exposed to second-hand smoke inside their homes are more prone to getting tuberculosis as compared those who are not. Households that use

solid fuel for cooking and do not have a separate kitchen are more prone to infection with tuberculosis than those using non-solid fuel for cooking and having a separate room for cooking (Singh S.K et. al, 2018). It was found that in Jammu and Kashmir there was a positive association between the frequency of smoking inside the house and the incidence of tuberculosis. It was found from the data that those households that smoke daily inside the house had 55 percent of the TB patients, and those that smoke weekly had 13 percent of the TB patients. But it was found that those who never smoked inside the house also had 25 percent of TB patients. As the frequency of smoking inside the house shifts from daily to weekly and then monthly, the burden of the TB patients declines accordingly (Table: 2).

6.15. Wealth Index of Tuberculosis Patients

It was found from the NFHS-5 data, though it was found that there was not any significant impact by higher score of wealth index on the incidence of tuberculosis burden in Jammu and Kashmir. It was found that richer sections of the population have higher incidence of tuberculosis with 26 percent of the total TB patients followed by the poorest section with 22 percent and among the middle sections of the society there were 21 percent of the total patients (Table: 3, Fig: 12).

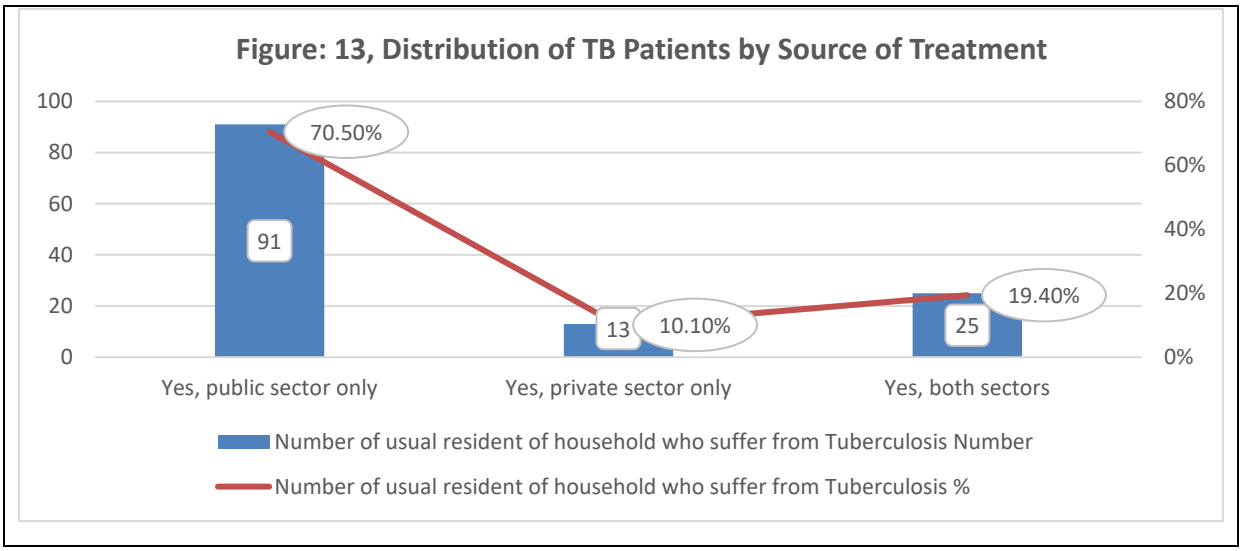
Fig: 12, Wealth Index of TB Patients



6.16. Source of Medical Treatment

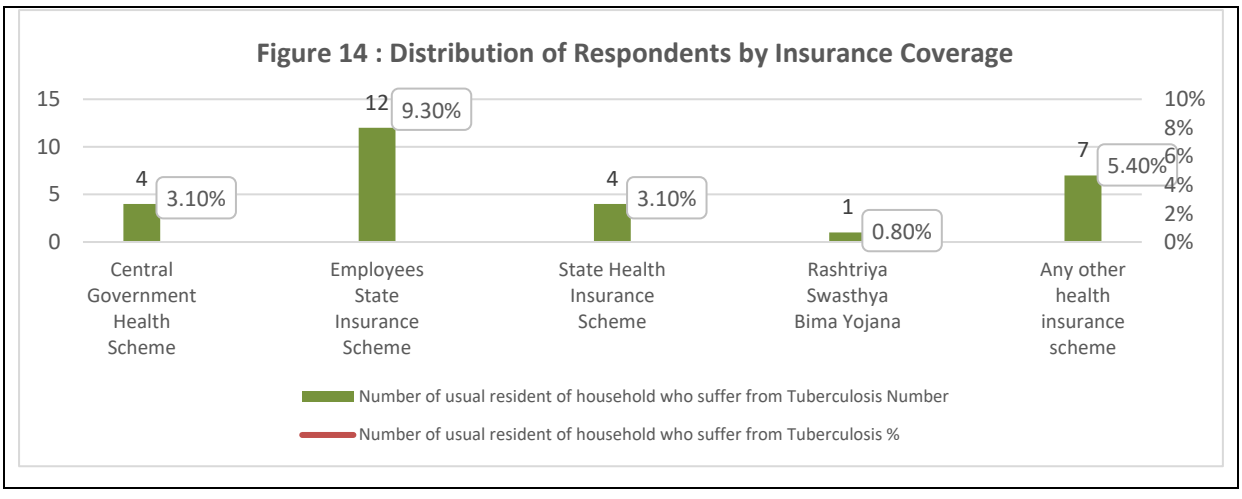
From the NFHS-5, it was found that 70 percent of the total patients had received the medical treatment from public health facilities, 10 percent had received from the private medical health facilities, and 19 percent of the patients had received the treatment from both private as well as public health facilities. So, it was found that maximum tuberculosis patients had availed the services from public health facilities. It is pertinent to mention that not a single

tuberculosis patient in Jammu and Kashmir has remained without any type of medical treatment (Table: 4, Fig: 13).



6.17. Health Insurance Scheme availed by the Tuberculosis Patients

