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# Scaling Up the Uptake of Tuberculosis Preventative Therapy among HIV Positive Clients at Okahao Clinic, Northern Namibia; A Quality Improvement Capstone Project

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***Abstract***

*Globally over 10.4 million people fell ill with TB, of which 1.7 million died from the disease in 2016. And in the same year, 40% of HIV deaths were due to TB. 95% of TB deaths occur in low- and middle-income countries, and Namibia has one of the highest case notification rates (CNR) of TB in the world. Tuberculosis Presumptive Therapy (TPT) treats latent TB infection, and this reduces the likelihood that active TB disease will develop. Whereas Namibia adopted TPT use for PLHIV in 2005, the national coverage has remained low and was estimated to be 35% in June 2018, and specifically at 42% for Okahao, ART Clinic. We therefore designed a quality improvement project to scale up the uptake of TPT at this clinic. We used both quantitative and qualitative methods. We conducted health education sessions daily for 15 minutes, and patients were taught about TPT. Three categories of clients were registered according to those who suggested TPT initiation. Category one (C1) were those where a clinician suggested TPT, Category two (C2) by the client themselves and category three (C3) by data administrators. We analyzed data using simple excel spread sheets as either trend graphs or pie charts. Category two had more clients started on TPT (n=1,609, 58.3%). TPT coverage within the backlog cohort improved from 42% to 94%, and for the new cohort, coverage increased from 81% to 100%. 13 clients (64%) reported skin related manifestations as side effects. Daily health education about TPT in HIV care settings improves uptake.*

***Keywords:*** *TB Presumptive Therapy (TPT), Uptake, HIV positive, Quality improvement project.*

## Introduction

Tuberculosis (TB) is listed among the top 10 causes of death worldwide [1, 2]. In 2016, 10.4 million people were diagnosed with TB, and 1.7 million died from the disease. Low - and middle-income countries account for over 95% of TB deaths [1-3] and these seven countries, India, Indonesia, China, Philippines, Pakistan, Nigeria, and South Africa account for 64% of the deaths globally.

In 2016 alone, over 1 million children were diagnosed with TB and 250 000 of these died of the diseases. TB (including children with HIV associated TB). TB remains one of the leading killers of HIV-positive people, accounting for over 40% of HIV deaths in 2016, and 74% of these were in Africa [1, 2]. The HIV prevalence among people with TB disease in southern Africa is about 50 % [1, 4, 5].

According to the WHO report of 2009, Namibia has one of the highest case notification rates (CNR) of TB in the world. And in 2010 alone, a total of 12,625 cases of TB were notified, which is an equivalent of a CNR of 589 per 100,000 population. This huge case load is attributed to the HIV epidemic whose prevalence of 18.8% among antenatal clinic mothers was

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18.8% in 2010 with a prevalence rate of 56% for HIV among TB patients [6, 7].

Not all individuals exposed to Mycobacterium tuberculosis (MTB) develop active TB, it is a small percentage that does, and this is because, for healthy persons, the immune system is able to control the infection and they remain disease-free for prolonged periods which is termed as latent infection. The risk of progression to TB disease is increased by HIV and similarly, the risk of transmission increases [1, 5].

HIV-infected people have 20 to 30 times more chances of developing active TB disease than those who are negative, and this therefore makes HIV the strongest risk factor for TB disease [2, 8]. There is a very lethal combination between TB and HIV where each of these diseases speed up the other's progress.

The first priority for TB control is treating people with active TB disease, however, the identification and treatment of patients with latent infection is very crucial. Treatment of latent TB infection with isoniazid reduces the chances of developing active TB, and similarly, it decreases the figures of adults with active disease that will transmit the infection to others [3, 9].

Isoniazid preventive therapy (IPT) means the provision of the drug isoniazid to people who are at high risk of progressing to active tuberculosis (TB).

IPT is recommended by the WHO as one of the three I's in the TB program and these are IPT, Intensified TB case finding, and lastly Infection control for TB. Even with the available convincing evidence that IPT can be used for TB prevention, very few countries outside of the Western world have gone ahead to implement this strategy [1, 2, 5].

