



**UTILIZATION STATUS OF ISONIAZID PREVENTIVE THERAPY AND
ASSOCIATED FACTORS AMONG NEWLY ENROLLED HIV/AIDS
PATIENTS ATTENDING PUBLIC HEALTH FACILITIES IN ADDIS
ABABA, ETHIOPIA**

THESIS

BY

FEKADE DEGU WOLDEKIDAN

MARCH, 2018

ADDIS ABABA, ETHIOPIA

**St. PAUL HOSPITAL MILLENIUM MEDICAL
COLLEGE, DEPARTMENT OF PUBLIC HEALTH**

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**A THESIS SUBMITTED TO DEPARTMENT OF PUBLIC HEALTH OF SPHMMC, IN
PARTIAL FULFILMENT FOR REQUIREMENTS OF THE MASETR'S DEGREE OF
PUBLIC HEALTH IN FIELD EPIDEMIOLOGY**

MARCH, 2018

ADDIS ABABA, ETHIOPIA

**St. PAUL HOSPITAL MILLENIUM MEDICAL COLLEGE,
DEPARTMENT OF PUBLIC HEALTH APPROVAL FORM:**

I, the under signed, declared that this is my bona fide original work, has never been presented in this or any other University, and that all the resources and materials used for the thesis, have been fully acknowledged.

Student Name: **Fekade Degu Woldekidan**

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Place: **Addis Ababa, Ethiopia**

Date of submission: _____

This thesis has been submitted for the examination with our approval as candidate's advisors.

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**St. PAUL HOSPITAL MILLENIUM MEDICAL COLLEGE,
DEPARTMENT OF PUBLIC HEALTH GRADUATE STUDIES FINAL
THESIS REPORT APPROVAL FORM:**

As member of the board of Examiners of the final thesis open defense, we certify that we have read and evaluated the thesis prepared by **Fekade Degu Woldekidan** under the thesis entitled **“Utilization status of Isoniazid preventive therapy and associated factors among newly enrolled HIV/AIDS patients attending public health facilities in Addis Ababa, Ethiopia”** and recommencement for the degree of master of public health in field epidemiology.

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Table of content	Page
Acknowledgement	i
Table of content.....	ii
Abbreviations and acronyms.....	iv
List of Tables	v
List of Figures	v
Abstract.....	vi
1. Introduction.....	1
1.1 Back ground.....	1
1.2 Statement of the study.....	2
1.3 Significance of the study.....	3
2. Literature Review.....	4
2.1 Overview of Isoniazid preventive therapy utilization	4
2.2 Factors associated with Isoniazid preventive therapy utilization.....	6
3. Objectives	9
3.1 General Objective:	9
3.2 Specific Objectives:	9
4. Methods and materials	10
4.1 Study area and period.....	10
4.2 Study design.....	11
4.3 Population	11
4.3.1 Target population	11
4.3.2 Source population	11
4.3.3 Study population	11
4.4 Inclusion and exclusion criteria	11
4.4.1 Inclusion criteria	11
4.4.2 Exclusion criteria	12
4.5 Sampling	12
4.5.1 Sample size determination	12
4.5. 2 sampling technique	13
4.6 Study variables.....	15
4.6.1 Dependent variables	15
4.6.2 Independent variables	15

4.7 Data collection tools and procedures	15
4.8 Data processing and analysis	16
4.9 Data management.....	17
4.10 Data quality assurance	17
4.11 Operational definitions.....	18
4.12 Ethical consideration.....	18
5. Results.....	19
5.1 Demographic characteristic of respondents	19
5.2 Isoniazid preventive therapy utilization.....	20
5.3 Factors associated with IPT utilization status	22
5.4 Qualitative findings.....	27
6. Discussion	30
7. Limitation of the study.....	31
8. Conclusion	32
9. Recommendation	32
10. References:.....	33
Annexes	36
Annex 1. Consent form.....	36
Annex 2. Questionnaires.....	37
Annex 3: Questionnaires for key informants	40

Abbreviations and acronyms

AACALMIA	Addis Ababa City Administration Land Management Information Agency
AAHB	Addis Ababa Health Bureau
AIDS	Acquired Immunodeficiency Syndrome
AU	African Union
ABHC	Alem bank Health Center
DOTS	Directly Observed Treatment for Short course
ERC	Ethical Review Committee
EFY	Ethiopian Fiscal Year
ETB	Ethiopian Birr
HAART	Highly Active Anti Retroviral Treatment
HC	Health Center
HF _s	Health Facilities
HIV	Human Immunodeficiency Virus
INH	Isoniazid
IPT	Isoniazid Preventive Therapy
IRB	Institution Review Board
ML HC	Mikili Land Health Center
PI	Principal Investigator
PLHIV	People Living with HIV
PPM	Public Private Mix
RDH	Ras Desta Hospital
SRS	Simple Random Sampling
TB	Tuberculosis
UNECA	United Nations Economic Commission for Africa
W9 HC	Woreda 9 Health Center
WHO	World Health Organization

List of Tables

Table 1: Demographic characteristics of the study participants by sex in the public health facilities of Addis Ababa, Ethiopia, 2017	19
Table 2: The crude odds ratio of demographic characteristics of the study participants, Addis Ababa, 2017	23
Table 3: The crude odds ratio of IPT utilization among PLHIV in public health facilities of, Addis Ababa, 2017	24
Table 4: Adjusted odds ratio of some independent variables to the IPT utilization status among PLHIV, Addis Ababa.....	25

List of Figures

Fig 1: Conceptual frame work of utilization status of Isoniazid preventive therapy [2, 4, 8, 10, 13,14,15,16, and 17].	8
Fig 2: Diagram illustrates the map of Addis Ababa by sub city administration, 2017	11
Fig 3: The sampling frame of the study in each stage in the Addis Ababa, 2017.....	14
Fig 4: Time based IPT utilization status of the study participants in public health facilities	21
Fig 5: Reasons for the delay or/and not to receive IPT among both lately IPT receiver and none receiver study participants in public health facilities of Addis Ababa, 2017.....	22
Fig 6: Qualitative findings about TB-HIV co-infection status and linkage in public health facilities, Addis Ababa, 2017	27

Abstract

Background: Isoniazid preventive therapy augments anti-retroviral treatment and prevents development of latent TB infection in HIV patients. According to Addis Ababa health bureau report, the current Isoniazid preventive therapy utilization early in time among newly enrolled PLHIV in Addis Ababa is low. In addition, factors contributing to low utilization of Isoniazid preventive therapy are not well known. Therefore, the aim of this study was to assess utilization status of Isoniazid preventive therapy and associated factors among newly enrolled PLHIV in public health facilities of Addis Ababa. **Methods:** A facility based cross-sectional study was conducted supplemented with qualitative study from November 13 to December 8, 2017 in Addis Ababa. The data collected at the exit of ART clinic after having consent of study participants. Pearson's chi-square test was used to check the distribution and multi-logistic regression with 95%CI at $p < 0.05$ used to analyze the associated factors.

Result: Eighty-four (22%) were received Isoniazid preventive therapy within three months of enrollment among 382 drug receiver. Majority 492(97.6%) were screened for TB at enrollment and 299(59.3%) hadn't TB symptom initially. The WHO HIV clinical stage IV patients and currently not in union with their partners had positive association to receive Isoniazid drug within three months of enrollment [AOR2.99; CI(1.476, 6.079) $p < 0.002$] and [AOR7.12; CI(1.46, 34.707) $p = 0.15$] respectively, being getting HIV care services at health center and presence of TB symptom at enrollment had negative association (AOR.148; CI(.074, .294) $p < .001$) and (AOR.447; CI(.24, .83) $p = 0.011$) respectively. Fear of drug resistance and toxicity, drug stock out, and weak M&E were supplementary qualitative results for barriers to low Isoniazid drug utilization among PLHIV. **Conclusion and recommendation:** Utilization status of Isoniazid preventive therapy among PLHIV in public health facilities of Addis Ababa was not good. Presence of TB symptom at the beginning and Enrollment at health center were contributing factors for low Isoniazid preventive therapy utilization in addition to other supplementary factors. Advanced TB screening for PLHIV and strengthening peripheral health care system are the key area to work.

Key words: TB, HIV, IPT utilization status, public health facility, Addis Ababa

1. Introduction

1.1 Back ground

Isoniazid preventive therapy augments anti-retroviral treatment, prevent development of latent tuberculosis infection to disease, and significantly reduce incidence of tuberculosis in the People Living with HIV. Tuberculosis (TB) is contagious and airborne disease caused by the bacillus mycobacterium tuberculosis [1]. As of World Health Organization (WHO) estimates, one-third of the population in the world has latent infection with Mycobacterium tuberculosis [2]. In 2015, there were an estimated 10.4 million new notifiable TB cases and 1.8 million deaths in the globe. Of which, 1.2 million (11.5%) cases and 400,000 (11%) of the deaths were from People living with HIV (PLHIV [1, 3]. The global burden of TB mainly lay down in the 22 countries and about 50% of prevalence occurs in 5 countries of South East Asia, namely, India, Indonesia, Bangladesh, Thailand, and Myanmar [4]. It is known by high mortality and amongst top 10 causes of death worldwide and leads HIV and malaria [1], ranking alongside HIV/AIDS by deadly list [5].