In Jammu and Kashmir, a meagre percentage of population had availed different the central and state sponsored health insurance schemes. It was found that only three percent of the tuberculosis patients had availed the central government health scheme, 9 percent had availed the employees state insurance scheme, less than one percent had availed Rashtriya Swasthya Bima Yojana and 5 percent of the tuberculosis patients had availed other health schemes also. Majority health insurance schemes were not availed by the tuberculosis patients, as a result they had to make the out of pocket expenditure for the different purposes (Table: 4, Fig :14).



7. CONCLUSION OF THE STUDY

The analysis of the data clearly depicts that with the increase in the age of an individual, increases the risk of the occurrence of TB as the prevalence of TB was found high among the older age groups irrespective of their marital status. Furthermore, it was found that increasing educational level of the tuberculosis patients proved to be successful for controlling the TB as the prevalence of TB was found lesser with increasing level of education. Further, higher proportion of TB patients were found in rural areas as the rural population constitutes more than three-fourth of the total population in Jammu and Kashmir. There was not any visible regional factor associated with the burden of tuberculosis while as highest prevalence of TB was found among Muslims in the Union Territory.

Overall, the total share of Scheduled Caste population is below 10 percent, but the prevalence of tuberculosis among them was found to be 16 percent out of the total TB patients. Similarly, in case of Scheduled Tribes, the share of TB patients was 19 percent, which clearly depicts the fact that the chance of having tuberculosis among various backward sections of the society is more than the general category of the population due to different life style as compared to their counterparts. It was also found that poverty (economic status) and prevalence of TB has positive relationship.

On the basis of family size, it was found that 70 percent of TB patients had non-nuclear families, while only 30 percent had nuclear family system. On the basis of ownership of the house, 90 percent own their house.

