PREVALENCE OF PULMONARY TUBERCLOSIS AND ASSOCIATED FACTORS AMONG PRISONERS IN WOLAITA ZONE, SOUTHERNETHIOPIA

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Abstract

Background: People concentrated in congregated systems, such as prisons, are important but often neglected reservoirs for TB transmission, and threaten those in the outside community. Therefore, the purpose of the present study is to determine the prevalence of pulmonary tuberculosis and identify associated factors among prisoners in Wolaita Zone, Southern Ethiopia.

Methods: A cross-sectional study design was performed on 302 study participants to assess the prevalence and identify associated factors of pulmonary tuberculosis among prisoners in Wolaita Zone, Southern Ethiopia, from March01/2015 to April 01/2015. Prisoners were included in the study because 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 sample was collected from suspected inmates and examined using sputum smear microscopy. Bivariate and multivariable binary Logistic regression was used to identify predictors of pulmonary tuberculosis.

Result: A total of 302 prisoners were included in the study. Among those, 15 (4.97%) prisoners were found to have TB giving a point prevalence of 497 per 100,000 populations of pulmonary TB among the study participants. Pulmonary tuberculosis was significantly associated with cigarette smoking (AOR=5.42, 95%CI= (1.21, 24.25), having history of contact with known TB patients at home (AOR=7.01, 95%CI= (1.54, 31.90), Sharing a room with a known TB patient (AOR=7.09, 95%CI= (1.59, 31.64), stay greater than 24 months in current prison (AOR=0.09, 95%CI= (0.02,0.47).and BMI<18.5kg/m2 ((AOR=5.35,95%CI=(1.01,28.22)

Conclusions and recommendation: There was high prevalence of TB among Prisoners in Wolaita Zone with possible active transmission of TB within the prison than general community. Strengthening of tuberculosis screening during entrance to prison inorder to control rapid transmission within prison.

Keywords: prevalence, Risk factors, Pulmonary Tuberculosis, Prison

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List of acronyms

AIDS	Acquired immunodeficiency syndrome
ART	Anti-Retroviral treatment
CX-RAY	Chest x-ray
DOTS	Directly Observed Treatment, Short-Course
EFY	Ethiopian Fiscal Year
FMOH	Federal Ministry of Health
HBC	High burden countries
HIV	Human immunodeficiency virus
LMIC	Low and middle income countries
MDG	Millennium Development Goals
MDR-TB	Multi-Drug Resistant TB
MOH	Ministry of Health
NGO	Non-Governmental Organization
NTCP	National Tuberculosis Control Program
PTB	Pulmonary Tuberculosis
SNNPR	Southern Nations Nationalities and peoples Region
SPSS	Statistical package for social science
TB	Tuberculosis
VIF	Variance inflation factor
WHO	World Health Organization
ZN	Ziehl-Neelsen

Chapter one: Introduction

1.1 Background

Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis, a rod shaped bacillus called "acid-fast." Sometimes the disease can be caused by mycobacterium bovis and mycobacterium Africanum. Tuberculosis is most commonly transmitted by inhalation of infected droplet nuclei, which are discharged in the air when somebody with untreated sputum-positive pulmonary TB coughs, sneezes, talks, spits or songs that may contain tubercle bacilli(1).

The risk of infection of a susceptible individual is therefore high with close, prolonged, indoor exposure to a person with sputum smear-positive pulmonary TB. TB affects individuals of all ages and both sexes(2,3). There are, however, groups, which are more vulnerable to develop the disease: Poverty, malnutrition and over-crowded living conditions have been known for decades to increase the risk of developing the disease(3). 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 serious socio-economic consequences in a country with a very high prevalence of the disease(3,4).Pulmonary infection occurs when TB bacilli, contained in a small infectious aerosol droplet, reaches a terminal airway and succeeds in establishing infection. In the great majority (90-95%) of persons infected with M. Tuberculosis, the immunological defense either kills the inhaled or ingested bacilli or perhaps more often, keeps them suppressed (silent focus) causing latent Tuberculosis infection. Only about 5-10% of such infected persons (primary infection) develop active disease in their life time(3,5,6).

Identification of TB suspects involves screening of patients for sign & symptoms of TB, in particular cough of two weeks or more duration. TB can be diagnosed by using different methods like bacteriological, molecular, histopathology & radiological methods(3,7).

The treatment of TB has two Phases: Intensive (initial) phase which consist of treatment with combination of four drugs for the first eight weeks for new cases, and with combination of five drugs for the first eight weeks followed by four drugs for the next four weeks for re-treatment cases. It renders the patient non-infectious by rapidly reducing the load of bacilli in the sputum, usually within 2-3 weeks except in case of drug resistance. Continuation phase immediately follows the intensive phase and is important to ensure cure or completion of treatment. It is necessary in order to avoid relapse after completion of treatment. This phase requires treatment

with a combination of two drugs, to be taken for 4 months for new cases and treatment with a combination of three drugs for re-treatment cases for 5 months(6).

Tuberculosis prevention and control is by early diagnosis and treatment of active tuberculosis, isolation of smear positive patients for at least 2-3 week after initiation of anti-tuberculosis (6).

1.2. Statement of problem

Tuberculosis remains a major cause of morbidity and mortality in many developing countries and a significant public health problem worldwide(1,8). TB is a treatable and curable disease, yet it continues to kill an estimate of 1.1 million people among HIV-negative cases of TB and 0.4 million people among incident TB cases that were HIV-positive globally. Thus in total, approximately 1.5 million people died of TB this equates to a best estimate of 15 deaths per 100,000 population(1).Tuberculosis hinders socioeconomic development: 75% of people with TB are within the economically productive age group of 15-54 years. Ninety-five percent (95%) of all cases and 99 % of deaths occur in developing countries, with the greatest burden in sub-Saharan Africa and South East Asia(8). Household costs of TB are substantial estimates suggest that tuberculosis costs the average patient three or four months of lost earnings, which can represent up to 30 percent of annual household income(9).

As a solutionvarious strategies being put in place such as “DOTS” strategy (1995-2005) and its successor, the Stop TB Strategy (launched in 2006). Between 1995 and 2009, a total of 41 million tuberculosis patients were successfully treated according to the DOTS/Stop TB Strategy and up to 6 million lives were saved as a result(10).

Poverty and low socioeconomic status as well as structural and social barriers prevent universal access to quality TB prevention, diagnosis, treatment and care. The promotion and realization of quality service to TB and ensure an effective response to TB as well as to achieve the Millennium Development Goals and increase impact on health, development and human rights more broadly(9).The primary aims of TB control programmes are early diagnosis and prompt treatment of infectious cases to limit transmission(5).Treatment outcomes are recorded internationally and targets of 70% case detection and 85% cure in smear positive pulmonary TB have been set(11).TB is currently limited to socially marginalized and other poor high-risk groups such as IV drug users, migrants from developing countries, and, over the past 30 years, HIV-infected persons. Congregate settings where people live in close proximity to each other such as prisons, jails, homeless shelters, refugee camps, military barracks, dormitories and

nursing homes has great risk to develop tuberculosis. Prison inmates constitute a high risk-group for tuberculosis (TB) in both developing and the industrialized countries(11,12).

In Ethiopia, there is few published study on TB in prison. Thus, this epidemiological study was conducted, in order to determine prevalence and associated factors of PTB among prisoners in Wolaita zone, Southern Ethiopia because prisoners are highly vulnerable group for both communicable and none communicable disease.

Chapter two: Literature review

2.1. Overview

Prevalence of Pulmonary tuberculosis in prison is higher than general community and which is affected by factors like socio-demographic and behavioral factors, prison related factors and morbidity related factors. The major strength of the reviewed literature was conducting study in a high risk environment, among the most neglected and vulnerable group of the population; where there are a number of un-met needs and high burden of diseases.

2.2. Tuberculosis prevalence in prison

The World Health Organization (WHO) reports that the rates of TB infection in prisons are much higher than in the communities outside prison and adds that the rate multi drug resistant (MDR TB) has risen considerably in LMICs notably in the former Soviet Union, East Asia and Sub Saharan Africa(14–17). Although data is limited, some reports suggest that TB infection rates in prison may be up to 100 times more common in prison than outside prison and up to a quarter of any country's TB cases may be found in prison. The International Red Cross reports that the rate of TB infection in Kyrgyzstan prisons was 40 times that in the civilian population while in Peru, the TB infection rate in prison was 49 times that outside prison(18). Study done in Brazil indicate that the point prevalence of PTB was 1913 per 100 000 (95%CI 1410–2580), about seven times higher than that of the general population(19). In sub Saharan Africa TB infection rates are equally high in prisons(20). In Botswana, 3,797/100,000(21), Malawi 1,100/100,000(22) and Zambia a large national survey found the TB infection rate of 4,000/100,000 people(23). There is limited information about TB in prisons in Ethiopia. Previous studies in Ethiopia reported the prevalence of PTB as 1913(24) and1482(25) per 100, 000 prisoners in Eastern and North Ethiopia respectively. Also study done in Gamo Gofa zone prisons of south Ethiopia indicate that there was 629 per 100,000 which is eight times of prevalence in outside community(26).

2.3. Risk factors of pulmonary tuberculosis in prison

2.3.1. Socio-demographic and behavioral factors

Most prisoners predominantly come from the poorly educated and socioeconomic deprived segment of the general population, so they are at greater risk of acquiring and developing

TB even before admission to prison. Studies have identified the following risk factors for TB among prisoners: low educated (27); homelessness, belonging to racial and ethnic minority groups and excess alcohol use (28); and low income and narcotic drug use (29). Accordingly, they may have poor access to health care that could increase the risk and prolonged period of infectiousness. Indeed, these factors have also an adverse effect on immunologic function that increases susceptibility to infection and development of the active disease(30). A large number of prison studies reported that the mean and median age of TB cases ranged from 27 to 37 years. In other words, TB in prisons whether from high or low incidence countries, is consistently reported among young adults (15-49). There are also a largest proportion of the prison population(23,31,32). Prison studies indicated a significant difference between male and female prisoners regarding identifying TB suspect and diagnosis (23,32). In Zambia prisons, new cases of TB only detected among male prisoners(23). Similarly, a prison study from Malawi showed that all PTB cases were male (40). Thus, the epidemiological difference could be due to poorer access to diagnostic facilities, higher exposure to infection and increased susceptibility rather than biological difference(30).