Tuberculosis is the major opportunistic infection and causes of death for HIV infected patients especially countries with constrained economy and poor settings particularly in Africa, Asia, and South America [6, 7]. Human Immunodeficiency Virus infection (HIV) is the highest risk factor for changing the latent TB infection in to the disease stage or developing new TB infection. The risk of developing TB infection with PLHIV is as high as 37 times greater compared to the none-HIV infection [8]. TB is responsible for the 30% of HIV related death in the Horn of Africa (Uganda) [9]. In high HIV prevalent countries like Ethiopia, TB infection is highly increased even though well established implementation of TB direct observed treatment short-course (DOTS) program [10]. Ethiopia is one of the known twenty-two high TB burden countries in the world and found the 3rd and 9th stages in the Africa and in the world respectively [11]. It is the major cause of death and hospital admission in the country [12, 13]. According to Addis Ababa Health Bureau TB-HIV report, the incidence of TB and low utilization of Isoniazid preventive therapy among PLHIV has continued as a problem in the capital City. Meanwhile, high number of TB-HIV and DOTS implementing health facilities, the incidence of TB in the City is still very high in HIV infected patients and is a challenge for stretched objectives of reducing HIV/AIDS associated morbidity and mortality.

1.2 Statement of the study

The utilization status of Isoniazid preventive therapy among people living with HIV in the Capital of Ethiopia is a challenging problem in the implementation of integrated TB-HIV program. As of 2008 Ethiopian fiscal year (EFY) Addis Ababa Health Bureau annual TB/HIV report, only 15% of HIV patients were provided Isoniazid preventive therapy among 7,134 newly registered PLHIV. It was significantly decreased by more than half (55.9%) compared with similar report a year before at which the IPT up take was 34% [14]. The problem is contrary to the objectives of the program at large. The root cause of this reduction and low uptake of IPT utilization on newly enrolled HIV patients in the City is not clearly understood.

Studies in other African countries revealed that there are a number of reasons that may hinder IPT utilization among PLHIV. Among these reasons: less accessibility of TB preventive treatment [3]; adverse reaction for INH drug and patients' forgetting to take it [6]; Insufficient information to patients on the use of INH [8], limitation of regular patient screening [15, 16], limitation of operational guideline and algorithm [16, 17]; reluctance and negative perception on the part of policy makers and program implementers, competing priorities for resource allocation, insufficient TB/HIV supply management, shortage of INH, perceiving fear of INH resistance TB [17]; provision of insufficient information about IPT (poor adherence) [18]; patients' interruption of their treatment before completion [19].

Though, the studies in the other African countries suggested the above mentioned reasons as the barriers for IPT utilization that it is not clear whether these problems infer the Ethiopia status or not. Few studies, here in the city, tried to assess the IPT utilization and focused to associate it with the demographic characteristics on general HIV positive patients as well. They also tried to quantify the status of IPT as low [10, 12] and as no association to the demographic characteristics of HIV patients [20, 21]. But they did not answer the underline cause or the associated factors related to the program system, the perception of the patients on IPT use, the availability of logistics and drug stock, and the attitudes of the health care workers on the program, and so on. Beside this, the studies did not incorporate the primary health facilities where majority of HIV patients have been served.

People living with HIV have still developed active tuberculosis while they follow chronic care services and on the HAART in Addis Ababa [14]. This implies that there are certain problems which have hinder the effectiveness of IPT utilization on HIV/AIDS programs in the public health facilities. Therefore, the aim of this study was to assess the utilization status of IPT and factors associated with it among newly enrolled PLHIV attending public health facilities in Addis Ababa, Ethiopia.

1.3 Significance of the study

The author believed that this study assessed the general IPT uptake status among newly enrolled HIV/AIDS patients and revealed the basic associated factors /barriers/ to its utilization in the public health facilities in the City. The findings founded from this study provided some clues to TB/HIV program managers and service implementers about the status of IPT utilization among newly enrolled HIV/AIDS patients and the key areas where the stakeholders need to focus addressing to maximize and improve the IPT utilization status. The researcher believed also that the finding of this research gives the researchers additional information to further in depth study on the related issue on HIV/AIDS patients.

2. Literature Review

2.1 Overview of Isoniazid preventive therapy utilization

Tuberculosis (TB) is contagious and airborne disease caused by bacillus mycobacterium tuberculosis. In 2015, it was one of the top 10 causes of death worldwide and was responsible for more deaths than HIV and malaria. In the same year, there were an estimated 10.4 million new (incident) TB cases worldwide; of which 11% were accounted People living with HIV. Similarly, 1.8 million people died from TB and 0.4 million were among people with HIV. The case fatality ratio varied from 5% to more than 20% [1].

Based on the World Health Organization (WHO) estimates, one-third of the world's population has latent TB infection with Mycobacterium tuberculosis. The risk of reactivation of latent TB infection is greatly increased in individuals with immune suppression, like HIV infection. The greatest burden of latent TB infection is found in Southeast Asia (prevalence, 46%), the Western Pacific region (32%), Africa (31%), and the Eastern Mediterranean region (27%), the Americas (15%), and the Europe (14%). In sub-Saharan Africa, one-third to one-half of HIV-infected individuals is co-infected with *M. tuberculosis* [2].

TB is the leading cause of death among all infectious diseases and WHO reported that in 2010 there were 1.1 million deaths among HIV negative people and 0.35 million deaths from HIV associated tuberculosis. The global burden of TB mainly lies in the 22 high burden countries and about 50% of prevalence occurs in 5 countries of South East Asia, namely, India, Indonesia, Bangladesh, and Thailand, Myanmar [4].

The spread of HIV in the past few decades in sub-Saharan Africa has been accompanied by a major increase in the number of new cases of tuberculosis. In 2010, 22.6% deaths exhibited for TB-HIV co-infection among an estimated 1.68 million people dying of Tuberculosis. The proportion of TB-HIV co-infection is highest in African countries and accounted for 82% of TB cases among people living with HIV [19].

TB is one of the major causes of morbidity and mortality in the Horn of Africa. The TB disease is one of the major health problems in different regional states of Ethiopia. According to the previous study, the TB disease is in the top ten causes of outpatient visit, hospital admission and deaths in the Somali Regional State (SRS) in 2008 [6]. The country is one of the top three in

Africa [6] and ranked 9th among the 22 countries in the glob with a high-burden of TB in 2010 [6, 7].

Latent TB and HIV infections have contributed to the increment of TB incidence in countries with dual burden infections. Isoniazid preventive therapy decreases the incidence of new active tuberculosis and latent TB infection on HIV/AIDS patients. So that, high level of IPT uptake on HIV/AIDS patients during early enrollment has benefited in reducing TB incidence and its associated morbidity and mortality [8].

Human Immunodeficiency Virus infection (HIV) is the highest risk factor for changing the latent TB infection in to disease stage or developing new TB infection. The risk of developing TB infection with PLHIV is as high as 37 times greater compared to the non HIV infection [10].

Tuberculosis is the major opportunistic infection and causes of death for HIV infected patients especially countries with in constrained economy and poor settings particularly in Africa, Asia, and South America [8, 9]. In high HIV prevalent countries like Ethiopia, TB infection is highly increased even though well established implementation of TB direct observed treatment short course (DOTS) program [11]. Co-infection of tuberculosis and HIV increases mortality rate of HIV patients [18].

There are certain activities (which collectively called 3Is) to reduce the burden of tuberculosis (TB) infection among PLHIV. These include: intensified TB case-finding (ICF), Isoniazid (INH) preventive therapy (IPT) and infection control in health-care and congregate settings (IC) [19].

One of the critical issues in selecting eligible patients for IPT is screening and ruling out for active tuberculosis. Unless and otherwise patients carefully screened they may treated with single INH drug and resulted in drug resistant TB. Screening PLHIV those who are eligible to IPT is diagnostic and symptom based as of WHO TB screening tools, not as complicated issue and not necessarily required highly qualified specialty especially in resource constrained settings. So screening is a precondition for delivery of IPT to PLHIV [20].

Counseling HIV infected patients before initiation of IPT concerning the patients' understanding about the rationale of IPT, potential INH side effects, regular attendance to follow up clinics, and freedom to take INH publicly increases the patients' adherence level to IPT [22].

Previous studies recommended that PLHIV without active TB infection should receive IPT for a minimum of six months as part of comprehensive chronic HIV care package [13]. The study conducted in Botswana, revealed that provision of IPT to PLHIV for more than 36 months, is highly beneficial in reducing and preventing from developing active tuberculosis in high TB prevalence area and high likelihood of transmission [21]. Isoniazid preventive therapy is effective, safe, and feasible disease prevention plan (scheme) and it should be addressed to all PLHIV including children and pregnant women. It has the effect of lowering the incidence of TB on PLHIV. Isoniazid Preventive Therapy with daily 300mg regimen for consecutive 6 months duration has an association with reduction of the development of active TB by 50% in all PLHIV [14] and nearly 60% in children age less than 15 years [21].

2.2 Factors associated with Isoniazid preventive therapy utilization

There are a number of reasons that may hinder IPT utilization among PLHIV. Of these: Factors that may contribute to low coverage include the need to screen for active TB, the use of TSTs where this is policy, weak health care systems, lack of treatment literacy, the reluctance of a national TB control program to use a first-line TB drug as preventive therapy, and the stigma associated with such use. If chest radiography is part of the screening process, it adds to the costs, and it may be a barrier to starting preventive therapy, particularly if there are no radiographic facilities on site [2]. Fear of isolation and discrimination, lack of recognition of symptoms and the stigma of association with HIV; feeling socially neglected and isolation within the family are main barriers for the effective IPT utilization [4]. Factors related to INH drug adverse effects that lead PLHIV to discontinue taking their Isoniazid preventive therapy include gastrointestinal disturbances, hepatotoxicity, pruritus, seizures, headache and arthralgia. Lack of coordination between the TB and HIV programs, and lack of supervision were another contributing factor for prolonged delays in initiating IPT for PLHIV and to decrease the use of IPT [8].

