

Analysis of Tuberculosis Trends and Treatment outcomes data in The Gambia reported in the DHIS2 from 2017 to 2021

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Abstract

Background

Tuberculosis remains a serious public health problem in The Gambia, 6th top cause of DALYs. Treatment outcome serves as a tool to control the quality of tuberculosis treatment provided by the health care system. The global epidemiology of tuberculosis has been shaped in recent decades by HIV/AIDS, urbanization and poverty. The majority of survey detected TB cases (95%) were new and not on treatment at diagnosis (Gambia Health Policy 2021–2030).

Methods:

The study is a retrospective cross-sectional secondary data review aimed at analyzing existing Programmatic Tuberculosis data extracted from the DHIS2.

Results

A total of 4109 TB Cases (Extrapulmonary and Pulmonary) were recorded in DHIS2 for the period 2017 to 2021, of which 3,349 (81.5%) were pulmonary TB Cases, males accounted for 59.9% while Western Health Region one which has about 50% of the National population accounted for 51.1% of the total number of cases 2099 (51.1%). A total of 5491 cases were reported for treatment outcome, this is higher than the number of active cases for the period in review which could be because data from the previous year reported in the new year. Out of this 575 (10.5%) completed treatment while 4720 (86%) were cured. During the period, a total of 3472 HIV Positive TB Coinfections were reported of which 36.1% (1290) were on ART, 9.9% (353) were cured and 4.0% (died)

Conclusion

We realize that there is a high turnout rate for treatment outcome especially for those that complete their treatment and those that are cured.

What Is Known About The Topic

- The global and continental burden of the disease
- Africa accounting for $\frac{1}{4}$ of the Global burden out of which 32% are co-infections with HIV
- Local/ National burden 128/100,000 representing a sharp decline from 2013 which was 490/100,000

What Is Yours Study Adding To The Body Of Knowledge On The Topic

- HIV Positive Co-infection accounted for 84.5% of all TB cases from 2017 - 2021
- 6% Extrapulmonary TB cases completed treatment with 2.4% being cured
- 3% Pulmonary TB cases cured with 2.1% completed treatment

Introduction

Tuberculosis remains a serious public health problem in The Gambia, as the 6th top cause of DALYs. In 2019, tuberculosis (TB) was the leading cause of death from an infectious agent accounting for 1.2 million deaths among HIV-uninfected people and 208,000 deaths among HIV-infected individuals globally (Baluku et al., 2022).

In the WHO African Region, where the burden of HIV-associated TB is highest, 85% of TB patients had a documented HIV test result. Overall, in 2020, 88% of TB patients known to be living with HIV were on ART (WHO Fact Sheet, October 2021). Africa accounts for $\frac{1}{4}$ of the Global burden out of which 32% are co-infections with HIV, and National burden of TB is 128/100,000 representing a sharp decline from 2013 which was 490/100,000

The majority of unsuccessful outcomes were attributed to death and of defaulter rate. HIV co-infection and retreatment were significantly associated with an increased risk of unsuccessful treatment outcomes compared to HIV negative and newly diagnosed TB patients, respectively. TB treatment success rate was in Africa was 79% below the WHO defined threshold of 85% with significant variation across countries (Teferi et al., 2021).

Treatment outcome serves as a tool to control the quality of tuberculosis treatment provided by the health care system. The global epidemiology of tuberculosis has been shaped in recent decades by HIV/AIDS, urbanization and poverty. Despite the availability of effective treatment, tuberculosis (TB) remains a major cause of morbidity and mortality, particularly in the developing world (Harper et al., 2003). Non-adherence to anti-TB treatment may result in the emergence of multidrug resistant TB (MDR-TB), prolonged infectiousness and poor TB treatment outcomes [4, 5]. In previous studies, patients related factors including feeling better, forgetfulness, lack of knowledge on the benefits of completing a treatment course, running out of drugs at home, distance to the health facility, HIV seropositivity, alcohol abuse, use of herbal medication, stigma and male gender were significantly associated with nonadherence to an anti-TB treatment (Teschahuneygn et al., 2015)

We conducted this study to describe pulmonary and extra pulmonary treatment outcomes in The Gambia between 2017–2021

Methods

Study setting/Area

The Gambia is located on the West African coast and extends about 400 km inland, with a population density of 176 persons per square kilometer (6). The width of the country varies from 24 to 28 kilometers and has a land area of 10,689 square kilometers. According to the Population and Housing Census (2013) projections, the population is estimated at 2.4 million in 2020, 50.7% are females with annual growth rate of 3.1%.

