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Prevalence and determent risk factors of active pulmonary tuberculosis in federal prison administration high security and Kilinto appointment prison centers at Addis Ababa, Ethiopia

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Research Project submission form

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This is to certify that the thesis paper prepared by Henock Abayineh, entitled: Prevalence and Associated Risk Factors of Pulmonary Tuberculosis among inmates at Federal Prison Administration of Ethiopia: The Case of Addis Ababa High Security Prison and Kilinto Remand Prison centers. And submitted in partial fulfillment of the requirements for Master of Science degree in Clinical Laboratory Sciences (Diagnostic and Public Health Microbiology Specialty track) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the Examining Committee:

Examiner_____ Signature _____Date _____

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_____

Chairman of the Department or Graduate Program Coordinator

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LIST OF ABBREVIATIONS

AAU	Addis Ababa University
AFB	Acid-Fast Bacilli
AIDS	Acquired Immune deficiency Syndrome
QA	Quality assurance
EPHI	Ethiopian Public Health Institute
EQA	External Quality Assurance
CDR	Case Detection Rate
DOTS	Directly Observed Therapy Short-course
EPTB-	Extra pulmonary Tuberculosis
FM/ZN	Florescent Microscopy/Ziehl-nelson
FMOH	Federal Ministry of Health
FPA	Federal Prison Administration Ethiopian
FDRE	Federal Democratic Republic of Ethiopia
HIV	Human Immunodeficiency Virus
MDR-TB	Multidrug Resistant Tuberculosis
NTPs	National Tuberculosis Control Programme
PCR	Polymerase Chain Reaction
PTB	Pulmonary Tuberculosis
QC	Quality Control
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization

OPERATIONAL DEFINITIONS

- **A Person Is Defined as TB Patient (PTB)** -if the case is confirmed bacteriological (two positive sputum smears for AFB smear or GeneXpert -positive) or a PTB patient on anti-tb treatment
- **Associated risk factors**. These include any attribute, characteristic, or exposure of an individual that increases the likelihood of developing TB.
- **MDRTB**: Defined as Resistance To At Least The Two Most Powerful First Line Anti-Tuberculosis Drugs; Isoniazid (INH) And Rifampicin (RIF)
- **Prevalence rate:** the total number of cases of TB disease that exists in the study area divided by the total Kality and Kilinto prison population.
- **Pulmonary tuberculosis**. Pulmonary tuberculosis is a disease caused by M. tuberculosis that mainly affects the lungs.
- **PTB Presumed to be**: A Person with Apparent Sign of Coughing (≥ 2 Weeks of Cough Duration), But Negative Bacteriological Tests (I.E. Negative for Sputum Smears and GeneXpert).
- **Prevalence:** prevalence of active TB disease or *MDR- TB* cases in a prison population
- **Treatment**: treatment outcomes of latent TB infection or active TB disease or MDR-TB cases

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ABSTRACT

Background: TB prevention and control practices in many correctional facilities were long needed. Particularly attention needs to be given to screening, identifying persons who are infected with Mycobacterium tuberculosis or who have active TB disease.

Objective: This study was done to assess the determinant factors for the prevalence of active pulmonary TB among presumed to be TB individuals with characteristic symptom of TB from Kality High Security Prison and Kilinto Prison Centers.

Method: a facility -based cross-sectional study design was used to recruit 218 inmates in Kality High Security and Kilinto Prison Centers, between April 1 and may 31st. Inmates were eligible for the study if they had cough for more than or equal to two weeks during the study period. Structured questionnaire was used to collect data on risk factors of pulmonary tuberculosis. Sputum samples were collected from presumed to be TB inmates and examined using sputum GeneXpert and light microscopy.

Result: From 218 examined sputum, 11/218 (5.4%) were positive. The prevalence of pulmonary tuberculosis was 5.04% (11/218) and 2.8% (6/218) as detected by GeneXpert and microscopy, respectively. 5 from Kilinto Remand prison (2.29%) and 7 from Kality High Security (3.21%) had PTB when tested with GeneXpert. From the total of 218 inmates, 92.7 % (202/218) were male where 11 (100%) of the PTB cases were male. In multivariate analysis, Prison home with less than 3 window with (AOR=3.2; 95% CI=0.9-10.31, Alcohol consumption with AOR=0.50; 95% CI=3.7-2.45, having history of TB infection (AOR=5.8; 95% CI=1.73-25.1), Age 18-45 (OR=0.15; 95% CI=0.29-0.89), had significant association with increased odds of being positive for PTB. in this study. RIF's resistance not detected.

Conclusion: 5.4 %*PTB* point prevalence in this study was twice higher than the national TB (0.211 %) indicated by National TB Indicator survey of 2013. Detected PTB was associated with being young age, availability of window, having TB history and Alcohol consumption was found to be risk factor for PTB. GeneXpert detected more *PTB* in the sputum sample (more sensitive) than microscopy.

Keywords: Prevalence, Risk Factors, PTB, Prison,

CHAPTER ONR
INTRODUCTION

1.1 Background

TB is the ninth leading cause of death worldwide and the leading cause from a single infectious agent, ranking above HIV/AIDS. In 2016, there were an estimated 1.3 million TB deaths among HIV-negative people (down from 1.7 million in 2000) and an additional 374 000 deaths among HIV-positive people. An estimated 10.4 million people fell ill with TB in 2016: 90% were adults, 65% were male, 10% were people living with HIV (74% in Africa) and 56% were in five countries: India, Indonesia, China, the Philippines and Pakistan. ([1])

Occurrence of active tuberculosis (TB) in prisons is usually reported to be much higher than the average levels reported for the corresponding general population. In prisons located in developing countries, TB has been reported as the most common cause of death. High levels of TB in prison populations are likely to be attributable to the fact that a disproportionate number of prisoners are from population groups already at high risk of TB infection and TB disease. Furthermore, the prison setting, where segregation criteria are based on crime characteristics rather than on public health concerns, may facilitate transmission. In addition, overcrowding, late case detection, inadequate treatment of infectious cases, high turnover of prisoners, and poor implementation of TB infection control measures are all known factors contributing to transmission of Mycobacterium tuberculosis ([2,3,4]).

Globally, the TB mortality rate is falling at about 3% per year. TB prevalence and incidence reduced substantially globally after the implementation of DOTs program in health facilities with steady promising decline of TB morbidity and mortality in highest TB burden countries. Despite the effort done to revert the epidemic disproportionate incidence of TB in different socio economic groups makes its control challenging and far from the expected end TB targets. Especially the burden of TB in prisons remains unchanged and still there is a huge gap to reach the most venerable groups of society ([5]).

Unprecedented high rate of drug resistant form of TB is also being reported from prison settings, this form of TB mostly emerges in prisons because of partial treatment or several

factors that promote MDR TB transmission. Prisoners thus constitute a high-risk population for MDR TB in almost every country ([6]) for these reasons, all prisoners should be screened upon entry or be asked about symptoms of TB with low resource countries, however, this practice is often not implemented properly or enforced adequately. This study conducted in Kality High Security and Kilinto Remand prisons at Addis Ababa city capital of Ethiopia systematically determine the prevalence of PTB and its associated risk factors.

1.2 Statement of the problem

Ethiopia is one of the 30 high TB burden countries. Per the WHO global TB report 2017, there were an estimated 182,000 (177 per 100,000) incident cases of TB in Ethiopia in 2017. There were an estimated 4,000 deaths (3.9 per 100,000) due to TB, excluding HIV related deaths, in Ethiopia during the same period. Per the 2017 health and health related indicators of the FMoH, tuberculosis is the third cause of death in Ethiopia. During the year 2017, a total of 127,407 TB cases were notified in Ethiopia. Among these 124,265 (97.5%) were new cases of TB, all forms. The proportion of new smear-positive, smear negative and EPTB among all new cases is 32.7%, 34.8%, and 32.5% respectively. Retreatment cases represent about 2.5 % of all TB cases notified [1, 7].

Per the Federal Minister of Health (FMOH) TB Control Program annual report, 2012 prompt identification of Presumed to be TB cases within a health facility and community is an essential and priority role of tuberculosis control program. Through awareness creation in the community on TB symptoms and the need to seek medical care, screening all clients entering a health facility for TB symptoms, identifying Presumed to be TB and Perform sputum smear examinations, tracing and examination of close contacts of TB patients, intensifying TB screening in high-risk groups should be the main strategies of TB control there by interrupting its chain of transmission by early initiation of treatment. HIV infection has been identified as a major risk factor for developing tuberculosis. The age group mainly affected is between 15 and 54 years, and this leads to grave socio-economic consequences in a country with a very high prevalence of the disease. ([8]).

Ethiopia TB case detection rate has been stable and close to 50 % for more than a decade despite annual increases in the number of notified TB cases annually. For instance, the number of notified TB cases has increased by an average of 8,500 TB cases annually for five successive years prior to 2011. However, the routine surveillance report has shown that, TB case notification has been declining every year since 2012 with an average of 13,000 TB cases per year. ([9])

Urgent response to improve TB prevention and control practices in many correctional facilities was long needed. Particularly attention need to be given to screening, identifying persons who are infected with *Mycobacterium tuberculosis* or who have active TB disease, containment preventing transmission of *Mycobacterium tuberculosis* and adequately treating persons who have active TB disease and monitoring and evaluation of the screening and containment activities need to critically be followed. Correctional-facility officials should also need to form close working relationships with local health system, which can assist correctional facilities in formulating, implementing, and evaluating these activities. Detention halls need to implement engineering control measure to reduce indoor pollution of the environment from non-respiratory protected meets with Active TB ([10])

This study therefore planned to determine the current PTB prevalence among inmates living in Addis Ababa areas. It also intended to identify PTB associated risk factors among the study participants. On the other hand, the sensitivity and specificity of microscopy and GeneXpert methods, Therefore, the detection rate of these two methods will be assessed.

1.3 Significance of the proposed study

The aim of this study is to determine the prevalence of PTB among inmates at Kality high security and Kilinto remand prison. This study also provides associated risk factors with PTB like age, sex, history of TB and Prison home with window. Case detection potency GeneXpert assessed by using microscopy method as a gold standard method. Overall, the finding of this study provides updated and current information on the status of PTB prevalence and associated risk factors.