The previous study revealed also that lack of regular up date for health care workers to screen HIV patients and put them on IPT, and insufficient awareness creation for patients by health care workers (doctors) are determinant factors for the implementation of Isoniazid preventive therapy to peoples living with HIV [10]. The other study described that the patients' HIV Clinical stages (stage III and stage IV), previous history of TB illness among patients, and limitation of regular

screening for all PLHIV were an observed factors that inhibits IPT uptake [13]. The slow IPT utilization coverage and implementation had been linked with concern of development of Isoniazid related resistance, drug side effects, providers' attitude on its effectiveness, failure to consistently use TB screening algorithms and shortage of drug supplies [14].

lack of experience, knowledge, and clarity on the benefits of IPT and existing guidelines by health workers; absence of an established system to monitor and evaluate the implementation of collaborative TB/HIV activities in resource constrained countries are factors that hinder utilization of IPT scale up [15]. Side effect, forgetfulness, perceived long duration of treatment, and being away from residential area in the patient side, and lack of advice by doctors and other health workers about how to use and benefit of IPT were major reasons for interruption or not completion of the full course of INH dose [16]. The reasons non-adherent patients' interruption of their treatment before completion is feeling better, long duration of treatment, side effect, and difficulty to access to health facility [17].

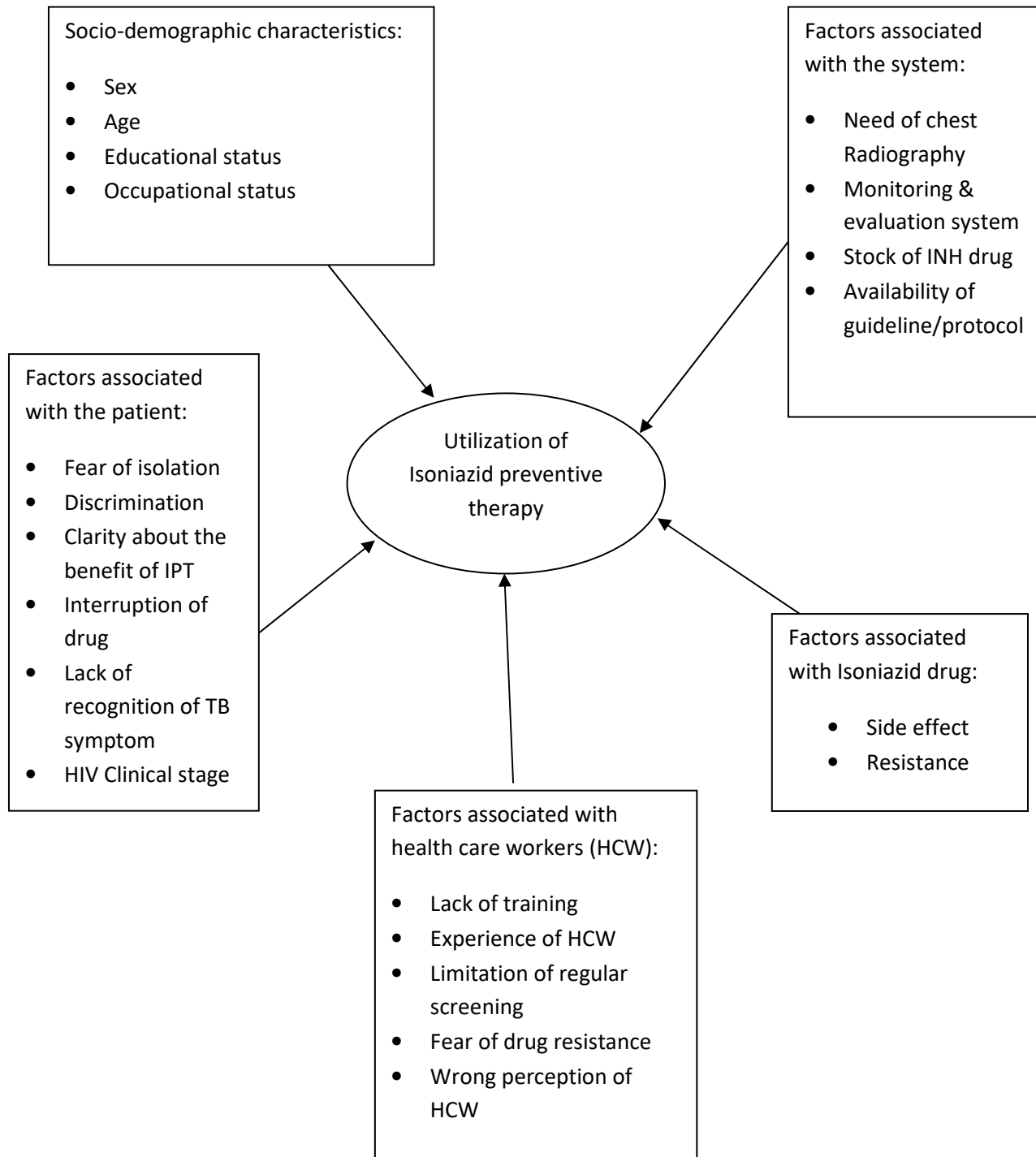


Fig 1: Conceptual frame work of utilization status of Isoniazid preventive therapy [2, 4, 8, 10, 13,14,15,16, and 17].

3. Objectives

3.1 General Objective:

To assess utilization status of Isoniazid preventive therapy and associated factors among newly enrolled HIV/AIDS patients in public health facilities in Addis Ababa, Ethiopia, 2017.

3.2 Specific Objectives:

- To assess utilization status of Isoniazid preventive therapy among newly enrolled HIV/AIDS patients
- To identify factors associated with utilization of Isoniazid preventive therapy among newly enrolled HIV/AIDS patients

4. Methods and materials

4.1 Study area and period

The study conducted from 13th November to 8th December 2017 in the twelve health facilities in the three sub cities namely Arada, Kirkos, and Kolfe keraniyo in Addis Ababa. Addis Ababa is the largest city and the capital of Ethiopia. It is the dominant political, economic, cultural, and historical city of the country. The City was chartered in 1886 by Emperor Minilik II. The City covers a total of 527 km² (203 sq miles) land capital. The city found at the coordinates of 8° 49' 55.929" and 9° 5' 53.853" North altitudes and between 38° 38' 16.555" and 38° 54' 19.547" East longitudes. The elevation of the Capital is 2,355m (7,726 ft). It is a home town of African Union (AU), foundation of United Nations Economic Commission for Africa (UNECA), Diplomats, and other international organizations. It is center relatively for modern economic and social activities in the country [23]. The City is sub divided in to 10 sub-cities and 117 Woredas. The population of the City as 2009 EFY projection is 2,914,406 with annual growth rate of 2.1% as of 2007 census [24].

The health system is structured hierarchically from regional health bureau to health facilities. Currently there are around eight-six public health facilities which have provided TB/HIV services in the City and going to sought to increase this number. Of which 11 are hospitals and the rest are health centers. As of 10 years my experience; supervision, support, feedback, and capacity building for program implementers has been provided by higher level and the reporting and other activities related with service provision has been performed by the lower level.

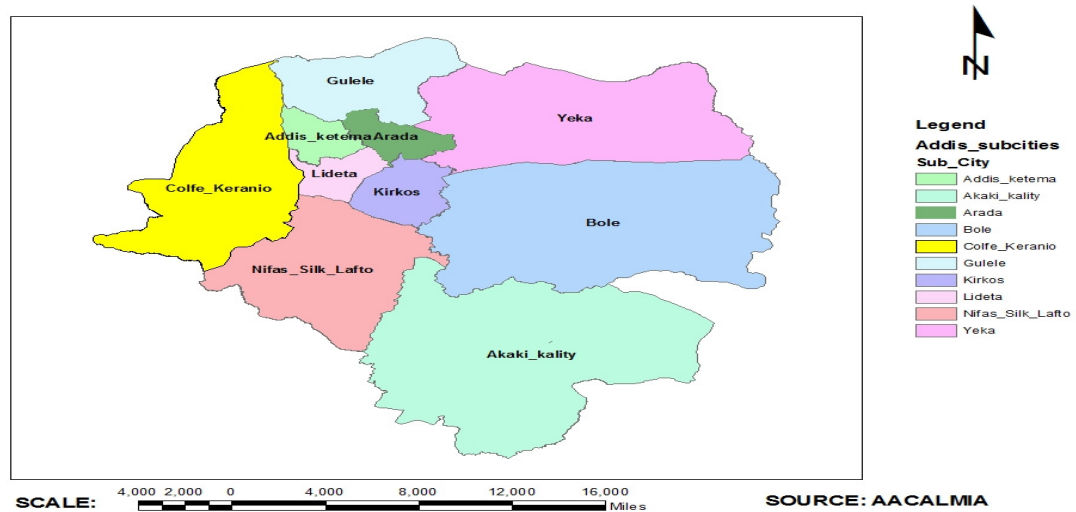


Fig 2: Diagram illustrates the map of Addis Ababa by sub city administration, 2017

4.2 Study design

A facility based cross-sectional study design was used supplemented with qualitative study.

4.3 Population

4.3.1 Target population

The target populations were all HIV/AIDS patients enrolled for chronic HIV care services in all health facilities in Addis Ababa.

4.3.2 Source population

The Source populations were included all HIV/AIDS patients enrolled for chronic HIV care services in all health facilities in the study area in Addis Ababa.

4.3.3 Study population

The study populations were those all HIV/AIDS newly enrolled in the sampled public health facilities and were directly participated in this study in the study area.

4.4 Inclusion and exclusion criteria

4.4.1 Inclusion criteria

All children and adults with HIV/AIDS newly enrolled to chronic HIV care services (both on Pre-ART and on ART service) before six months of the data collection period, without active TB, currently not on anti TB treatment, and previously not treated for drug resistant TB.

4.4.2 Exclusion criteria

- All children and adults with HIV/AIDS newly enrolled to chronic HIV care services (both on Pre-ART and on ART service) before six months from the data collection period and at the same time having had known active tuberculosis and already on anti-TB treatment, and treated for drug resistant TB
- All children and adults with HIV/AIDS newly enrolled to chronic HIV care services for less than six months from the data collection period.