A course of TPT using isoniazid can reduce the risk of HIV-infected individuals developing TB by almost 60% [1, 2]. Since its first use in Namibia in 2005, the coverage of TPT nationwide remains low and it was estimated to be 35% in June 2018 for all healthcare facilities providing HIV care services combined. While the TPT coverage at Okahao ART clinic was above the national average at 42%, it was still below the minimum of 95%. We therefore set up a quality improvement project to scale up the uptake of TPT among HIV-positive clients at Okahao ART clinic.

The QI project was set up with the primary objective of scaling up the TPT uptake among HIV-positive clients and secondarily to assess the impact of daily patients' health education on TPT uptake.

The Specific objectives included the following.

1. To improve TPT coverage in patients who were enrolled in HIV care before 31 July 2018 from 42% in August 2018 to 90% by February 2020.
2. To ensure 90% of eligible patients initiated on ART from August 2018 to August 2020 also receive TPT.
3. To assess the impact of daily patients' health education on the uptake of TPT.

## Methodology

### Overview

The quality improvement project was set up in consultation with experienced health professionals in the ministry of health including senior HIV clinical mentors and quality improvement coaches and advisors. This project was a quality improvement initiative, which applied rapid change of ideas and the PDSA technique was used.

The clinic set up a QI team and identified change ideas to test using the model for improvement. Some of the change ideas tested and adopted included developing TPT registers for patient tracking, patient health education on TPT, using reminders to initiate TPT and updating patient records. Patients were divided into two cohorts to track TPT coverage effectively. The backlog cohort included patients that initiated ART before 31 July 2018 while the new cohort involved patients that started ART from first August 2018 and beyond. Data

collection was done through paper-based tools and this information was later captured in an excel dashboard monthly.

## Study Settings

The project took place at the community level of Okahao District Hospital ART clinic, Namibia. Okahao district is one of the four districts in Omusati region of northern Namibia, with a total population of 43,645 and HIV prevalence of 16.9% among adults [6,7]. The facility has 4500 clients on ART and baseline data for 2018 showed that only 42% of these have ever received a course of TPT for at least 6 months.

## Study Design

The project was a quality improvement project with the aim of scaling up TPT uptake that involved both quantitative and qualitative methods. The quantitative methods involved a review of client records of attendance at the ART clinic and pharmacy plus the exact number of clients who had never received a course of TPT while the qualitative methods consisted of areas related to adherence of clients to ART, TPT initiation and completion. TPT coverage which was defined as either being on TPT or having completed TPT within the reporting period. A team of three healthcare workers from Okahao Clinic attended the inaugural QIC learning session in July 2018.

The clinic compiled and submitted monthly reports using an Excel template and the regional QI coaches validated the reports before forwarding them to the national level for review and aggregation. The QI project was carried out through the daily health education sessions given to the clients. A schedule indicating the responsible Nurse, Health Assistant or Data Administrator was drawn up. A uniform message highlighting TB prevention in general, Isoniazid, eligibility criteria, duration, contraindications, and side effects was developed. Sessions lasted 15 minutes. Clients received papers and fliers with information about Isoniazid. Facilitators encouraged clients to ask clinicians about TPT.

When initiating TPT in the consulting rooms, three categories of clients were registered according to who suggested TPT initiation. In category one (C1) clients the prompt was by the clinician, Category Two (C2) by the clients themselves and category three (C3) by data administrators after finding no TPT status.

## Data Collection

Client records files were recruited daily to check whether there was a TPT status indicated, and this was crosschecked with the data from routinely collected MOHSS client monitoring and evaluation records showing at least a 12-month period of follow-up. Data from paper records was entered into a created digital database in Excel format and Word documents that were updated daily.

The following information was collected:

1. Number of active clients registered in the clinic before 31 August 2018 and after this date.
2. The number of clients with known TPT status, which was defined as on TPT, completed TPT or Never been on TPT. (3) Age (4) Gender (5) TB status at initiation of ART (6) WHO stage at ART initiation and the ongoing treatment stage (7) Standardized TPT outcomes like Stop TPT, Dead, Alive on TPT or Transfer out. (8) Who prompted the process of TPT initiation as categorized as C1, C2 or C3 and (9) TPT-related side effects.

