Isoniazid Preventive Therapy Uptake among People living with HIV and enrolled in care in Butebo District, Uganda.

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DEDICATION

I dedicate this work to my family for their patience, understanding, encouragement, prayers, and support during my stay away from home as I pursued the studies.

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LIST OF ABBREVIATIONS

TB	: Tuberculosis
HIV	: Human Immunodeficiency Virus
PLHIV	: People Living with Human Immunodeficiency Virus
IPT	: Isoniazid Preventive Therapy
INH	: Isoniazid
WHO	: World Health Organization
ART	: Anti-Retroviral Therapy
CXR	: Chest X-Ray
Mtb	: Mycobacterium tuberculosis
PTB	: Pulmonary Tuberculosis
CD4	: Cluster of Differentiation 4
TST	: Tuberculin Skin Test
LTBI	: Latent Tuberculosis Infection
BCG	: Bacille Calmette-Guerin
H/C	: Health Center
SPSS	: Statistical Package for the Social Science
FY	: Financial Year
LMICs	: Low- and Middle-Income Countries
DHMIS	: District Health Management Information Systems
VHTs	: Village Health Teams
NTLP	: National Tuberculosis and Leprosy Program
NA	: Not Applicable

GLOSSARY OF TERMS

Active Tuberculosis	A person with symptoms and signs suggestive of tuberculosis and found to have the disease (through investigations or clinically).
Eligibility	A person who meets the criteria to be offered Isoniazid Preventive Therapy.
Gene Expert	A WHO-approved cartridge-based rapid diagnostic test that uses a molecular technique to simultaneous detect Mycobacterium tuberculosis (MTB) and Rifampicin resistance in a patient.
Isoniazid Preventive Therapy	The administration of a medicine called Isoniazid to individuals with a latent infection of Mycobacterium tuberculosis to prevent progression to active TB disease.
People Living with HIV	Children, Adolescents and Adults infected with the HIV virus in their body.
IPT Uptake	The proportion of PLHIV on ART care and eligible for **IPT** who had been initiated on INH treatment.
IPT Completion	Completion of INH treatment without evidence of progression to active Tuberculosis.
INH stock status	Availability of Isoniazid drugs for IPT at the treatment centers.

Frequency of INH refill	Regularity of INH refills for the cases enrolled on IPT.
IPT default	Patients not taking INH for two months or more, consecutively after starting treatment.
Pre IPT counseling	Patient education sessions about IPT that take place before initiation of the course of treatment.
Household density	Number of people living in the same house with the IPT case.

ABSTRACT

Background: Tuberculosis (TB) remains a major public health problem worldwide, especially in developing countries. Despite clear evidence that isoniazid preventive therapy (IPT) can reduce the risk of TB disease among PLHIV, uptake of IPT is low in many resource-limited settings with high TB-burden. Therefore, this study was carried out to determine the level of IPT uptake and its associated factors amongst PLHIV who do not have active TB disease.

Methodology: This was a retrospective quantitative study amongst newly diagnosed PLHIV who do not have active TB in the FY 2019/20 and enrolled for ART in HIV/TB Clinics in Butebo district in Uganda. Demographic factors (age, sex, religion, marital status, employment status, education level, area of residence, household density), health facility factors (pre-IPT counselling), community factors (distance from H/C, incurred costs to reach H/C), and IPT drug related factors (IPT adherence, default on IPT, frequency of INH refill, INH stockouts) data were collected from 4 selected health facilities using questionnaire tool. Descriptive statistics was used to generate frequency cross tables.

Results: A total of 272 eligible cases were included in the study amongst which 93 (34.2%) achieved IPT uptake. Mean duration (years) between HIV diagnosis and start of IPT was 4.31 (SD ±3.782). IPT Uptake among males 34 (37%) and females 59 (32.8%). Modal age group for IPT Uptakes was 20-35 years. 7 (70%) of the employed took up IPT compared to 86 (32.8%) of the employed. IPT uptake was highest among the married 62 (39.5%). Majority of the uptake cases were Christians of which 75 (35.4%) started IPT.

Other factors which affected the rate of IPT Uptake include Education level, residence status, household density, Incurrence of costs to reach H/C, Distance from H/C, and Pre-IPT counselling. IPT completion was 91 (97.8%). All cases with good adherence to IPT adherence completed treatment 84 (100%) compared to 7 (77.8%) among those with poor adherence. Of the cases who defaulted on IPT 4 (66.7%) completed IPT while 87 (100%) of those who did not default completed. All the cases 88 (100%) who had regular INH refill completed IPT compared to 3 (60%) with irregular refill. 91 (97.8%) did not experience INH stock outs and completed IPT.

Conclusion: This study showed that IPT Uptake was very low at 34.2%. IPT uptake may be scaled up by addressing the factors affecting IPT Uptake, as well as integrating IPT services in routine HIV care, enhancing supervision and monitoring, simplifying screening procedures, providing free screening, training of health workers, and improving logistical supplies at the health centers. The shortcomings need to be discussed at all levels of management from the Health Center, the District and centrally at the Ministry of Health Tuberculosis Control Program.

