

Analysis of Tuberculosis Trends and Treatment Outcomes Data in 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 (Disability-Adjusted Life Year). 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 co-infections 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.

Keywords: Tuberculosis, Treatment outcome, Co-infection, HIV, District Health Information System 2 (DHIS2)

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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 JB, *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 ¼ 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 MY, *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 M, *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 (Tsefahuneygn G, *et al.*, 2015; WHO, 2021). In previous studies, patient-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 non-adherence to an anti-TB treatment (Tsefahuneygn G, *et al.*, 2015).

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

METHODOLOGY

Study setting/area

Gambia is located on the West African coast and extends about 400 km inland, with a population density of 176 persons per square kilometer (WHO, 2021). 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 (IHSN, 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 (WHO, 2021). 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 (WHO, 2021).

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 support 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 (WHO, 2021).

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 Figure 1 below, out of this 575 (10.5%) completed treatment, while 4720 (86%) were cured.

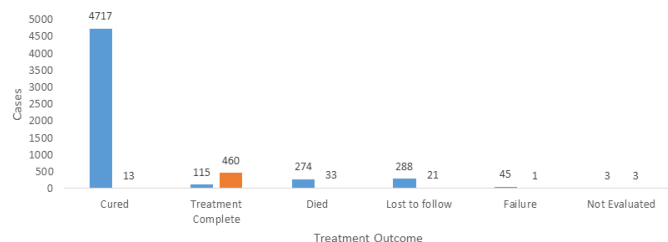


Figure 1: Proportion of TB cases with an outcome in the Gambia from 2017-2021

Note: (■): Pulmonary Tuberculosis (PTB); (■): Extrapulmonary Tuberculosis (EPTB).

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% (died) as shown in Figure 2 below.

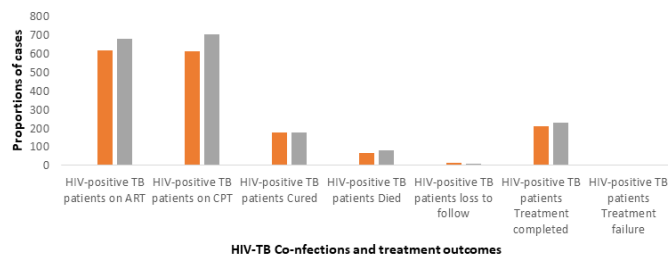


Figure 2: Proportions of TB-HIV co-infections and their treatment outcomes in the Gambia 2017 to 2021

Note: (■): Male; (■): Female

DISCUSSION

This study showed that majority of the TB cases are pulmonary as compared to extra-pulmonary and most of the cases were male (Table 1). Of the total cases on treatment, only few completed treatment during the per-

iod 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% (Table 2).

Table 1: Proportion of TB cases (pulmonary and extrapulmonary) by demographic and geographic distribution in Gambia 2017-2021

Description	Pulmonary TB (n=3349)	Extrapulmonary TB (n=760)	Total cases (n=4109)
Age group (in years)			
0-4	182	53	235
May-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
Regions			
Central River Region (CRR)	74	22	96
Lower River Region (LRR)	72	19	91
North Bank East Region (NBER)	135	28	163
North Bank West Region (NBWR)	86	18	104
Upper River Region (URR)	259	37	296
Western Region 1 (WR1)	1647	452	2099
Western Region 2 (WR2)	1074	186	1260

Table 2: TB treatment outcomes in Gambia 2017-2021

Treatment outcomes		
Extrapulmonary TB (EPTB)	n=531	%
Cured	13	2.4
Complete treatment	460	86.6
Died	33	6.2
Lost to follow	21	4
Failure	1	0.2
Not evaluated	3	0.6
Pulmonary TB (PTB)	n=5465	%
Cured	4714	86.3
Complete treatment	115	2.1
Died	274	5
Lost to follow	288	5.3
Failure	45	0.8
Not evaluated	26	0.5

This study showed that majority of reported TB cases in the country was 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 co-infections are either on ARVs or CPT and many of these cases with co-infections recovered or are treated of TB (Table 3). 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 are similar to a study conducted in Uganda in 2021.

Table 3: HIV positive-TB co-infection and outcomes in Gambia 2017-2021

TB-HIV co-infections (n=3572)	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
Male	614	613	177	65	15	208	3
Female	676	702	176	79	11	228	5

CONCLUSION

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.

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.

ETHICAL 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 has been given for the study to be published.

AVAILABILITY OF DATA AND MATERIALS

The raw data generated for the analysis is available

AUTHORS CONTRIBUTION

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; UC 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; Kebba D. Sanneh-Helped in data extraction and analysis.

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