## Inclusion and Exclusion Criteria

We included all HIV-positive clients who were registered in the health facility and had never completed a dose of TPT for at least 6 months. We excluded clients who had been diagnosed with conditions such as exfoliative dermatitis, known liver disease, alcohol abuse, active TB disease or related symptoms.

### Sample Size

There was no need to determine the sample size since every client who had never completed TPT at the time of starting the project was included.

### Data Analysis

The quantitative data was analyzed using simple Excel spreadsheets on computers as either simple trend graphs or pie charts and these quantitative study outcomes were measured as percentages (%)

### Ethical Consideration

The project was implemented following the routine way in which the facility clients are followed up and there were no direct patient identifiers. However, the project protocol was submitted to the institutional review board at the Ministry of Health for their notification. Study findings were shared with the Regional Health Directorate and Ministry of Health as well as other stakeholders that support the TB/HIV program in the district.

### Study Duration

The project was for 2 years from 1st August 2018 to 31st August 2020.

## Results

### Social Demographics

From Table 1, 2,342 clients were initiated on TPT from the backlog cohort. Of these 68% were female and 32% were male. From the New cohort, a total of 422 clients were initiated on TPT of which 57% were female and 43% were male. The age range for all the clients was 7 to 78 years.

**Table 1.** Socio-Demographics of Clients

| **Socio-Demographics** | **Backlog TPT Cohort** | **New TPT Cohort** |
|---|---|---|
| | ***Number (%)*** | **Number (%)** |
| **Sex** | | |
| Male | *749 (32)* | 181(43) |
| Female | *1591 (68)* | 239(57) |
| **Age** | | |
| <20 | 46(2) | 18(4) |
| 21-40 | 740(32) | 190(45) |
| 41-60 | 1269(54) | 146(35) |
| >60 | 285(12) | 66(16) |
| **Total** | 2340 | 420 |

### Cadres who Suggested TPT initiation (Impact of Health Education on TPT Coverage)

Category one (C1) clients were 690 representing 25% whose process of TPT initiation was started by the clinician, Category two (C2) were 1,609 representing 58.3% whose process of initiating TPT was started by the clients themselves following health education by facility staff and lastly category three (C3) was 460 representing 16.7% and for them the initiation process was suggested by the data administrators after finding no TPT status in the clients' records. Look at Figure 1 reflecting these percentages.

It is noted that more clients were initiated on TPT after informing the clinicians that they needed to be given TPT. This is attributed to the fact that the clients had received health education about TPT.

