



## Original Article

# Demographic Characterization of Patients Suffering from Tuberculosis Visiting Tertiary Care Hospital, Lahore

Misbah Arshad<sup>1</sup>, Muniba Tariq<sup>1</sup>, Maimoona Ashfaq<sup>1</sup>, Sidra Khalid<sup>1</sup>, Hafsa Kamran<sup>1</sup>, Maria Aslam<sup>1</sup> and Zainab Sharmeen<sup>1</sup>  
<sup>1</sup>University Institute of Diet and Nutritional Sciences, Faculty of Allied Health Sciences, The University of Lahore, Lahore, Pakistan

**Keywords:** Demographic characterization, Tuberculosis, Pulmonary tuberculosis, Extra pulmonary tuberculosis, CAT treatment

**How to Cite:**

Arshad, M., Tariq, M., Ashfaq, M., Khalid, S., Kamran, H., Aslam, M., & Sharmeen, Z. (2021). Demographic characterization of patients suffering from tuberculosis visiting tertiary care hospital' Lahore . *Pakistan Journal of Health Sciences*, 2(02). <https://doi.org/10.54393/pjhs.v2i02.27>

**Article History**

Received: 10<sup>th</sup> July 2021

Accepted: 8<sup>th</sup> August 2021

Published: 31<sup>st</sup> December 2021

**Corresponding author:**

Sidra Khalid

University Institute of Diet and Nutritional Sciences, Faculty of Allied Health Sciences, The University of Lahore, Lahore, Pakistan  
 Sidrakhalid.uaf@gmail.com

**ABSTRACT**

Tuberculosis is a contagious disease, primarily caused by bacteria specifically *Mycobacterium tuberculosis*, *M. bovis*, or *M. africanum*. TB is a communicable disease involving impoverishment, mal-nutrition and poor immune system. Morbidity and mortality of TB are measured very high in developing countries **Objective:** To assess the demographic characterization of tuberculosis patients visiting Tertiary Care Hospital Lahore **Methods:** A cross-sectional study was carried out at the chest department of Sir Ganga Ram Hospital, Lahore during November-2018 to January-2019. A sample of 100 tuberculosis patients was selected through non-probability convenient sampling technique. Patients were assessed through pre-tested questionnaire. SPSS version 21.0 was used for data analysis **Results:** Among 100 participants, 55 patients were female and 45 patients were male. The prevalence of tuberculosis is more in female than male. 24% male and 22% female were suffering from pulmonary TB. The mean age of the patients was 35 years. Geographically 59% were from urban areas; 42% patients belonged to lower class. BMI of 47% patients were normal; 39% patients were underweight; 10% patients were overweight and 4% patients were obese. 60% patients were living joint family and 59% were from urban areas **Conclusions:** It was concluded that the prevalence of tuberculosis is more common in urban or congested areas. Socioeconomic status also has a significant impact on the development of disease.

**INTRODUCTION**

Tuberculosis is one of bacterial diseases caused by *Mycobacterium tuberculosis*. Generally transmitted from one person to another through small particles of sneezing and coughing [1]. It can affect any part of body but mainly affects lungs (respiratory system). other parts that can be affected are brain, abdomen, bone, kidneys and glands [2]. It is a serious condition but can be cured through antibiotics [3]. People with strong immunity never develop symptoms, because immune system fight against bacteria [4]. In some cases, bacteria cannot be killed but immune system work to control its further progression. There are two major types of tuberculosis: Latent and Active tuberculosis. In Latent, patients do not have any symptoms and damage in chest X-ray but blood tests show infection [5]. In active, patients experience coughing, fever and pain [6]. Weight reduction is more common in active cases. With the passage of time symptoms become more severe. The BCG vaccine is used to protect against tuberculosis. This vaccine is recommended for new borns, children and adults who are considered to be at risk of catching tuberculosis [7].