4.5 Sampling

4.5.1 Sample size determination

The sample size was calculated using the formula for a single population proportion by assuming 5% margin of error and 95% confidence interval (CI) ($\alpha=0.05$) for each objective.

1. The calculated sample size for IPT utilization proportion $P=0.287$ [19] was:-

$$n = \frac{\left(\frac{Z \alpha}{2}\right)^2 P(1-P)}{d^2} = \frac{Z^2 P(1-P)}{d^2} = \frac{(1.96)^2 0.287 \times 0.713}{(0.05)^2} = 314$$

2. The calculated sample size for initiation IPT alone prior to HAART [8] was:-

$$n = \frac{\left(\frac{Z \alpha}{2}\right)^2 P(1-P)}{d^2} = \frac{Z^2 P(1-P)}{d^2} = \frac{(1.96)^2 0.79 \times 0.21}{(0.05)^2} = 255$$

3. The calculated sample size for adverse effect related to INH treatment [8] was:-

$$n = \frac{\left(\frac{Z \alpha}{2}\right)^2 P(1-P)}{d^2} = \frac{Z^2 P(1-P)}{d^2} = \frac{(1.96)^2 0.012 \times 0.988}{(0.05)^2} = 18$$

4. The calculated sample size for WHO clinical staging [14] was:-

$$n = \frac{\left(\frac{Z \alpha}{2}\right)^2 P(1-P)}{d^2} = \frac{Z^2 P(1-P)}{d^2} = \frac{(1.96)^2 0.8214 \times 0.1786}{(0.05)^2} = 225$$

Where: n = the required sample size

z = the value of the standard normal curve score corresponding to the given confidence interval = 1.96

P = proportion of each variable which was found on previous study.

d = margin of error (type one error) = 5%.

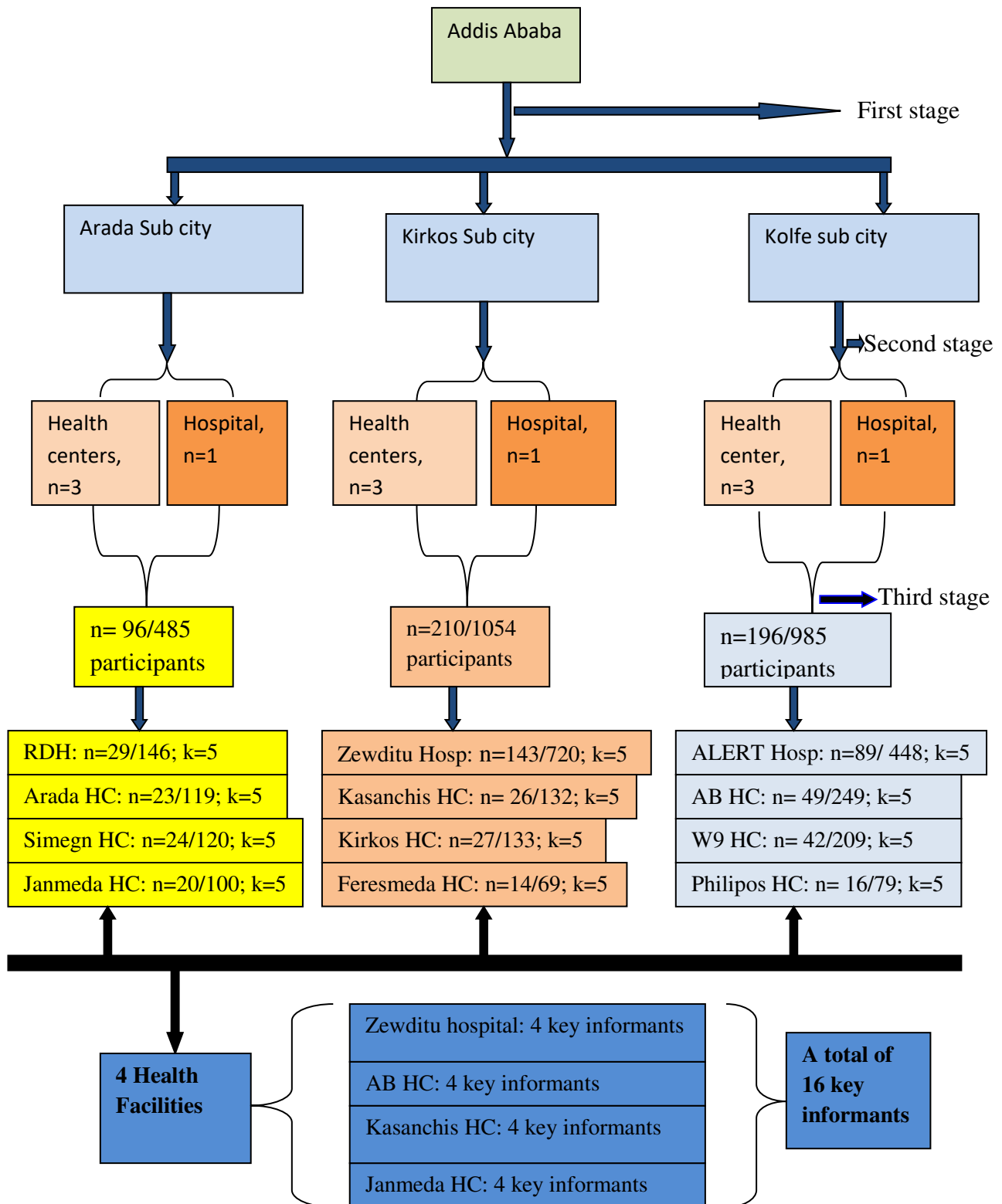
The highest sample (314) was taken from calculated sample sizes. To maximize the power of the study and to reduce design effect resulting from multi-stage sampling technique, the actual

sample size was multiplied by 1.5 & considered 10% non-response rate. The final sample size became 506 for quantitative study. The sample size for qualitative study was purposely decided to be 16 from one-third sampled health facilities. Sixteen key informants 4 from each health facility representing to the management system, the TB-HIV service provider, the logistic system, and the adherence support groups were added.

4.5. 2 sampling technique

A multistage sampling technique was used to obtain the final sample size. There were a total of 86 TB/HIV services implementing public health facilities in Addis Ababa (75 health centers and 11 hospitals). The three stages went through to obtain the final sample size. Stage one: three sub cities namely Arada, Kirkos, and Kolfe keraniyo were selected using lottery method among other ten sub cities found in Addis Ababa. Stage two: 9 health centers and 3 hospitals were selected using the same methods among 28 TB-HIV implementing government health facilities found in the selected sub cities. Here hospitals were selected purposely by assuming they have served for general PLHIV in the city. Stage three: 506 sample participants were selected among 2,524 PLHIV newly enrolled in chronic care service from 01 Hamle 2007 EFY to 30 Sene 2009 EFY within the selected health facilities using SRS method. As indicated in the following figure, the sample participants in each health facility were proportional to the number of enrolled PLHIV in the specified time frame.

One-third (4) of TB-HIV service implementing government health facilities were selected among 12 sampled HFs by lottery method to interview key informants. Cost and time visibility was considered while selecting those health facilities. Based on the plan a total of 16 key informants (four from each sampled HF representing to the management system, TB-HIV service provider, the logistic system, and adherence support groups in each selected HF) were interviewed using semi-structured questionnaire.



K= constant value to select the k^{th} patient with SRS technique in each health facility

Fig 3: The sampling frame of the study in each stage in the Addis Ababa, 2017

4.6 Study variables

4.6.1 Dependent variables

Utilization status of Isoniazid preventive therapy (strong or weak) among PLHIV

4.6.2 Independent variables

Demographic characteristics included: sex, age, residential area, marital status, educational status, and occupational status; IPT utilization status; factors determining TB screening, IPT and HAART initiation status included: date of knowing HIV status, date of HAART initiation, WHO clinical stage of HIV during enrollment, date of TB screening, presence of sign and symptom of TB during initial screening, date ruled out absence of active TB, days between initial TB screening and INH initiation, reasons for not initiating INH following immediately after ruling out absence of active TB, provision of clarification before initiating INH, completion of recommended doses of INH; and accessibility of manpower and logistics included: availability of INH stock in the chronic care service unit without interruption, availability of trained adherence counselors for a full working hours in the health unit, availability of TB-HIV trained health workers in the ART clinic, and availability of National TB-HIV guideline/manual/protocol/ TB screening algorithm in the ART unit.

4.7 Data collection tools and procedures

For interviewing the study participants (people living with HIV), the structured questionnaire was used. The questionnaire was developed from previous studies in different international journals and ensured it as a standard. The questionnaire translated in to local language (Amharic language) before administering to interview and local language interviewer assigned to easily communicate with the interviewee. The questionnaire was tested in five percent of the sample on similar patients other than sampled health facilities within the selected sub cities before collecting the actual data weather it was workable or not and founded it well workable.

The study participants (PLHIV) were interviewed at the exit of ART clinic after having verbal and written consent. The data collectors collected information from each participant following to introducing themselves and explaining the objective of the study until the required sample was obtained. Each data collector filled a minimum of ten questionnaires per day. Only one data collector was assigned to one health institution to minimize customers' confusion and discomfort within the ART service unit. Supervisors closely supervised the data collectors and the data

collection process, checked filled questionnaires for their completeness on the site and compiled and submitted them to principal investigator (PI) on daily base. The PI supervised the data collectors and supervisors daily on the data collection site. The PI checked each questionnaire and tallied based on the variables.

The key informants representing to the management system, ART clinic (TB-HIV service provider), logistic system (ART pharmacy), and the adherence supporter groups were interviewed using semi-structured questionnaire and tape recorder. The principal investigator arranged the key informants and interviewed them in the logical way based on the questionnaire. One rapporteur appointed to write the responses of the key informants and supported with tape recorder. Three key informants were interviewed in a day and took 6 days to complete interviewing all key informants.