CHAPTER ONE
INTRODUCTION

1.1 Background

Tuberculosis is a preventable and curable infectious disease caused by *Mycobacterium Tuberculosis.*[1] It is one of the leading ten causes of morbidity and mortality throughout the world.[2] In 2019, 10 million people acquired TB globally. Africa accounts for 24.5% of global TB burden with over 1.4 million cases notified, and 608,000 died from the disease. Mortality from Human Immunodeficiency Virus/TB coinfection was over 211,000 in 2019. Additionally, the percentage of People Living with HIV who were newly enrolled on Isoniazid Preventive Therapy was 60%.[3]

IPT reduces incidence of TB by up to 60% reduces mortality among PLHIV by 55%. The World Health Organization recommends the use of Isoniazid given daily for 6 months. PLHIV who do not have active TB are recommended to take IPT.[4]

According to a United States Centers for Disease Control and Prevention report, HIV prevalence in Uganda was 5.7% and the burden of TB was at 201 per 100,000 people as of 2017. 40% of PLHIV were co-infected with TB.[5] In 2014, Uganda's Ministry of Health instituted Policy guidelines for health workers indicating that all PLHIV must be screened and have IPT given to all those without active TB.[6] The WHO target for IPT coverage is ≥ 90% by 2035.[7] In one Kenyan study conducted in 2003 to 2012, only 0.5% of newly diagnosed PLHIV were initiated on TB preventive treatment in Uganda with completion rate as low as 39%. No recent published data is available to show progress of IPT in Uganda.

Such low coverage is likely to hinder achieving the WHO target of reducing TB incidence and mortality by 90% by the year 2035.[4]

IPT uptake has been slow despite it being a priority WHO recommendation for PLHIV for over a decade. As of 2019, only 49% of HIV-positive people newly enrolled in ART care received IPT globally.[8] This study will assess the factors contributing to IPT uptake among PLHIV who are enrolled in care at health facilities in Butebo. It is a new district in Eastern Uganda that was established in 2017. Because of this its health system is still developing and lacks programmatic indicators to scale up utilization of IPT for TB among its PLHIV.

This study is relevant due to the very low IPT coverage in Uganda. This indicates that there are several barriers to the implementation of IPT policy guidelines. To improve IPT coverage and reduce the burden of TB among PLHIV in Butebo district and Uganda at large, it is important that the bottlenecks to IPT uptake among eligible PLHIV are identified and solved.[9] The findings of the study will provide a situational analysis regarding the implementation of IPT in Butebo district and serve as an additional knowledge on the implementation barriers affecting IPT uptake and completion, as an efficacious tool for TB control. With this, solutions can be adopted to strengthen its efficacy.

1.2 Conceptual framework

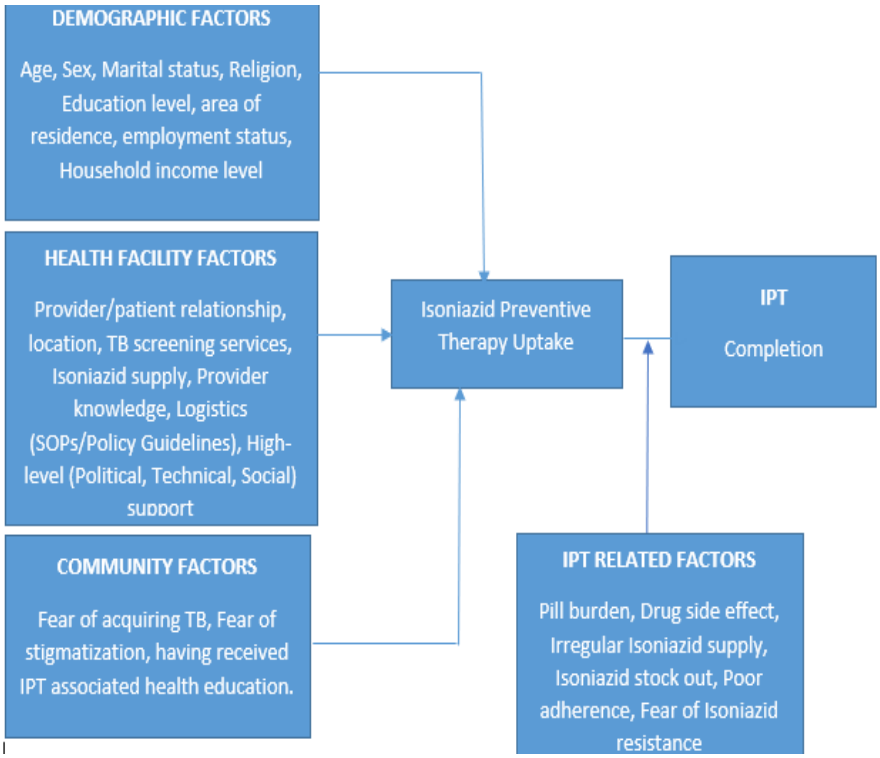

Figure 1: Conceptual framework of factors likely to influence uptake of IPT among PLHIV.[4]