2.3.2. Prison related factors

Overcrowding is one of the typical characteristic of prisons that attributes to a high burden of TB. A case-control study in St. Petersburg prisons (Russia) reported that an overcrowded room (more than 2 people per bed) and spending less time outdoors were independent risk factors for developing TB in the prison (29). The Georgian study also indicated that being accommodated in a prison with large number of prisoners(>600) had a significant association with an increased risk of active TB; there was three times greater risk for prisoners accommodated in large prisons (>600 prisoners) compared to small prisons (< 300 prisoners). Large prisons are notorious for having poor hygienic standards and lack of adequate ventilation(31).

The length of imprisonment is one of the commonly identified risk factor for TB. But, the risk related to duration of staying, either short or long period staying, has given contradictory results in different studies. For instance, having PTB was positively associated with a short staying (1-2 years) in Ivory Coast (33), Cameroon (32) and Tanzania (34) prisons. These studies suggested that prisoners could have TB before they were sentenced, or a high transmission rate of TB and poor living conditions may led to a rapid progression to the

disease in those susceptible. Conversely, the Georgian study showed that the risk of getting TB for those who stayed 2 years or more was two times greater than for those who were imprisoned for less than one year (31). As a result of poor living conditions, physical and emotional stress, the longer prison stay may attribute to lengthy exposure to infection as well as deterioration of immunologic function. On the other hand, the length of staying was not a significant risk factor for TB in a Zambia prisons study(35).

Re-imprisonment (32,24), and a history of previously being in a prison (28,36)were found to increase the risk of TB. A study in Maricopa County (USA) reported that 24% of TB patients in the civilian society had a history of imprisonment in the county jail prior to their TB diagnosis. The majority of them (83%), who later developed TB, had not received any TB screening while in jail (28). Similarly, a study in Memphis (USA) found that 43% of community residents with TB had been incarcerated in the same jail at some time before their diagnosis. This jail was a source of TB outbreak for prisoners and community members that lasted several years (37).

Overall, the studies explicitly stated that the prison related factors are attributing to a high TB burden both inside as well as outside of prisons and thus need to be addressed in TB control strategies.

2.3.3. Morbidity related factors

Historically, prisons and diseases have been strongly linked ever since prisons became the main repository of socially marginalized and poor individuals. In 1666 an English Act of Parliament noted that prisoners were infecting others in a court when they came for their trials. John Howard, the great prison reformer, also died in 1790 from typhus after he visited a sick prisoner in Ukraine (38). This historical event illustrates that prison health is not only about those inside bars, it is also the health of the general population. In other words, prison health is an integral part of community health, because prison staff, guards, visitors, judiciary staff, and health personnel have close contact with prisoners that may easily acquire and transmit TB or any other infectious diseases to other healthy prisoners and the general population (39).

A large number of studies documented high burden of infectious diseases, such as HIV, sexual transmitted infections, hepatitis and skin infections, mental health problems and substance abuse (38,34,40). For example, a study in Ghana prisons reported higher prevalence of HIV, hepatitis and STI among prisoners and prison officers as compared to the general public. Significant

associated factors included prisoners aged 17-46, low socio-economic status (being illiterate, unmarried and female prisoners), longer imprisonment, intravenous drug use, and homosexuality. Intra-prison transmission between prisoners and prison officers was also suggested as a possible transmission route (41).

The rapid rise of TB epidemic is also well linked with the fastest growing risk of HIV infection in the prison population. For instance, HIV infection in Russian prisons was 75 times higher than the community at large (42,43). In Zambia's prisons, more than one in four prisoners among the 13-15,000 prisoners was infected with HIV. It was higher than the estimated prevalence of HIV among adult in the general population (41).Malnutrition is also commonly identified in different studies(11,23,31). For instance, a study in Zambia found that nutritional status and food intake was universally poor in all surveyed prisons (33). Cameroon (32) and Georgia(31) studies reported a low body mass index (BMI) as a significant predictor of TB.

In general, the prison population is a vulnerable group for suffering from higher burden of communicable and non-communicable diseases

2.4 Conceptual frame work

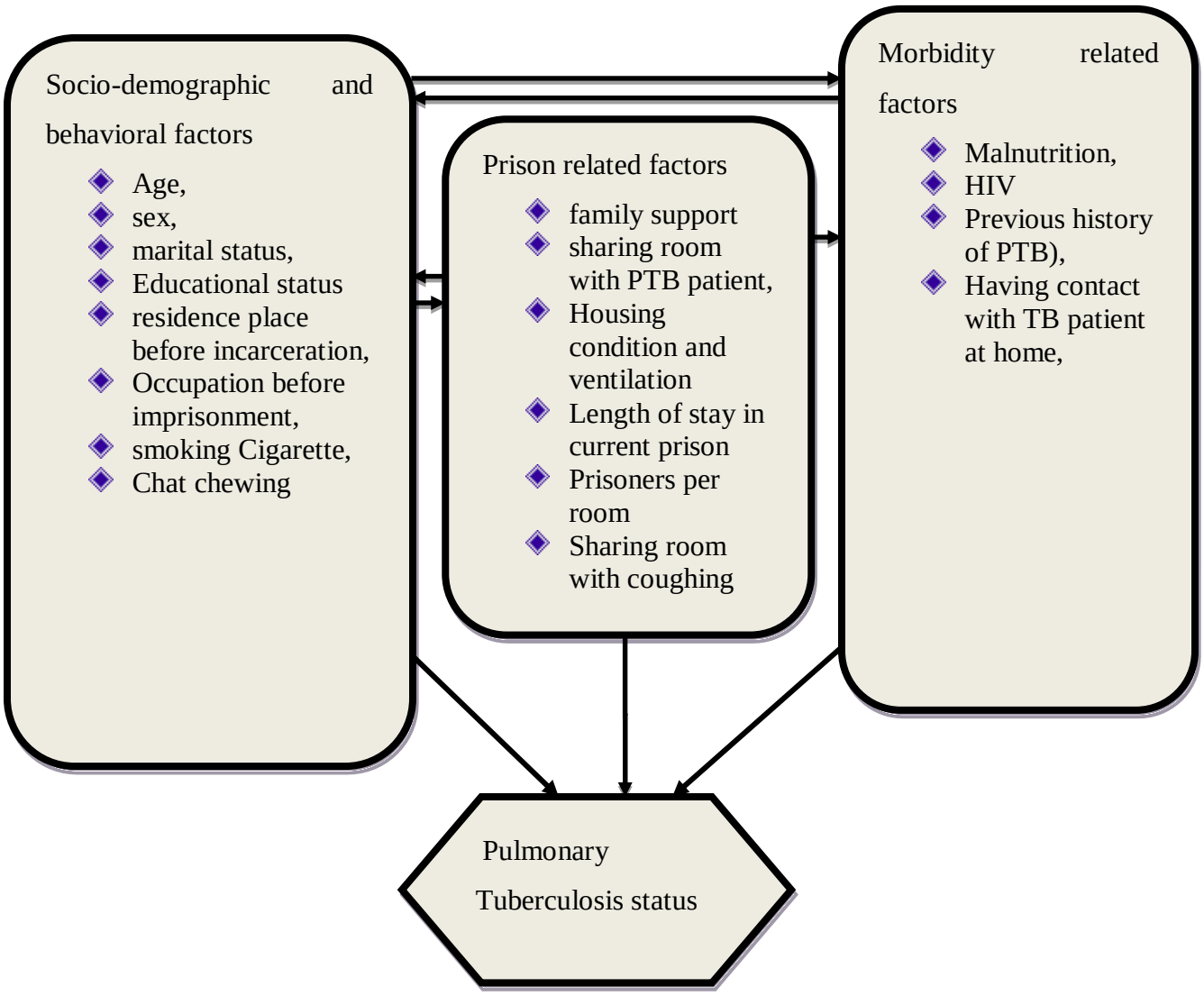

Figure 1 Conceptual frame work of prevalence and risk factors of pulmonary tuberculosis in prison

Source: Developed after reviewing different literatures.

2.5 Significance of the study

The study findings expected to facilitate decision making on TB diagnosis, prevent further spread and provide pertinent prevention and control measures. It will have animportant contribution for developing and implementing TB control program in prisons. This will give a chance to detect and manage those undiagnosed TB cases, and reduce potential sources of transmission for the prison and general population. Moreover, it will encourage policy makers, program managers, and scientific communities to take required steps and measures for the wellbeing of prison and general population at large.

Chapter three: Objective

3.1 General objective

To determine prevalence and associated risk factors of PTB in the Wolaita zone prison, 2015.

3.2 Specific objectives

1. To assess prevalence of pulmonary tuberculosis among prisoners in Wolaita Zone.
2. To identify factors associated with Pulmonary Tuberculosis among Wolaita zone prisoners.

Chapter four: Method and Materials

4.1 Study area and period

The study was conducted from March 01/2015 to April 01/2015, among Wolaita zone prisoners. Wolaita zone is found in Southern nation nationality people Regional State. It is located in south west of Ethiopia. It is 380 km far away from Addis Ababa, and 170 km from regional city Hawassa. Bordered by administrative zone of Hadiya in North, Sidama in East, Gamo Gofa in South, and Dawro in West. Administratively, Wolaita zone is organized by 13 woredas, 340 kebeles, 337 peasant associations, 3 city administrations. Based on health profile of Wolaita zone health department, a total population of 1,812,173 of this 896,482(49.47%) are male and 915,691(50.53%) female for the year 2014/15. As to health infrastructures three Hospital, seventy health center, three hundred fourty health posts and one hundred thirty nine different level private clinics which deliver routine health services to the community and twenty three private pharmacies are being present. Within the zone there is one prison with 1553 prisoners (1480 male and 73 females).