The population size is set to reach 2.8 million in 2025. The crude birth rate is 46 per 1000 population while the total fertility rate is 4.4 births per woman (7). The high fertility level has resulted in a very youthful population structure. Nearly 44% of the population is below 15 years and 19% between the ages 15 to 24. Average life expectancy at birth is 61.5 years overall with females constituting 62.3 and males 59.6 years (6).

TB is diagnosed and managed at 41 DOT sites across the country and these sites are in the Hospitals, Major and Minor Health Facilities. There are Regional Leprosy TB Officers at all the Seven Regional Health Directorates who supports and coordinate TB Control activities in their various regions.

Study Design

We reviewed Tuberculosis surveillance data obtained from the DHIS2. Data Source and Analysis We reviewed TB Data obtained from the DHIS2 covering 2017–2021. We extracted data on TB types, and different types of categories of bacteriologically confirmed treatment outcomes. We validated, tabulated and analyzed data using Microsoft Excel.

Ethical considerations

Considering the study being secondary data analysis of existing national TB data available in the DHIS2, thus Ethical issues may not be considered since the Ministry of Health have given approval for the Analysis to be conducted.

Results

A total of 4109 TB Cases (Extrapulmonary and Pulmonary) were recorded in DHIS2 for the period 1st January 2017 to 31st December 2021, of which 3,349 (81.5%) were pulmonary TB Cases, males accounts for 59.9% while Western Health Region one which has about 50% of the National population accounts for 51.1% of the total number of cases 2099 (51.1%). A total of 5491 cases which were reported for treatment outcome as illustrated in Fig. 1 below, out of this 575 (10.5%) completed treatment while 4720 (86%) were cured.

During the period, a total of 3,472 HIV Positive TB Co-infections accounting for 84.5% of the total reported cases during the period were reported of which 36.1% (1290) were on ART, 9.9% (353) were cured and 4.0% (died) as shown in Fig. 2 below.

Discussions

This study showed that majority of the TB cases are pulmonary as compared to extra-pulmonary and most of the cases were male. Of the total cases on treatment, only few completed treatment during the period while majority were cured. A significant number of TB cases had HIV co-infection and a few of these were cured while the mortality rate among those with co-infection was 4.0%.

This study showed that majority of reported TB cases in the country were pulmonary TB. A significant number of cases were under five years of age which is a cause for concern. Males constituted more than half of all cases. The cure and treatment completion rate were impressive with pulmonary TB cases had the highest cure rate with males accounted for the majority of deaths especially in Pulmonary TB cases and this is similar to a study conducted in Zimbabwe in 2019,

Extrapulmonary TB have a high number that completed treatment, this is similar with a study conducted in Uganda in 2021. Most of the cases with coinfections are either on ARVs or CPT and many of these cases with coinfections recovered or are treated of TB. Notwithstanding, some of these cases are lost to follow up and their outcome remains unknown if they are unreachable. The main limitation of the study was the fact that the predictors for treatment success could not be determined due to the unavailability of patient level data. The findings of limitation is similar to a study conducted in Uganda in 2021. Notification and documentation of the outcomes of treatment was never done during the period and this was as a result of the limited reporting indicators in the DHIS2. HIV Positive TB cases had very low treatment failure within the five-year period

Conclusion

In conclusion, there was high proportion of TB cases that completed their treatment and got cured. Though mortality was low, it was higher among Pulmonary TB cases compared to Extrapulmonary TB Cases. This study also showed that co-infection with HIV was higher among females.

Declarations

Ethics approval and consent to participate

Ethical clearance has been given for the study and all participants and authors have given both verbal and written consent to participate in the study.