Globally tuberculosis is a major public health issue leading toward increased morbidity and mortality rate [8]. Currently, 26% world's population is affected by tuberculosis [9]. Pakistan ranked at fifth due prevalence of tuberculosis and incidence rate is increasing day by day [10]. In 2014 342 patients were reported with tuberculosis out of 100000 participants and in 2016 there were 518 patients in Pakistan [11]. World Health Organization calculated Multi-drug-resistant tuberculosis in

new cases is 35% and 21st within the earlier treated TB cases. The overall estimates of TB burden incidence rate in 2016 in Pakistan is 518 per 100 000 population. The mortality of TB is 21 per 100,000 population [12]. The World Health Organization 2016 annual report states 'The TB epidemic is larger than previously estimated'. TB causes 1.5 million deaths and 49 million DALYS every year [13]. Under nutrition rises the danger of TB infection to active TB disease that results in loss in weight. A balanced diet and full of all nutrients play a vital role in treating TB patients. TB patients require high caloric diet. Gurung lumen *et al.*, conducted a study in Nepal on TB patients to assess their dietary intake and nutritional status. Their study found that the nutritional status of the TB patients improved comparatively from the start of disease to the time of study [14]. Stunted growth is a longtime risk issue for infectious disease (TB). A study by Lönnroth *et al.*, urged that being overweight could be a protecting factor. Six studies were enclosed in all of them, there was a log-linear inverse association among TB occurrence and BMI. The average slope gave a decrease in TB incidence of thirteen point eight% per unit rise in BMI [15].

## METHODS

This cross-sectional study was conducted at the tertiary care hospital of Lahore, Pakistan. In this study 100 TB patients were enrolled from the department of tuberculosis Sir Gangaram Hospital, Lahore. The study duration was 12 weeks. Pre-tested questionnaire was used to collect data. Data were collected by using convenient probability sampling technique. Statistical analysis of data was determined by using SPSS version 21. Statistically *Chi-square* test was used to determine between variables association.

## RESULTS

According to current results, the mean age of participants was 34.64 years. Sixty-eight percent participant were married, more of participant were belonged to lower and lower middle class about 42%. Sixty participants were belonged to joint family and 59% were living in urban areas. Results also showed that 70% TB patients were non-smokers and 30% TB patients were smokers as shown in table 1.

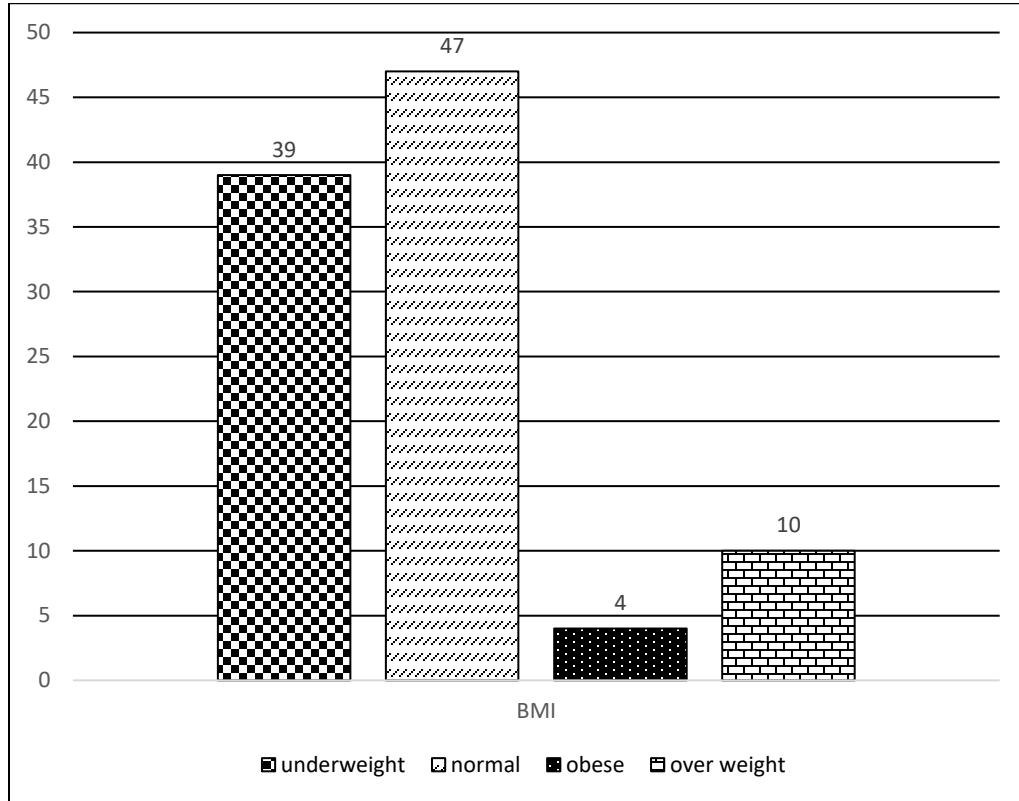
<b>Age (Total 100 participants were participated)</b>			
Minimum	Maximum	Mean	
18	70	34.64	
<b>Gender</b>			
Male		female	
45%		55%	
<b>Marital status</b>			
Single		Married	
32%		68%	
<b>Socioeconomic status</b>			
Upper class	Lower middle class	Middle class	Upper class
42%	42%	15%	1%
<b>Family size</b>			
More than 5 members		Less than 5 members	
85%		15%	
<b>Type of family</b>			
Joint		Single	
60%		40%	
<b>Residential area</b>			
Urban		Rural	
59%		41%	
<b>Smoking</b>			
Yes		No	
30%		70%	