The factors that likely influence uptake of IPT amongst PLHIV can be grouped into four main categories:

Demographics of PLHIV

Factors related to the background of PLHIV include age, gender, marital status, area of residence, level of education, employment status, monthly income, and socioeconomic status of TB case.[4]

Health facility factors

They include provider/patient relationship, cost/distance of transportation of PLHIV for screening test and collection of isoniazid (INH), screening services, supply of isoniazid, the availability and cost per test of tuberculin skin test, chest-X ray (CXR) machine and gene X-pert machines. These factors can individually or collectively affect IPT uptake.

Implementation of IPT by Healthcare providers is influenced by factors like provider training on IPT, presence of IPT guidelines, presence of standard operation procedures, as well as structural organizational factors which include policy, physical and work environment. High-level support and commitment for the IPT program is also necessary for to successful IPT implementation.[10]

Community factors

Fear of acquiring TB, fear of stigmatization, lack of money for transport, level of IPT-associated health education and adherence to medication in the absence of symptoms by the community members can likely influence the uptake of IPT.[11]

IPT related factors

These include pill burden, drug side effect, irregular isoniazid supply, isoniazid stock out, poor adherence and fear of isoniazid resistance can individually or collectively influence adherence and completion.[4]

1.3 Study Objectives

The objectives of this study were to:

a) Determine the eligible proportion of PLHIV who were initiated on IPT in Butebo.

b) Identify factors associated with uptake of IPT in Butebo.

c) Determine the rate of IPT completion in Butebo.

CHAPTER TWO

LITERATURE REVIEW

2.1 Epidemiology of Tuberculosis

The estimated global burden of TB in 2018 was 10 million incident cases and TB was a leading killer of HIV-positive people. Even though the global incidence of TB is falling at about 2% per year, there is need to accelerate to a 4-5% annual decline to reach the 2020 milestones of the End TB Strategy.[12] An estimated 58 million lives were saved through TB diagnosis and treatment between 2000 and 2018[13] and ending the TB epidemic by 2035 is among the health targets of the Sustainable Development Goal 3.3.

TB occurs in every part of the world and poses a great threat to the human lives in Africa due to limited and overwhelming health care services.[14] The burden of HIV associated TB was highest in Africa in 2018 accounting for 24.5% of the new TB cases worldwide. In Uganda, the estimated TB incidence rate is 201 per 100,000 persons per year.[5]

Globally a total of 748,000 people who were newly enrolled in HIV care were started on TB preventive treatment in 2018 representing only 49% of people newly enrolled in HIV care. Uganda reported an estimated 34000 PLHIV and having TB in 2018 which accounted for 39.4% of all incident TB cases in that yaer.[15] However, no data was readily available for the proportion of PLHIV who have accessed IPT in Uganda.

2.2 Etiology and Risk Factors of TB

TB is almost exclusively transmitted through the inhalation of air droplets containing the bacilli from *Mycobacterium tuberculosis (Mtb)* from patients with active PTB.[16] HIV is a key factor behind the resurgence in TB incidence worldwide and remains the pre-eminent

risk factor for the development of TB. The risk of progression from latent TB to active TB is significantly higher among HIV-infected population.[17] In 2013, globally PLHIV were 29 times more likely to develop active TB disease than those who are HIV-negative. Risk factors for incident TB amongst HIV patients include being male, having low body mass index or middle upper arm circumference, lower CD4 cell count, and advanced WHO disease stage.[18] In a study done in Tanzania, male gender, WHO clinical stage 3 and 4, baseline CD4 count <200 cells/ml and having not used IPT were independently associated with the active TB amongst people with HIV and on antiretroviral therapy.[19] In Uganda where TB is endemic, very few studies have been conducted on the factors of influencing uptake of IPT among PLHIV enrolled in care at rural health facility settings.[20]

2.3 Screening and Detection of TB

Early detection and diagnosis of TB is essential to the control of the disease.[21] Screening Pulmonary TB in PLHIV begins with a complete clinical assessment for suggestive signs and symptoms such as cough, fever, loss of appetite, weight loss and night sweats, followed by the collection of specimens for microbiologic testing. Other available routine investigations such as HIV testing, chest radiography, a tuberculin skin test (TST) are done.[22]