4.8 Data processing and analysis

Data processing:

Quantitative data: Data cleaning was given an emphasis during and after the data collection period. Each collected data was checked for its consistency and completeness. Then, the collected data was translated in to English language for processing. The data was coded, tallied, and organized manually before entering in to the computer. The organized data was entered in to designed template (form) in Epi Info soft ware. Then the data was again checked for its missing variables and completed supporting with the line listing within the soft ware. The completed data was exported and stored in the data storage file.

Qualitative data: The collected data was carefully categorized in to similar responses based on the questionnaire by the principal investigator. The recorded data was transcribed word by word and cross checked with the written response data that obtained from a particular key informant. The missed data during write up was included. Finally, the categorized data was summarized in to the more similar response data and prepared for analysis.

Data analysis

The stored data was imported in to statistical package for social science (SPSS) soft ware version 21. Data analysis was performed using SPSS soft ware. The demographic characteristics and other variables related to the patients' clinical status and HIV care service provision were analyzed for their frequency and percentage separately. Additionally, the central tendency and dispersion was analyzed for the age of the study participants.

Here, each variable was tested for its independence and evenly distribution using Pearson's chi-square test to cells which had five and more expected counts and Fisher exact test or Likelihood ratio tests to cells which had expected count less than five with asymptotic 95% confidence level under the crosstab. All independent variables were analyzed separately using binary logistic regression with 95% confidence level whether each variable had an association to the dependent variable (utilization status of IPT) or not. All the independent variables that had the p value $<.20$ were collectively analyzed by multi covariate binary logistic regression method to identify the independent variables that had the strong association to the IPT utilization status among PLHIV.

4.9 Data management

The supervisors checked the collected data before the data collectors leave the data collection sites. Each supervisor took responsibility for the completeness and quality of data in each study unit. They oversaw the entire data collection procedures starting from introduction to the departing process of the study participants. The principal investigator (PI) checked and cleaned the daily collected data for its consistency, completeness, and clarity for the entire data collection period. The data was coded, tallied and organized at daily base. The Amharic version questionnaire was translated back to English for the convenience of analysis.

4.10 Data quality assurance

The data collection tool was valid since it was adapted from similar studies both at national and international level. It was carefully translated in to local (Amharic) language before administering. The data collectors and supervisors were selected based on their ability to speak, listen and write both English and Amharic language to participate in the data collection process. The nominees were from ART clinics other than sampled health facilities. Both the data collectors and supervisors were Degree holder in health and had additional training particularly on TB-HIV program and had experience working in ART clinic. Data collectors were trained for two days on what to collect, how to collect, when, where, and why they collect the data. Similarly, supervisors were trained on how to supervise the data collectors, how to cross check the collected data, how to monitor the data completeness and consistency, when to compile the collected data, to whom he/she submit the compiled data in addition to the above enquiries. The training was provided by experienced person. The principal investigator facilitated the training process step by step.

4.11 Operational definitions

Early in time: The first three months of IPT receiving time of the PLHIV from their HIV care enrollment.

Good IPT utilization status: The PLHIV, who were screened for tuberculosis at the initial HIV care visit, unlikely ruled out active TB, and not previously treated for drug resistant TB; were received IPT within three months from their HIV care enrollment, and completed the recommended daily single dose of 300mg Isoniazid preventive therapy within 7 months of initiation.

Not good IPT utilization status: The PLHIV, who didn't fulfill the conditions mentioned under the "strong IPT utilization status".

Completed: The newly enrolled PLHIV completed the recommended daily single dose of 300mg Isoniazid drug within 7 months of initiation.

Incomplete: The newly enrolled PLHIV, who didn't complete the recommended daily single dose of 300mg Isoniazid drug within 7 months of initiation.

Latently: The IPT receiving time of the PLHIV after three months of their HIV care enrollment.

Public health facilities: The health facilities that have served the general public in the city and owned by government.

Newly enrolled: Any person who had been tested and confirmed with a positive HIV status and had been newly registered to Pre-ART care and/or ART service.

4.12 Ethical consideration

The study was conducted following the approval of Institution Review Board (IRB) of SPHMMC and ethical research committee (ERC) of regional health bureau after having written letter of permission from Addis Ababa health bureau and local health institutions at the data collection sites. Each study participant was clearly informed the aim of the study and the benefits he/she will have from the study. And clarification provided for every study participant as he/she has the right to accept or refuse to interview if he/she came to any question he/she didn't want to answer. They also were assured that as there will be no risks of being involved in this study and if any potential risk they have it will be appropriately managed. The parents or care givers were interviewed having had permission for those less than 15 years study participants. Verbal and written consent obtained from direct participants and parents of the children before administering interview. The collected data was kept strictly confidential by using code for every participant.

5. Results

5.1 Demographic characteristic of respondents

Five hundred-and-four (99.6%) study participants were involved in this study from the planned 506 samples in public health facilities of Addis Ababa. Among those respondents 209(41.5%) were male and 295(58.5%) were female. The mean age of the respondents was 40.64 years with the SD $\pm$ 10.11years. The majority 487(96.6%) of study participants were resident of Addis Ababa and nearly half or 248 (49.2%) of the study participants were currently in union (married). Around one-fifth of the study participants had not formal education and 78 (15.5%) were joined tertiary education. Majority 293(58.1%) of the study participants were employed in government and private organizations and 93(19%) were self employed in trade

Table 1: Demographic characteristics of the study participants by sex in the public health facilities of Addis Ababa, Ethiopia, 2017

Age group	Sex		
	Male: n=209(%)	Female: n=293(%)	Total: n=504(%)
≤ 25 year	4 (2)	23(7.4)	27 (24)
26-50 years	154 (8)	245 (83)	399 (9)
> 50 years	51 (5.4)	27 (79.1)	78 (15.5)
Total	209 (100)	295 (100)	504 100.0)
Residential area			
In Addis Ababa	200 (95.7)	286 (97.0)	486 (96.4)
Other regions	9 (4.3)	9 (3.0)	18 (3.6)
	209 (100.0)	295 (100.0)	504 (100.0)
Marital status			
Currently in union	142(68.0)	106(35.9)	248(49.0)
Single	31(13.8)	59(20.0)	90(18.0)
Currently not in union	38 (18.2)	130(44.1)	168(33.0)
Total	209(100.0)	295(100.0)	504(100.0)
Educational			

background			
No formal education	29(13.9)	79(26.8)	106 (21.0)
Primary	66(31.6)	95(32.2)	161 (32.0)
Secondary	71(34.0)	86(29.2)	159 (31.5)
College & above	43(20.4)	35(11.9)	78 (15.5)
Total	209(100.0)	295(100.0)	504(100.0)
Occupational status			
Employed	155(52.9)	138(46.8)	293(58.1)
Trader	25(12.0)	11(3.7)	36(7.1)
Unemployed	20(9.6)	62(21.0)	82(16.3)
Other jobs	9(4.3)	84(28.5)	93 (18.5)
Total	209(100.0)	295(100.0)	504(100.0)

5.2 Isoniazid preventive therapy utilization

Nearly three-fourth or 383(76.0%) study participants received Isoniazid preventive therapy while 121 were yet not received. However, only 84(21.9%) study participants received the drug early in time (within three months of their HIV care enrollment) among 383 IPT receivers. The rest four-fifth 299 (78.1%) of the IPT receivers were took the drug lately (after three months of their HIV care enrollment).

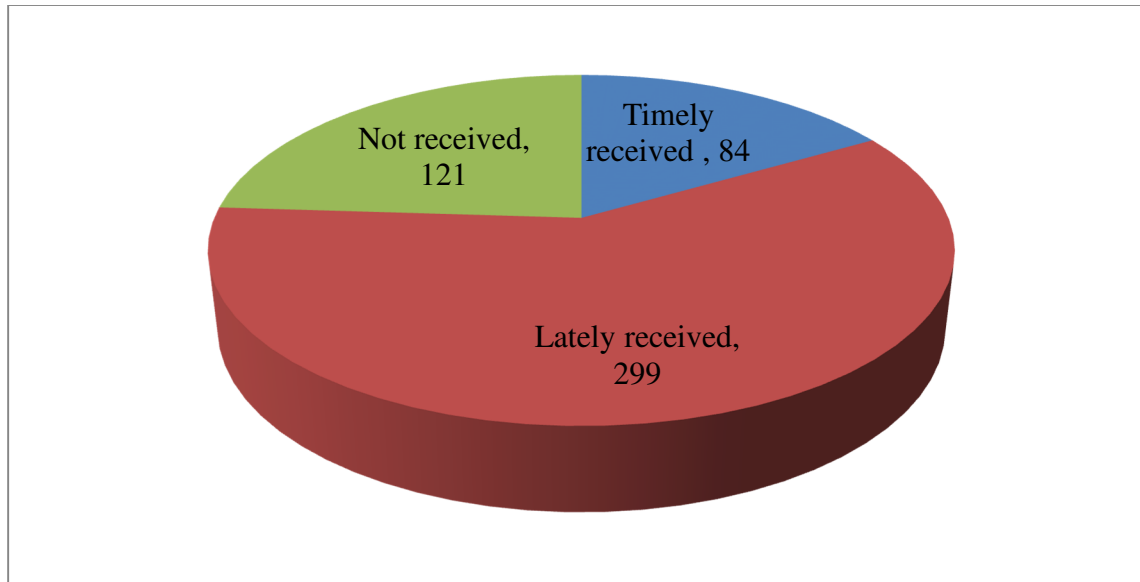


Fig 4: Time based IPT utilization status of the study participants in public health facilities

Around 312(62%) of study participants were HIV clinical stage I and II during their HIV care enrollment. Of which only 251(88.3%) were received Isoniazid preventive therapy. Four hundred-and-twelve (81.7%) respondents started their anti-retroviral (ART) drug immediately following to their HIV care enrollment while 92 were started lately. Four hundred and eighty-eight (96.8%) of the study participants were screened for TB during enrollment while the rest sixteen were not. The study participants screened for TB at every their HIV care visit were 393(78%), 100 were screened intermittently, and eleven were not screened at all. Two hundred and six (40.9%) study participants had have one or more sign and symptom of TB at initial visit while 298(59.1%) had not. Out of those none TB symptomatic patients 224(75.2%) were received IPT; of which only 57(25.4%) received the drug in recommended time or within three months of their HIV care enrollment. Among IPT receivers 167(74.6%) were took the drug lately. Nearly nine tenth or 463(91.9%) study participants were given clarification about their TB status during initial HIV care visit.