**Table 1:** Demographic characterization of TB patients

Family history TB	Frequency
Yes	37
No	63
Total	100

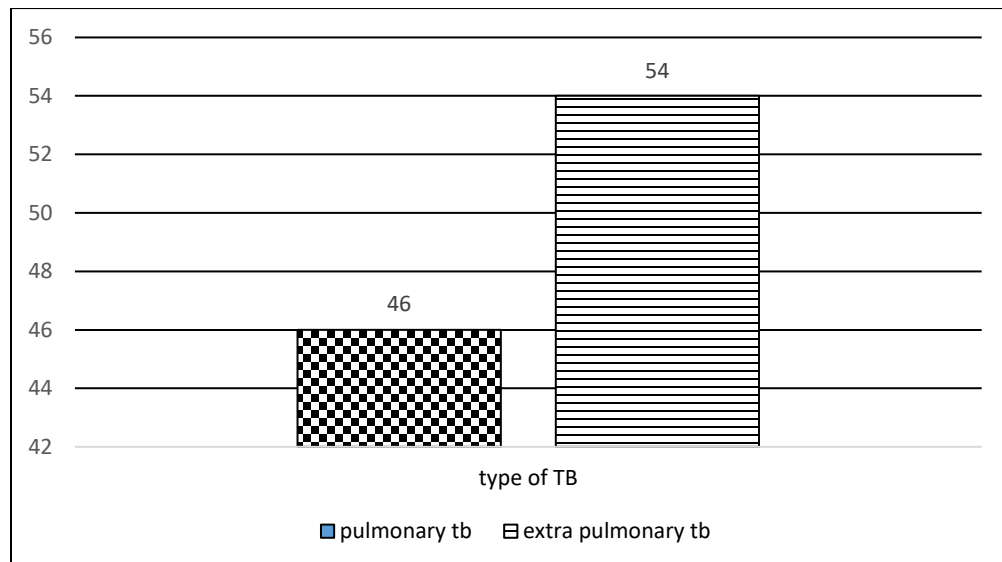
**Table 2:** Frequency Distribution of family history of TB

Results showed that; 63 TB patients had no family history of TB 37% TB patients had a family history of TB shown in table 2.



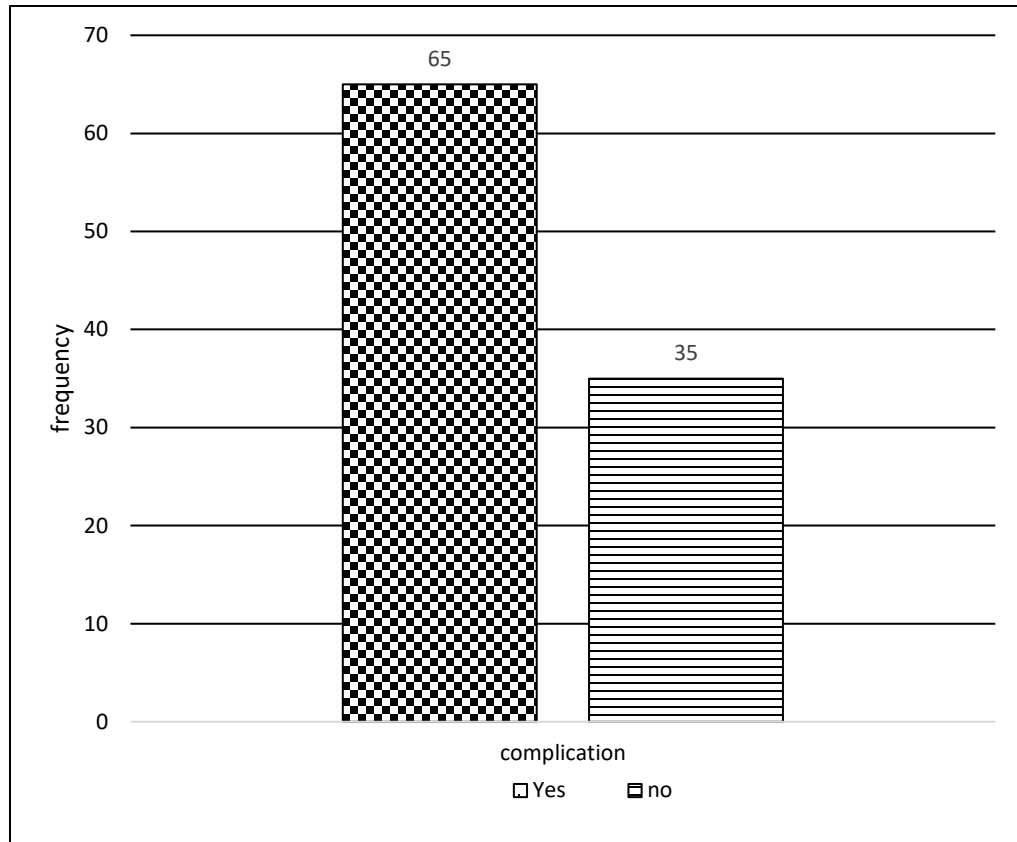
**Figure 1:** Frequency distribution of BMI