CHAPTER TWO
LITERATURE REVIEW

According to WHO, the prevalence of TB in prisons is very high, accounting for up to 25% of the TB burden in a given country, and is reported to be 10 to 100 fold higher than in the general population, in both low- and high-incidence countries ([11]).

TB transmission in prisons poses significant risks to inmates as well as the general population. It is one of the fastest – growing epidemics in prison populations in SSA. Despite its highly endemic nature, TB among prisoners in this region is not well documented. Accurate data of TB in prisons in SSA countries are not readily available since surveillance and data reporting mechanisms are poor or non - existent. While there have been many comprehensive literature reports of TB in prisons from USA and Europe, very little research was done in developing countries including SSA([12,13]).

Major limitations for successful TB control were inaccuracy of diagnostic algorithms and the lack of adequate laboratory facilities reported by 61.5% of studies. The turnover of prisoners is high and on any given day four to six times the estimated 9 million imprisoned persons that pass-through prisons. This high dynamics and TB Prevalence poses public health concern and continues to be source of infection through prison facility employees and the visiting communities. Still prisoners' contribution for high TB Prevalence is not well understood or monitored properly. As research data shows, annual TB prevalence rate over more than double per 100,000, population as compared to the general population prevalence average are not unusual in many countries. As passive case report data shows at different counties from the report in France and Russian federation with a lowest to highest prevalence of 8.6 and 240 /100000, the general population prevalence rate 41.3 and 9,930 to prison notification rate ([13],[14,15]).

TB incidence rates are also extremely high in Africa as the report shows, 79.3 and 209.0/100000 general populations compared to 3,363.0 and 5,142cases /100,000 populations in prison Rwanda and Malawi respectively ([16,17]).

In Africa, Similar Cross sectional studies carried out in prisons of Cameroon, South Africa, Nigeria, Ivory Coast, Tanzania, and Democratic Republic of Congo showed high TB prevalence rate of3517, 3512, 2405, 9332, 3571, 1389, and 17735 cases per 100,000 populations respectively [18-23]. It was much higher than the prevalence rate in the general population of each country

Similar study from Brazil also reported high prevalence of pulmonary TB with the rate of 1,763 all forms of TB per 100,000 inhabitants from this total positive AFB were reported from 504/100,000 population which has a potential to transmits within the circle of as this study indicates the risk of developing TB were 35 times high than the national average and for prisoners incarcerated for more than 6 months were reported greater risk of developing TB (OR = 3.47; 95% CI: 2.26 -5.34) and to be waiting placement in the prison system (OR = 2.03; 95% CI: 1.32 -3.12) than all other estimated Risk for TB ([24]).

There is limited information about TB in prisons in Ethiopia. Previous studies in Ethiopia reported the prevalence of PTB as 1913 and 1482 per 100, 000 prisoners in Eastern and North Ethiopia respectively. Research data also shows prevalence of active pulmonary TB with rate of 19.4% this figure Extrapolated and the finding implies that there were 629 pulmonary tuberculosis cases per 100,000 prisoners. Smoking, previous history of treatment for pulmonary tuberculosis, poor ventilation of the cells, cough for more than four weeks before diagnosis, and decreased body mass index, were also reported as risk factors ([25, 26]).

With this all red spotted evidence for TB Prevalence in prison settings, control strategies implemented or expanded to these settings very limited due to varies reasons, still the data shows there is alarming evidence of high TB transmission risk in prison settings. In line with this fact data drown from 340 subjects in Malaysia prison Kajang assessed for skin test indurations and clue of latent TB irrespective of Age and HIV infection [27]

In addition to poorly ventilated shard rooms that promote TB transmission within inmate's addition risk factor common in prison settings, such as alcoholism, smoking, and drug use, which contribute delay in diagnosis Prisoners with undetected TB, can thus disseminate the disease to other parts of the prison or even to different prisons through moving prisoners from one prison to another. Prisoners also circulate within prisons because authorities transfer prisoners from one part of the prison to another to their poor health and are risk factors for developing TB. For these reasons, they enter prison already ill or with a higher risk of becoming ill compared to the general population. In some countries, while they are incarcerated, prisoners live under harsh and unhealthy environments and suffer from malnutrition, intense psychological and physical stress, and violence. These factors can adversely affect prisoners' immune systems and make them more vulnerable to becoming diseases with active for of TB ([28, 29]).

TB prevalence and incidence reduced substantially globally after implementation of DOTS program in health facilities with steady promising decline of TB morbidity and Mortality in most high TB Burden countries. Despite the effort done to revert the epidemic disproportionate incidence of TB in different socio economic groups makes its control challenging and far from the expected end TB targets. Especially the Burden of TB in Prisons remains unchanged and still there are huge gaps to reach the most venerable groups of society. Thus, Prevalence rates in prisons usually exceed prevalence rates in the specific country national average substantially ([30]).

Unprecedented high rate of drug resistance form of TB also reported from prison settings, this form of TB mostly emerges in prisons because of partial treatment or several factors that promotes MDR TB transmission. Prisoners thus constitute a high-risk population for MDR TB in almost every country [(31).]

Therefore, well monitored diagnostic and treatment program enhanced case finding and treatment specially reaching and treating the missed TB cases particularly those with the potential of transmission to high contact groups need to be assessed and treated. Periodic

monitoring of the epidemiology in this community also is a key aspect for controlling and subsequent management of TB and MDR-TB in prison setting.

Concerning Ethiopia, despite a successful improvement on the undergoing TB control measures, and growing awareness of TB infection during imprisonment, up to date information regarding the status was unknown. The aim of this study was to determine prevalence and associated risk factor that can increase the transmission of TB in federal Prison facilities.

CHAPTER THREE

HYPOTHESIS

Ho: The prevalence of PTB among inmates is high in Addis Ababa, Kality high security and Kilinto remand prison centers.

CHAPTER FOUR

OBJECTIVES

4.1. General objective

- To determine the prevalence of PTB and determinant risk factor among inmates who imprisoned at Kality high security and Kilinto remand prison centers, Addis Ababa, Ethiopia.

4.2. Specific Objectives

- To determine the prevalence of PTB among inmates who imprisoned at Kality high security and Kilinto remand prison centers, Addis Ababa, Ethiopia.
- To assess associated risk factors at the study site.
- To assess the sensitivity of GeneXpert against microscopy in detecting TB infection among the study participants.

CHAPTER FIVE
MATERIALS AND METHODS

5.1 study area

Federal Prison Administration (FPA) was established under the FDRE, Federal Attorney General with a mission of upholding the rule of law. The FPA has about seven prison site health facilities at different levels of structure from clinic, health center to a general hospital, where multitude of prisoners, warder officers and their families access health care services.

Addis Ababa High Security and Kilinto Remand prisons are the two prison centers that are found adjacent to each other in the Akaki Kality sub-city, Addis Ababa. The setup of these two prison centers is designed with a capacity to accommodate more than 5,343 inmates of both sexes and its relative location is placed on the out skirts of the Akaki- Kality sub-city. The inmates in these centers include sentenced prisoners and trial-awaiting ones.

At this time, according to the information obtained from the prison admin office, the number of prisoners in both prison centers is estimated at 5,343. In terms of their sex, while 85% of them are males the remaining 15 % are females. These days, the custodies are eventually agglomerated with an increasingly infiltrating migrant population from nearby rural areas that has given rise to seemingly busy services area exhibited with adjacency of the Kality Drivers Training Institute, Addis Ababa Technology University and Tirunesh Beijing Hospital, to name a few. The vicinity is home to several low-income earning populations.

5.2 Study design and Period

Facility -based cross-sectional study was conducted at Kality high security and Kilinto remand prison conducted from May/1/2017 –June 30/2017 Kality and Kilinto prisons. All inmates underwent TB symptom screening according to WHO criteria. From the identified TB-suspects, two sputum samples were analyzed using ZN smear microscopy and GeneXpert. A standardized questionnaire assessing TB risk factors was completed for each TB suspect.

5.3Population

5.3.1**Source** population

The source population of the study was all inmates in Kality high security and Kilinto remand prison centers of Addis Ababa city, Ethiopia.

5.3.2 Study population

Study population inmates with reproductive age >18 years, at least two weeks caught at the time of the study period were the study population and they were consented to participate in the study and signed the informed consent forms were enrolled on the study**.**

5.4 Eligibility criteria

5.4.1 Inclusions Criteria

- All consented voluntary inmates with >18 years of age and two weeks caught at the study sites during the study period.

5.4.2 Exclusion Criteria

- Serious illness
- Known TB status followed by treatment and continuous anti-TB treatment follow up during imprisonment

5.5 Study Variables

5.5.1 Dependent variables

- Prevalence PTB
- Risk factors associated with PTB

5.5.2 Independent variables

- Smoking
- Size of sharing room
- History of TB
- Duration of stay imprisoned

- Low BMI
- Educational status
- Alchol consuption
- Co-infection
- Number of inmates in the room

5.6 Measurement and Data collection

5.6.1 Sample size determination

The sample size was determined based on the 8.9% prevalence data from previous publication from Eastern Ethiopia using the formula for single proportion and with a desired 5% margin of error and 95% confidence interval plus 10% non-response rate [18].

$$n = \frac{Z\alpha/2 1((q=1-p) = (1.96)^2(0.089)\ (1-0.089)}{d^2} = \frac{}{0.05^2} = 125+10\% = 137$$

n = sample size

Zα/2 = the standard normal value for the level of confidence desired 1.96 at 95% C.I.

d = margin of error, required size of standard error (at 95% Confidence level)

p = Proportion of expected prevalence *(q=1-p)*.

5.6.2 Sampling Technique

Because the samples were drawn from two separate institutions and there was also a design effect faced, the researcher was forced to multiply the total sample size by 1.5 i.e. 137*1.5=205+, to just make the sample more representative, in lieu of 137. Accordingly, a total of 218 symptomatic individuals were included using purposive sampling technique from each cluster or zone, which is a customarily practiced segregation of prisoners for security reasons. In addition to each positive case from this study, two to ten potential contacts were considered to have contracted the disease given the frequency and extent of exposure for screening based on the verbal witness obtained from identified MTB positive index cases.