2.4 TB Prevention

In 2015, WHO adopted the End TB Strategy with the overall goal to “End the global TB epidemic” by 2035, and there were three high-level, overarching indicators and related targets for 2030 and 2035. These three indicators were: the number of TB deaths per year;

the TB incidence rate (new cases per 100,000 population per year); and the percentage of TB-affected households that experience catastrophic costs because of TB disease.[23] The 2030 targets are a 90% reduction in TB deaths and an 80% reduction in the TB incidence rate, compared with levels in 2015, while the 2035 targets are a 95% reduction in TB deaths and a 90% reduction in the TB incidence rate, compared with levels in 2015.[7] Essentially, the prevention of new infections of *Mtb* and their progression to TB disease is critical to reduce the burden of disease and death caused by TB, and to achieve the End TB Strategy targets set for 2030 and 2035.[24] Currently, three major categories of health interventions are available for TB prevention. These include treatment of latent tuberculosis infection (LTBI), prevention of transmission of Mtb through infection prevention and control, and vaccination of children with the BCG vaccine.[25]

2.5 Isoniazid Prevention Therapy

IPT is a chemoprophylaxis which reduces the risk of a first episode of TB occurring in people exposed to infection or with latent infection and the risk a recurrent episode of TB.[26] WHO recommends Isoniazid taken at a daily dose of 10 mg/kg/day (maximum 300 mg) for at least six months. The main groups eligible for preventive therapy are those at most risk of progressing to TB disease such as PLHIV, infants and children who are contacts of TB patients, as well as people on immune suppressing treatment. To improve on the uptake of IPT, the National TB and Leprosy Program in Uganda has guided on enrolment of all PLHIV to enroll on IPT for six months after screening to exclude active TB.[6]

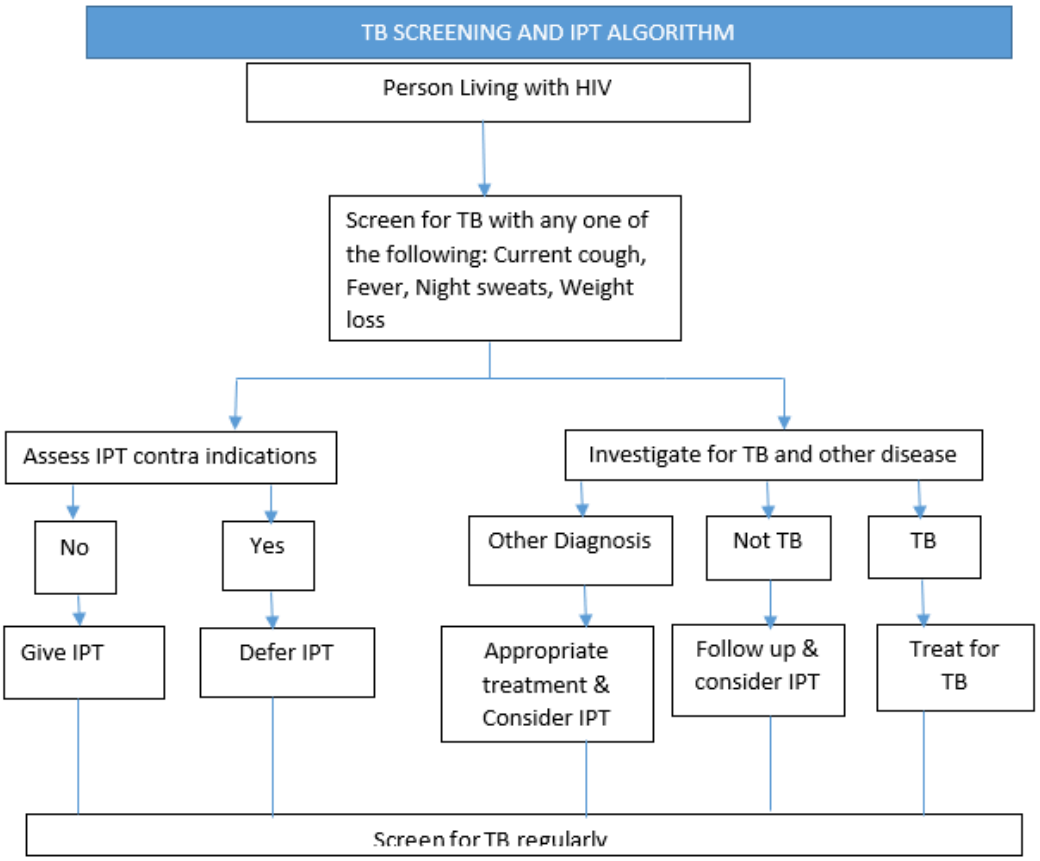

Figure 2: WHO, 2010. TB Screening and IPT Algorithm for adults and adolescents living with HIV in HIV prevalent and resource constrained settings.[27]

CHAPTER THREE
METHODOLOGY

3.1 Study design

This was a retrospective quantitative study to determine the level of IPT uptake, and factors contributing to the completion of IPT among eligible PLHIV enrolled in care at the health centers in the Financial Year 2019/2020 in Butebo, Uganda.