Results showed that 47% TB patients were normal; 39% TB patients were underweight; 10% patients were overweight and 4% TB patients were obese as shown in figure 1.



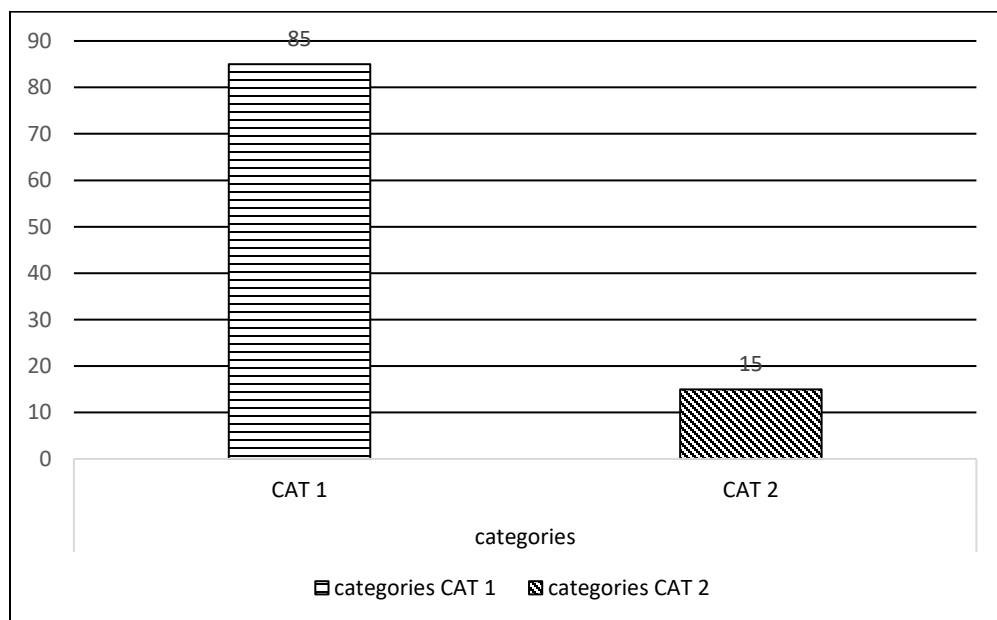
**Figure 2:** Frequency distribution of type of TB

Results showed that 54% patients were suffering from extra pulmonary TB; while 46% patients were suffering from pulmonary TB as shown in figure 2.



**Figure 3:** Frequency distribution of occurrence of complication

Results showed that 65% TB patients had suffered from different complications like stress and anxiety; 35% TB patients had not suffered from any complication during their disease condition as shown in figure 3.



**Figure 4:** Frequency Distribution of CAT treatment

Results showed that 85% TB patients had CAT 1 treatment and 15% TB patients had CAT 2 treatment as shown in figure 4.