A positive association was found between the users of solid fuel and the tuberculosis prevalence in Jammu and Kashmir. Further, it was found that 95 percent of the tuberculosis patients had a separate kitchen for cooking purpose. As the frequency of smoking inside the house shifts from daily to weekly and then monthly, the burden of the TB patients was found declining accordingly.

It was also found that 70 percent of the total TB patients had received the medical treatment from public health facilities, 10 percent had received from private medical health facilities,

and 19 percent of the patients had received the treatment from both private as well as public health facilities. Only a very meagre proportion of the TB patients had availed different types of health insurance schemes.

Furthermore, it was found from the logit model that a significant impact was found on the prevalence of tuberculosis by the increasing number of rooms available with the family, availability of separate kitchen, frequency of smoke inside the room, wealth index of the TB patients, caste, and education level of the patients. The values of significance and standard error were found low and Wald coefficients were found high, which validates the fact that there exists a significant impact on the prevalence of tuberculosis.

As the Tuberculosis prevalence was found to be higher among the older population as compared to the younger ones. Therefore, it is suggested that the screening of older population may be intensified and done on regular intervals (especially among the economically weaker sections of the society) so that this population can be protected (as the incidence of mortality among older age is higher) on priority.

Awareness among illiterate or people with little education, SCs and other weaker sections of the society have also higher prevalence of tuberculosis primarily due to less or no awareness about prevention of TB and in this regard, it is suggested to involve SHC-HWCs along with the AWCs to organize awareness camps in their localities regarding the awareness and treatment seeking behaviour for prevention of TB.

Anneaxure-1

Table 1: Percentage Distribution of TB Patients with various Socio-Economic and Background Characteristics in Jammu and Kashmir NFHS-5

Background Characteristics		Number	% of TB Patients
Age of the TB Patients	21-30	15	12%
	31-40	28	22%
	41-50	19	15%
	51-60	37	29%
	Above 60 years	30	23%
Current marital status	Never married	5	3.9%
	Married	113	87.6%
	Widowed	9	7.0%
	Divorced	2	1.6%
Educational level attained	No education, preschool	49	38.0%
	Primary	14	10.9%
	Secondary	54	41.9%
	Higher	12	9.3%
Type of place of residence	Urban	23	17.8%
	Rural	106	82.2%
Religion of the patients	Hindu	33	25.6%
	Muslim	83	64.3%
	Sikh	13	10.1%
Caste of the Patients	Scheduled caste	19	16.5%
	Scheduled tribe	22	19.1%
	Other backward class	10	8.7%
	None of them	64	55.7%
Sex of head of household	Male	121	93.8%
	Female	8	6.2%
Economic Status of the Household	APL	47	36.4%
	BPL	81	62.8%
	Don't know	1	0.8%
House Ownership	Male member	94	91.3%
	Female member	5	4.9%
	Both	4	3.9%
Type of House	Kuchha	10	7.8%
	semi-Pucca	48	37.2%
	Pucca	71	55.0%
Household structure	Nuclear	39	30.2%
	Non-nuclear	90	69.8%
Number of rooms used for sleeping	1-2	48	37.3%
	3-4	77	59.7%
	More than 5	4	3.0%

Continue Table 1…. Background Characteristics		Number	% of TB Patients
kitchen have any ventilation	No	5	5.3%
	Yes	89	94.7%
Place where household members wash their hands	Observed	122	94.6%
	Not observed: not in dwelling	7	5.4%
Total		**129**	**100.0%**
Presence of water at hand washing place	Water not available	7	5.7%
	Water is available	115	94.3%
Total		**122**	**100.0%**

Table 2: Percentage Distribution of TB Patients by Type of cooking fuel used by HHs in J&K