3.2 Study area

The study was conducted in Butebo, a rural district in eastern Uganda with a population of about 150,000 people. The district has 13 Health Centers with only 4 of them providing comprehensive TB screening, basic diagnostics (sputum smear, Gene Xpert), and treatment services. These include: Butebo H/C IV, Kakoro H/C III, Nagwere H/C III and Kabwangasi H/C III. They represented entry points for TB/HIV cases where IPT was provided. IPT implementation practices in TB treatment health facilities in Butebo are similar and they function following the guidelines stipulated by Uganda's Ministry of Health. Each of the TB treatment facilities had two qualified staff working in TB/HIV Clinics. They are supposed to be trained in TB management to provide counselling to PLHIV about IPT before they start the regimen. INH was provided free of charge to PLHIV in Uganda after screening to rule out active TB. All eligible PLHIV were also offered the opportunity to choose the nearest healthcare facility they wish to receive IPT and Anti Retro Viral Therapy for HIV.

3.3 Study population

PLHIV in Butebo district without active Pulmonary TB and meeting the inclusion criteria were studied.

3.3.1Inclusion criteria

a) PLHIV and.

i. Enrolled on ART in the HIV Clinic

ii. Unlikely to have had active Pulmonary TB

3.3.2Exclusion criteria

a) PLHIV and.

i. Not enrolled on ART at the HIV Clinic

ii. Diagnosed with active PTB

3.4 Sampling

Purposeful sampling was done. Butebo district has 13 health facilities of which only 4 provided HIV/AIDS and TB Services. These facilities were selected for the study.

3.6 Quantitative data collection techniques and tools

Primary data from the IPT, TB, and ART registers or cards for PLHIV were extracted. The research assistant filled the questionnaire together with the health worker providing IPT care. Lists of relevant questions needed to achieve the study objectives formed the basis for the questionnaire.

3.7 Variables

The main dependent variable for this study is IPT Uptake. IPT Completion status is a consequential dependent variable looked at in this study. Independent variables include Demographics factors (age, sex, religion, marital status, employment status, education

level, area of residence, household density), health facility factors (pre-IPT counselling), community factors (distance from H/C, incurred costs to reach H/C), and IPT drug related factors (IPT adherence, default on IPT, frequency of INH refill, INH stockouts) were elaborated in the questionnaire. Due to COVID-19 restrictions, only factors obtainable from patients records at the health centers were studied.

3.8 Definition of variables

Table 1. **Variables and their definition as relevant to this study**

VARIABLES	OPERATIONAL DEFINITION	MEASUREMENT VALUES
Age	Referred to as the years of the patient as reported at the time of HIV diagnosis and Uptake of IPT.	Continuous values
Gender	Referred to as the sex of the patient as reported at the time of HIV diagnosis.	Categorical values: -Male –Female
Employment status	Referred to whether the patient is employed as reported at the time of HIV diagnosis or IPT Uptake	Categorical values: Employed/Un employed
Marital status	Referred to the marital status reported by the patient	Categorical values: Single, Married, Divorced, Widowed
Religion	Referred to the religious background of the SPPTB patient	Categorical Values: -Christian -Moslem-Others
Education level	Referred to as the educational status attained by the patient at the time of HIV diagnosis	Categorical Values: Primary, Secondary, Tertiary, None
Residence	Referred to the address or area of residence of the patient during the study	Categorical Values: -Urban –Rural
Household density	Referred to the number of people who lived in the same house with the patient.	Continuous values
Incurred costs to reach H/C	Referred to patient's ability to afford money to travel to access health services at the H/C	Categorical values: Yes/No

Distance from H/C	Referred to as the distance from a patient's home to the H/C	Categorical Values: 5 km or less/Over 5 km
Pre-IPT counselling	Referred to whether the patient received education talks about IPT before starting the treatment	Categorical values: Yes/No
Default on IPT	Referred to whether the patient dropped out from treatment at a point in time.	Categorical Values: Yes/No
Frequency of INH refill	Referred to regularity of the patient's INH refill in the H/C	Categorical values: Regular/Irregular
INH Stockouts	Referred to the stock status of INH at the H/C during the period of IPT	Categorical Values: Yes/No
IPT Uptake	Referred to whether the patient received IPT (INH) after HIV diagnosis	Categorical Values: Yes/No
IPT completion	Referred to whether the patient completed the six months course of IPT (INH)	Categorical Values: Yes/No
IPT adherence	Referred to whether the patient was committed no to miss some doses of the IPT (INH)	Categorical values: Good/Poor

3.9 Data Management.

Questionnaires were attributed to serial numbers that helped match them to the database if there was need for cross-verification and the data entered in an electronic data entry form. The dataset was stored in personal laptop and backed up.

3.10 Data analysis

A preliminary analysis was carried out to make sure that there was no missing data and coding was performed to facilitate creation of a data set. SPSS (Statistical Package for the Social Science) version 25 was then used to do all the analysis process within this research. Association between variables was analyzed by performing Chi-square test between the independent variables with the dependent variable. If there was significant association between two variables, the analysis was continued with logistic regression analysis.

3.11 Quality control

3.11.1 Recruitment and training of research assistants

To assist in effective data collection, a research assistant from each of the four health centers was trained by the Principal Investigator to appreciate the aims and objectives of the study, how to collect data as well as ethical considerations of the research.