## DISCUSSION

Results of current study which was conducted to find out the demographic characterization of TB patients, showed that that 47% TB patients were normal; 39% TB patients were underweight; 10% patients were overweight and 4% TB patients were obese. Another study conducted by Karyadi E *et al.*, which showed that TB patients were under nourished; fat proportion, albumin concentration, blood hemoglobin, plasma vitamin A and plasma zinc are lowered [16]. Gurung lumen *et al.*, conducted a study in Nepal which showed that TB patients are under nourished [17]. Lönnroth *et al.*, conducted a study being overweight could be a protecting factor in patients suffers from TB [18]. A study conducted by Aaron R.*et al.*, which showed that; there is strong association in between TB and BMI happened only with pulmonary TB and not extra-pulmonary TB, but the current study showed under nutrition is present in both pulmonary and extra pulmonary TB patients [19].

Current study results showed that 42 % TB patients belonged to lower class; 42% TB patients belonged to lower middle class; 15 % TB patients belonged to middle class and 1% TB patient belonged to upper class. A study conducted by Samuel B *et al*; showed that by providing nutritional support was associated with lower risk of ineffective treatment in poor TB patients [20]. Current study showed 24 male and 22 females were suffering from PTB; 21 male and 33 female suffers EPTB. Similar findings were also observed by Al-Otaibi F *et al*; [21], Chan-Yeung M *et al*; [22] and Sreeramareddy CT *et al*; [23] which showed that extra pulmonary tuberculosis was more frequent in females as compare to males. Results of current study showed that; 70% TB patients were non-smokers and 30% TB patients were smokers. Bates MN et al; conducted a study which showed that smoking is a risk factor for TB infection and TB disease [24].

## CONCLUSION

Study concluded that Tuberculosis was much prevalent (especially Extra pulmonary) in patients living in urban areas and with joint family. Incidence rate of tuberculosis was high among lower and middle class. It was more common in married individuals as compare to unmarried. Data analysis also showed that CAT 1 treatment was mostly used for the treatment of tuberculosis in tertiary care hospital of Lahore.

## REFERENCES

1. Babu S. Biomarkers for treatment monitoring in tuberculosis: a new hope. *EBioMedicine*. 2017;26:13-4.
2. Churchyard G, Kim P, Shah NS, Rustomjee R, Gandhi N, Mathema B, Dowdy D, Kasmar A, Cardenas V. What we know about tuberculosis transmission: an overview. *The Journal of infectious diseases*. 2017;216(suppl\_6):S629-35. [doi.org/10.1093/infdis/jix362](https://doi.org/10.1093/infdis/jix362).
3. Nguyen L. Antibiotic resistance mechanisms in M. tuberculosis: an update. *Archives of toxicology*. 2016;90(7):1585-604. [doi:10.1007/s00204-016-1727-6](https://doi.org/10.1007/s00204-016-1727-6).
4. Reid MJ, Arinaminpathy N, Bloom A, Bloom BR, Boehme C, Chaisson R, Chin DP, Churchyard G, Cox H, Ditiu L, Dybul M. Building a tuberculosis-free world: The Lancet Commission on tuberculosis. *The Lancet*. 2019;393(10178):1331-84.
5. Kiazzyk S, Ball TB. Tuberculosis (TB): Latent tuberculosis infection: An overview. *Canada Communicable Disease Report*. 2017;43(3-4):62. [dx.doi.org/10.14745%2Fccdr.v43i34a01](https://dx.doi.org/10.14745%2Fccdr.v43i34a01).
6. Yoon C, Dowdy DW, Esmail H, MacPherson P, Schumacher SG. Screening for tuberculosis: time to move beyond symptoms. *The Lancet Respiratory Medicine*. 2019;7(3):202-4. [doi.org/10.1016/S2213-2600\(19\)30039-6](https://doi.org/10.1016/S2213-2600(19)30039-6).
7. World Health Organization. BCG vaccine: WHO position paper, February 2018—recommendations. *Vaccine*. 2018;36(24):3408-10. [doi.org/10.1016/j.vaccine.2018.03.009](https://doi.org/10.1016/j.vaccine.2018.03.009).
8. Kehbila J, Ekabe CJ, Aminde LN, Noubiap JJ, Fon PN, Monekosso GL. Prevalence and correlates of depressive symptoms in adult patients with pulmonary tuberculosis in the Southwest Region of Cameroon. *Infectious Diseases of Poverty*. 2016;5(1):1-8. [doi:10.1186/s40249-016-0145-6](https://doi.org/10.1186/s40249-016-0145-6)
9. Chakaya J, Khan M, Ntoumi F, Aklillu E, Fatima R, Mwaba P, Kapata N, Mfinanga S, Hasnain SE, Katoto PD, Bulabula AN. Global Tuberculosis Report 2020—Reflections on the Global TB burden, treatment and prevention efforts. *International Journal of Infectious Diseases*. 2021;113:S7-12. [doi.org/10.1016/j.ijid.2021.02.107](https://doi.org/10.1016/j.ijid.2021.02.107).
10. Petkar KC, Chavhan S, Kunda N, Saleem I, Somavarapu S, Taylor KM, Sawant KK. Development of novel octanoyl chitosan nanoparticles for improved rifampicin pulmonary delivery: optimization by factorial design. *AAPS Pharm Sci Tech*. 2018;19(4):1758-72. [doi:10.1208/s12249-018-0972-9](https://doi.org/10.1208/s12249-018-0972-9).