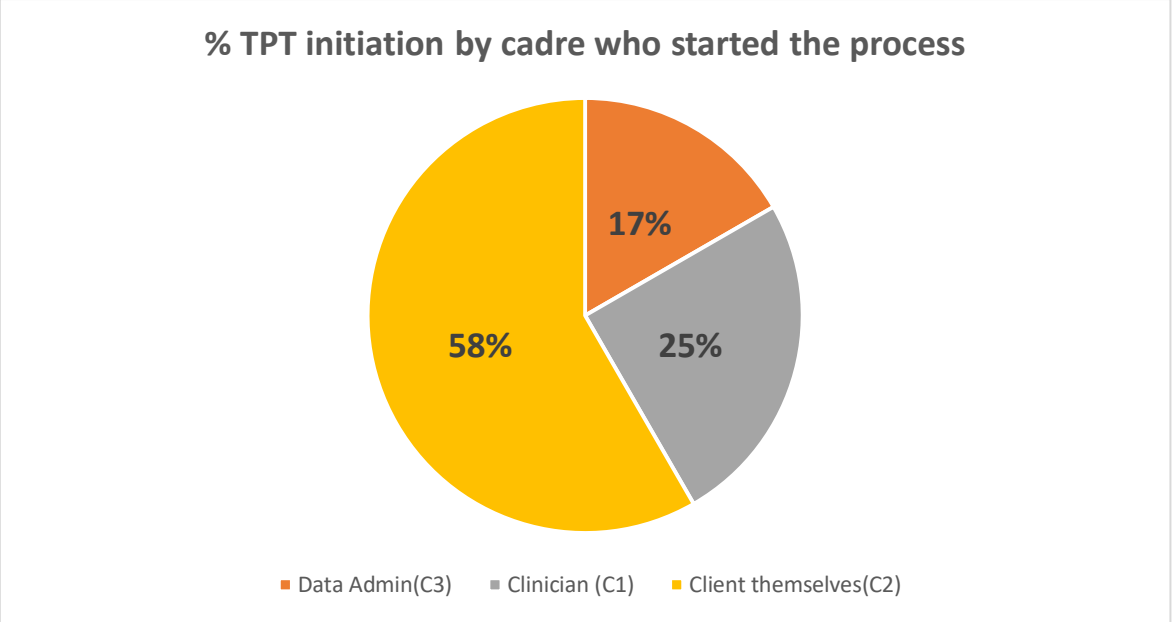


**Figure 1.** Categorization by Cadre that Suggested TPT Initiation (Impact of Health Education on TPT Coverage)

## Backlog Cohort TPT Coverage

Backlog cohort was defined as the number of patients who initiated ART before 31 July 2018 and had never been on TPT for at least six months. The backlog TPT coverage gradually improved from a baseline of 42% (n=1,890) in July 2018 to 85% by December 2019 (n=3825) and 94% (n=4230) by August 2020. This is reflected in Figure 2.

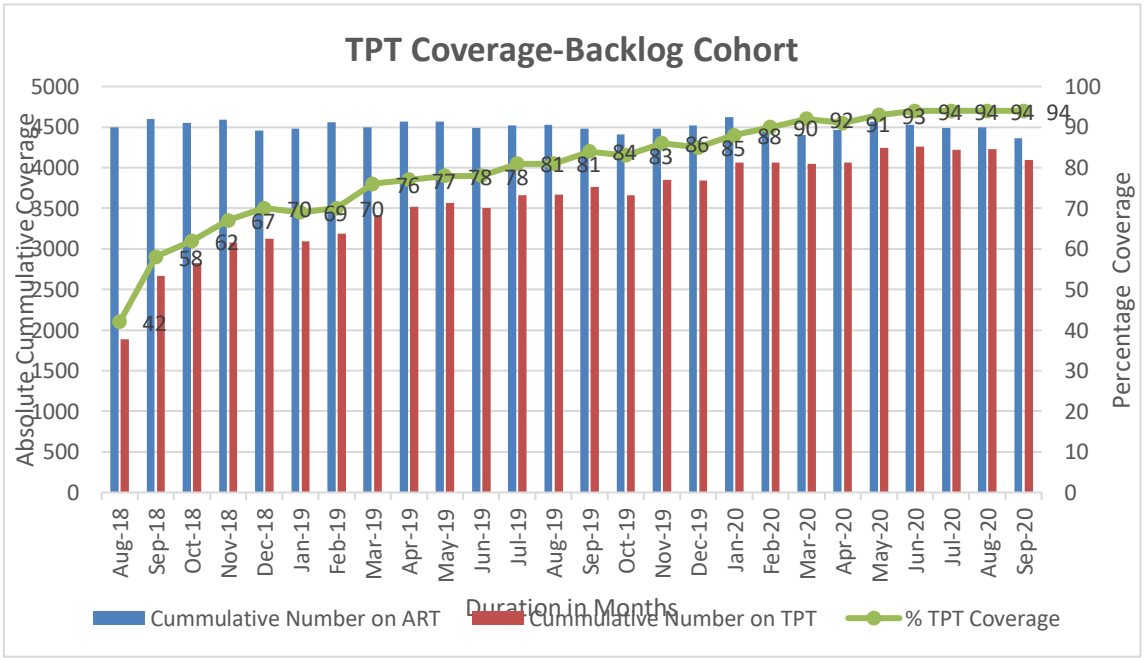


**Figure 2.** Backlog Cohort TPT Coverage

## New Cohort TPT Coverage

TPT New cohort was defined as the number of patients that newly initiated ART from August 2018 moving forward. The cumulative New TPT coverage increased from 81% (n=17) in August 2018 to 100% (n=420) by August 2020. This is reflected in Figure 3.