From the total study participants 403(80%) were given information about the importance of IPT use; of which 356(88.3%) from IPT receiver and 47 (11.7%) from none IPT receiver. From all 383 IPT received interviewed study participants, 365(95.3%) used recommended daily 300 mg single dose of Isoniazid for six consecutive months, but eighteen interrupted taking the drug

before completion. Among eighteen drug interrupted study participants ten were due to drug intolerance, 3 were due to wrong perception, the other three were due to lost to follow up, and the rest two were due to other reasons.

Among 420 both lately IPT receiver and none receiver, 322(72.9%) didn't know what the reason was to delay or not to receive IPT at the recommended time (within three months of HIV care enrollment), but 98 (17.1%) gave their different assumption.

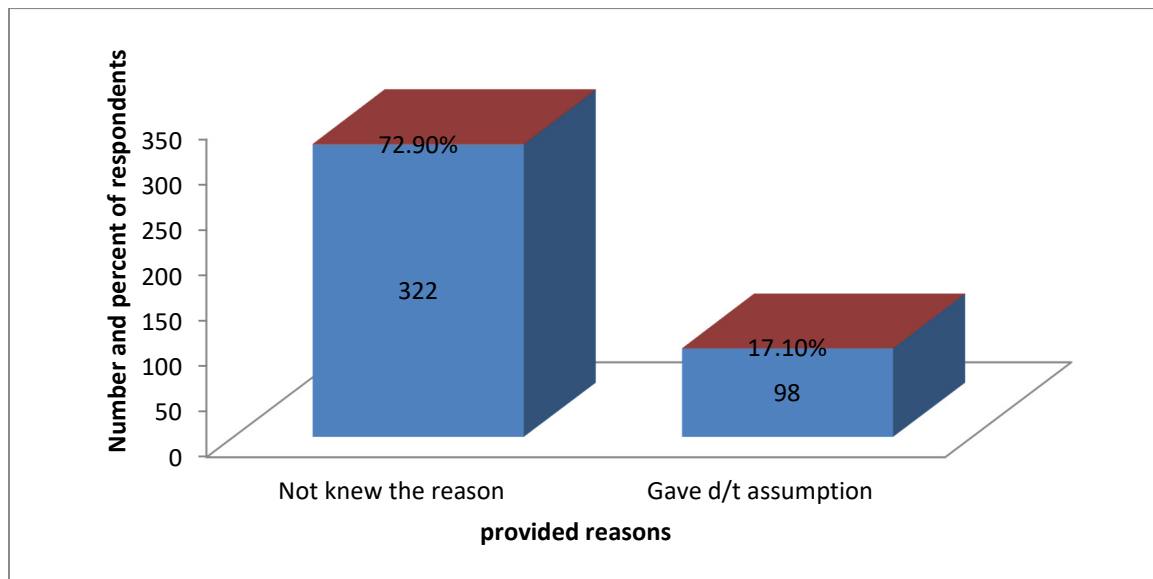


Fig 5: Reasons for the delay or/and not to receive IPT among both lately IPT receiver and none receiver study participants in public health facilities of Addis Ababa, 2017

5.3 Factors associated with IPT utilization status

The crude statistics analysis of predictors showed that some variables had an association with Isoniazid preventive therapy utilization status. Age group and marital status indicated an association with IPT utilization status among variables under the demographic characteristic. The age group ≤ 25 years and 26-50 years had less likely to have strong IPT utilization status compared with the age groups > 50 years with COR .137; CI (.041,.459) $p=.001$ and COR .322; CI (.125,.826) $p .018$ respectively. For every increased age group, there was probability of good level of IPT utilization status. Similarly, PLHIV currently not in union with their relatives had an association with strong IPT utilization status (COR 1.8; CI (1.014, 3.195) $p .045$).

Table 2: The crude odds ratio of demographic characteristics of the study participants, Addis Ababa, 2017

Independent Variables		Status; n=504 (%)		COR	95% CI (EB)		Sign
	Category	Good	Not good		Lower	Upper	
Sex	Male	32(15.3)	177(84.7)	.845	.522	1.367	.492
	Female	52(17.6)	243(82.4)				*
Age group	1-25 years	9(23.3)	18(66.7)	.137	.041	.459	.001
	26-50 years	70(17.5)	329(82.5)	.322	.125	.826	.018
	>50 years	5(6.4)	73(93.6)				*
Marital status	Currently in union	47(18.9)	202(81.1)				*
	Single	18(20.2)	71(79.8)	.918	.500	1.684	.782
	Currently not in union	19(11.4)	147(88.6)	1.800	1.014	3.195	.045
Educational background	No formal education	12(11.1)	96(88.9)	1.455	.616	3.435	.393
	1 ⁰ education	32(19.9)	129(80.1)	.733	.354	1.516	.402
	2 ⁰ education	28(17.8)	129(82.2)	.838	.400	1.753	.638
	3 ⁰ education	12(15.4)	66(84.6)				*
Occupational status	Employed	48(16.4)	245(83.6)				*
	Trade	8(22.2)	28(77.8)	.686	.29	1.595	.381
	Unemployed	15(18.3)	67(81.7)	.875	.462	1.659	.683
	Others	13(14)	80(86)	1.206	.621	2.339	.580

* Reference category

Variables related to service provision at health facilities and the patient status at initial HIV care enrolment and during follow up visits were analyzed whether they had an association or not to the dependent variable. The HIV enrollment time, HIV clinical stage, ART starting time, clarification to the patients about their TB status at the initial visit, frequency of TB screening during follow up visits, and the service provision health facilities had crude association with the dependent variable. The people living with HIV enrolled in to HIV care before one year were 7.76 times to have strong IPT utilization status than whom enrolled between last 6 months to one year duration with CI (3.019, 19.948) $p < 0.001$. The WHO clinical stage III & IV had more

likely to have strong IPT utilization status with respect to WHO clinical stage I with COR 2.04; CI (1.079,3.858) p .028 and COR 7.825; CI (1.802, 33.975) p .006 respectively.

Table 3: The crude odds ratio of IPT utilization among PLHIV in public health facilities of, Addis Ababa, 2017

Independent Variables	Category	Status; n=504 (%)		COR	95% CI (EB)		P value
		Good	Not good		Lower	Upper	
HIV enrollment Time	6 mon. to 1yr	11(57.9)	8(42.1)				*
	Before 1yr	73(15.1)	412(84.9)	7.760	3.019	19.948	.000
HIV clinical stage	Stage I	31(23.1)	103(76.9)				*
	Stage II	33(18.8)	143(81.2)	1.304	.751	2.275	.345
	Stage III	18(12.9)	122(87.1)	2.040	1.079	3.858	.028
	Stage IV	2(3.7)	52(96.3)	7.825	1.802	33.975	.006
ART starting time	Lately	61(14.8)	351(85.2)	.521	.302	.899	.019
	Immediately	23(25)	69(75)				*
TB symptom at enrollment	No	57(19.1)	241(80.9)				*
	Yes	27(13.1)	179(86.9)	1.568	.954	2.578	.076
Clarification of TB status @ begin	No	2(4.7)	41(95.3)	4.435	1.052	18.706	.043
	Yes	82(17.8)	379(82.2)				*
Frequency of TB screening during follow up visits	Not at all	0(0)	11(100)	2E ⁹	.000	—	.999
	Some times	28(28)	72(72)	.427	.254	.719	.001
	Always	56(14.2)	337(85.8)				*
Clarification about IPT benefit	No	13(12.9)	88(87.1)	1.448	.766	2.735	.250
	Yes	71(17.6)	332(82.4)				*
Service provider	HC	69(26.6)	190(73.4)	.180	.099	.324	.000
HF type	Hospital	15(6.1)	230(93.9)				*

* Reference category

The adjusted odds ratio showed that the PLHIV currently not in union with their partners, and having WHO clinical stage IV had positive association with good IPT utilization, while the presence of TB symptom at the HIV care enrollment and being getting HIV care services in health center had negative association. As shown on table 5 below, the PLHIV currently not in union with their partners were more likely in good Isoniazid preventive therapy utilization status [AOR 2.996; CI (1.476, 6.079) p .002]. The PLHIV being getting HIV care services in public health centers were 14.8% times at risk to be in not good status with CI (.074, .294) p<.001.