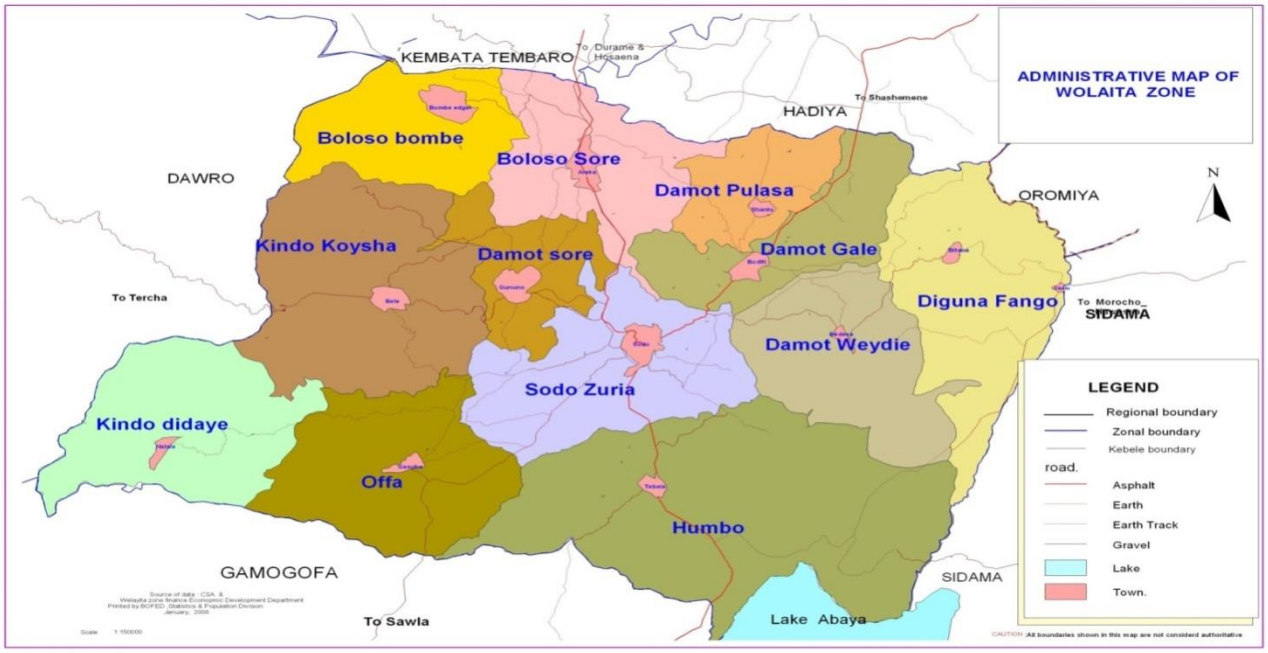

Figure 2 Map of Wolaita Zone
Source: wolaita zone health department Annual report2006 E.C

4.2 Study design

Institution based cross sectional study was employed.

4.3 Population

4.3.1 Source population

All prisoners found in Wolaita zone.

4.3.2 Study population

Were all eligible prisoners with cough ≥2 weeks and pulmonary tuberculosis patients currently on anti-TB treatment with in the prison.

4.4 Sample size determination and sampling method

4.4.1 Sample size determination

The sample size was calculated by using single population proportion formula by considering the following assumptions,

P= prevalence of PTB from Gamo Gofa zone prisons study, p=19.4% (26), $Z\alpha/2$=statistic for the level of confidence at 95%, which is 1.96, 4% margin of error (d). The following formula was used for calculating the sample size. $n = (Z\,{}^{\alpha}/_{2})2 \times P(1-P)/d2$(44)

$n = \frac{(1.96)2\times 0.194\,(1-0.194)}{(0.04)2} = 375$, because of total population (1086) is less than 10,000 population correction formula $nf = \frac{n}{1+n/N} = \frac{375}{1+375/1086} = 278$ by considering 10% none response total sample size was estimated 306.

4.5 Sampling procedure

During the study period, a mass screening strategy was used to identify PTB suspects. First, complete registration of all prisoners who have just a cough. Secondly, all those who had coughed were interviewed whether or not they fulfilled the inclusion criteria. Then after this those fulfill the criteria were diagnosed for tuberculosis. At last the pulmonary tuberculosis patients on treatment, newly diagnosed TB patients and pulmonary TB suspects were assessed about risk factors

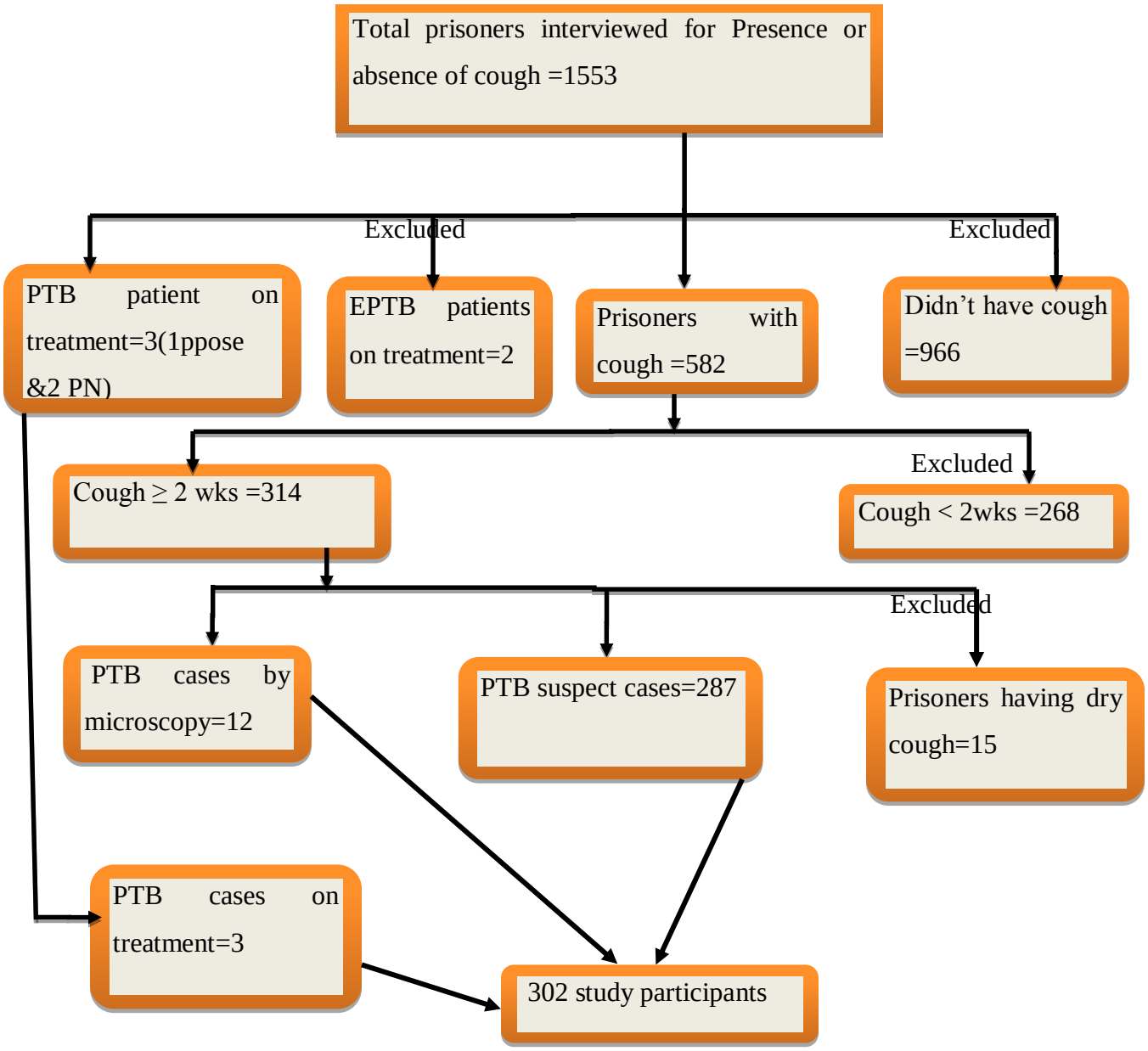

Fig.3: Sampling and screening framework of PTB among prisoners in Wolaita zone prison

NB:ppose=smear positive pulmonary tuberculosis

PN: smear negative pulmonary tuberculosis

4.6 Eligibility criteria

4.6.1 Inclusion criteria

Prisoners, who had ≥ 2 weeks duration of cough, were included in the study. In addition, PTB patients, who were taking anti-TB treatment during the study, were included in the study.

4.6.2 Exclusion criteria

Those prisoners who have ≥ 2 weeks duration of cough but unable to produce sputum were excluded from the study.

4.7 Variables

4.7.1. Dependent variable

Pulmonary tuberculosis status

4.7.2. Independent variables

Socio-demographic and behavioral factors: (Age**,** gender, marital status, education**,** Occupation, residence**,** smoking cigaretteand Khat chewing).

Prison related factors (Length of staying, Frequency of imprisonment, Sharing room with TB patient**,** Sharing room with coughing person, Prisoners per room, housing and ventilation status of room, Family support).

Morbidity related factors (Prior history of TB, Contact history with TB patient at home**,** HIV/AIDS, Malnutrition, Identified co-morbidity,Hospital admission).

4.8 Data quality control

4.8.1 Data collection instrument

Data was collected by using interviewer administered structured questionnaire that was initially adapted from previous study done in Eastern Ethiopia prison(24)in English then was translated to both Wolaitigna and Amharic/ by language experts in Wolaitigna and Amharic and back translated to English by another language experts to ensure consistency of question.

4.9 Standard operative procedure (sop) in diagnosing or confirming PTB

4.9.1Collection and handling of sputum specimen

A collection of specimen for identifying Mycobacterium was conducted during the study period. Therefore, three early morning sputum specimens was collected on three consecutive days using coded and clean plastic containers by laboratory personnel according to WHO (1998) guidelines on sputum collection procedure. The collected specimen was used for direct smear microscopy immediately.

4.9.2 Direct smear microscopy of the sputum

The common staining technique, of carbon fuchsine (Ziehl-Neelsen) procedure was used for direct smear microscopy according to NTCP protocol. A positive result indicated the presence of AFB in the specimen. It was recorded in terms of the number of AFB per 100 fields. A negative result in this method had indicated that no acid-fast bacilli had been seen in 100 fields. It does not exclude the diagnosis of TB as some patients harbor fewer tubercle bacilli that cannot be detected by direct microscopy. A poor quality specimen may also produce negative results (45). In this study, all sputum specimens was stained and examined in the microscope (100 fields) by trained senior laboratory technicians.