3.11.2 Data entry

Data was checked to ensure that all information was properly identified and filled. Errors and omissions detected were discussed and adjusted accordingly.

3.12 Ethical Consideration.

Ethical clearance for this study was obtained from the Yonsei Severance Hospital Institutional Review Board. IRB number is Y-2020-0107

CHAPTER FOUR

RESULTS

4.0 Recruitment of study samples

This study was conducted from August 25th to September 15th, 2020. Case files of 272 patients eligible for this study were obtained and reviewed to obtain data relevant for this study.

4.1 IPT uptake in Butebo district

Table 2. **IPT Uptake by Health Center**

N (%)

Name of Health Center	Mean ±SD (Years) between the date of diagnosis of HIV and start of IPT Uptake	Number of IPT Uptake within 1 Year	Number of IPT Uptake Over 1 Year	No IPT Uptake	Total	Rate (%) of IPT Uptake
Butebo	5.00 ± 4.206	8 (7.0)	19 (16.5)	88 (76.5)	115 (100.0)	23.5
Kakoro	4.63 ± 3.82	7 (13.7)	17 (33.3)	27 (52.9)	51 (100.0)	47.1
Kabwangasi	3.80 ± 3.189	8 (14.5)	12 (21.8)	35 (63.6)	55 (100.0)	36.4
Nagwere	3.59 ± 3.750	10 (19.6)	12 (23.5)	29 (56.9)	51 (100.0)	43.1
Total	**4.31 ± 3.782**	**33 (12.1)**	**60 (22.1)**	**179 (65.8)**	**272 (100.0)**	**34.2**

Table 2. above shows the status of IPT uptake for each of the Health Centers. The mean duration from HIV diagnosis up to IPT Initiation was 4.31 years with SD of 3.782 years. The number of patients who took up IPT within 1 year from HIV diagnosis was 33

(12.1%) and the highest proportion was Nagwere H/C with 10 (19.6%) while the lowest proportion was Butebo H/C having 8 (7%). The general IPT uptake at over 1 year from HIV diagnosis was 60 (22.1%) patients and was highest in Kakoro H/C with 17 (33.3%) while also lowest in Butebo H/C with 19 (16.5%). The group of No IPT Uptake was the majority with 179 (65.8%) patients and the largest number was from Butebo H/C, 88 (76.5%), and the lowest number from Kakoro H/C, 27 (52.9%). In general, 93 (34.2%) patients took up IPT from the 272 who were eligible.

Table 3. **IPT Uptake by contributing factors**

N (%)

Variable		**IPT UPTAKE STATUS**		**Total**	***p*-value**
		Uptake	**No Uptake**		
Gender	Female	59 (32.8)	121 (67.2)	180 (100.0)	0.492
	Male	34 (37.0)	58 (63.0)	92 (100.0)	
Age group (Years)	1 to 12	7 (41.2)	10 (58.8)	17 (100.0)	0.407
	13 to 19	2 (22.2)	7 (77.8)	9 (100.0)	
	20 to 35	28 (41.8)	39 (58.2)	67 (100.0)	
	36 to 64	53 (32.1)	112 (67.9)	165 (100.0)	
	65 or over	3 (21.4)	11 (78.6)	14 (100.0)	
Employment status	Employed	7 (70.0)	3 (30.0)	10 (100.0)	0.015
	Un employed	86 (32.8)	176 (67.2)	262 (100.0)	
Marital status	Single	14 (25.5)	41 (74.5)	55 (100.0)	0.166
	Married	62 (39.5)	95 (60.5)	157 (100.0)	
	Divorced	8 (25.0)	24 (75.0)	32 (100.0)	

	Widowed	9 (32.1)	19 (67.9)	28 (100.0)	
Religion	Christian	75 (35.4)	137 (64.6)	212 (100.0)	0.604
	Moslem	18 (30.5)	41 (69.5)	59 (100.0)	
	Others	0 (0.0)	1 (100.0)	1 (100.0)	
Education level	Primary	51 (26.2)	144 (73.8)	195 (100.0)	<0.001
	Secondary	33 (62.3)	20 (37.7)	53 (100.0)	
	Tertiary	2 (66.7)	1 (33.3)	3 (100.0)	
	None	7 (33.3)	14 (66.7)	21 (100.0)	
Residence	Rural	70 (28.8)	173 (71.2)	243 (100.0)	<0.001
	Urban	23 (79.3)	6 (20.7)	29 (100.0)	
Household density (people)	2 or less	1 (50.0)	1 (50.0)	2 (100.0)	0.451
	3 to 5	61 (36.7)	105 (63.3)	166 (100.0)	
	6 or more	31 (29.8)	73 (70.2)	104 (100.0)	
Incurred costs to reach H/C	Yes	50 (28.2)	127 (71.8)	177 (100.0)	0.050
	No	43 (45.3)	52 (53.7)	95 (100.0)	
Distance from H/C	5 km or less	63 (35.8)	113 (64.2)	176 (100.0)	0.450
	More than 5 km	30 (31.3)	66 (68.7)	96 (100.0)	
Pre-IPT counselling	Yes	80 (98.8)	1 (1.2)	81 (100.0)	0.114
	No	11 (91.7)	1 (8.7)	12 (100.0)	

Table 3 above shows IPT Uptake status in Butebo district by contributing factors. Of the 272 study cases, 93 (34.2%) were in the category of IPT Uptake while 179 (65.8%) were in the category of No IPT Uptake.