Table 4: Adjusted odds ratio of some independent variables to the IPT utilization status among PLHIV, Addis Ababa

Independent Variables	Category	Status; n=504		COR	95% CI		AOR	95% CI		p. value
		Good	Not good		Lower	Upper		Lower	Upper	
Marital status	Currently in union	47(18.9)	202(81.1)							*
	Single	18(20.2)	71(79.8)	.918	.500	1.684	1.627	.743	3.566	.244
	Currently not in union	19(11.4)	147(88.6)	1.800	1.014	3.195	2.996	1.476	6.079	.002
HIV clinical stage	Stage I	31(23.1)	103(76.9)							*
	Stage II	33(18.8)	143(81.2)	1.304	.751	2.275	.71	.353	1.425	.335
	Stage III	18(12.9)	122(87.1)	2.040	1.079	3.858	1.49	.678	3.276	.321
	Stage IV	2(3.7)	52(96.3)	7.825	1.802	33.975	7.12	1.460	34.707	.015
TB symptom at enrollment	No	57(19.1)	241(80.9)							*
	Yes	27(13.1)	179(86.9)	1.568	.954	2.578	.447	.240	.832	.011
HF type	Health center	69(26.6)	190(73.4)	.180	.099	.324	.148	.074	.294	<.001
	Hospital	15(6.1)	230(93.9)							*

* Reference category

5.4 Qualitative findings

Sixteen key informants from different groups working in the HIV/AIDS program under the four health facilities were participated in this study. Of sixteen study participants fourteen were females and two were males. The average age of the key informants was 33.3 years and range 25 years (24 to 49 years). Among those key informants ten were degree holders, three were diploma holders, and the rest three had certificate.

They were asked five questions to explain the utilization status of IPT and associate factors among PLHIV using semi-structured questionnaire. Their summary response was as follow:

Eleven out of 16 respondents agreed that the status of TB-HIV co-infection in their respective health facility is still going on even if some sort of reduction probability has there. Five respondents mentioned it that as it has been improved from previous trend. However, all participants agreed that the linkage between these two programs has shown progression from time to time.

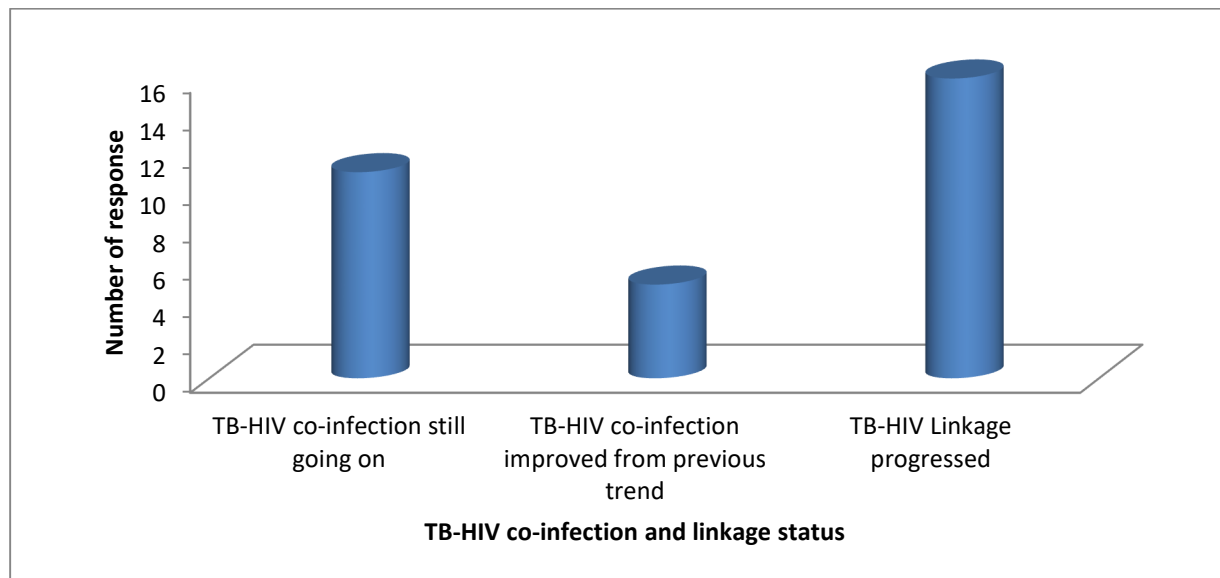


Fig 6: Qualitative findings about TB-HIV co-infection status and linkage in public health facilities, Addis Ababa, 2017

All 16 participants responded for the ‘question perception of participants about the necessity of Isoniazid preventive therapy for PLHIV’ that Isoniazid preventive therapy is essential and necessary to protect TB disease and to improve the immune status of people living with HIV.

They were asked: how do you evaluate the preparation and readiness of the stakeholders in your health facility to provide IPT for those eligible people living with HIV? Fourteen (87.5%) out of 16 participants replied that stakeholders at the health facilities level are ready and integrated each other to provide IPT for those eligible PLHIV. They also concluded that the loose integration exist with the drug supplier especially with PFSA and coordination at health bureau and health offices level concerning to IPT implementation program.

Two participants: one 25 years old male participant from health center representing the leadership group and the other 35 years old female participant from hospital representing the adherence support group responded for this question that *“readiness and preparation of health workers at ART clinic still remain weak by pointing out different reasons to not to provide Isoniazid preventive therapy for the patients. They included that some PLHIV complain as they have exposed to pill burden and refused to take IPT due to weak counseling service”*.

How do you describe the strength and weakness of the following systems /groups/ in contributing to scale up IPT coverage to the PLHIV? For this question all participants shared that as the INH and pyridoxine supply interruption is frequent and lacks continuity.

All 16 participants agreed that TB screening report at each patient visit at health facility level was good but decision to rule out the absence of active TB and to provide IPT for those eligible PLHIV at the right time was weak. Nearly two third (62.5%) of key informants remarked that each stakeholder at the health facility level tried to accomplish its duty accordingly. They added their assumption that interruption of INH and absence of pyridoxine is the main reasons for the weakness to scale up Isoniazid coverage at the right time.

Four participants: - One 27 years female participant from logistic group, a 28 and 49 years female participants from care provider group and a 35 years female participant from adherence group underlined that *“lack of confident from health workers during screening to rule out absence of active TB and fearing development of drug resistance TB*

are the prominent reasons in addition to shortage and interruption of INH and pyridoxine drugs. Half of them quoted the main reasons for the weakness of IPT scale up coverage that the negligence and negative attitude of health workers to screen and rule out the absence of active TB at appropriate time and to prescribe INH for those eligible PLHIV as well''.

They also were asked “what are the major bottle necks/ barriers that block the coverage and retard the required result of Isoniazid preventive therapy on people living with HIV?” Thirteen participants answered that lack of INH continuity; eight (50%) participants responded that the absence of pyridoxine drug, four (25%) participants said poor awareness among patients; three participants added poor understanding of health workers about IPT; other three participants responded as negligence, negative attitude and fear of INH drug outcome.

A 28 years female participant from care provider group responded that *“absence/limitation of additional TB screening materials (e.g. Chest X-ray) in public health facilities is the basic barrier to rule out the presence or absence of active TB during HIV care enrollment”.*

Another a 27 years male participant from logistic group said *“weak relationship between health care workers and HIV patients and absence of up to dated training for health workers in the HIV/AIDS care service department were major barriers”.*

6. Discussion

This study revealed that prevalence of Isoniazid preventive therapy among PLHIV in public health facilities in Addis Ababa was 76%. This is nearly similar with the high IPT implementing countries like Malawi in which the IPT prevalence in 2015 was 79% ^[3] and better achievement than other TB burden countries like Indonesia in which the prevalence of IPT among newly enrolled PLHIV in 2015 was 2% ^[3]. This study also showed high achievement compared with the previous study in North Ethiopia' in which the coverage was 20% ^[26]. Possible reason for the deference of this result could be better expansion of health facilities in the Addis Ababa. However, prevalence of early IPT users among PLHIV based on expert's recommended time frame was 16.7% which is nearly similar with 2013 national TB-HIV sentinel surveillance report conducted by EPHI/CDC at which it was 18.2% ^[11] and the report of Addis Ababa health bureau TB-HIV report (15%) ^[12]. But which is less than by half from previous cross-sectional study conducted in Nigeria at which it was 30% ^[10] and is slightly below from 2013

This study found out that TB screening for people living with HIV during HIV care enrollment and the patients' understandings about the importance of IPT use from both IPT receivers and none receivers was high. Almost all interviewed key informants agreed on this result. However, the IPT receiving status at the recommended time was not good i.e. nearly one for every five patients. And it was directly related with the confidence of health care provider in deciding unlikely to rule out active TB. This directly showed that the high level TB screening activity for HIV/AIDS patients in health institution was either for the formality of the program without benefit of the HIV patients or due to frequent INH drug stock out to provide Isoniazid preventive therapy at the right time.

The study detected also that the highest almost nearly 95.3% Isoniazid preventive therapy completion rate among people living with HIV. It was more likely resulted from strong adherence counseling to the patient before and during IPT receiving period about the importance of the drug. It showed a better achievement compared with many previous studies in Rio-de Janeiro, Brazil' at which it was 85% ^[8], in Addis Ababa it was 86.5%. ^[16], in Zimbabwe it was 81% ^[27], in Thailand it was 75% ^[28], in Swaziland it was 89.4% ^[29].

The study unveiled from the qualitative result that INH drug stock out and absence of pyridoxine; weak monitoring and evaluation from program managers; and lack of confidence unlikely to rule out active TB were the major barriers to scale up and early initiation of Isoniazid preventive therapy for PLHIV. These findings are revealed in the previous studies on the title ‘opinion of implementation of IPT for people living with HIV worldwide [15] and in North Ethiopia [26]. Both studies described that perceived fears of resistance to INH and fear of toxicity of INH, reluctance and negative perception of program managers, shortage of INH, lack of monitoring and evaluation system, and lack of training were as the major barriers. However, this result was contrary to the study conducted in Jimma, Ethiopia on the title ‘perceived barriers to implementation of IPT for PLHIV in resource constrained country’ in which the poor patient adherence was as a major barrier [30].

The service provision health facility had an association with the Isoniazid preventive therapy. Among the study participants those who got HIV care service in health center were less likely to receive IPT in the recommended time than from receiving in hospitals. However, I didn’t get literatures from web site media to discuss this result since almost all studies related to Isoniazid preventive therapy utilization have been conducted in hospitals but didn’t tell the primary health care system. As my suggestion the health centers may lack the additional aid materials to screen TB at the early stage of HIV care enrollment. The low level of confidence of the health care workers in the health centers another issue for the occurrence of this gap.