4.9.2.1. Internal quality control

All containers of stains and reagents were checked the date received and the date first opened. Any material found to be unsatisfactory, for example scratched slides, poor quality of reagents, etc., were recorded as such and was removed from the laboratory immediately. Date of preparation and name of the reagent was labeled on the bottle.

4.9.2.2. External quality control: was assured by Sending smears from the peripheral laboratory to the Regional Laboratory for re-reading.

4.10. HIV testing of PTB suspects

To determine the HIV sero status of the TB suspected inmates, pre-test counseling was provided to the volunteer prisoners by trained health professionals. Whole blood was collected from prison inmates. Serum was separated by centrifugation within 2hour of collection and kept at -20°C until used. HIV infection was determined using anti-HIV antibody test (rapid test currently used for national test algorism in Ethiopia). KHB (shangai kehua bio-engineering co Ltd. china) was used for the first screening and positive samples were re-tested with STAT PAK (chembio

HIV1/2 STAT PAK Assay USA). Samples giving discordant result in the two tests (KHB &STAT PAK) were re-tested using tie-breaker (Unigold).After testing, the study participants were provided with posttest counseling by the counselor. To assure confidentiality of test results, only code numbers were used to identify sample of study participants.

4.11. Nutritional assessment

Body weight was measured to the nearest 0.1 kg on an electronic digital scale and height was measured to the nearest 0.1 cm. Body mass index (BMI), defined as the weight in kilogram of the individual divided by the square of the height in meter, was used to determine the nutritional status of the patients into severe malnutrition (BMI < 15.9 kg/m2), moderate malnutrition (BMI = 16–16.9 kg/m2), mild malnutrition (BMI =17–18.4 kg/m2) and normal (BMI = 18.5-25 kg/m2) as recommended by WHO (48).

4.12 Data collectors

Six diploma nurses for data collection, two laboratory technicians for laboratory test, and one health officer and one laboratory technologist for supervision was recruited. One day training on how to fill the questionnaire, request the consent, assure confidentiality of information of the study participants was given to data collectors and supervisors to ensure the quality of the field operation by principal investigator. During data collection, the supervisors had supervised the data collection process in daily base and perform quality checks. The instrument was pre tested on 5% of the sample in Hadiya zone prison which is 97km far from the study area to check reliability of the tool.Based on the findings and feedback obtained from the pre-testing process, no modification was done on the questionnaire.The pre-tested data was not included in the main data analysis.

4.13. Data processing and analysis

All collected data from questionnaire and laboratory analysis was checked manually before entry to software. Then, the data was coded and entered in to a computer using EpiData version 3.1 software. The software was created based on data type and size, categories, validating permitted values and ranges, and codes to missing value. Corrections were made according to the original data. Finally, the data was exported to SPSS version 16 software for analysis.

4.14. Data analysis

The data was analyzed by using SPSS version 16 software. Descriptive analysis was carried out for each of the variables to check frequency, distribution and missing value. Bivariate analysis was employed to check crude association between pulmonary tuberculosis status and independent variables. Chi-square test was conducted to see variables fulfilling assumption. Variable with p value <0.25 on bivariate analysis was entered to multivariable logistic regression to identify the factorsthat affect pulmonary tuberculosis positivity. Binary logistic regression test was used to assess association between independent variables and PTB status. Odds ratio and corresponding 95% confidence intervals was used to quantify the degrees of association between independent variable and PTB status. Results with p-value ≤0.05 were considered as being statistically significant and the rest was refuted. Multicollinearity among independently associated variables was checked by multicollinearity diagnostic test VIF in linear regression but it was not detected. Finally, result was presented in text, tables and charts.

4.15 Dissemination plan

The result of this thesis will be presented to Jimma university collage of Health sciences, a summary result was communicated to the Zonal Health department, and Administrative bodies in the prison. Presentations at professional, local, and national meetings and finally effort will be made for publication in peer reviewed national and international journals.

4.16. Ethical considerations

The study was conducted after approval secured from the Ethical Review Committee of Jimma University (ERCJU). Formal letters from the Ethical review committee of Jimma University to Zonal Health Department, then letter of permission was produced from administrative bodies of the Zone to the prison administration. Finally written consent was obtained from each study participants before making interview and confidentiality was secured. In addition all the responses were kept confidential and anonymous and participants can withdraw from the study at any time during interview.

4.15 Operational definition

A Case of tuberculosis:

A definite case of TB (defined below) or one in which a health worker has diagnosed TB and has decided to treat the patient with a full course of TB treatment.

Confirmed case: A clinically compatible illness that is laboratory confirmed (48).

TB Suspect: is any person with cough of two weeks or more duration (48).

Low Body mass index (BMI): a person who have body mass index <18.5 kg/m^2(24)

High body mass index (BMI): a person with body mass index ≥18.5 kg/m^2

Good Housing and ventilation status of room if fulfills above or equal to mean score. (Such as; Presence of window, opening of window, spending outside room, has sleeping place, bed cloth and cemented pavement of the room (24).

Poor Housing and ventilation status of room if fulfills below mean score (such as; Presence of window, opening of window, spending outside room, having sleeping place, bed cloth and cemented pavement of the room).

Tuberculosis disease: new case: Active TB in a person who has never been treated for TB before, or has active disease from a new genotype (49).

Long duration stay: if the prisoners stay in current prison for more than 24 months(24).

Short duration stay: if the prisoner stay in current prison for less than or equal to 24 months

Spending outside room less timeif prisoners spend outside room less than one hour per day(46).

Smear-Positive PTB: was diagnosed when there were two positive results of smearmicroscopy for AFB or one sputum smear-positive and suggestive chest x-ray finding.

Smear-negative PTB: 1) a patient with three initial smear examinations negative for AFB by direct microscopy, 2) no response to broad spectrum antibiotics, and 3) three smear-negative examinations by direct microscopy for the second time, 4) radiological abnormality consistent With PTB

Chapter five: Results

5.1. Socio-demographic and behavioral factors

During the study period there were 1553 prisoners in Wolaita Zone prison. After screening the whole prisoners for having cough for at least 2-weeks, 302 study participants had participated into the current study and 262(86.8%) and 253(83.2%) of them were males and 15- 44 years old respectively. The age of study participants ranges from 19 to 62 years with median value of age 32 years.

Among study participants 176(58.3%) were married, 52(17.2%) were illiterate, 57% were rural, 108(35.4%) were currently cigarette smokers and 125(41.4%) werecurrently Khatchewers. (Table 1 below)

Table 1 Socio-demographic and behavioral characteristics of the study population in Wolaita zone prison, 2015. (N)=302

Variables	Label	Frequency (%)	PTB status	
			Has PTB	Has no PTB
Age	15-44 years	253(83.8)	11(4.3%)	242(95.7%)
	>44 years	49(16.2)	4(8.2%)	45(91.8%)
Gender	Male	262(86.8)	14(5.3%)	248(94.7%)
	Female	40(13.2)	1(2.5%)	39(97.5%)
Marital status before imprisonment	Single	95(31.5)	3(3.2%)	92(96.8%)
	Married	176(58.3)	11(6.2%)	167(93.8%)
	Divorced	314(10.2)	1(34.4%)	28(96.6%)
Level of education	Illiterate	52(17.2)	2(3.8%)	50(96.2%)
	Grade 1-12	159(52.6)	8(5%)	151(95%)
	Above grade 12	91(30.1)	5(5.5%)	86(94.5%)
Occupation before imprisonment	Farmer	88(29.1)	5(5.7%)	83(94.3%)
	Governmentemployee	63(20.9)	2(3.2%)	61(96.8%)
	Private employ	43(14.2)	4(9.3%)	39(90.7%)
	Student	49(16.2)	1(2%)	48(98%)
	Housewife	26(8.6)	1(3.8%)	25(96.2%)
	Has no job	7(2.3)	0(0%)	7(100%)
	Merchant	26(8.6)	2(7.7%)	24(92.3%)
Residence	Rural	162(53.6)	4(2.5%)	158(97.5%)
	Urban	140(46.4)	11(7.9%)	129(92.1%)
Current Cigarette smoking	No	194(64.2)	3(1.5%)	191(98.5%)
	Yes	108(35.8)	12(11.1%)	96(89.9%)
Current Khat chewing	No	177(58.6)	5(2.8%)	172(97.2%)
	Yes	125(41.4)	10(8%)	115(92%)

5.2. Prison related characteristics of the study population

Of the 302 study participants majority of them 289(95.7%) have support from family and 256(84.8) were supported by both visit and food. About 200(66.2%) of the study participants stay in prison for more than 24 months. All participants get imprisoned for the first time. About 102(33.8%) have been imprisoned with known Tuberculosis patient in their room, 216(71.5%) of the study participants have been imprisoned with chronic coughing person in same room and 173(80.1%) of them stay with chronic coughing person for less than or equal to 3 week. There were 262(86.8%) prisoners in greater than 100 prisoners in the same room. All study participants live in the room with window from this 290(96%) open window always and 12(4%) less time. Nearly all study participants 301(99.7%) spend their time outside room every day. All study participants had their own bed clothes, sleep at foam on bed,in a room with cemented floor and 288(95.4%) were with good housing condition (Table2).