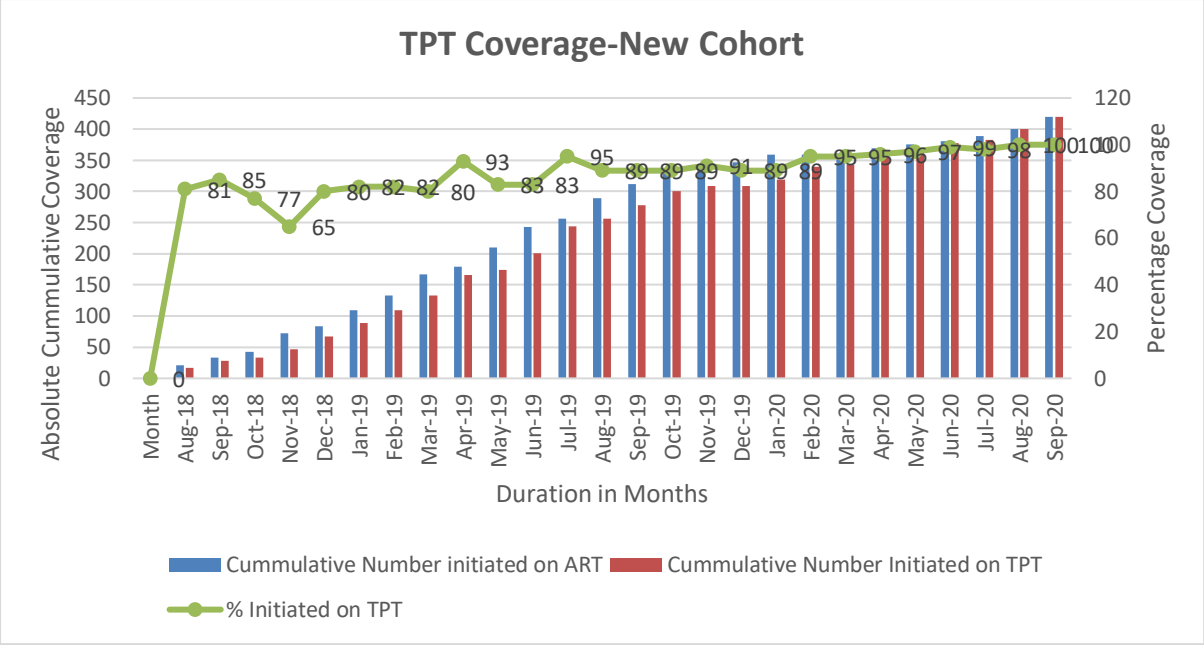


**Figure 3.** New Cohort TPT Coverage

## Side Effects Related to TPT(Isoniazid)

A total of 21 clients reported side effects related to Isoniazid which was the drug used for TPT. 64% (n=13) reported skin-related manifestations which were either rashes or itching. 20% (n=5) reported peripheral neuropathy. 10% (n=2) reported hepatitis and 6% (n=1) had gastrointestinal-related symptoms like Nausea, Vomiting and Diarrhea. This is summarized in Figure 4.