11. Mendis S, Davis S, Norrving B. Organizational update: the world health organization global status report on noncommunicable diseases 2014; one more landmark step in the combat against stroke and vascular disease. *Stroke*. 2015;46(5):e121-2. doi.org/10.1161/STROKEAHA.115.008097.
12. World Health Organization. Global Tuberculosis Report 2013. World Health Organization; 2013.
13. Waitt CJ, Squire SB. A systematic review of risk factors for death in adults during and after tuberculosis treatment. *The International journal of tuberculosis and lung disease*. 2011;15(7):871-85. doi.org/10.5588/ijtld.10.0352.
14. Gurung LM, Bhatt LD, Karmacharya I, Yadav DK. Dietary practice and nutritional status of tuberculosis patients in Pokhara: a cross sectional study. *Frontiers in Nutrition*. 2018 ;5:63. doi.org/10.3389/fnut.2018.00063.
15. Lönnroth K, Williams BG, Cegielski P, Dye C. A consistent log-linear relationship between tuberculosis incidence and body mass index. *International journal of epidemiology*. 2010;39(1):149-55. doi.org/10.1093/ije/dyp308.
16. AL-Auqbi TF. Nutritional and Epidemiological Characteristics of Iraqi TB Patients. *Iraqi Journal of Community Medicine*. 2007;20(3).
17. Walzl G, McNerney R, du Plessis N, Bates M, McHugh TD, Chegou NN, Zumla A. Tuberculosis: advances and challenges in development of new diagnostics and biomarkers. *The Lancet Infectious Diseases*. 2018;18(7):e199-210. doi.org/10.1016/S1473-3099(18)30111-7.
18. Lönnroth K, Williams BG, Cegielski P, Dye C. A consistent log-linear relationship between tuberculosis incidence and body mass index. *International journal of epidemiology*. 2010;39(1):149-55. doi.org/10.1093/ije/dyp308.
19. Oxlade O, Huang CC, Murray M. Estimating the impact of reducing under-nutrition on the tuberculosis epidemic in the central eastern states of India: a dynamic modeling study. *PloS one*. 2015;10(6):e0128187. doi.org/10.1371/journal.pone.0128187.
20. Samuel B, Tyson Volkmann SC, Mukhopadhyay S, MejoJose KM, Kumar AM, Oeltmann JE, Parija S, Prabhakaran AO, Moonan PK, Chadha VK. Relationship between nutritional support and tuberculosis treatment outcomes in West Bengal, India. *Journal of Tuberculosis Research*. 2016;4(4):213. dx.doi.org/10.4236/2Fjtr.2016.44023.
21. Al-Otaibi F, El Hazmi MM. Extra-pulmonary tuberculosis in Saudi Arabia. *Indian Journal of Pathology and Microbiology*. 2010;53(2):227.
22. Yang Z, Kong Y, Wilson F, Foxman B, Fowler AH, Marrs CF, Cave MD, Bates JH. Identification of risk factors for extrapulmonary tuberculosis. *Clinical infectious diseases*. 2004 ;38(2):199-205. https://doi.org/10.1086/380644.
23. Sreeramareddy CT, Panduru KV, Verma SC, Joshi HS, Bates MN. Comparison of pulmonary and extrapulmonary tuberculosis in Nepal-a hospital-based retrospective study. *BMC Infectious Diseases*. 2008;8(1):1-7. http://www.biomedcentral.com/1471-2334/8/8.
24. Bates MN, Khalakdina A, Pai M, Chang L, Lessa F, Smith KR. Risk of tuberculosis from exposure to tobacco smoke: a systematic review and meta-analysis. *Archives of Internal Medicine*. 2007;167(4):335-42. doi:10.1001/archinte.167.4.335.