Table 2: prison related characteristics of study participants among prisoners in Wolaita zone southern Ethiopia, 2015(N=302)

Variables	Label	Frequency (%)	PTB status	
			Has PTB	Has no PTB
Length of staying in current prison	≤24 months >24 months	109(36.1) 193(63.9)	13(86.7%) 2(13.3%)	96(33.4%) 191(66.6%)
Sharing room with TB Patient	Yes No	102(33.8) 200(66.2)	12(80%) 3(20%)	90(31.4%) 197(68.6%)
Housing and ventilation condition	Good Poor	288(95.4) 14(4.6)	13(86.7%) 2(13.3%)	275(95.8%) 12(4.2%)
Length of stay with TB patient	<3 weeks ≥3 weeks	97(95.1) 5(4.9)	9(69.2%) 4(30.8%)	88(98.9%) 1(1.1%)
Sharing room with coughing person	Yes No	289(95.7) 13(4.3)	13(86.7%) 2(13.3%)	203(70.7%) 84(29.3%)
Family support	Yes No	289(95.7) 13(4.3)	13(86.7%) 2(13.3%)	276(96.2%) 11(3.8%)
Number of prisoners per room	≤100 >100	40(13.2) 262(86.8)	1(6.7%) 14(93.3%)	39(13.6%) 248(86.4%)

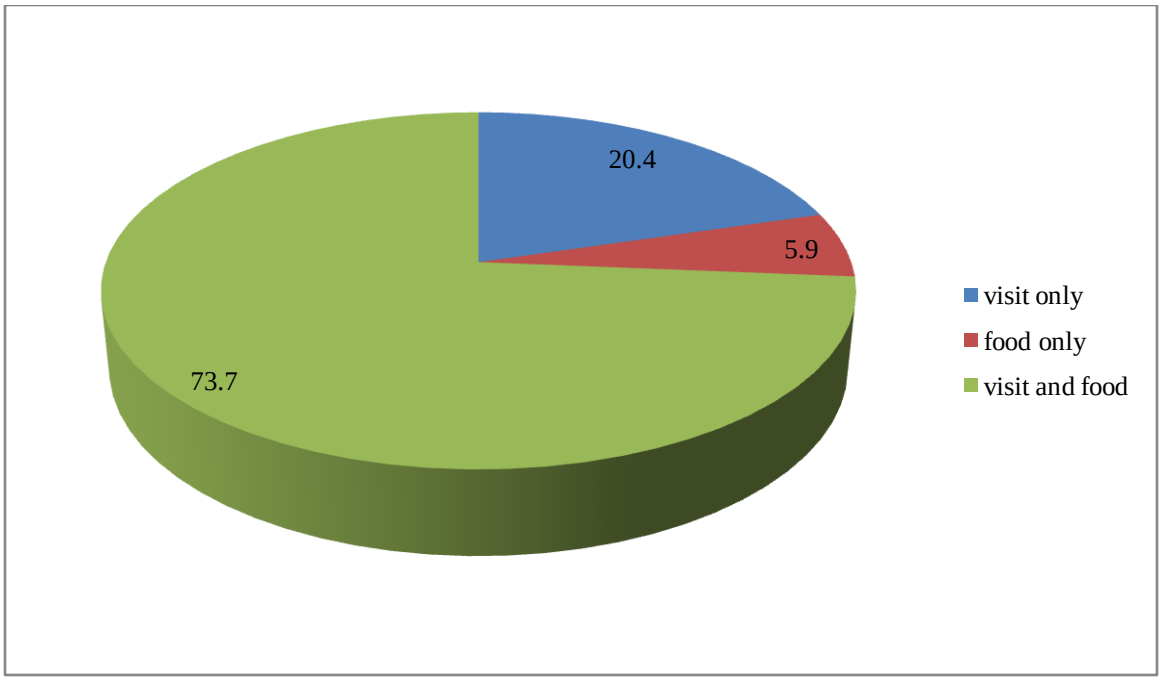

Figure 4Kind of family support for study participants in wolaita zone prison southern Ethiopia, 2015

5.3. Morbidity related factors

Five (1.7%) prisoners reported for having identified co-morbidities; hypertension (N=1) and Diabetic mellitus (N=4) were mainly recognized and all of them were taking treatment. Regarding their history of contact with a TB patient before imprisonment, 198(65.6%) did not have contact. HIV test was provided to 297(98.3%) volunteer study participants and 4(1.3%) had HIV/AIDS sero status positive and among those one has pulmonary tuberculosis. All study participants did not have history of pulmonary tuberculosis. As to the BMI level, 197(65.2%) of them were above or equal to 18.5 kg/m.^{2} (Table3).

Table 3: morbidity related characteristics of study participants in wolaita zone prison southern Ethiopia, 2015 (N=302**).**

Variables	Label	Frequency (%)	PTB status	
			Has PTB	Has no PTB
Contact with known TB patient at home	No Yes	198(65.6) 104(34.4)	3(20%) 12(80%)	195(67.9%) 92(32.1%)
Hospitalization	No Yes	287(95) 15(5)	13(86.7%) 2(13.3%)	274(95.5%) 13(4.5%)
Body mass index	< 18.5 kg/m^2 ≥ 18.5kg/m^2	105(34.8) 197(65.2)	13(86.7%) 2(13.3%)	92(32.1%) 195(67.9%)
HIV test result	Positive Negative	4(1.3) 293(98.7)	1(6.7%) 14(93.3%)	3(1.1%) 279 (98.9%

5.4 Prevalence of pulmonary tuberculosis

Of the 302 study participants, 12 were confirmed to have PTB by smear microscopy. Including 3 patients who had started anti-tuberculosis treatment before conducting the study, the overall of PTB was 4.97%. Extrapolation of the current finding indicates that the prevalence of PTB in prisons of the study area was about 497/100,000 which was 4.60 folds higher than the prevalence in the general community in southern Ethiopia (47).All of the 15 PTB confirmed patients were new patients.

Table4: Bivariate binary logistic regression analysis of associated factors with PTB among prisoners of Wolaita Zone, N=302

Variable	Label	Pulmonary tuberculosis status		
		Has pulmonary tuberculosis	Has no pulmonary tuberculosis	p-value
Residence	Rural Urban	4(26.7%) 11(73.3%)	158(55.1%) 129(44.9%)	0.042*
Cigarette smoking	No Yes	3(20%) 12(80%)	191(66.6%) 96(33.4%)	0.002*
Khat chewing	No Yes	5(33.3%) 10(66.7%)	172(59.9%) 115(40.1%)	0.051
Length of stay in the current prison	≤ 24 months >24 months	13(86.7%) 2(13.3%)	96(33.4%) 191(66.6%)	0.001*
Sharing room with known TB patient in same room	No Yes	3(20%) 12(80%)	197(68.6%) 90(31.4%)	0.001*
Having contact with known TB patient at home	No Yes	3(20%) 12(80%)	195(67.9%) 92(32.1%)	0.001*
Body mass index	< 18.5 kg/m^2 ≥ 18.5 kg/m^2	13(86.7%) 2(13.3%)	92(32.1%) 195(67.9%)	0.001*

1=Reference, *= significant p-value (≤0.05)

5.5Factors independently associated with pulmonary tuberculosis.

The Variables which has independently significant association with pulmonary tuberculosis among prisoners were smoking cigarette, contact with known TB patient at home, sharing the room with known TB patient, nutritional status (BMI) and length of stay category in current prison as shown in table5 below.

The risk of getting active pulmonary tuberculosis was almost five time more likely among those prisoners who were cigarette smokers compared to none smokers (AOR=5.42, 95%CI= (1.21, 24.25). Likewise, those who had history of contact with tuberculosis patient before imprisonment were almost seven times more likely to develop active pulmonary tuberculosis than those did not have contact (AOR=7.01, 95%CI= (1.54, 31.90). Those with BMI <18.5kg/m^2 were almost five times more likely develop pulmonary tuberculosis than with BMI ≥18.5kg/m^2 (AOR=5.35, 95%CI= (1.01, 28.22). Sharing a room with a known TB patient was almost seven times more likely to develop active TB than their counter parts (AOR=7.09, 95%CI= (1.59, 31.64). A person who stay greater than 24 months in current prison was 91% less likely to develop active pulmonary tuberculosis than those stay less than or equal to 24 months (AOR=0.09, 95%CI= (0.02,0.47).

Table5: Factors independently associated with PTB among the prisoners in Wolaita Zone, Southern Ethiopia, 2015 (N)=302

Variables	Label	Pulmonary tuberculosis status		
		Has PTB N (%)	Has no PTB N (%)	AOR(95%CI)
Khat chewing	No yes	5(33.3%) 10(66.7%)	172(59.9%) 115(40.1%)	1 2.29(0.46,11.42)
Residence	Rural Urban	4(26.7%) 11(73.3%)	158(55.1%) 129(44.9%)	1 2.67(0.56, 12.66)
Cigarette Smoking	No Yes	3(20%) 12(80%)	191(66.6%) 96(33.4%)	1 5.42(1.21,24.25)*
Body mass index	<18.5 kg/m^2 ≥ 18.5 kg/m^2	13(86.7%) 2(13.3%)	92(32.1%) 195(67.9%)	5.35(1.01,28.22) 1
Having contact with known TB patient at home	No Yes	3(20%) 12(80%)	195(67.9%) 92(32.1%)	`1 7.01(1.54,31.90) *
Sharing room with known TB patient	No Yes	3(20%) 12(80%)	197(68.6%) 90(31.4%)	1 7.09(1.59,31.64) *
Length of stay in current prison	≤ 24 months > 24 months	13(86.7%) 2(13.3%)	96(33.4%) 191(66.6%)	1 0.09(0.02,0.47) *

*=P≤ 0.05(significance level), 1=Reference

6. Chapter six: Discussion

This study showed that the prevalence of PTB among the study participants in Wolaita Zone was 4.97%. Extrapolation of the current finding indicates that the prevalence of PTB in prison of the study area was about 497/100,000 which was 4.6folds higher than the prevalence in the general community in southern Ethiopia (47).This has shown an increased transmission of TB which could lead to outbreak in the prisons unless immediate action is taken(24).The prevalence of pulmonary TB in the study population was lower than the study conducted in Eastern Ethiopia (8.9%), North Gondar prison(10.4%), and Gamo Gofa prison(19.4%). One of the possible reasons might be due to the method used for diagnosis of PTB (only AFB sputum smear test) in current study while others have used in addition to AFB, culture and cx-ray. The prevalence of PTB in current study was in line with the study findings in Tajikistan(4.5%),in Rio de Janeiro, Brazil(4.6%),(27).while other studies from district prisons of Pakistan(2.2%), jail of Lahore Malawi, reported significantly lower prevalence (50, 22).

Smoking was significant risk factor of PTB in the current study. This finding was in agreement with the study findings conducted in Pakistan(37), and southern Ethiopia (26). However, the finding of previous study in prison of Eastern Ethiopia was in contrary to the current findings (24). One possible explanation might be the number of nonsmokers in eastern Ethiopia prisons was very small and not enough to show smoking as risk factor for PTB (24).

In the current study length of stay in the current prison for long duration has protective effect on PTB as compared to those stayed for short duration. In agreement to this one study from Cameroon (32), has indicated that long duration of stay in prison has slight protective effect on PTB as compared to those stayed for short duration. This protective effect might be due to increased awareness about PTB by those stayed for longer time in the prison than those who were sentenced newly. This assumption is supported by previous study conducted in Gamo Gofa(26).