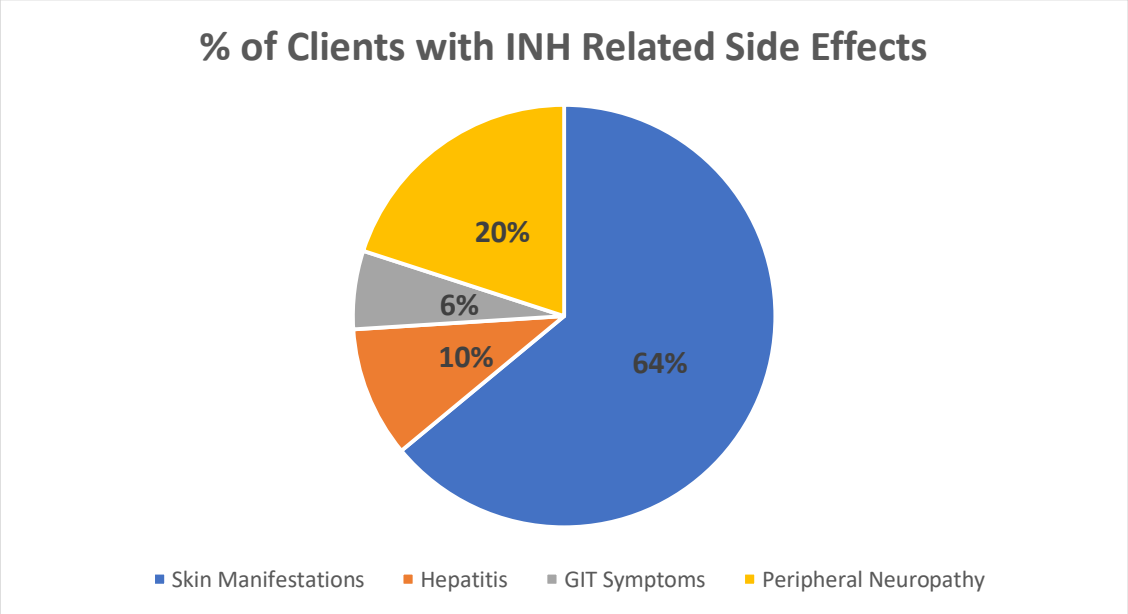


**Figure 4.** Side Effects Related to TPT (Isoniazid)

## Discussion

There is continuous evidence supporting the use of Isoniazid for TB prevention among HIV-infected persons. Prescription of isoniazid chemoprophylaxis for 3, 6, and 12 months lowers the risk of TB by 21%, 65%, and 75%, respectively. However, longer treatment duration makes compliance very poor, and this lowers the effectiveness of the medications [5, 10, 13, 14].

The global TPT coverage remains very poor despite growing evidence that this intervention works. At my facility here in Namibia, IPT coverage was at 42% and this motivated us to set up a quality improvement project to improve it to at least 95%.

Various health worker and administration factors impact the uptake of TPT, and it has been emphasized in numerous articles that health worker and patient education, together with TB screening prior to IPT initiation increases the confidence of both health workers and patients to take TPT. Patients' health education was one of the major components of this quality improvement project.

The combination of TPT and ART prevents TB or death in HIV patients more than ART alone, and this effectiveness is estimated to be at 60%. TPT effectiveness is augmented by the ability of ART to restore the immune system, and this emphasizes the fact that TPT should not be used alone, but together with ART [9-11]

Multi-Drug Resistance TB(MDR-TB) threatens the "END TB" program and special attention is needed pertaining to prophylaxis. Among MDR-TB contacts that receive a course of TPT, the risk reduction of developing TB together with protection is between 37 to 90%. Following a systematic review Isoniazid cannot the best option and efficacy is not known for chemoprophylaxis after contact with MDR-TB, but instead a fluoroquinolone or two second-line drugs with the same susceptibility profile as the primary isolate can be considered for prophylaxis [2, 4, 7].

The protection after prophylaxis is not known because not much data is available on this topic since most studies didn't follow up with their participants for a long duration. This is therefore a grey area for research. In our project, some clients received INH for 9 months while others 6 months following the review of the national TB guidelines [4, 5].

We identified documentation as a very important component of quality improvement as most clients had completed their TPT dosages, but they had never been updated in their records.

Health education given to clients is very critical as it empowers them to be responsible enough to demand TPT whenever they enter the clinician's consultation rooms. As seen in our QI project results, the highest number of clients initiated TPT because of clients reminding the clinicians about TPT. This was attributed to the health education sessions that were given to them every morning before being consulted by the clinicians.

## Conclusion

Implementation of quality improvement collaboratives needs a dedicated team of healthcare workers, and this can yield significant improvements in TPT uptake. Health education empowers the clients to own their affairs concerning TPT up to the extent of them asking for TPT by themselves. Facilities should have all their HIV-positive clients initiated on TPT and ensure completion, and if this is done, the prevalence of TB is expected to drop drastically.

## Conflict of Interest

No conflict of interest to declare.


## Acknowledgement

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