5.7 Data collection

5.7.1 Socio-demographic data

After obtaining informed consent, a structured questionnaire was administered to document the ages, socio-economic (level of education, marital, occupation status, family size), Smoking, Size of sharing room, History of TB, Duration of stay imprisoned, Low BMI, Educational status, Co-infection(area of residence) data on participants.

5.7.2 Data collection tool

Semi-structured questionnaire was used to collect socio-demographic data and risk factors. The tool was prepared after reviewing different related literatures. The original questionnaire which was prepared in English language was used by data collectors for data collection. Interviewers were well trained, and all have practiced on sample collection how to interview and fill the data collection tool three days before the actual study started.

5.7.3 Sputum Sample collection

After reading verbal consent and getting the signature from each study participants, sputum sample was collected. Two early morning sputum specimens were collected on two consecutive days using coded and clean plastic containers by laboratory personnel per WHO guidelines on sputum collection procedure (32). The collected specimen was pooled in one container and daily transported using ice box to the laboratory for smear microscopy and GeneXpert.

5.7.4 Direct smear microscopy of the sputum

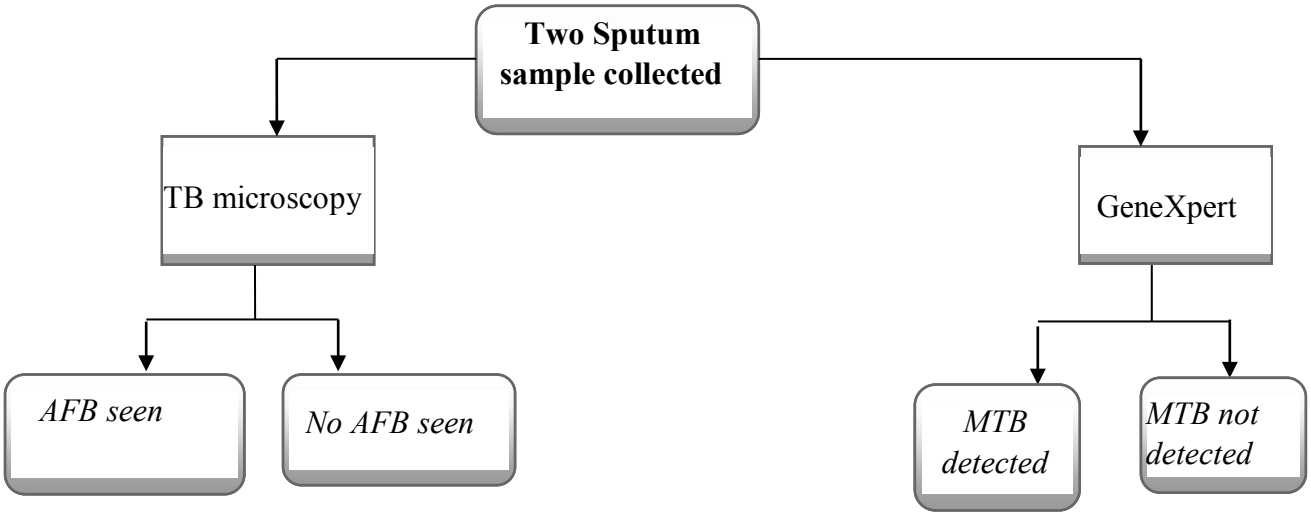
The common staining technique, (Ziehl–Nielsen) procedure for direct smear microscopy was used per NTCP protocol [(1).] A positive result indicates the presence of AFB in the specimen and the individual tested is considered to have smeared positive PTB. A negative result in this method indicates that no acid-fast bacilli are seen in 100 fields and the individual tested is considered to have no smear positive PTB. All sputum specimens were stained and examined in the microscope (100 fields) by trained

laboratory technicians. It was conducted at a laboratory of Federal Prison Administration of Ethiopia.

5.7.5 GeneXpert

GeneXpert was tested at federal prison administration general hospital laboratory per the manufacturer and facility SOP to test GeneXpert for TB. The presence or absence of MTB organism and RIF resistance was verified and documented at respective data sheet attached with study questionnaire at facility using POC testing device GeneXpert MTB/RIF assay from direct sputum samples after diluting with sample dilute buffer provided with cartridge then incubated for 15 min with interval mixing finally loaded in to the machine after recommended bar code encoding system and wait until it finalize internal RT-PCR process and reported necessary a control, patient result data according to Cepheid, standard operating procedure or job aid.

Principle of sample collection



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The sputum sample from participants was collected and used for the detection of PTB. Smeared and prepared sample was tested using microscopy and GeneXpert test methods.

5.8 Data management and analysis

The gathered data was entered in to SPSS V 20 and double checked before analysis. Then the data has been exported to SPSS version 20 for analysis. The descriptive statistics (mean, percentages or frequency) was calculated. Finally, the bivariate logistic regression analysis was used to see the relation between dependent variable and independent variables. Probability values (P) of < 0.05 were considered as statistically significant and the study findings were explained in words and tables.

5.9 Data quality assurance

5.9.1 Pre-analytical quality assurance:

Standard Operating Procedures (SOPs) were strictly followed verifying that all reagents and test kits meet expiration date and quality control parameters. The sample was collected by trained laboratory technologist and principal investigator. All slides and kits were labeled with the respective client's unique identification number. Visual inspection of any possible contamination of collected sample was performed. The manufacturer's storage temperature specifications were adhered to by monitoring the air temperature during transportation and storage.

5.9.2 Analytical phase quality assurance

All Laboratory tests (TB microscopy, GeneXpert, sputum smear preparation and reading) followed the standard procedure of each test type as written by the manufacturer. Internal quality control was performed for ZN stain on the daily basis on known negative and positive slides for *TB*. Working solution with was prepared from the filtered working solution during the study period. The expiry dates of utilized reagents, GeneXpert cartilage, and all other utilized supplies had been observed to ensure that they are not expired.

5.9.3 Post analytical quality assurance:

All laboratory results of analyzed samples were recorded on respective report formats following completing the test.

5.10 Ethical consideration

Ethical clearance had been approved and ethical granted by "Department Research and Ethical Review Committee (DRERC) of the Department of Medical Laboratory Sciences, School of Allied Health Sciences, College of Health Sciences, and Addis Ababa University. Copy of ethical clearance along with the proposal paper has been submitted to FPA.

I received a letter of concern and recognition from Kality and Kilinto prisons and dealt the inmates Administration office. After the purpose and procedures of the study was explained to the medical director and laboratory, data collectors and laboratory technologists were selected and get training on data collection and laboratory investigation three days before the actual data collection date for the study was started.

Since the start of the study, all study consented participants were enrolled as the participants of the study. Data was filled on questionnaire by assigned personnel; samples were collected within the zonal inmate's office. Samples were coded and confidentiality of study participant's data was maintained throughout the study period. Refusal not to participate in the study were not occurred, samples were collected for 218 interviewed inmates.

CHAPTER SIX

RESULTS

6.1. Description of the Study Participants

A total of 218 inmate age>18 years and at least 2 weeks of caught were included in the study. This included 59 (27%) from Kilinto prison, and 159(73%) from Kality prison center. Among the study participants 202 (92.7%) were male and the rest 16(7.3%) were female. Higher number of participants which is 35.8% is exhibited for the age group 25-31 followed by 31% for the age group 18-24 and 17.4% for 32-38. Likely, the least number of participants are observed for the age groups 39-45 and >45 which account for 11% and 9 % respectively.

SOCIO-DEMOGRAPHIC VARABLE LABEL		FREQUANCEY	PERSENT
Age	18-24	69	32%
	25-32	78	36%
	33-38	38	17%
	39-45	24	11%
	>45	9	4%
Occupation	Self-emp.	65	30%
	Government	21	10%
	Farmer	19	9%
	Merchant	27	12%
	Daily laborer	27	12%
	unemployed	59	27%
Educational status	Illiterate	40	18%
	Primary	92	42%
	Secondary	59	27%
	Higher level	27	12%
Marital status	Single	103	47%
	Married	98	45%
	Divorced	17	8%
Place	Kality	159	73%
	Kilinto	59	27%

Table 1: Socio-demographic characteristics of study participants, April. 1-May 31. 2017

The remaining 7.3% were females. This gender disparity in the research sample is attributable to, and the mirror reflection of the normal disproportional number of inmates in the research places that men out number that of women in addition to principally the inclusion criteria.

Regarding the type of occupation of participants' that they used to lead as source of their livelihood before imprisonment, majority of them that comprise 29.5% were self-employed. 12% of the participants were engaged in the second bulk sources of livelihood-merchandise and daily labor-each. Government office and farming were the third sectors each from which about 8% of the participants used to earn their living.

Pertaining educational status, 42% of the participants fall in the primary school category from grade 1-8 and 27% were from 9-10. And, the third majority that constitute 18.3% were illiterates who can never write and read at all. (Table 2).