In contrast study conducted in Pakistan showed positive association between staying for long duration in prisons and PTB (36). One of the possible explanation might be increased risk of exposure to infectious cases of pulmonary tuberculosis

In this study sharing room with known TB patient was significantly associated with PTB positivity. In line to this study conducted in Eastern Ethiopia(24) showed significant association with sharing same room with known tuberculosis patients for pulmonary TB positivity. This association could be due to Epidemiological link that can lead from person to person transmission, which shows weak segregation of PTB patients by early detection.

In this study having history of contact with known tuberculosis patient before imprisonment has significant association with acquiring pulmonary tuberculosis. But this significance was not seen in any study conducted elsewhere. This association could be due to reactivation of latent tuberculosis infection because of immunity degradation.

In this study, under nutrition (BMI<18.5kg/m^2) was significantly associated with pulmonary tuberculosis positivity. In agreement with this findings, study conducted in Cameron(32), and Brazil (27), indicated low BMI (i.e. <18.5kg/m^2) as the risk factor for TB. The possible reason for this could be malnutrition equally is recognized as a risk factor for the reactivation of latent TB and its progression to disease. This assumption is supported by previous study (51). This link is besides bi-directional as TB can cause or predispose to malnutrition. Hence when comparing individuals with and without active PTB in this cross-sectional study with respect to their nutritional status, a causal effect cannot be assigned to malnutrition, even though it came out as a significant predictor in the multivariate analysis. Moreover it is also claimed that scientific evidence for a causal relationship between malnutrition and the development of TB disease are weak and that the biological link between the two morbid states is still not well understood (52,53).

The strength of this study was conducting study in a high risk environment, among the most neglected and vulnerable group of the population; where there are a number of un-met needs and high burden of diseases and inclusion of all prisoners in the screening process rather than taking random sample. The limitation of the study was underestimation of prevalence of PTB because of under-reporting of cough duration by respondents, cross sectional study design and method of diagnostic test used.

Chapter seven: Conclusion and Recommendation

7.1. Conclusion

This study, indicated a high prevalence of PTB among the prisoners; than the prevalence in the general population. It also demonstrates a high burden of undetected and infectious PTB cases in the prison. Risk factors found to associated with PTB included cigarette smoking, having contact with known TB patients at home before imprisonment, nutritional status (BMI),sharing a room with a TB patient and length of stay in current prison greater than 24 months. The study findings should be taken into account to target high risk individuals and prioritize TB prevention and control activities.

7.2. Recommendations

Prison clinic staffs

Strengthening Segregation of smear positive patients for 2–4 weeks after the start of anti-TB treatment by early detection should be given a priority in prison TB control strategies.

Screening tuberculosis during entrance to prison should be strengthened inorder to control rapid transmission within the prison.

Researchers

Conducting a prospective study including prison staffs will give a better estimation of prevalence (incidence) and associated risk factors of PTB.

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Appendices

Questionnaires

Jimma University College of Public Health Faculty of Medicine Department of Epidemiology Enquiry about participation in PTB research project in Wolaita zone prison. Good morning/good afternoon. My name is _____. I am working for an investigator doing this thesis for the partial fulfillment of master's degree in Epidemiology. I would like to thank you for accepting our invitation for this information session. The purpose of this research is to determine the magnitude and factors associated with pulmonary tuberculosis (TB) among inmates in this prison. The study finding will give baseline information about the burden of the disease and helps for planning and implementing TB control and prevention intervention. I will ask you information about factors associated with pulmonary TB and to submit three samples of sputum that will be analyzed for the diagnosis of TB. You are selected to participate in this study due to symptom you have i.e. Cough $\geq$ 2 weeks. So, participation will give you an opportunity for diagnosis and getting recommended treatment of TB according to national guidelines.

I would like to assure you that all of your responses to our questions will be kept confidential throughout the study process using coding system that only managed by the researcher. Any of the information you provide will be used only by the research team and will, by no means, be revealed to a third party. After finalizing analysis and reporting, your personal identifiers will be removed. I would like to assure you that your participation in this research will not affect your imprisonment or working condition. In addition, this study has an ethical clearance (legal permission).You have full right to refuse, withdraw or completely reject part or all of your participation in the study. But we encourage your full participation as the answers you give on this form are very important to this study and helps for planning TB control and prevention measures in prison.

Do you understand the information correctly? If you have questions, you can ask at any time and also we will provide you the answers. We would be thankful if you spend some time with us answering questions related to the issues described above. The interview will take 20 minutes.

Do you agree to participate? 1 yes_____ 2 No_____

Declaration of consent for the study

Consent Form

I have read or understand the information sheet above and clearly understood the purpose and anticipated benefit of the research. I hereby need to assure with my signature below that I, without any coercion or forceful act by the research team, have decided to voluntarily participate in the study in-front of the witness.

1. Study subject's Witness's

Code number_____ Name _____

Signature _____ Signature _____

Date_____ Date _____

Data collectors

Name_____

Signature_____

Date_____

English version interviewed type of questionnaire

Code Number_____ Room No_____

No	Questions	Coding category/response	Skip to
Part I. Socio-demography characteristics			
101	Age in years	_____years	
102	Sex	1= female 2=male	
103	Marital status	1= single 2= married 3= divorced 4= other specify	
104	Can you read and write	1=yes 2=no	If no skip to 107
105	If yes, did you have formal school year?	0= yes 1= no	
106	If yes, educational status	1= illiterate 1= from1-12 grade	

		2=above grade 12	
107	Occupation before imprisonment	1= farmers 2= Government employed 3= self employed 4= student 5= house wife 6= No job 7=merchant 8= Other specify	
108	Residence place(according to local administration)	1= rural 2=urban	
109	Do you smoke?	1= no 2= yes	
110	If yes, for how long?	_____years	
111	Do you Chew 'chat'?	1= no 2= yes	
112	If yes, for how long?	_____years	
Part II. Prison History and condition			
201	Do you have support from family	1= No → Skip to Q 203 2=Yes	
202	If yes to Q 201, by what do they support you?	1=Visit only 2=Food only 3=Visit and food	
203	If you have family visit, how many times per week do they bring food?	_____per week	
204	How long did you imprisoned in the current prison?	_____months	
205	How many times did you get imprisonment in the current prison?	_____times	
206	Have you been imprisoned in another prison?	1=no → Skip to Q.209 2= yes	

207	If yes to Q.205, how many times?	_____times	
208	If yes to Q.205, how long?	_____months	
209	Have you been imprisoned with known TB patient in same room?	1= no 2= yes 3= I don't know	
210	If Yes to Q.208, for how long?	_____months/years	
211	Have you imprisoned with chronically coughing person in same room?	1=no ⟶ 2.=yes	Skip to Q.214
212	If yes, for how long?	_____	
213	How many inmates are imprisoned in your room?	_____per room	
214	Do you have window in your room?	1=no ⟶ 2= yes	Skip to Q216
215	If yes to Q.213, How often do you open the window?	1= always 2= sometimes 3= never	
216	How frequently are you spending your time outside room?	1= everyday 2= less time 3= never	
217	Do you have your own bed clothes?	1= yes 2= no	
218	How is your sleeping place in prison?	1= Mattress on floor 2= Carpet on floor 3= Bed 4= Other specify.	
219	Status of the pavement of your room's floor	1= soil 2= Cement 3= stone 4= others	
220	Do you share drinking and eating materials with other persons?	1= yes 2= no	
Part III. Morbidity History and Status			

301	Currently, what kind of symptoms (complaints) do you have? N.B. Don't mention choices for Interviewee. Multiple choices possible.	1=cough 2= chest pain 3=difficulty of breathing 4=fever 5= weight loss 6= night sweating 7= loss of appetite 8= malaise 9= fatigue 10= others(specify)	
302	For how long have you been Coughing?	_____weeks	
303	Did you visit and receive any treatment for your current complaint?	1= no ⟶ 2= yes	Skip to Q.305
304	If yes to Q.303, where?	1= health institution outside of the prison 2= prison's clinic 3= both 4= other specify	
305	How many times did you visit for these symptoms (those mentioned in Q.301)?	_____times	
306	If no to Q.303, why?	_____	
307	Did you have these symptoms (those mentioned in Q.301) before your imprisonment in this prison?	1= no ⟶ 2= yes	Skip to Q.309
308	If yes to Q.307, Did you visit prison clinic at that time?	1= yes 2= no 3= I don't remember	
309	Have you been diagnosed for TB?	1= no 2= yes	
310	If yes to Q.309, When have you been diagnosed for	1=Before imprisonment	

	TB?	2=During imprisonment 3= I don't know	
311	If yes to Q.309, did you take treatment?	1= yes 2= no	
312	If yes to Q.309, did you complete the full course of treatment?	1= yes 2= no	
313	Do you have identified or diagnosed health problem like Diabetic mellitus, Hypertension…etc?	1= no ⟶ 2= yes 3= I don't know	Skip to Q.318
314	If yes to Q.314, what is/are the problem?	_____	
315	If yes to Q.314, are you taking any treatment?	1= yes 2= no ⟶	Skip to Q.318
316	Have you ever been hospitalized?	1= no ⟶ 2= yes	Skip to Q.321
317	If yes to Q.318, how long?	_____months	
318	Did you have contact with known TB patient at home?	1= no 2= yes 3= I don't know	
319	Weight(to be measured by data collector)	_____kg	
320	Height(to be measured by data collector)	_____meter	
321	Collected sputum (to be filled by data collector): make mark if taken. N.B. The respondent should know why and when should give the sputum.	1= morning1 2= morning2 3= morning3 4= no sputum(write reason why there is no sputum)	

Part IV: Direct Microscopy (AFB) result

Sputum	AFB result	Grading			
		scanty	+1	+2	+3
First day					
Second day					
Third day					

Part v: HIV TEST

Code of patient	HIV Pretest counseling		Accept and tested		Test result		Posttest counseling	
	Yes	No	Yes	NO	Positive	Negative	Yes	No

WOLAYTTATO DOONA OYSHA SHAAKUWA

Jimma Yunburshiyaa derettetta paxxatettanne akkamo saynisse koloojiyyaappe Epidemolooje timirtte shako kifilee

D/Z/Z/K Asata, Wolayta zoone qasho keetta garssan de'iyya asatan Goofina xaama harggenne gaasota pilgganaw oosettiyo xinaatte

Sunttay taage _____getteetays.Taani ootiyooge Jimma yunvurhsee naa'antto detta degerriyya anjjettettanayyo oottiya pilgeetta giddishin ha sohuwaan beetidoy qasho keettan de'iyaa higge muranchattan beetiya goofina xaammanne ha harggiyoo baaso woykko gaaso giddiybaata pilgganaayo hintteppe naqqaasha koshshees.Zaarannayo eeno giddo gishshaw keehippe galattays. Ha pilggettayoo waana halchoy hargiyanne gaasotta eerannaga. Hegga gishaw hintte tayo cuchcha heezutoo quffidi immanayyo koshshees. Ha pilggettayo doorettiddo gaasoykka naa'uu saaminttaanne heggaappe aaro wodiya kuffisiddo gishshas. Ha pilggexxan hintte tannara giddiyoogge goofina xaama pliggettannas, heggappekka beettiyaaba giddikko like xale ekkidi paxxanas maades. Aybba oyshaynne zaaro hinttegge xuura giddiyooga yootays. Ha pilggettan hintte ootiya qaatas aybbanne hinttenna qasho keetta ehiya metoy de'enaaga yootays. Ha pilggetta dossaada kaalidooganne eeno giddooga ta kusha mallatan erisays.