In the Female gender only 59 (32.8%) of them were in the IPT Uptake group while among the males only 34 (37.0%) of them were in the IPT Uptake group. The result was not statistically significant in this study (*p*,0.492) hence Gender did not significantly affect the IPT Uptake status.

When age was categorized, only 7 (41.2%) of the cases aged 1-12 years were in the IPT Uptake group which was second only to 28 (41.8%) of the 20-35 age group. The least IPT Uptake was seen among the cases who were 65 years and over with only 2 (21.4%). The result was not statistically significant in this study (*p*,0.407) hence these age groups did not significantly affect the IPT Uptake status.

Considering Employment status, 7 (70%) of the Employed cases were in the IPT Uptake group compared to 86 (32.8%) of the Unemployed. This result was statistically significant in this study (*p*,0.015) hence employment significantly affected IPT Uptake status.

Considering Marital status, the highest IPT Uptake was 62 (39.5%) among the Married cases while the least uptake was 8 (25.0%) amongst the Divorced cases. The result was not statistically significant in this study (*p*,0.166) hence Marital status did not significantly affect IPT Uptake status.

When Religion was considered, 75 (35.4%) of the Christians were in the IPT Uptake group which was higher than 18 (30.5%) of the Moslems who took up IPT. The result was not statistically significant in this study (p,0.604) hence religion did not significantly affect IPT Uptake status.

When education level was analyzed, IPT Uptake was highest in the category of those cases who had Tertiary education 2 (66.7%) while the least uptake was among those who only had Primary education 51 (26.2%). The result was highly significant in this study (*p*, <0.001) hence education level very significantly affected IPT Uptake status.

Considering Residence status, cases from Urban settings 23 (79.3%) were in the IPT Uptake group compared to 70 (28.8%) of those from Rural settings. The result was highly significant in this study (*p*, <0.001) hence Residence very significantly affected IPT Uptake status.

When Household density was analyzed, highest IPT Uptake was in group of households with 2 or less people, 1 (50%), and the uptake was least in group of households with 6 or more people, 31 (29.8%). The result was not statistically significant in this study (*p*,0.451) hence Household density did not significantly affect IPT Uptake status.

In Costs to reach the H/C category, the highest IPT Uptake was in the group that incurred No costs, 43 (45.3%), and lower in the group that Incurred costs to reach the H/C, 50 (28.2%). The study result was statistically significant for this study (*p*,0.050) hence Incurrence of costs to reach the H/C significantly affected IPT Uptake status.

Distance from the H/C was analyzed and found 63 (35.8%) of those who lived 5 km or less from the H/C took up IPT. This was higher than 30 (31.3%) of those who took up IPT and stayed more than 5 km from the H/C. This result was not statistically significant in this study (*p*,0.450) hence distance from the H/C did not significantly affect IPT Uptake status.

Pre-IPT counseling factor was analyzed and found that 80 (98.8%) of those who were counselled took up IPT. This was higher than 11 (91.9%) who did not receive counselling but took up IPT. This result was not statistically significant (*p*,0.114) hence Pre-IPT counselling did not significantly affect IPT Uptake status.

4.2 IPT Completion in Butebo district

Table 4. **IPT Completion by Health Center**

N (%)

Name of Health Center	Completed IPT	Not Completed IPT	Total	Rate of IPT completion (%)
Butebo	27 (100.0)	0 (0.0)	27 (100.0)	100
Kakoro	24 (100.0)	0 (0.0)	24 (100.0)	100
Kabwangasi	18 (90.0)	2 (10.0)	20 (100.0)	90
Nagwere	22 (100.0)	0 (0.0)	22 (100.0)	100
Total	**91 (97.8)**	**2 (2.2)**	**93 (100.0)**	**97.8**

Table 4 above shows the IPT Completion status by Health Center in Butebo district. 91 (97.8%) of those who received IPT were able to complete the six months course of

treatment compared to 2 (2.2%) who did not complete the treatment. IPT Completion was highest in the three Health Centers of Butebo, 27 (100%), Nagwere, 22 (100%), and Kakoro, 24 (100%). The lowest IPT Completion was in Kabwangasi H/C, 18 (90%).