6.2. Univariate analysis of the association between PTB and Socio-demographic factors

Almost all, except one, the risk factors assessed did not show a statistically significant association with the prevalence of tuberculosis among prisoners. Age was the only risk factor that showed a significant association with the prevalence of tuberculosis among prisoners. With OR (95% CI) value of 0.15(0.29-0.89) and a P-value of less than 0.03 age had a significant association (Table. 2)

VARIABLE	LABEL	PTB NEG	PTB POS	OR	P. VALUE
Age	18-44	200	9	0.15(0.29-0.89)	0.03
	>45	7	2		
Sex	Male	191	11		
	Female	16	0		
Religion	Orthodox	9	136		

	Protestant	1	31		
	Muslim	1	34		0.99
	Others	0	6		
Marital status	Married	101	2		
	Unmarried	94	4		
	Divorced	12	5		
Education	Illiterate	36	4	1.19(0.13-10.3)	0.7
	Primary	87	5		
	Secondary	59	0		
	Higher	25	2	0.6(0.31-1.3)	
Employment	Employed	151	9		0.87
	Unemployed	39	2		

Table 2 Univariate analysis of the association between PTB and Socio-demographic factors among studied participants, Kality and Kilinto prison April l- May 31, 2017

6.3. PTB related symptoms screening

A total of 218 participants were interviewed for symptom screening. From those interviewed, 216 (99 %) reported that they were coughing for 2 weeks or more; 165(76%) prisoners had fever and night sweating. Still 151(69 %) of them lost weight up to 15 kg. these respondents were identified as possible TB suspects per the NTP definition. All of participants reported at least one out of the four TB related symptoms mentioned during screening. (Chronic cough, fever, night sweat, weight loss) during the study period (Table 3)

PTB related symptoms variable	LABEL	FREQUANCY	PERCENT
Cough for two or more week	Yes	216	99%
	No	2	1%
Fever and night sweating	Yes	165	76%
	No	53	24%
Weight lost in kg	Yes	66	30%

	No	151	69%
Chest pain	Yes	107	49%
	No	111	51%
Shortness of breath	Yes	77	35%
	No	141	65%

Table 3: PTB related symptoms screening of study participants, April. 1-May 31. 2017

6.4. Univariate analysis of the association between PTB and symptoms

In the present study, even if all of participants screened at least one out of the four TB related symptoms none of TB symptom showed a significant association with PTB (table 4)

VARIABLE	LABEL	PTB NEG	PTB POS	OR(95% CI)	P. value
cough for two or more week	Yes	205	11		0.9
	No	2	0		
cough productive	Yes	109	5	0.7(0.22-2.5)	0.64
	No	98	6		
fever and night sweating	Yes	155	10	3.35(0.4-26.8)	0.24
	No	52	1		
Weight lost in kg	Yes	62	4	1.3(0.37-4.7)	0.6
	No	144	7		
chest pain	Yes	100	7	1.8(0.5-6.5)	0.38
	No	107	4		
shortness of breath	Yes	71	6	2.2(0.68-7.7)	0.18

Table 4. Univariate analysis of the association between PTB and symptoms related factors among studied participants, Kality and Kilinto prison April l- May 31, 2017

6.5. Facility and behavioral related risk factors

218 participants were interviewed. From those interviewed140(64.2%) prisoners stayed for ≤ 2 year in the current prisons, the majority of them, 133(61%), were Transferred from other prison, while 176(80.7%) prisoners stayed for > 2 year in other prison. In addition, 42(19.3%) of them had a history of imprisonment in another prison for > 2 year. Nevertheless, 59(27.1%) of the prisoners were jailed at Kilinto prison during a pre-trial period. They were usually transferred when they got sentence. 200 (91.7%) >100 roommate's prisoners reported of sharing a room Also, 166(76.1%) of them were sharing cell with a height<2 meter (Table 5).

VARIABLE	LABEL	FREQUENCY	PERCENT
Duration of stay	<2 Years	140	64.22%
	>2 Years	78	35.78%
Transferred from other prison	Yes	133	61.01%
	No	85	38.99%
Estimated size of prison in m^2	<100	18	8.26%
	>100	200	91.74%
Number of doors	1 Door	198	90.83%
	>2 Doors	20	9.17%
Number of windows	1-3 Window	43	19.72%
	> 3 Window	175	80.28%
Open air	Yes	215	98.62%
	No	3	1.38%
Number of roommate's	<100	58	26.61%
	>100	160	73.39%
Tobacco Smoking	Yes	88	40.37%
	No	130	59.63%
Alcohol consumption	yes	104	47.71%
	No	114	52.29%

Table 5. Facility and behavioral related risk factors among studied participants, Kality and Kilinto prison April l- May 31, 2017

175(80.2%)of them were sharing room with 1-3 Window Sixty (27.5%) prisoners were only visited by their families, at least once per week,160(73.3%) of them were in a cell that had ≥ 100prisoners, and 58(26.7%) of them were in a cell that had ≤ 100 prisoners and 198(90.8%) prisoners were in a cell with one door. All cells in the two prisons have toilet. (Table 5)

6.6. Univariate analysis of the association between PTB and Facility and behavioral related risk factors

From prison releated risk factors that showed a significant association with the prevalence of tuberculosis among prisoners were length of stay in current prison with OR (95% CI) value of 0.2(0.05-0.89) and a P-value of less than 0.03, height of the prison cell with OR (95% CI) value of 0.2(0.07-0.82) and a P-value of less than 0.02, number of windows of the prison with OR (95% CI) value of 5.5(1.5-19.0) and a P-value of less than 0.04 and number of room's mates with OR (95% CI) value of 0. 3.57(1.05-12.2) and a P-value of less than 0.034 shows a statistically significant association with the prevalence of tuberculosis among prisoners (Table 6).

VARIABLE	LABEL	PTB NEG	PTB POS	OR(95% CI)	P. value
length of stay in current prison	<2 years	125(57.3)	3(1.3)	0.2(0.05-0.89)	0.03
	>2 years	82(37.6)	8(3.6)		
Transferred from other prison	yes	124(56.8)	9(4.1)	3.0(0.6-14.3)	0.16
	No	83(38)	2(0.9)		
length of stay other prison	<2 years	166(76.1)	10(4.5)	2.4(0.3-19.8)	0.39
	>2 years	41(18.8)	1(0.45)		
Location of the prison	Kality	152(69.7)	7 (3.1)	0.6(0.17-2.2)	0.4
	Kilinto	55(25.2)	4(1.8)	2.6(0.5-13.3)	0.23
Estimated size in m^2	<100	16(7.3)	2(0.9)		
	>100	191(87.6)	9(4.1)		
Height of the prison	<2 meter	161(73.8)	5(2.2)	0.2(0.07-	0.02

cell	>2 meter	46(21.1)	62.6)	0.82)	
number of doors of the prison	1 door	179(82.1)	11(5)		0.9
	>2 doors	20(9.1)	0(0)		
number of windows of the prison	1-3 window	37(16.9)	6(2.7)	5.5(1.5-19.0)	0.04
	> 3 window	170(77.9)	5(2.2)		
open air	yes	204(93.7)	11(5)		0.9
	no	3(1.3)	0		
number of rooms meats	<100	52(23.8)	6(2.7)	3.57(1,05-12.2)	0.04
	>100	155(71.1)	5(2.2)		
Contact with TB patient	yes	30	4	3.3(0.9-12.2)	0.06
	No	177	7		
Known disease condition	Yes	16	2	2.6(0.5-13.3)	0.2
	No	191	9		
Known disease	No	191	9		
	HIV	6	1	0.2(0.02-2.2)	0.2
	Diabetics	5	0	0.8(0.04-16.9)	0.9
	other malignancy	5	1		
Smoking	Yes	85	3	0.5(0.1-2.08)	0.37
	No	122	8		
Alcohol consumption	yes	100	4	0.6(0.17-2.1)	0.4

	No	107	7		
Treated for TB	Yes	11	4	7.3(1.9-27.9)	0.04
	No	192	7		

Table 6. Univariate analysis of the association between PTB and Facility and behavioral related risk factors among studied participants, Kality and Kilinto prison April l- May 31, 2017

6.7. Multivariate analyses of associated risk factors

When looking the multivariate analysis of associated risk factors that showed a significant association with the prevalence of tuberculosis among prisoners, length of stay in current prison with AOR (95% CI) value of 6.3(1.1-0.35.1) and a P-value of less than 0.03, height of the prison cell with OR (95% CI) value of 4.2(1.2-14.2) and a P-value of less than 0.02, number of windows of the prison with OR (95% CI) value of 0.25(0.75-.0.89) and a P-value of less than 0.03 and number of room's mates with OR (95% CI) value of 0.25(0.75 -0.89) and a P-value of less than 0.034 showed statistical significance (Table 7).

VARIABLE	LABEL	PTB NEG	PTB POS	AOR(95% CI)	P. value
AGE	18-44	205	11	6.3(1.1-35.1)	0.034
	>45	2	0		
History of TB treatment	Yes	11	4	1.30.36-0.57)	0.04
	No	192	7		
Number of rooms mates	<100	155	10	0.81(0.18-0.63)	0.01
	>100	52	1		
Number of windows	<3	62	4	0.25(0.75 -0.89)	0.03
	>3	161(73.8)	5(2.2)		
Height of the cell	Yes	46(21.1)	62.6)	4.2 (1.2-14.3)	0.02
Length of stay in current prison	<2years	125(57.3)	3(1.3)		
	>2 years	82(37.6)	8(3.6)	2.2(0.68-7.7)	0.18
	Unmarri	136	5		

Marital status	ed				
	married	30	4	21.3(3.63-120.2)	0.01
	Divorced	177	7		

Table 7 Multivariate analyses of associated risk factors

6.8. TB Case Detection

6.8.1. GeneXpert PCR Test

Among the study participants, 11 (5.04%) were positive for MTB cases detected from Kality and Kilinto prisons. *MTB* infections identified in Kality 7 (63.6%) of the positive cases and *Kilinto* making up for the rest 4 (36.4%) of the positive cases (table 2), and with no RIF resistance was detected. Among the MTB positive cases, 11(100%) of them were male (Table 4). Regarding the place where the inmates selected 159 (72.9%) and 59 (26.1%) presumed to be TB Kality and Kilinto prison respectively.

6.8.2. AFB Microscopic Diagnosis

Examination of sputum by using AFB microscopy shows that, out of a total of 11 GeneXpert confirmed *MTB positive* cases, the AFB microscopy test showed positive result for only 6 (63.6%) of them. Moreover, from negative *MTB* cases, which was confirmed by the GeneXpert test, the microscopy give positive result for none of them (Table 8). AFB microscopy was 54.5% [CI: 51.5-57.2] sensitive and 100. % specific for the diagnosis of *MTB* infection, with a positive predictive value and negative predictive values of 100% and 94.95% (90.20-99 respectively.

Microscopy	**GeneXpert**			
	Positive n (%)	Negative n (%)	Total	Statistics
Positive	6(54.5)	0	6	X^2 = X2= 2.32
Negative	5(45.5)	207(100)	212	P= .3.84
Total	11(100)	207(100)	218	

Table 8: Comparison of PTB detection: Microscopy versus GeneXpert,

CHAPTER SEVEN

DISCUSSION

In this study, a total of 241 inmates imprisoned in two prison centers experienced TB Symptom screening, a total of 218 (4.51%) fulfilled the TB screening criteria out of whom 23(9.5%) were already diagnosed earlier by Ziehl-Nielsen Smear Microscopy and GeneXpert and were placed on anti-tuberculosis treatment during imprisonment. Among the remaining 218 participants, 11 (5.04%) were newly diagnosed with active pulmonary tuberculosis. Thus, the point prevalence of pulmonary TB among inmates who had cough for at least 2-weeks was 5.04% (11/218).