Pilgettas dooretiida yaraa Markka

Shako payddo---------- Suntta----------

Mallatta---------- Mallatta----------

Gallassa ---------- Gallassa ----------

--

Oysha shiishiyagga

suntta ----------

Mallatta----------

Gallassa ----------

p.maara	Oysha	Zaaro	
Derettettane ikkonoome hanotta			
101	Yeleta laytta	----------laytta	
102	Mattuma	1. Attuma 2. Macca	

103	Ako- gelo hanotta	1= akabeykke/gellabeeykee 2= Akaas/gelaas 3= shaahettidda 4= azinnay/machchiyya hayqeed/qaasu 5=Harraba gidikko	
104	Nabbabiyooganne xaafiyooga danda'eeti?	1=ee 2= danda'ikkee	Danda'ikkee 107pinna
105	Zaaroy ee giddikko kawo timirtte kaalideetti?	1=ee kaallas 2=kaalabeeykke	
106	Zaaroy ee giddikko tammaro dettay	1=1-12tho kifile 2=koyro kollojje 3=dippilooma 4=digire 5=hara gidikko yootitee	
107	Ha qasho keeta gelannashin kaseera oosoy aybee?	1=kawo oosancha 2=goshshancha 3= Buzo ooso eqota 4= tamaare 5=sooyzzo 6=oosoy baa 7=Hara gidikko yootitte	
108	Kaseera hintte de'iyoosay	1= gaxaree 2= katama	
109	Shigaara cuwisseetti?	1=Cuwiseekee 2= ee cuwissays	
110	Zaaroy ee giddikko woyssa laytte doomidossappee	_____laytta	
111	Caate coommeetti?	1= coommikke 2= coomayssi	

112	Zaaroy ee giddikko woyssa laytte doomidossappee	_____laytta	
Naa'antto shaakko oyshatta			
201	Keeta asaati oychchiyoona?	1= oychchokkonna 2= ee oychchossonna	0 giddiko 204kko pinna
202	Ee giddikko aybbin oychchiyyoona?	1= coo yiidi 2= katta xallan 3=kattaninne yiyoogaan	
203	Soo asappee maaduwa demiyyaaba gidikko saminttan aappunttoo kata demmeetti?	_____samminttan	
204	Ha qasho keettan woysa wodiya takkiddetti?	_____agina	
205	Ha qasho keettan woysatto qasheetideetti?	_____tto	Qashettibeenadikko 209 pinna
206	Hara qasho keetta qashettidetti?	1= qashetaas 2=qashettabeykke	
207	Zaaroy o205 ee gidikko aapuntto qashettidetti?	_____tto	
208	Zaaroy o205 ee gidikko ay keena wodiyaa	_____aginna/laytta	
209	Goofinna xaama sahettiyo asara isi kiffiliyan takkidetti?	1=takkabeykke 2= ee 3= errikke	
210	Ee giddikko woysa wode?	_____agina/laytta	
211	Takkida quffoy de'yo asara daro wodiya qasho keethan aatidetti?	1= takkabeykke 2= ee	Takkabeykke giddikko 214 pinna
212	Ee giddikko woyssa wode?	_____	

213	Hintte de'iyaa kifilen aapun asati de'iyoonna?		
214	Hintte de'iyo kifilen maskkotey de'ii?	1= baawa 2= de'ee	Baawa gidikko o216koo pinna
215	De'iyaaba gidikko woyssa saatiya dooyetti?	1= ubbatto 2= guuta wodes 3= daro guuta wodiyaas	
216	Kifileffe Karen appun saatiya takkeettii?	1=ubbatto 2= aaxi aaxidi 3= kare kiyyi errokko	
217	Zin'iyyo hiitay de'ii?	1= ee 2= baa	
218	Aybban zin'eetti?	1= firaashe 2= jibba 3= arsaan 4= harabay diiko____	
219	Kifile wuygge aybee?	1= biita 2= simmintto 3= shuchchaa 4= hara___	
220	Hintte qofan hinttenne kifile geeshatettay ay malee?	1= daro lo 2= lo 3= lo'enna	
221	Kata nne haata misha issippe go'etteeti?	1= ee 2= go'ettokko	
Heezantto shaakuwa goffina xaamara gakketiyya hargeetu hanota			
301	Ha'i hintenna sakkeiyoobay?	1= qufo 2= tira saho 3= shemppannayo waayettes 4=michees 5= bollay guuxis 6= qamma caawoyees 7= katta dosissenna	

		8= dafurssees 9= labbantees 10= hara___	
302	Qufo takoossapee	_____saminta	
303	Ha'I sahuwayyo akkamettiditte?	1= akkamettabeykke 2= akkamettas	Akkamettibeenaba diko o306kko pinna
304	Akkamettidaba dikko awan?	1= qasho keetappe karen 2= qasho keeta paxxatetta equwan 3= naa'ankka 4= hara diiko yoota	
305	Appuntto akkametanaayo simeretteditee?	_____tto	
306	Akkamettibeenaba dikko ayssi?	_____	
307	O301 beetiya sahota malaattay qasho keeta gelanaappe kaaseera dommiddee?	1=gidenna 2=ee	Giddenna diikko O309kko pinna
308	Ee gidikko qasho keeta paxxatetta kilinnike go'ettideetti?	1=ee 2= go'ettabeykke 3= wozanttikkee	
309	Goofina xaamas xeelettidee?	1=xeeletttabeykke 2= ee	
310	Ee gidikko awdee xeeletidetti?	1=qashettannappe kaseera 2= qashotogappe doomin 3= errikke	
311	Zaaroy O309s ee giddikko xale eekidetti?	1= ee 2= eekabeykke	
312	Zaaroy O311s ee giddikko xale ekki wurssideetti?	1=ee 2= wurssabeykke	
313	Dumma paxxatetta metoy lemisos shukkaare sahoy, suuttasuggettay, hhm de'ii?	1=baa 2= ee 3= errikke	Errike O318kko pinna

314	Ee giddikko aybbe?	_____	
315	Ee giddikko xale go'ettetti?	1= ee 2= go'ettikke	
316	Saho gaasuwan hospitaalen zi'nni erreetti?	1= akammetta erikke 2= ee	
317	Ee giddikko woysa wodes?	_____agina	
318	Qashettannappe kaseera goofina xaama hargganchaara suure gakketettay de'i?	1= baa1 ee 2= errikke	
319	Bolla deexo(naqaasha shiishiyay likkees)	_____kg	
320	equwa(naqaasha shiishiyay likkees)	_____meetire	
321	Cuchay shiqees(naqaasha shiishiyay likkees) cucha ekkogappe guyiyyan malattiitte **Wozanto** cuchay ekketiyaa gaasoy he urrayo qonccanna koshees	1= koyro guura 2= naa'antto guura 3= heezantto guura 4= cuchay ekkettibeena(gaasoy xaafetto)	

<u>የአማርኛ ቋንቋ ቃለመጠይቅ ቅጽ</u>

<u>ጅማ ዩኒቨርሲቲ የህብረተሰብ ጤናና ህክምና ሳይንስ ኮሌጅ ኢፒዴሚዮሎጂ ትምህርት ክፍል</u>

<u>በደቡብ ክልል፣ወለይታ ዞን ማረሚያ ቤት ውስጥ ያለ ቲቢ በሽታ መጠንና ለቲቢ ህመም መንስኤ የሚሆኑ ነገሮች ላይ የሚደረግ ጥናት</u>

ስሜ----------ይባላል፡፡ እኔ የሚሰረዉ በጅማ ዩኒቨርሲቲ የድህረ ምረቃ የጥናት ጽሁፍ አባል ውስጥ ነዉ፡፡ በዚህ የተገኛሁት በማረሚያ ቤት ዉስጥ ያለዉን ቲቢ መጠንና አጋላጭ ሁኔታዎችን ለማወቅ እንዲያስችለኝ ዘንድ መረጃ እንድትሰጡ ነዉ፡፡ ለመነጋገር ጊዜዎትን ስለሰጡ ከልብ አመሰግናለሁኝ፡፡ የዚህ ጥናት ዋና ዓላማ በዚሁ ማረሚያ ቤት ዉስጥ ባሉ ታራሚዎች ያለዉን የቲቢ ህመም መጠንና አጋላጭ ሁኔታዎችን ለማወቅ ነዉ፡፡ስለዚህ ከእርሶ የሚጠበቀዉ ለቲቢ የሚያጋልጡ ሁኔታዎች ላይ መረጃ፣ ለአክታ ምርመራ ሶስት ዙር አክታ(የመጀመሪያ ጧት፣ሁለተኛ ጧት እና ሶስተኛ ጧት) ምራቅ ሳይገባበት እንድሰጡኝ ነዉ፡፡ለዚህ ጥናት የተመረጡበት ምክንያት ሁለት ሳምንትና ከዚያ በላይ የቆየ ሳል ስላለብዎት ነዉ፡፡ በጥናቱ መሳተፍዎ ቲቢን እንድመረመሩ፣ ከምርመራ በኋላም ቲቢ ብገኝብዎት ደረጃዉን የጠበቀ ህክምና