7. Limitation of the study

During data collection period the patients’ recall bias for their long term HIV care services and IPT status was identified in some extent. The effect of that bias was incomplete response from the study participants. However, the data collector team patiently reminded the patients to recall their back IPT status and HIV care service history. Additionally, to minimize the bias, the patients’ HIV care service registration book was observed to those study participants whom unable to remind their back IPT and HIV history.

8. Conclusion

The utilization status of Isoniazid preventive therapy among people living with HIV in public health facilities of Addis Ababa was not good. The Isoniazid preventive therapy coverage at the recommended time (within three months of HIV care enrollment) was low despite the prevalence is high. Those PLHIV currently not in union with their partners, WHO HIV clinical stage 4, presence of TB symptom at the enrollment, and having HIV care service in health centers were associated with IPT utilization. However, tuberculosis screening at the beginning and follow up visit of the patients was high, it lacks decision. Weak integration, frequently drug stock out, lack of confidence, and loose monitoring & evaluation were major barriers of IPT utilization status in Addis Ababa. There was no significant problem in the patient side on the Isoniazid preventive therapy utilization.

9. Recommendation

- Needs the commitment of program managers at Addis Ababa Regional Health Bureau level to look IPT as the basic TB infection control package on PLHIV and to coordinate drug importers and distributors to avail uninterrupted drug supply all the time.
- Health care workers in the HIV care unit need continuous, up to dated and evidence based capacity building about IPT implementation
- Addis Ababa Regional Health Bureau needs to consider integrating initial TB screening for all PLHIV with regional laboratory for Gin X-pert diagnosis.
- Addis Ababa Regional Health Bureau and sub city health offices have to strengthen the Isoniazid preventive therapy implementation for PLHIV specially at the primary health care system and regular and consistent monitoring and evaluation of IPT program

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Annexes

Annex 1. Consent form

Introduction: Hello! My name is _____ and I am the second degree student in SPHMMC. I am conducting research on the topic of “Utilization Status of Isoniazid Preventive Therapy and Associated Factors among Newly Enrolled HIV/AIDS Patients Attending in public Health Facilities of Addis Ababa, Ethiopia”.

Purpose of the study: To assess the utilization status of Isoniazid preventive therapy and associated factors among newly enrolled PLHIV to provide evidence based information.

Procedure: As part of the study we would first like to ask some questions about your personal details. Then we will interview you the service that you have got from HIV Care services in this health facility and the information you have about TB and TB-HIV as well.

Duration of interview: The interview will take 15 to 20 minutes to complete.

Benefits: This information will help the government and other stakeholders to plan problems reduction and service improvement strategies in HIV Care service. Similarly, PLHIV will be benefitted from proper TB screening service and IPT use to preventing the development of TB.

Risks: We assure you that there will no risks of being involved in this study.

Right to accept or refuse: Participation in this study is voluntarily. If you come to any question you don't want to answer, just let me know and I will go on to the next question; or you can stop the interview at any time. Are you voluntary now? I would very much appreciate your participation in this study. I hope you will participate and respond to all the interviewed questions in the study since your views are important.

Confidentiality: Any participant’s identifier will not be written on the questionnaire. Whatever information you provide will be kept strictly confidential, and will not be shared with anyone other than members of the study team. At this time, do you want to ask me anything about the study please? May I begin the interview now?

Signature of interviewer: _____ Date: _____

Here, I assure by giving verbal and written consent participation in this study having clear explanation and understanding about the purpose and benefits of the study; assurance of absence of risk involving in the study and having believed well keeping confidential for any information that I have being provided. Therefore, I approved with my signature as I am voluntary participating in the study. Signature of participant _____ Date: _____

Annex 2. Questionnaires

Questionnaire for Utilization status of Isoniazid Preventive Therapy and Associated Factors among newly enrolled HIV/AIDS Patients Attending in Public Health Facilities, Addis Ababa, Ethiopia.

S. N ^o	Questionnaire	Possible responses
Part I. Socio- demographic characteristics of the patients		
1	Code of the respondent	_____
2	Sex	1= Male 2= Female
3	Age	Age (Year): _____
4	Address	Sub city _____ District _____ H. N ^o _____
5	Marital status	1= Married 2= single 3 = divorced 4= widowed 5=Separated
6	Educational status:	1= illiterate 2 = read & write 3= primary (grade 1-8) 4= secondary (grade 9-12) 5= Higher education (college)
7	Occupation:	1= Government employee 2= Private employee 3= Self employed 4= Trader 5=Student 6= Daily laborer 7= unemployed 8=housewife 9=NGO 10= other (specify)
Part II. Questionnaire focusing to Tb screening, HIV clinical stage, IPT and HAART initiation, and patient-provider relationship		
1.	When did you know your HIV status?	1) Since a month 2) One to six months ago 3) Six to one year ago 4) Before one year (Refer patient intake form)
2	In which WHO's HIV clinical stage you were when you enrolled in to chronic care service in the health facility?	1) Stage I 2) stage II 3) stage III 4) stage IV (Refer patient intake form)
3	When did you start Anti-HIV treatment (HAART)?	1) Immediately after HIV care enrollment 2) After completion of IPT 3) Concurrently with IPT 4) not yet started
4	Have you been screened for TB at your	1) Yes 2) No

	HIV care enrollment?	
5	Had you have some or all of the following signs and symptoms such as cough, weight loss, night sweating, loss of appetite, and fatigue during initial follow up visit?	1) Yes 2) No
6	Have you ever treated for drug resistant TB	1) Yes 2) No
7	Did your care provider disclose you the presence or absence of the signs and symptoms of TB at the beginning?	1) Yes 2) No
8	Did you receive the INH medication immediately after disclosing you the absence of active TB in you?	1) Yes 2) No
9	If you have been ruled out for absence of active Tuberculosis at the initial visit, when did you start receiving IPT?	1) Within a 3 months 2) Between 3 to 6 months 3) Between six months to one year 4) after one year 5) Not yet started
10	If your answer for Q7 is No, what was/were basic reason/s which holds you from receiving IPT?	1) HIV clinical stage 2) Pill burden 3) Previous TB history 4) Absence of INH 5) Absence of pyridoxine 6) Presence of TB symptom 7) Fear of drug side effect 8) Refusal 9) other 10) I don't know the reasons
11	Have you had given information about the benefit and procedures of IPT use by your care provider in the ART clinic?	1) Yes 2) No
12	Did you take the recommended dose of a single tablet (300mg) of INH daily for six month duration without interruption?	1) Yes 2) No
13	For how long you receive the Isoniazid preventive therapy?	1) For lease than a month 2) For three months 3) For consecutive six months 4) For more than six months 5) Interrupted before

		completion without specific time
14	How frequent did your care provider screen you about TB in your subsequent follow up visit since your HIV care enrollment?	1) At every visit 2) Sometimes 3) No, at all
15	If your answer for Q11 is No, what is the reason behind?	1) Pill burden 2) Drug intolerance 3) Drug shortage 4) Believe of less drug effectiveness 5) Forgetfulness 6) Due to lost to follow up
16	Where was your initial HIV care enrollment?	1. Health center 2. Hospitals 3. Others

Thank you!

Annex 3: Questionnaires for key informants

Questionnaire for Utilization status of Isoniazid Preventive Therapy and Associated Factors among newly enrolled HIV/AIDS Patients Attending in Public Health Facilities, Addis Ababa, Ethiopia.

S. N ^o	Questionnaire	Possible responses
Part I. Socio- demographic characteristics of the patients		
1	Code of the respondent	_____
2	Sex	1= Male 2= Female
3	Age	Age (Year): _____
4	Address	Sub city: _____ HF: _____
5	Marital status	1) Married 2) single 3) divorced 4) widowed 5) Separated
6	Profession:	_____
7	Responsibility:	1= Administration 2= Logistics 3= Clinician 4= Adherent supporter
Part II. Questionnaire focusing on the status of TB-HIV co-infection, attitudes of the interviewees about use of IPT, logistics system, and major barriers that hinder IPT utilization		
1	How do explain the status of TB-HIV co-infection in this health facility?	1. _____ 2. _____ 3. _____
2	How do you perceive the necessity of IPT for eligible PLHIV?	1. _____ 2. _____
3	How do you evaluate the preparation and	1. _____

	readiness of the stakeholders to provide IPT for those eligible PLHIV?	2. _____ 3. _____
4	How do you describe the strength and weakness of the following systems /groups/ in contributing to scale up IPT coverage on the PLHIV?	1. Management system: _____ _____ _____ 2. Logistic system: _____ _____ _____ 3. Clinician: _____ _____ _____ 4. Adherence supporter: _____ _____ _____
5	What are the major bottle necks/ barriers that block the coverage and retard the required result of IPT on PLHIV?	1. _____ 2. _____ 3. _____ 4. _____ 5. _____

Thank you!

Biography

The author is called Fekade Degu Woldekidan and was born on 21st November, 1978 in Guragie Zone, Southern Ethiopia. I attended my primary education and high school at Koter Gedira Elementary School and Pawi, Ayer Tena, and Addis Ketema Secondary School, respectively. Then I joined Haramaya University in 2005 and graduated with BSc. in Nursing in 2007.

After graduation I worked as Junior Nurse Professional in Deneba Health Center, North Shoa, Amhara National Regional State from October, 2007 to August, 2009 and as Disease Prevention and Control Officer in the department of Health Promotion and Disease Prevention Process at Kolfe Keraniyo Sub-City Health Office until October, 2015. Then I joined St. Paul's Hospital Millennium Medical College in November, 2015 for a postgraduate studies in Field Epidemiology Training Program.