Extrapolation of the finding implies that there were 55045.8 pulmonary tuberculosis cases during the survey period per 100,000 prisoners. In comparison to data published by WHO in 2016, the observed prevalence in our prison study was still twice times higher than that estimated for the general Ethiopian population which was 211 per 100,000[33]. It is not a surprise to see such an increase of TB considering conditions such as overcrowding, which could also be observed in Kality prison. In this study, coupled with limited access to medical care existing in prisons, the observed overall TB prevalence in this study was much higher than what was reported in the previous Ethiopian studies ([19–21]), conducted in 2009 to 2014. Possible reasons for that might be differences in study size, strict inclusion criteria applied etc.

TB prevalence in Kality and Kilinto prisons might be also associated with overcrowding rather than decline of TB prevalence in the general population observed for Ethiopia in the last five years. The national TB survey of 2010/2011 reported TB prevalence of 77/100000 ([32]), while in 2013 the prevalence in the general population declined to 211/100000 ([33]). Further, Ethiopia is among those African countries which had achieved the 2015 global targets announced by the Stop TB partnership, reflecting the efforts of the national government and its allies to control TB in the country, including TB in prisons.

However, we observed a great variability of TB prevalence in Kality and Kilinto prisons that Seven TB cases were detected in Kality prison and four in Kilinto while TB cases of (11/218)

5054.2 per 100,000 prisoners were found in a prison, the highest TB prevalence. The data suggests that there might be relevant differences in the efficiency and commitment of the prison health workers or responsible authorities to implement systematic and effective TB-control strategies. For instance, in Kilinto prison facilities there was no any segregation area for newly diagnosed inmates with infectious TB.

Further, inmates imprisoned in rooms without a window had three times higher TB risk than those with windows. Other findings of prison studies from Ethiopia which assessed the effect of ventilation through windows were observed to have similar findings ([20, 21]) that a decreased awareness of TB and its transmission mode associated with illiteracy and lower socio-economic standard and poor health services and the lack of well-trained health professionals could have augmented the reason for the prevalence.

Sharing a cell with a TB patient or a chronically coughing prisoner was identified to be risk factors for acquiring PTB infection (Table 3). This is further augmented by the epidemiological link between newly diagnosed PTB cases, and those who were receiving anti-TB treatment and defaulters; most notably horizontal pattern (person-to-person) of transmission was documented in this study (Table 7). This is partly explained by lack of segregating TB patients, absence of pre-detention TB screening, and overcrowding that prolong period of infectiousness thus favoring transmission of M. tuberculosis.

In Kality prison, smear-positive patients were only segregated for the full initial phase of DOTS treatment, whereas prison Kilinto did not have a separation ward for TB patients. Segregation of smear-positive patients could be a priority in a prison TB control program, as these patients are the most contagious and constitute the major source of infection. Same report indicted these groups of people were at least 22% as likely as smear-positive patients to transmit TB. In addition, due to a limited diagnostic performance of direct smear microscopy; main diagnostic tool of TB in low income countries ([36]), there will be higher likelihood to miss infectious cases and categorize a smear-positive patient as negative. Hence, this should be taken into consideration of planning TB control strategies in the

prison. In this study, the length of stay in the prison was significantly associated with PTB, despite the majority of study participants stayed for the short duration (Table 4). It was similar to that of a Zambian prison study ([37]), whereas, Cameroon ([38]) studies indicated a short staying as the risk factor for TB. On the contrary Georgian ([39]) studies reported a longer staying as the risk factor. This point has already been presented in the literature review. This has also been documented usually among individuals who commit crime repeatedly, such as homeless and street gangs that are likely to be deprived of living conditions and health care, thus have greater risk of acquiring TB ([36]). Similarly, studies carried out in Cameroon ([38]) identified re-imprisonment as the risk factor for TB. Factors relating to living and crowding conditions did not show any level of significance and hence were not considered as explanatory variables for PTB prevalence in this study, though they are known to favor dissemination of TB. The fact that living and overcrowding conditions are similar for all the prisoners in all the three sites, might have precluded their effects on outcomes of TB infection. This finding was similar with that of a Zambian study ([37]); where there are no differences related to living conditions such as overcrowding and large number of prisoners per cell between culture-positive and -negative TB groups. In contrary, a case-control study in Russia ([39]) mentioned prison factors like high ratio of prisoners per available bed, not having own bed clothes, and little time out-doors as independent risk factors. Cross-sectional nature of the study could be one of the possible reasons for not observing the significance level of these factors.

Among TB symptoms, chest pain was the only symptoms significantly associated with PTB in this study (Table 5), whereas a Brazilian prison study reported a range of symptoms that had significant association with TB ([40]). Similarly, a Georgian study mentioned loss of appetite as an independent risk factor ([39]). In Thailand prisons study, weight loss made significant independent contribution to a diagnosis of smear-positive TB ([34]). One of the possible reasons is that most of them had a common source of food, where every prisoner was provided three meals per day. So this may reduce individual variation and certainly its effect on outcomes of TB infection studies in Cameron ([38]) and Georgia ([39]) mentioned low BMI (i.e. ≤ 18.5 or ≤ 20 kg/m2) as the risk factor for TB.

CHAPTER EIGHT
STRENGTH AND LIMITATION OF THE STUDY

8.1 Strength of the Study

This study outshines having the following specific strengths to name a few:

- The study is conducted in the prison setting where data is scarcely available for strict security reason
- The study drawn relatively a larger sample size which makes it representative
- The study used current automated machine to accurately detect PTB and RIF resistance
- It has tried to discuss as much risk factors as possible responsible for active PTB in prison setting
- It detected 11 new PTB cases among 218 presumed to be PTB cases which has its own contribution in the national TB control Programme
- The study used SPSS version 20 statistical software correctly to present data accurately
- The study had well known advisors in the area of the field who guided the research work excellently

8.2. Limitation of the study

The study experienced some limitations that necessitate the results to be interpreted with caution. First, the relatively strict inclusion criteria for symptomatic prisoners which demand productive cough for at least 2 weeks plus one additional TB symptom might have resulted in an overestimate of TB-prevalence. This assumption might be supported by the low proportion (4.8 %) of Presumed to be TB in this study compared to other publications [5, 6]. On the other hand, study assistants trained on data collection could have biased data due to over or under reporting of risk factors or prisoners might not remember facts correctly or did not want to reveal the true information. Third, our findings might not be representative of the prison population of the whole country due to restriction to prisons only in Addis Ababa. Fourth, weak association between active pulmonary TB and other risk factors for which data might have been corrupted during collection stage otherwise.

CHAPTER NINE

CONCLUSION AND RECOMMENDATION

9.1. Conclusion

According to the findings made by the MOH, 2017, the national prevalence of Active Pulmonary TB was estimated at 842.2 per 100,000 populations. Compatible to this finding, prisons are the key targets of TB prevention interventions in the developing countries all and particularly in Ethiopia which ranks second in TB positive population in Africa. Based on the findings, this research similarly has come up with the following conclusions.

- Kilinto and Kality prisons combined in Addis Ababa are observed to have the highest TB positive population of 0.82% as compared to the national prevalence which is 2% that is 55% caused by congested living condition
- 47.8% new TB positive result is true among inmates after entering the prison associated to limited number of window availability and/or willingness to open them for sufficient ventilation

9.2. Recommendation

The researcher of this work proposes the following basic recommendations to be implemented in the prison settings to prevent Active Pulmonary TB, based on the conclusions set above.

- As correction establishments, prisons are vested primary with the responsibility of confining inmates for correction and imprisonment. Hence, they undoubtedly give little or no attention for sufficient availability of windows, or to keep them open. However, the prison admin is recommended to keeping rooms open for sufficient aeration.
- Because inmates in prisons are often accommodated based on their criminal intensity and sex, health issues such as TB should continue by prison admin staffs to be considered for accommodation reasons.
- Health education among prisoners should be intensified with appropriate action-oriented habits of health seeking behaviors.

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Annexes

I. Annex I: Participant information sheet (English version)

Participant information sheet

Name of main researcher:	Henock Abayineh
Advisors/Coinvestigators:	Kassu Desta
	Mengistu Tadesse
Name of institute:	AAU and FPA
Funded by:	FPA
Reviewed by:	AAU

Title of the project: Prevalence and Associated Risk Factors of Pulmonary Tuberculosis among inmates at Federal Prison Administration of Ethiopia: The Case of Addis Ababa High Security Prison and Kilinto Remand Prison Centers.

Why do we need to conduct the study?

As WHO recommendation, inmates should be screened PTB to receive therapy and to prevent transmission to the community to determine Associated Risk Factors of Pulmonary Tuberculosis among inmates at Federal Prison Administration of Ethiopia. The result of this study can hint ways for national TB control Programme. Although, limited studies have focused on similar objectives, they all are undertaken in different geographical locations even in Africa regarding these crucial phenomena; therefore, this study will have contribution to the scientific database and baseline data in Ethiopia. The main objective of this study is to determine *Prevalence and Associated Risk Factors of Pulmonary*

Tuberculosis among inmates at Federal Prison Administration of Ethiopia: The Case of Addis Ababa High Security Prison and Kilinto Remand Prison Centers.

Study procedure

To achieve planned objective, a physician/nurse will select symptomatic prisoners which demand productive cough based on the criteria and screen for TB disease by using physical and clinical examination (symptom screening). Those inmates will undergo TB infection screening using sputum AFB microscopy and GeneXpert and a total of 10 ml blood (2 tea spoon bloods) will be collected for QFTB-GIT assay, IFN-□, IL-4 and IL-10 ELISPOT assay and TB IgG ELISA determination. Those women who found to have active TB will participate further in the study. All tests will be carried out by laboratory technologists at FPA General Hospital laboratory, Addis Ababa, Ethiopia. Your attending Physician/Nurse will tell you the clinical and laboratory test result (except blood tests) and you will get appropriate treatment.

What is expected from me as a study participant?

On volunteer base, physician/nurse will ask you about personal identification information (age, sex, address etc.) and about your health condition to assist the physical and clinical examination.