Table 5. **IPT Completion status by contributing factors**

N (%)

Variable		COMPLETION STATUS		Total	*p*-value
		IPT Completed	IPT Not Completed		
IPT Adherence	Good	84 (100.0)	0 (0.0)	84 (100.0)	<0.001
	Poor	7 (77.8)	2 (22.2)	9 (100.0)	
Default on IPT	Yes	4 (66.7)	2 (33.3)	6 (100.0)	<0.001
	No	87 (100.0)	0 (0.0)	87 (100.0)	
Frequency of INH refill	Regular	88 (100.0)	0 (0.0)	88 (100.0)	<0.001
	Irregular	3 (60.0)	2 (40.0)	5 (100.0)	
INH Stockouts	Yes	0 (0.0)	1 (100.0)	1 (100.0)	<0.001
	No	91 (98.9)	1 (1.1)	92 (100.0)	

Table 5 above shows IPT Completion status by contributing factors in Butebo district. When IPT Adherence was analyzed, those who had good adherence all completed IPT, 84 (100%). This was higher than IPT completion among those who had poor adherence, 7 (77.8%). When IPT default status was analyzed, 4 (66.7%) of those who defaulted from treatment were able to complete IPT while majority, 87 (100%), of those who did not default managed to complete IPT. Analysis of frequency of INH refill showed that all, 88

(100%), of those who had regular refills were able to complete IPT. This was higher than only 3 (60%) of those who had Irregular refills but completed IPT. For INH stock status, 91 (98.9%) of cases experienced no stockouts of INH and completed IPT. All these results were highly significant at (p, <0.001) hence the variables very significantly affected IPT completion.

CHAPTER FIVE
DISCUSSION

5.1 Discussion

In this study, 34.2% of the newly diagnosed PLHIV were initiated on IPT. Similar findings on IPT uptake were found in epidemiological studies conducted in South India which reported 33%[28], and in Zambia which reported 30%[29]. Despite the slight differences in the methodology and study designs, the IPT uptake established in this study was found to be higher than 6.3%, 18.0%, 22%[30], and 26.8%[31] which were reported in Malawi[32], Timor-Leste[33], India and South Africa respectively. In contrast, other studies in Ethiopia[34], Gambia[35], Rwanda[36] and Benin[37] reported 64.3%, 89%, 89% and 99% of IPT uptake respectively, which were much higher compared to the findings of the current study. The integration of IPT into the programmatic delivery of healthcare might explain the high uptake reported in the study findings reported in these countries.

This study results attested that majority of the cases were female although IPT Uptake was highest among the males which could be partly explained by the differences in health seeking behaviors in the district where more females partake healthcare services than men. Majority of cases were unemployed which may be explained by the finding that majority of them had attained only primary level of education. Most of the cases initiated on treatment lived in rural households within 5 km from the health centers, which could have made access to health services more favorable hence influencing uptake of IPT. Majority of the cases incurred travel costs probably due to the bad nature of the roads, limited travel means, and given that the distance to the health facility remains far for some of them too.

While majority cases were married, those who lived without partners were also significant which could have contributed to poor social support to seek IPT services at the health centers. Majority cases were Christians because it is the dominant religion in Butebo district.

The results show that IPT completion rate was high. The factors favorably influencing the completion of treatment include good IPT Adherence, limited default on IPT, regular INH refills, and No stockouts of INH at the health centers.

5.2 Study limitations

The research was conducted in Butebo district; thus, the findings might not be generalized to the whole country. A major limitation of this study is the inability to conduct face to face interviews with the study cases to determine their personal and community factors that determined IPT uptake and completion. This was majorly due to the lockdown regulations instituted by the government because of COVID-19 pandemic, and the lack of finances to facilitated home visits. The health workers were also not interviewed to obtain their perspectives about IPT services in the health centers.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This study shows that the recommendations of WHO and Uganda's National Tuberculosis and Leprosy Program (NTLP) for screening all newly diagnosed PLHIV and initiating them to IPT were still not well implemented. The rate of IPT uptake was found to be low although the completion rate among those who took up treatment was high. Poor IPT uptake represents missed opportunities to prevent future Tuberculosis cases amongst the PLHIV. The findings in this research are consistent with earlier studies conducted in other parts of Africa, and other Low- and Middle-Income Countries (LMICs). Major gaps in IPT uptake may be scaled up by addressing the factors affecting IPT Uptake, alongside integrating IPT with other routine HIV-AIDS/TB and community care services, enhancing supervision and monitoring, training of health workers, and maintaining regular INH supplies at the health centers. IPT implementation shortcomings need to be discussed at all levels of management from the Health Center to the District level, and centrally at the Tuberculosis Control Program of the Ministry of Health.

6.2 Recommendations

The NTLP and the district(s) should train healthcare providers on the benefits of implementing IPT care services, complete data capture and storage, and including IPT uptake and completion among the core TB indicators for reporting in the District Health Management Information Systems (DHMIS). The health care providers should integrate IPT with their routine HIV-AIDS/TB services to capture all potential cases for IPT. Community HIV/TB counsellors and VHTs need to be supported further to conduct health education and home visits to the PLHIV to increase uptake of IPT and to monitor them through the period of treatment.

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