እንድያግኙ ይረዳዎታል፡፡ የትኛዉም መረጃ ምስጥራዊነቱ የተጠበቀ ነዉ፡፡በጥናቱ መሳተፍዎ የማረሚያ ቤት ሁኔታን በምንም ዓይነት መልኩ አይነካም፡፡ የጥናቱን ዓላማንና የወደፊት ጥቅሙን ምንም ዓይነት ጫና ሳይኖርበት ሙሉ በሙሉ ስለ ተረዳሁኝ፤ በምስክር ፊት በፍርማ አረጋግጣለሁኝ፡፡

የተሳታፊ

ኮድ----------

ፍርማ----------

ቀን----------

የምስክር

ስም----------

ፍርማ----------

ቀን----------

የመረጃ ሰብሳቢ

ስም----------

ፍርማ----------

ቀን----------

ተ.ቁ	ጥያቄ	መልስ	ዝለል
		የታራሚ/ዋ ማህበራዊና ኢኮኖሚያዊ ሁኔታ	
101	ዕድሜ	----------ዓመት	
102	ጾታ	1 ሴት 2 ወንድ	
103	የትዳር ሁኔታ	1አላገባሁም 2 አግብቻለሁ 3 ተለያይተናል 4ባለቤቴ ሙታብኛለች/ኛል 5 ሌላ ካላ ይጠቀስ	
104	ማንበብና መጻፍ ይችላሉ	1 አዎ 2 አልችልም →	107
105	መልስዎ አዎ ከሆነ መደበኛ ት/ት ተከታትለዋሉ	1 አዎ 2 አልተከታተልኩም	
106	መልስዎ አዎ ከሆነ የት/ት ደረጃ	1ከ1-12 ከሆነ፣--------ከፍል 2 ሰርትፍኬት 3 ድፕሎማ 3 ድግሪ 4 ሌላ ካላ ይጠቀስ	
107	ማረሚያ ቤት ከመግባትዎ በፊት የነበራዎት ዋና ስራዎት	ነ ገበሬ 2 የመንግስት ሠራተኛ 3 የግል ተቋም ተቀጣሪ 4 ተማሪ 5 የቤት እመቤት 6 ስራ ዬለኝም 7ሌላ ካላ ይጠቀስ	
108	የመኖሪያ አድራሻዎት (የበፊቱ)	1ገጠር 2 ከተማ	

109	ስጋራ ታጨሳለህ/ሻለሽ	1አላጨስም 2 አዎ	
110	አዎ ከሆነ ለስንት ዓመታት	ለ---------- ዓመታት	
111	ጫት ትቂማለህ/ሚያለሽ	1አልቂምም 2 አዎ	
112	አዎ ከሆነ ለምን ያህል ጊዜ	ለ----------ዓመታት	
	ክፍል ሁለት የማረሚያ ቤት ሁኔታ		
201	ከቤተሰብ ድጋፍ ያገኛሉ	1 አላገኛሁም ⟶ 2 አዎ	ወደ 204
202	አዎ ከሆነ ምን አይነት ድጋፍ	1ጉብኝት ብቻ 2 ምግብ ብቻ 3 ምግብና ጉብኝት	
203	ከቤተሰብ ድጋፍ የምያገኙ ከሆነ በሳምንት ስንት ቀን የምግብ ድጋፍ ያገኛሉ	----------በሳምንት	
204	በዚሁ ማረሚያ ምን ያህል ጊዜ ቆዩ	----------ወራት	
205	በዚሁ ማረሚያ ቤት ስንት ዙር ታሰሩ	---------- ዙር	
206	በሌላ ማረሚያ ቤት ታስረዉ ያዉቃሉ	1 አላዉቅም ⟶ 2 አዎ	ወደ 209
207	ለጥያቄ ቁ 205 አዎ ከሆነ ስንት ጊዜ	----------ጊዜ	
208	ለጥያቄ ቁ 205 አዎ ከሆነ ምን ያህል ጊዜ	----------ወራት	
209	ከቲቢ ታማሚ ጋር በአንድ ክፍል ቆይተዉ ያዉቃሉ	1 አልቆየሁም 2 አዎ 3 አላዉቅም	
210	አዎ ከሆነ ምን ያህል ጊዜ	----------ወራት/ዓመታት	
211	የቆየ ሳል ካለበት ሰዉ ጋር ባንድ ማረሚያ ክፍል ዉስጥ ቆይተዉ ያዉቃሉ	1 አልቆየሁም ⟶ 2 አዎ	ወደ 214
212	መልስዎ አዎ ከሆነ ምን ያህል ጊዜ	----------	
213	አሁን ባሉበት ክፍልዎ ስንት ታራሚ አለዉ	----------ባንድ ክፍል	
214	በክፍልዎ መስኮት አለዉ	1 የለም ⟶ 2 አዎ	ወደ 216
215	አዎ ከሆነ ምን ያህል ሰዓት ክፍት ይሆናል	1 በተለምዶ 2 ጥቂት ሰዓት 3 በጣም ጥቂት ሰዓት	
216	ከክፍል ዉጪ ምን ያህል ሰዓት ይቆያሉ	1 በየቀኑ 2 ላልፎ ላልፎ 3 ዉጪ አልወጣም	
217	የራስዎ መኝታ አለዎት	1 አዎ 2 የለኝም	
218	ምን ላይ ነዉ የሚተኙት	1 ፍራሽ 2 ጆባ 3 አልጋ	

		4 ሌላ ካላ ይጠቀስ	
219	የክፍሉ ወለል	1 አፈር 2 ስሚንቶ 3 ድንጋይ 4 ሌላ ካላ ይጠቀስ	
220	በርስዎ አመለካከት የግልና የክፍሉ ንጽህና ምን ይመስለዎታል	1 በጣም ጥሩ 2 ጥሩ 3 መጥፎ	
221	የምግብና የመጠጥ እቃ በጋራ ነዉ የሚጠቀሙት	1 አዎ 2 አንጠቀምም	
		ክፍል ሶስት ተጉዳኝ በሽታ ሁኔታ	
301	ባሁኑ ሰዓት የሚሰማ የህመም ስሜት	1 ሳል 2 የደረት ህመም 3 የትንፋሽ ማጠር 4 ትኩሳት 5 ክብደት መቀነስ 6 ማላብ(ማታ) 7 የምግብ ፍላጎት መቀነስ 8 መዛል 9 ድካም 10 ሌላ ካላ ይጠቀስ	
302	ሳሉ ምን ያህል ጊዜ ቆየ	----------ሳምንታት	
303	አሁን ለምሰማዉ ስሜት ህክምና አግኝተዋሉ	1 አላገኛሁም ⟶ 2 አዎ	ወደ 306
304	አዎ ከሆነ ፤ ከዬት	1 ከማረሚያ ቤት ዉጪ ካለዉ ጤና ተቋም 2 ከማረሚያ ቤት ክልኒክ 3 ከሁለቱም 4 ሌላ ካላ ይጠቀስ	
305	ለህክምና ስንት ጊዜ ተመላለሉ	----------ጊዜ	
306	ከላይ በ ጥ.ቁ 301 የተዘረዘሩ ምልክቶች ማረሚያ ቤት ከመግባትዎ በፊት ነበረዎት	1 አልነበረም ⟶ 2 አዎ	ወደ309
307	አዎ ከሆነ የማረሚያ ቤቱን ክልኒክ ተጠቅመዉ ነበሩ	1 አዎ 2 አልተጠቀምኩም 3 አላስታዉሰዉም	
308	ቲቢ በሽታ ተመርምረዉ ነበሩ	1 አልተመረመርኩም 2 አዎ ተመርምሬዋለሁ	
309	አዎ ከሆነ መቼ ነበረ የተመረመሩት	1 ማረሚያ ቤት ከመግባቴ በፊት 2 ማረሚያ ቤት ከገባሁ በኋላ 3 አላዉቀዉም	
310	መልስዎ ለ309 አዎ ከሆነ መድሃኒት አግኝተዉ ነበር	1 አዎ 2 አላገኛሁም	
311	መልስዎ ለ310 አዎ ከሆነ ሙሉ መድሃኒቱን ጨርሰዉ ነበር	1 አዎ 2 አልጨረስኩም	
312	ተለይተዉ የታወቀ የጤንነት ችግር ለምሳሌ፣ደም ግፊት፣የስኳር ህመም፣...ወዘተ አለብዎት?	1 የለብኝም 2 አዎ 3 አላዉቅም	
313	አዎ ከሆነ፣ የትኛዉ የጤንነት ችግር	----------	
314	አዎ ከሆነ መድሃኒት እየተጠቀሙበት ነዉ	1 አዎ 2 አልጠቀምም ⟶	ወደ318

315	በህመም ምክንያት በሆስፕታል ተኝተዉ ታክመዉ ያዉቃሉ	1 አልታከምኩም 2 ኣዎ	
316	ኣዎ ከሆነ ለምን ያህል ጊዜ	----------ወራት	
317	ኣዎ ከሆነ ምክንያቱ ምን ነበር	----------	
318	ማረሚያ ቤት ከመምጣትዎ በፊት ከታወቃ ቲቢ ታማሚ ጋር ቀጥተኛ ግኑኝነት ነበረዎት	1 አልነበረም 2 ኣዎ 3 አላዉቅም	
319	ክብደት(በመረጃ ሰብሳቢ ይለካል)	----------ኪሎ ግራም	
320	ቁመት(በመረጃ ሰብሳቢ ይለካል)	----------ሜትር	
321	ኣክታ ይሰበሰባል(በመረጃ ሰብሳቢ ይሞላል) ኣክታን ከወሰዱ በኋላ ምልክት ያድርጉ **ማሳሰቢያ**፣ኣክታ ን የሚሰጥ ሰዉ ለምን አላማ እንደምወሰድ ማወቅ ኣለበት፡፡	1 የመጀመሪያ ጧት 2 ሁለተኛ ጧት 3 ሦስተኛ ጧት 4 ኣክታ አልተወሰደም (ምክንያት ይጻፍ)	