In addition, if you agree to participate in this study, you will be requested to give two sputum and to. If you give sputum, you are kindly requested to adhere to the sputum specimen collection schedule and procedure that is indicated to you by your health care providers. Your full commitment to participate is helpful for the prevention, diagnosis and control of TB in prison. You need to know that your result might be discussed with other appropriate individuals out of these health facilities. But your name, address and phone number will not be disclosed and rather an identification code will be used in such condition.

How much time will I spent to participate in this study?

You will spend one hour until the specimen is collected, the questioner is filled and the consent form is signed.

What are the risks of participating in this study?

No serious health hazard will be caused due to your participation in the study which is confirmed through Ethical clearance committee of Addis Ababa University and FPA Hospital. Screening test and will have no serious adverse effects related to the procedure. The procedure used sputum and it will have no effect on the participants,

How my information is to be kept in secrete?

All information that you give and the result from your specimen will be used for this study only. Only limited number of health professionals will have access to the information. All the information will be encoded in the computer and saved with password protection.

What are benefits from participation?

Although many inmates can benefit from PTB treatment, those who are most likely to benefit are those PTB inmates who will be tested through sputum GeneXpert and AFB microscopy. However, routine testing of not practical due to cost, and therefore is not routinely done in Ethiopia. One of the benefits of this study is that you will have sputum AFB microscopy and GeneXpert performed and this will help you to know whether you will have active

PTB and you will get early treatment this will help to prevent progression to drug resistance TB and transmission to others. You will also obtain all the results of the analysis for free and you will not directly benefit from the result of the blood test, but the test could help in the development of improved diagnostic tests and treatment in the future for patients like you.

Incentives and compensation

You will not be paid for your participation. However, any expense that you will spend because of the study will be covered by the project. If the results of the laboratory examinations do have a direct benefit in your health, you can discuss with the physician and get your results and treatment as required. However, this study will benefit at large the community in minimizing the burden of TB.

What are my rights as a participant of the study?

You have the right to withdraw yourself from the study at any time and your sample will not be used for the study purpose. All the service provided in the health facilities will not

be discontinued. You are also welcomed if you have any question for further explanation about the study.

Agreement

After reading and listening about the study procedures and other related issues done in the study, you will be kindly requested to put your signature of agreement. Your signature indicates that your participation is only based on your volunteer participation.

What can I do if I have a question or a problem?

Please direct any question you may encountered during this study to:

Principal Investigator

Name: Henock Abayineh: phone number: +251911627887 email henoka71@gmail.com

Advisor :

Name: Kassu Desta : phone number: +251911107099 email kasudesta2020@gmail.com

Name: Mengistu Tadesse phone number: +25191111837 6email**: tadessemengistu@gmail.com**

For additional information, please contact Addis Ababa University, College of Allied Health Science, and Department of Medical Laboratory Science at:

Telephone: +251-1-12-75-51-70

II. Annex II: Participant information sheet (Amharic version)

ለጥናቱ ተሳታፊ የሚሰጥ መረጃ

ዋና ተመራማሪ: ሔኖክ አባይነህ

አማካሪዎች፡ካሱ ደስታ እና መንግስቱ ታደሰ

የተቋሙ ስም፡ አዲስ አበባ ዩኒቨርስቲ

የጥናቱ በጀት የሚሸፈነው፡የፌደራል ማረሚያ ቤቶች አስተዳደር የገመገመው ክፍል፡አዲስ አበባ ዩኒቨርስቲ የተከበሩ ተሳታፊ፡በመጀማሪያ በህግ ታራሚዎች የቲቢ ህመም የስርጭት መጠነና የተጋላጭነት መንስኤ በቲቢ ህመም በተደጋጋሚ በሚጋለጡ የህብረተሰብ ክፍሎች ላይ በሚደረገው ጥናት ለመሳተፍ ፍቃደኛነት ወትን እንጠይቃለን፡፡

ይህ ጥናት በአዲስ አባባ ዩኒቨርሲቲ ህክምና ላቦራቶሪ ሳይንስ ትምህርት ክፍል ፤ የፌደራል ማረሚያ ቤቶች አስተዳደር ስነ-ምግባር ገምጋሚ ኮሚቴዎች ጥናቱ እንዲካሄድ ፍቃድ አግኝቷል። የጥናቱን ሁኔታ እና ዓላማ በተመለከተ ግልጽ የሆነ ማብራሪያ የሚሰጥ ሲሆን፤በተጨማሪም ግልጽ ያልሆነለዎትን ማንኛውንም ጥያቄ መጠየቅ ይችላሉ፡፡በዚህ ጥናት ላይ የሚኖረዎት ተሳትፎ ሙሉ በሙሉ በፍቃድኝነት ላይ የተመሠረተ ነው፡፡በጥናቱ ለመሳተፍ የሚስማሙ ከሆነ በጽሑፍ ወይም በጣት ፊርማዎትን ማስቀመጥ የጠበቅበዎታል፤ ከፈለጉ ይህንን የመረጃ ቅጽ አንድ ቅጂ ለራስዎ ሊያስቀሩ ይችላሉ፡፡

የጥናቱ አርዕስት፡-የቲቢህ መም የስርጭት መጠነና የተጋላጭነት መንስኤ በቲቢ ህመም በተደጋጋሚ በሚጋለጡ የህብረተሰ ብክፍሎች፣ አዱስ አበባ ዩኒቨርሲቲ፣ ኢትዮጵያ የምርምሩ ዓላማ የዓለም የጤና ድርጅት፤ ሁሉም የህግ ታራሚዎች የቲቢ አምጪ የሆኑ ተህዋስን ለመከላከል የቲቢ መከላከያ መድሃኒት መውሰድ እንዳለባቸው ገልጸል፤ ይህም ወደ መድሀኒት የተላመደ ቲቢ በሽታ እንዳይቀየር እና ሌሎች እንዳይተላለፍ ለማድረግ ያስችላል፤ ይሁን እንጂ የዚህ በሽታ ስርጭት እና የበሽታ መንስኤ ምክንያቶች የተጠቁ የህግታራሚዎች ላይ እስካሁን አይታወቅም፡፡በአሁኑ ጊዜ ይህን በሽታ ለመከላከል ጥረት እየተደረገ ቢሆንም፤ በኢትዮጵያ ውስጥ ግን መከላከያው እስካሁን ያለው የመከላከል አቅም እስካሁን አይታውቅም፡፡ አሁን እኛ የምናደርገው ጥናት የቲቢ አምጪ ተህዋሳት ተጠቂ የሁኑ የህግ ታራሚዎች በሽታውን ለመከላከል በሚደረገው ዓለም አቀፋዊ ጥረት የበኩላችንን አስተዋፅኦ ለማድረግ ነው፡፡

የዚህ ጥናት ውጤትም የመከላከል አቅም ላይ መሠረት አድርጎ አዲስ የመመርመሪያ ዜዴ እና መከላከያ ለመፍጠር የሚያስፈልገውን ነገር ሊጠቁመን ይችላል፡፡

ይህንን የሚመስሉ ጥናቶች በተለያዩ የዓለማችን ክፍሎች ኢትዮጵያ እንዲሁም በአፍሪካ እየተሰሩ ነው፡፡ ስለዚህም የዚህ ጥናት የመጨረሻ ግኝት ከማንኛውም አገር የምርምር ግኝት ይልቅ በአገራችን ያለውን ሁኔታ አገናዝቦ በሃገራችን ለሚኖሩ በቲቢ ተጠቂነት የተጋለጡ የህግ ታራሚዎች ሊጠቅም የችላል፡፡የጥናቱ ቅደም ተከተል ከላይ የተጠቀሰውን የጥናቱን ዓላማ ለማሳካት ሀኪም ወይም ነርስ ኩሁለት ሳምንት በላይ የሚስሉ የህግታራሚዎች መርጠው በቲቢ በሽታ መያዝ አለመያዛቸውን ለማወቅ የቲቢ ምልክቶች ምርመራ ይደረግላቸዋል፡፡በምርመራው ውጤት በቲቢ በሽታ እንደተያዙ ከዚህ በፊት የቲቢ ህሙማን መድሀኒት እየወሰዱ ያሉ በጥናቱ አይካተቱም፡፡ በማስከተልም የቲቢ በሽታ የተጠረጠሩ በቲቢ አምጭ ተህዋስ እንደተጠቁ እና እንዳልተጠቁ በማይክሮስኮፕ እና በጂን ኤክስፐርት ላይ ምርመራ ይደረግላቸዋል፡፡

5ሚ.ሜ እና ከዚያ በላይ የቀላ ክብ ፒፒዲ የሰረገበት ቦታ ላይ ከታየ ያቺ እናት በቲቢ አምጪ ድብቅ ተህዋስ ተጠቂ ናት ማለት ነው፡፡ በአጠቃላይ በህክታ በማይክሮስኮፕ እና ጂንኤክስፐረት ዘመናዊ የላብራቶሪ ዘዴዎችን ለመስራት እንጠቀምበታለን፡፡እነዚህ የላቦራቶሪ ስራዎች የሚሰሩት በዋና ተመራማሪው በፌደራል ማረሚያቤቶች አስተዳደር ላቦራቶሪ ክፍል ነው፡፡ የሚያከመዎት ሀኪም ወይም ነርስ ስለ ህክምና ላቦራቶሪ ምርመራ ወይም ውጤት (ከደም ውጤት በስተቀር) ይነገርዎታል፡፡

የጥናቱ ተሳታፊ በመሆኔ የሚጠበቅብኝ ምንድን ነው?