Indicators		Number	%
Type of Fuel Used by the usual Residents	Electricity	23	17.8%
	LPG	50	38.8%
	Kerosene	1	0.8%
	Charcoal	1	0.8%
	Wood	52	40.3%
	Straw/shrubs/grass	1	0.8%
	Agricultural crop	1	0.8%
In this household, is food cooked on a stove, a chullah or an open fire?	Stove	1	1.8%
	Chullah	52	92.9%
	Open fire	3	5.4%
Frequency household members smoke inside the house	Never	32	24.8%
	Daily	71	55.0%
	Weekly	17	13.2%
	Monthly	5	3.9%
	Less than once a month	4	3.1%
Total		**129**	**100.0%**

Table 3: % Distribution of TB Patients by various assets that their HHs possess in J&K

		Number	Percentage
Owns land usable for agriculture	**No**	35	27.1%
	Yes	94	72.9%
Has bank account	No	6	4.7%
	Yes	123	95.3%
Wealth index combined	Poorest	29	22.5%
	Poorer	22	17.1%
	Middle	27	20.9%
	Richer	34	26.4%
	Richest	17	13.2%
Total		**129**	**100.0%**

Table 4: Percentage Distribution of TB Patients by Source of Medical Treatment and Health Insurance Schemes in J&K

		Number of usual resident of household who suffer from Tuberculosis	
		Number	**%**
Place from which medical treatment received	Yes, public sector only	91	70.5%
	Yes, private sector only	13	10.1%
	Yes, both sectors	25	19.4%
Is any usual member of this household covered by a health scheme or health insurance?	No	102	79.1%
	Yes	27	20.9%
	Don't know	0	0.0%
Central Government Health Scheme	No	125	96.9%
	Yes	4	3.1%
Employees State Insurance Scheme	No	117	90.7%
	Yes	12	9.3%
Central Government Health Scheme	No	125	96.9%
	Yes	4	3.1%
State Health Insurance Scheme	No	125	96.9%
	Yes	4	3.1%
Rashtriya Swasthya Bima Yojana	No	128	99.2%
	Yes	1	0.8%
Any other health insurance scheme	No	122	94.6%
	Yes	7	5.4%
Total		**129**	**100.0%**

Table 5: Percentage Distribution of TB Patients by getting exposed to smoke or use of tobacco by usual residents of HH in J&K

		Does any usual resident of your household suffer from tuberculosis?	
		Number	**%**
Smokes or uses tobacco	No	54	41.9%
	Yes	75	58.1%
	Don't know	0	0.0%
Suffers from TB	Not listed as suffering from TB	94	72.9%
	Yes	35	27.1%
Location where treated for TB	No place	0	0.0%
	Yes, public sector only	20	57.1%
	Yes, private sector only	5	14.3%
	Yes, both sectors	10	28.6%
	Don't know	0	0.0%
Total		**129**	**100.0%**

Table 6: Dependent Variable: Any Usual Resident of Household suffer from Tuberculosis

Variables in the Equation						
	B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Type of place of residence	-.267	.266	1.009	1	.315	.766
Number of rooms used for sleeping	.141	.049	8.127	1	.004	1.151
Type of cooking fuel	-.060	.041	2.129	1	.145	.942
Food cooked in the house/ separate building/ outdoors	.445	.147	9.147	1	.002	1.560
Frequency household members smoke inside the house	-.056	.100	.321	1	.571	.945
Wealth index combined	-.277	.094	8.606	1	.003	.758
Is this a scheduled caste, a scheduled tribe, other backward class, or none of them?	-.219	.083	6.928	1	.008	.803
Is any usual member of this household covered by a health scheme or health insurance?	.250	.111	5.111	1	.024	1.284
Highest educational level attained	-.206	.082	6.284	1	.012	.814
Sex of the patients	-.688	.341	4.083	1	.043	.502
Does Household has BPL card?	.215	.116	3.448	1	.063	1.239
Constant	-3.513	.724	23.552	1	.000	.030

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