Consent for publication

Consent have been given for the study to be published

Availability of data and materials

The raw Data generated for the analysis is available and is been shared as a supplementary file

Competing interests

There are no competing interest and this manuscript has not been submitted anywhere for publication

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Authors' contributions

Balla Jatta - Corresponding Author, Data collection, analysis, interpretation, writing

Peter Adewuyi - Helped in edition and review for content

Patrick Nguka - Helped in edition and review for content and mentoring

U C David - Helped in edition and review for content and concept development

Amadou Woury Jallow - Helped in data extraction and Analysis

Sana Malang Sambou - Helped in Data Analysis and Interpretation

Baba Kunta Fofana -Helped in edition

Mustapha Bittaye - Helped in edition and review for content

Wandifa Samateh - Helped in data extraction and Analysis

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Tables

Table 1: Proportion of TB Cases (Pulmonary and Extrapulmonary) by demographic and geographic distribution in The Gambia 2017 - 2021

Description	Pulmonary TB	Extrapulmonary TB	Total Cases
Age Group	n=3349	n=760	n=4109
0-4	182	53	235
5-14	339	81	420
> 15	2828	626	3454
Gender			
Male	1999	464	2463
Female	1350	296	1646
Year			
2017	736	143	879
2018	690	136	826
2019	782	141	923
2020	670	167	837
2021	489	155	644
Region			
CRR	74	22	96
LRR	72	19	91
NBER	135	28	163
NBWR	86	18	104
URR	259	37	296
WR1	1647	452	2099
WR2	1074	186	1260

Table 2: TB Treatment outcomes in the Gambia 2017 – 2021

Treatment Outcome		
Extrapulmonary TB		
EPTB	n=531	%
Cured	13	2.4
Treatment Complete	460	86.6
Died	33	6.2
Lost to follow	21	4.0
Failure	1	0.2
Not Evaluated	3	0.6
Pulmonary TB		
PTB	n=5465	%
Cured	4717	86.3
Treatment Complete	115	2.1
Died	274	5.0
Lost to follow	288	5.3
Failure	45	0.8
Not Evaluated	26	0.5

Table 3: HIV Positive – TB Coinfection and outcomes in the Gambia 2017 – 2021

TB - HIV Coinfections	HIV-positive TB patients on ART	HIV-positive TB patients on CPT	HIV-positive TB patients Cured	HIV-positive TB patients Died	HIV-positive TB patients loss to follow	HIV-positive TB patients Treatment completed	HIV-positive TB patients Treatment failure
n=3572							
Male	614	613	177	65	15	208	3
Female	676	702	176	79	11	228	5