በጥናቱ ለመሳተፍ ፈቃደኛ ከሆኑ ሀኪሙ/ነርስ የግልና አንዳንድ የህክምና ምርመራ መረጃዎች ለማግኘት ጥያቄዎችን ሊጠይቁዎት ይችላሉ፡፡ ከዚህ በተጨማሪ የህክታ ምርመራ እንዲመረመሩ በአክብሮት እንጠይቃለን፡፡ እርስዎ በዚህ ጥናት ላይ መሳተፍዎ የህግታራሚዎች የቲቢ በሽታ ምርመራ፣ መከላከልና መቆጣጠር ዘመቻ ላይ ትልቅ አስተዋፅኦ አለው፡፡

በተጨማሪም ከተወሰደው ናሙና ላይ የሚገኙ መረጃዎች ከዚህ ሆስፒታል ውጭ ለሚገኙ እና ለሥራው አግባብነት ላላቸው ሰዎች ቢነገር የማይቃወሙ መሆኑን መስማማት ይጠበቅበወታል፡፡ይሁን እንጂ ይህ ዓይነቱ መረጃ የርስዎን ማንነት የሚገልጹ መረጃዎችን ማለትም ስም፤ አድራሻ እና ስልክ ቁጥር የመሳሰሉትን መረጃዎችን አይጨምርም፡፡ ይልቁን ምለዚህጥናትአገልግሎትብቻየሚውልእርሰዎንለማወቅየሚያስችልመለያቁጥርላይእንዲውልይደረጋል፡፡

በዚህ ጥናት መሳተፍ ምን ያህል ጊዜይፈጃል? የተዘጋጀውን መጠይቅ ለሞሙላት ፤ የስምምነት ቅጹ ለመፈረም እና ናሙና ለመስጠት አንድ ሰዓት ያስፈልጋል፡፡በዚህጥናትመሳተፍየሚያስከትላቸውየጎንዮሽጉዳትምንድናቸው?

በዚህ ጥናት በመሳተፋችሁ በሰዉነታችሁና በጤናችሁ ላይ ምንም ችግር እንደማያመጣ በጥንቃቄ ታይቶ በአዲስ አበባ ዩኒቨርስቲ እና በፌደራል ማረሚያ ቤቶች አስተዳደር ስነ-ምግባር ገምጋሚ ኮሚቴዎች ፍቃድ ተሰጥቶታል፡፡እንዲሁም ናሙናው በሚሰበሰብበት ወቅት ምንም ዓይነት ችግር በህግታራሚዎች ላይ አያስከትልብዎትም፡፡ ስለዚህም የሚያጡት ነገር ቢኖር መጠይቁን ለሞምላት የሚያጠፉት ጊዜ ነው፡፡

የህክምና መረጃዬ በሚስጥር ተጠብቆ መቆየት የሚችለው እንዴት ነው? ስለ ራስዎ የሰጡት ማንኛውም መረጃ እና ከተወሰደው ናሙና ላይ የተገኘው የላቦራቶሪ ውጤት የሚውለው ለጥናቱ ዓላማ ብቻ ነው፡፡

ይህን ማህደር ሊያገኙ የሚችሉት የተወሰኑ የጥናቱ ተባባሪ ሠራተኞች ብቻ ናቸው፡፡ ከዚያም በላይ ስለ እርስዎ ያለውን ማንኛውንም መረጃ የተለየ የይለፍ ቃል ባለው የኮምፒውተር የመረጃ ማህደር ውስጥ እንዲቀመጥ ይደረጋል፡፡

በዚህ ጥናት መሳተፍ የሚያስገኛቸው ጥቅሞች ምንድን ናቸው? ምንም እንኳን ብዙ በማረሚያ ቤቶች ውስጥ በቲቢ መከላከያ መድሃኒት ሊጠቀሙ ቢችሉም፤እንደዚህ አይነት በፈቃደኝነት ላይ የተመሰረተ የህክታ ምርመራ እና ባለየምርመራ ዘዴ ተመርምረው በቲቢ አምጭ ተህዋስ እንደተጠቁ የህግታራሚዎች ግን ከማንም በላይ ይጠቀማሉ፡፡ ነገር ግን ይህ ዓይነቱ አሠራር ከበጀት እጥረት የተነሳ በኢትዮጵያ ተግባራዊ እየሆነ አይደለም፡፡ስለዚህ አንዱ ጥቅም ቲቢ የተጠረጠሩ በማይክሮስኮፕ እና በጂንኤክስፐርት የቲቢ ተህዋስ እንደተጠቁ ወይም እንዳልተጠቁ ለማወቅ ያስችላል ስለዚህም አስፈላጊውን ቅድመ ምርመራ በማድረግ የቲቢ በሽታን ለመከላከል እና ሌሎች እንዳይተላለፍ ያስችላል፤በምርመራውም ከቲቢ መከላከያ መድሃኒት ብዙ እንደሚጠቀሙ ማወቅ ይቻላል፡፡ በተጨማሪም የምርመራውን ውጤት በነጻ ማግኘት ይችላሉ፡፡ምንም እንኳን እርስዎ ከደም ውጤት በቀጥ ታባይጠቀሙም እነዚህ ምርመራዎች እና የምርመራ ውጤቶች ወደ ፊት ለእንደርሰዎ ዓይነት ታካሚዎች የተሻለ የምርመራ ዘዴ ለማግኘት ይጠቅማል፡፡ ማበረታቻና ማካካሻ እርስዎ በዚህ ጥናት በመሳተፍዎ ብቻ የሚከፈልዎት ተጨማሪ የገንዘብ ክፍያ የለም፡፡ ነገር ግን ወደ እዚህ የጤና ማእከል ሲመላለሱ

የሚያወጡት ወጪ ሙሉ በሙሉ ይከፈልዎታል። የምርመራ ዉጤትዎ አስፈላጊ ከሆነ ከሀኪም ጋ በመነጋገር በቂ ሕክምና ይደረግላቸዋል፡፡ይሁን እንጂ ይህ ጥናት በህብረተሰባችን ያለው የቲቢ በሽታ ስርጭት በመቀነስ ያለዉ እንድምታ ትልቅ ስለሆነ በዚህ ጥናት በመሳተፍ የበኩላችሁን አስተዋፅ አያድርጉ፡፡

በዚህ ጥናት ተሳታፊ በመሆኔ መብቶቼ ምንድን ናቸው? በጥናቱ ውስጥ ያለዎትን ተሳትፎ በማንኛውም ጊዜ የማቋረጥ ሙሉ መብትዎ የተጠበቀ ከመሆኑም በላይ የሰጡት ናሙና ለጥናቱ ዓላማ አይውልም፡፡በተጨማሪም ራስዎን ከጥናቱ በማግለልዎ ምክንያት የሚቀርብዎት ምንም ዓይነት የሆስፒታል አገልግሎት አይኖርም፡፡ ከዚህም በተጨማሪ ጥናቱን በተመለከተ ማንኛውን ምዓይነት ጥያቄ የመጠየቅ እና ገለፃ የማግኘት መብት አለዎት፡፡

ስምምነት፡ - ጥናቱን በተመለከተ በቂ መረጃ ካገኙ በኋላ የስምምነት ፊርማ ይፈርማሉ፡፡ይህ ፊርማ የእርስዎን ፈቃደኝነትን ያረጋግጣል፡፡

ጥያቄ ካለኝ ወይም ችግር ቢያጋጥመኝ ምን ማድረግ አለብኝ ? ህንን ጥናት በተመለከተ ወይም ከዚህ ጥናት ጋር በተዛመደ መልኩ ስለ ሚያጋጥሙ ችግሮች ወይም ጥያቄ ከለዎት የሚከተለውን አድራሻ ይጠቀሙ፡፡

- ዋና ተመራማሪ፡ሔኖክ አባይነህ ስልክ +251911627887 ኢ-ሜይል-henoka71@gmail.com
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ለተጨማሪ መረጃ የአዲስ አባባ ዩኒቨርስቲ የህክምና ላቦራቶሪ ሳይንስ ትምህርት ክፍልን ስልክ(የቢሮ)

+251-1-12-75-51-መጠቀምይችላሉ፡፡

III. Annex: Consent form (English version)

Informed consent (study participants)

Name of main researcher:	Henock Abayineh.
Advisors/Co- investigators:	Kassu Desta Mengistu Tadesse
Name of institute:	AAU and FPA
Funded by:	FPA
Reviewed by:	AAU

RESEARCH TITLE: "Prevalence and Associated Risk Factors of Pulmonary Tuberculosis among inmates at Federal Prison Administration of Ethiopia: The Case of Addis Ababa High Security Prison and Kilinto Remand Prison Centers"

Name: _____Age:_____Address:_____Hospital:_____Serial number: _____

If you agree to take part, please read this form and sign the consent sheets at the end.

1. I have read, or it was read to me, the information sheet concerning this study and I understand what will be required of me if I take part in the study.
2. I am aware of the possible risk and benefits of this study.
3. I know that being in this study is voluntary.
4. I understand that at any time I may withdraw from this study without giving a reason and without affecting my normal care.
5. My questions concerning this study have been answered
6. I know that there is no special payment for being participating in the study.
7. I agree to take part in this study.

Name: _____Signature:_____Date: _____

The participant is unable to sign. As a witness, I confirm that all the information about the study was given and the participant consented to taking part.

_____ _____

Signature **Date**

We thank you for consenting to take part in the study

IV. Data Collection Sheet

1. Date, Ethiopian calendar (DD-MM-YY): ☐☐-☐☐-☐☐
2. Participant ID: ☐-☐☐☐☐☐
3. Interviewer ID: ☐-☐☐
4. Informed consent signed: ☐Yes ☐No, not eligible
5. Confirmed Kality Prisoner ☐Kality Prisoner Female Prisoner
6. Visit type (check one): ☐Entrant Screen ☐Resident Screen #1 (>30d since entrant screen) ☐Resident Screen #2 (>30d since entry)
7. Sex: ☐Male ☐Female
8. Age in years (must be at least 18 years old): ☐☐
9. Age in years (must be at least 18 years old): ☐☐
10. Prison Location: ☐Entrant ☐Resident If resident- Zone ☐Block ☐☐
11. Occupation (check one): ☐None ☐Student ☐House wife ☐Merchant ☐Gov.Employee ☐ Peasant ☐Other
12. Marital Status (check one): ☐Never married ☐Married ☐Divorced/Separated ☐Widow/ a.Widower
13. Literacy: ☐Literate ☐Illiterate
14. Educational Level (check one): ☐None ☐Elementary (0-8) ☐Secondary (9-10) ☐Preparatory (11-12) ☐University (Diploma) ☐University (Undergrad-Degree)
15. Religion (check one): ☐Orthodox Christian ☐Protestant Christian ☐Muslim ☐Other
16. Ethnicity (check one): ☐Amhara ☐Oromo ☐Tigre ☐Southern ☐Other
17. Residence before prison (check one): ☐Urban ☐Rural ☐Pastoral ☐Refugee Camp

18. Prior prison residence: ☐No ☐Yes If Yes-duration in years ☐☐

19. Current prison residence: Duration in years☐☐

20. Prior to prison, number of people in house or dwelling: ☐☐

21. Prior to prison, number of rooms in house or dwelling: ☐☐

S.NO	TB Symptom Screen Questions	Yes	No
1.	Cough > two weeks		
2.	Fever of any duration		
3.	Hemoptysis		
4.	Night Sweats of any duration		
5.	Weight loss		
6.	TB Screen Positive		

Any patient having any one of: cough for > 2 weeks, fever, night sweats, weight loss or hemoptysis is TB screen positive and should be referred to prison clinic for TB evaluation

S.NO	Additional Symptom Questions	Yes	No
A.	Current cough		
B.	Sputum Production		
C.	Fever >2 weeks		
D.	Night Sweat >2 weeks		
E.	Weight loss ≥3 kg in the last 4 weeks		
F.	Any perceived weight loss in the last 4 weeks		
G.	History of TB contact in the past one year		
H.	Loss of appetite		
I.	Swelling in the neck/armpits/elsewhere		

J.	Chest pain		
K.	Genital discharge now		
L.	Pain with urination now		
M.	Genital ulcer now		

S.No	Medical History	Yes	No	N/A
1.	TB diagnosis ever			
a)	If Yes, Year of TB diagnosis (Ethiopian calendar)?	□□□□		
2.	Current Anti-TB treatment			
3.	Previous Anti-TB treatment			
a)	If Yes to previous Anti-TB treatment, Year of anti TB treatment (Ethiopian calendar)?	□□		
b)	If Yes to previous Anti-TB treatment, Total duration of TB treatment, in months	□□		
c)	If Yes to previous Anti-TB treatment, Completed TB treatment			
4.	HIV diagnosis ever			
a)	If Yes, Year of diagnosis (Ethiopian calendar)	□□□□		
b)	Currently on antiretroviral (anti-HIV) medication?			
5.	Diabetes diagnosis ever			
6.	Cancer diagnosis ever			
	TB Screen Positive			
b)	Currently on antiretroviral (anti-HIV) medication?			
5.	Diabetes diagnosis ever			
6.	Cancer diagnosis ever			

7.	Current Smoking cigarettes per day: 0= none; 1= 1-5; 2 = 6-10; 3 = >10	☐
8.	Alcohol use prior to prison drinks: 0 = none; 1 = less than 1 per day; 2 = 2 or more drinks per day OR 6 or more drinks on one occasion. (1 drink= 355mL f Tella/beer or 150mL of Tej/wine 45mL of Arkie/dry alcohol)	☐
9.	Current use of khat: 0 = Never; 1 = less than once per week; 2 = 2 or more times per week	☐
10.	Number of People you had sex with in your life? If participant refuses to answer the question, please check "Refuse" box.	☐☐☐☐Refuse
11.	Weight in Kg.	☐☐☐
12.	Height in Centimeters	☐☐☐
TB: Referred to laboratory/radiology with request forms for TB workup? [Was subject TB screen positive (Q#6) OR if HIV+ with current cough (a)]		

V. መረጃ መሰብሰቢያ ቅጽ

በአዲስአበባ ዩንቨርስቲ የጤና ሳይንስ ኮሌጅ የሕክምና ላብራቶሪ ዲፓርትመንት ይህ መረጃ መሰብሰቢያ ቅጽ ስለተሳታፊዎች አጠቃላይ ለቲቢ ባክቴሪያ ሊያጋልጣቸው የሚችሉትን ምክንያቶች ለማወቅ የሚረዳ መረጃ መሰብሰቢያ ቅጽ ነው፡፡

ለጥናቱ መሳካት እና ትክክለኛነት ያግዘን ዘንድ ጥያቄዎችን በጥንቃቄ አንብበው ወይም ተረድተው በታማኝነት ያለምንም ፍራቻ እንዲሞሉልን በትህትና እንጠይቃለን፡፡

የተቋሙ ስም----------ዓ/ም----------

የጥናቱ ርዕስ ፡የቲቢ ህመም የስርጭት መጠነና የተጋላጭነት መንስኤ በተላመደ ቲቢ ህመም በተደጋጋሚ በሚጋለጡ የህብረተሰብ ክፍሎች

ተ. ቁ	ጥያቄ	መልስ
1	(በኢትዮጵያ ቀን አቆጣጠር) (ቀን-ወር-ዓ.ም):	□□-□□-□□
2	የጥናት መለያ ቁጥር:	□-□□□□□
3	ፆታ	□ወንድ□ሴት
4	ዕድሜ(ከ 18 አመት በላይ መሆን አለበት):	□□
5	ሃይማኖት:	□ኦርቶዶክስ□ሙስሊም□ፕሮቴስታንት□ሌሎች
6	የጋብቻ ሁኔታ:	□ያላገባ□ያገባ□የፈታ/ች
7	የቀድሞ የቤተሰብ ብዛት (የአናኗር ሁኔታ)	□በአንድ ክፍል ብዙ ቤተሰብ□ተመጣጣኝ □ከቤት እንስሳት ጋር
8	የትምህርትሁኔታ:	□መፃፍናማንበብየማይችል□የመጀመሪያ ደረጃ □ 2ኛደረጃ□ከፍተኛየት. ደረጃ
9	የቀድሞየሥራሁኔታ:	□የግል□የመንግሥትግብርና□ንግድ □የቀንሰራተኛ□ጡረተኛ□ሌሎች
10	አሁን ባሉበት ማረሚያ ቤት የቆዩበት ጊዜ በወራት/	□□-□□-□
11	እርስዎባሉበትክፍልበአማካይስንትታራሚጋርይኖራሉ ?	□□
12	በቀን/በሳምንት/በወርስንትሰውይጠይቆታል?	□□
13	ከማረሚያቤቱካሉሠራተኞችጋርበአማካይለምንያህል ጊዜበቀን/ በሳምንት/በወርበቅርበትይገናኛሉ?	□□
14	የሚጋሩት ክፍል ስፋት	□□
15	የጣሪያ ከፍታ ርዝመት በአማካይ ምን ያህል ነው?	□□

16	የሚጋሩት ክፍል ስንት በርች እና መስኮት አሉት?	በር□□መስኮት□□
17	እርስዎባሉበትክፍልስንትታራሚዎችበቀን-በሳምንትበወርይለቃሉ/ይዛወራሉ?	□□-□□-□□
18	ለሁለትሳምንትየቆየሳልአለብዎት?	አዎ□አይደለም□
19	ሳሉአክታአለው?	□አዎ□አይደለም□[አዎከሆነመልስዎ] ደምየቀላቀለነው ?አዎ□አይደለም□
20	የትኩሳትእናበመኝታሰዓትየላብምልክትአለዎት?	□አዎ□አይደለም□[አዎከሆነመልስዎ]ለምንያህልሳምንት?
21	ምክንያቱያልታወቀየክብደትመቀነስበአማካይ1.5 ኪግ እና የምግብ ፍላጎት ማነስ ባለፉት ሁለት ና ሦስ ት ሳምንት ውስጥ አጋጥሞታል?	□አዎ□/አይደለም□አልተለካሁም
22	የደረት/የጀርባሕመምአለዎት?	አዎ□አይደለም□ [አዎከሆነመልስዎ] ለምንያህልሳምንት?□
23	ከዚህበፊትየቲቢህመምታመውያውቃሉ?	አዎ□አይደለም□ [አዎ ከሆነ መልስዎ]
24	ለመጀመሪያጊዜነውየታመሙት?	□ያገረሸነው□ መድሃኒቱን አቋርጠውነው□ ከሳምባ ውጪ የሆነ የቲቢ ህመም ነው
25	በወቅቱ የቲቢ ህክምናውን ጨርሰዋል?	□አዎ□አይደለም□□አይደለም ከሆነ መልስዎ
26	ከዚህ በፊት ከቲቢ ታማሚ ጋር የቅርብ ግንኙነት ነበርዎት?	□አዎ □አይደለም
27	አዎ ከሆነ መልስዎ	□ቤተሰብ□ጓደኛ□የሥራ ባልደረባ□ታራሚ
28	ደህንነቱባልተጠበቀሁኔታከአገርውጪተጉዘውያውቃሉ?	□አዎ□አይደለም
29	አገርአቋራጭሹፌር/ረዳትሆነውያውቃሉ?	□አዎ□አይደለም
30	የሚታወቅበሽታአለብዎት?	□አዎ□አይደለም□
31	አዎ ከሆነ መልስዎ	□ስኳር/□ኤች.አይ.ቪ/ካንሰር/□ነቀርሳ
32	ሲጋራ የማጨስ ልማድ አለዎት?	□አዎ□□□ለምንያህልጊዜ□አይደለም□ □አቁሜአለሁ
33	ማረሚያ ቤት ከመግባትዎ በፊት አልኮል የመጠጣት ልማድ ነበርዎት?	□አዎ□አይደለም
34	በዚህየ ማረሚያ ቤት ውስጥ ወይም በሌላ ማረሚያ ቤት ከቲቢ ታማሚ ጋር የቅርብ ግንኙነት ነበርዎት?	□አዎ□አይደለም
35	ከቲቢ ታማሚ ጋር የቅርብ ግንኙነት ከነበርዎት? የቅርር ብሁኔታ ?	□የማደሪያ ክፍል በመጋራት □በአንድ ግቢ ውስጥ □አብሮ በመኖር □ የመመገቢያ □የመዝናኛቦታ□ትምህርትቤት□ሌላ

Declaration

I, the undersigned laboratory personnel, certify that I am conducting every steps of the procedures incorporated in this SOP after a prior reading.

Name	**Signature**
……...	……...

Quality assurance

Quality assurance Laboratory methods used in this study such as AFB microscopy and GeneXpert Quality Assurance Will be assured using internal quality control material which is validated under National TB laboratory internal quality control protocol. More over to guaranty the validity of all methods and application of the methods periodic External quality control participation and result will be considered.

Advisor_____ Signature _____Date _____

Advisor_____ Signature _____Date _____

Advisor_____ Signature _____Date _____