Figures

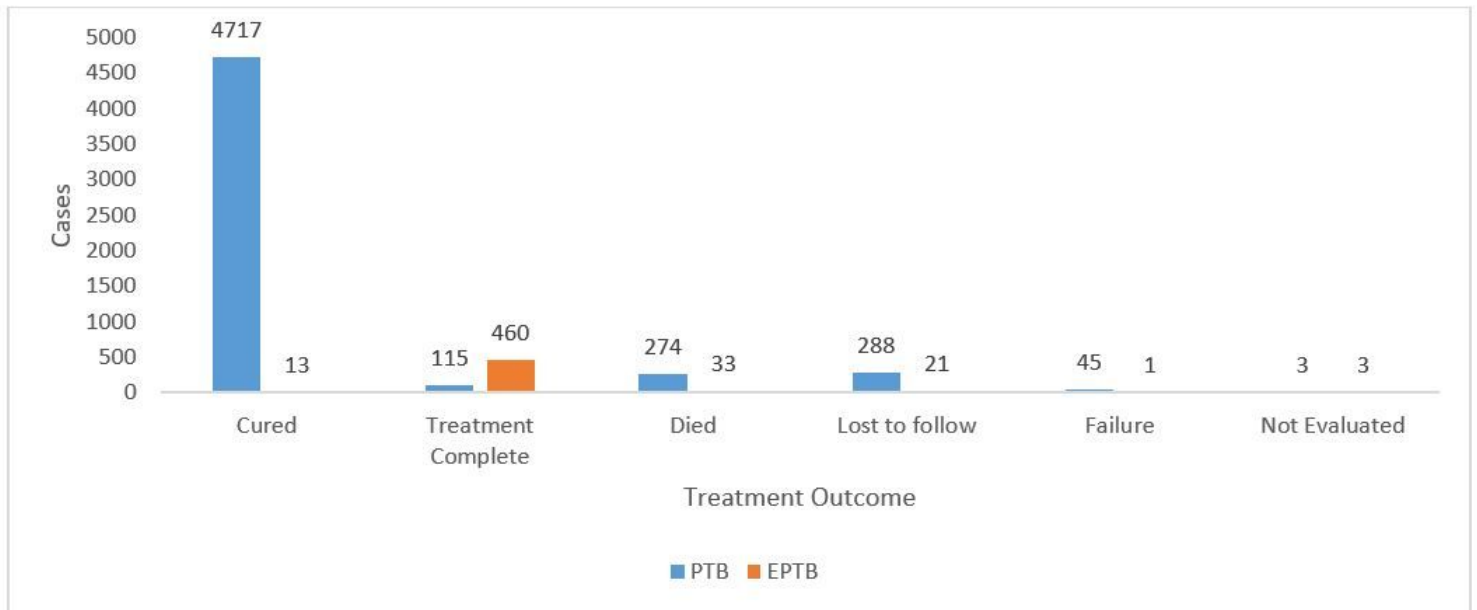


Figure 1

Proportion of TB Cases with an outcome in The Gambia from 2017 2021

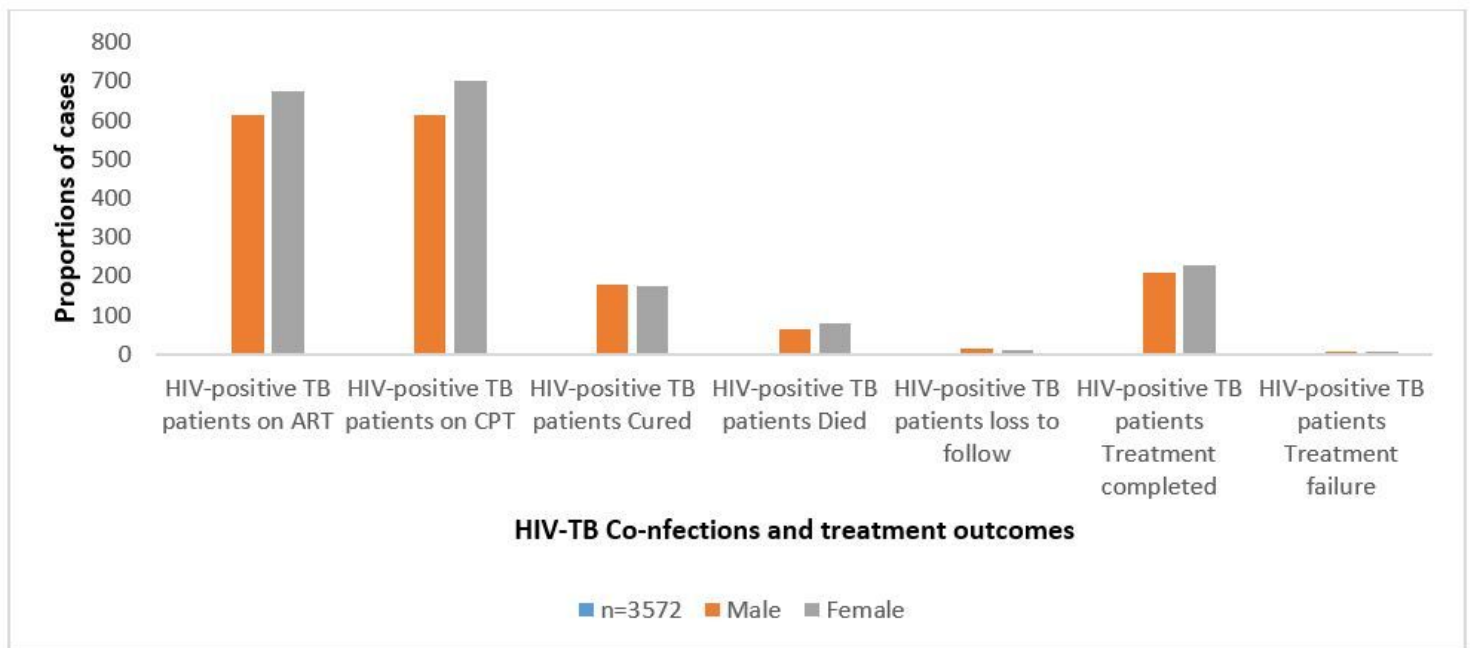


Figure 2

Proportions of TB-HIV Co-infections and their treatment outcomes in the Gambia 2017 to 2021

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [TBRXOutcomeBalla.xls](#)