IMPACT ON PAEDIATRIC TUBERCULOSIS DIAGNOSIS OF IMPLEMENTING THE NEW TREATMENT DECISION ALGORITHMS IN AN MSF NUTRITIONAL CENTRE, MAIDUGURI, NIGERIA

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BACKGROUND AND OBJECTIVES

∞Nigeria has the highest burden of tuberculosis (TB) of African countries and the sixth highest in world (WHO, 2022).

∞In 2021, the WHO estimated that 467,000 new TB cases occurred leading to 125,000 deaths (WHO, 2022b).

∞Key triggers of the TB burden in Nigeria include malnutrition, with an estimated 20% of TB cases attributable to malnutrition in 2019 (WHO, 2019) and HIV.

∞In 2021, 6% of the TB cases notified were children younger than 15 years (30% of them aged 0-4 years and 70% 5-14 years) globally and 8% in Borno state (where MSF operates) (NTBLCP Nigeria, 2021).

Objective: To show the impact on TB diagnosis of the new WHO treatment decision algorithms for pulmonary TB in children under 10 years in a context with food insecurity and acute malnutrition.

METHODS

Retrospective analysis of programmatic data in children under 10 years attending the Maiduguri Therapeutic Feeding Centre in Nigeria.

We describe the number of children diagnosed and started on treatment from June to December in both 2022 and 2023 (i.e., prior to and after the implementation of the WHO TB algorithms in routine care).

For the diagnosis of pulmonary and disseminated TB with pulmonary as the primary focus, the algorithm was used.

For diagnosis of pulmonary TB, we use **Algorithm A** (with XRay) and **Algorithm B** without (without XRay) as seen below.
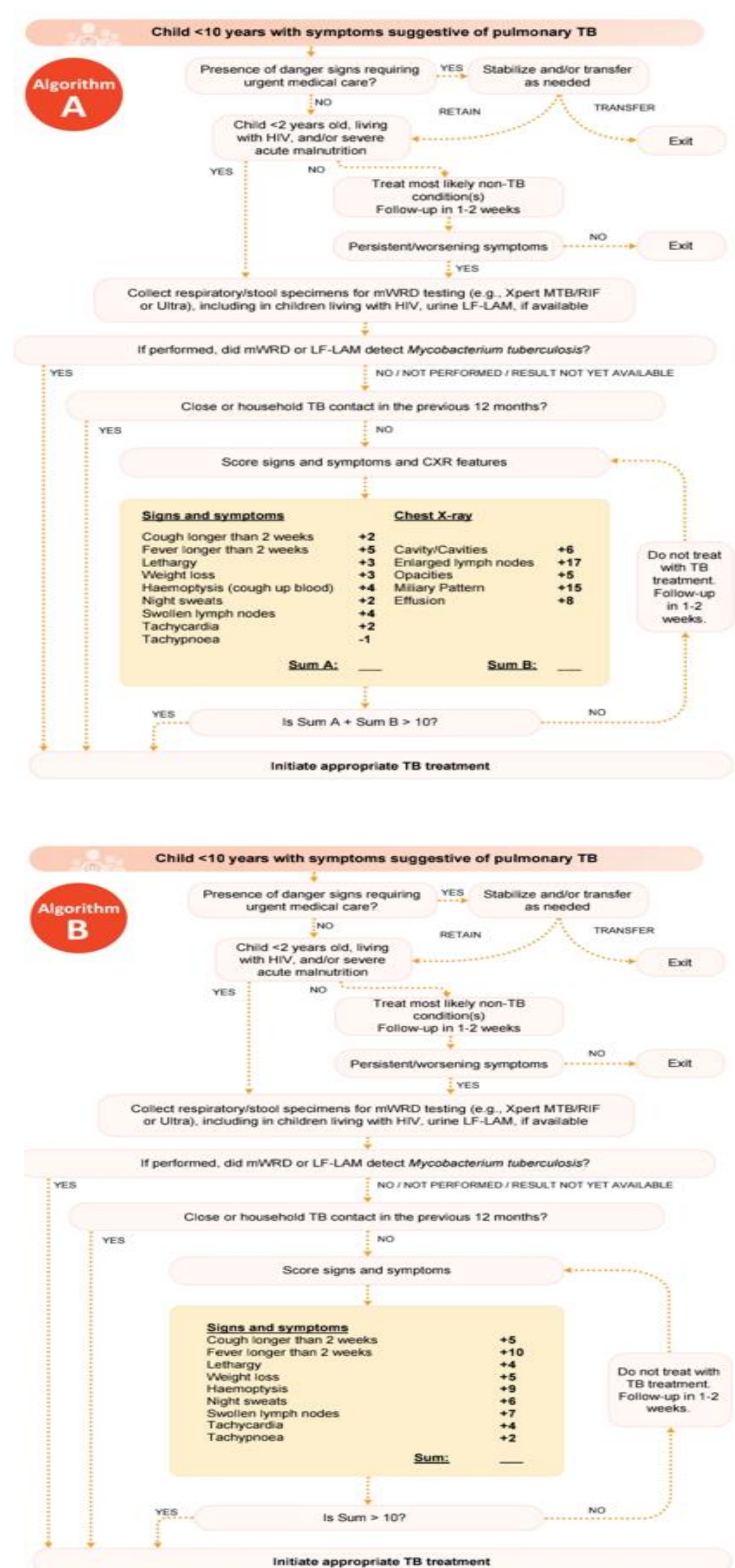

RESULTS

From June to December, 6649 children were admitted as inpatients (ITFC) in 2022 and 7309 in 2023, representing a 9.9% increase in 2023.

The number of children diagnosed with TB rose from 190 to 310 from 2022 to 2023, an increase of 63.2%, following the algorithms' implementation. The resulting proportion of TB cases among all admitted patients increased from 2.6% in 2022 to 4.2% in 2023. Also, the Average length of stay (ALOS) before TB diagnosis reduced from 9.9 days in 2022 to 8.9 days in 2023.

The age distribution of patients were similar while sex distributions were dissimilar in 2022 and 2023 respectively.

Figure 1. Proportion of presumptive TB patients out of Total ITFC admissions at NKH, Maiduguri in 2023
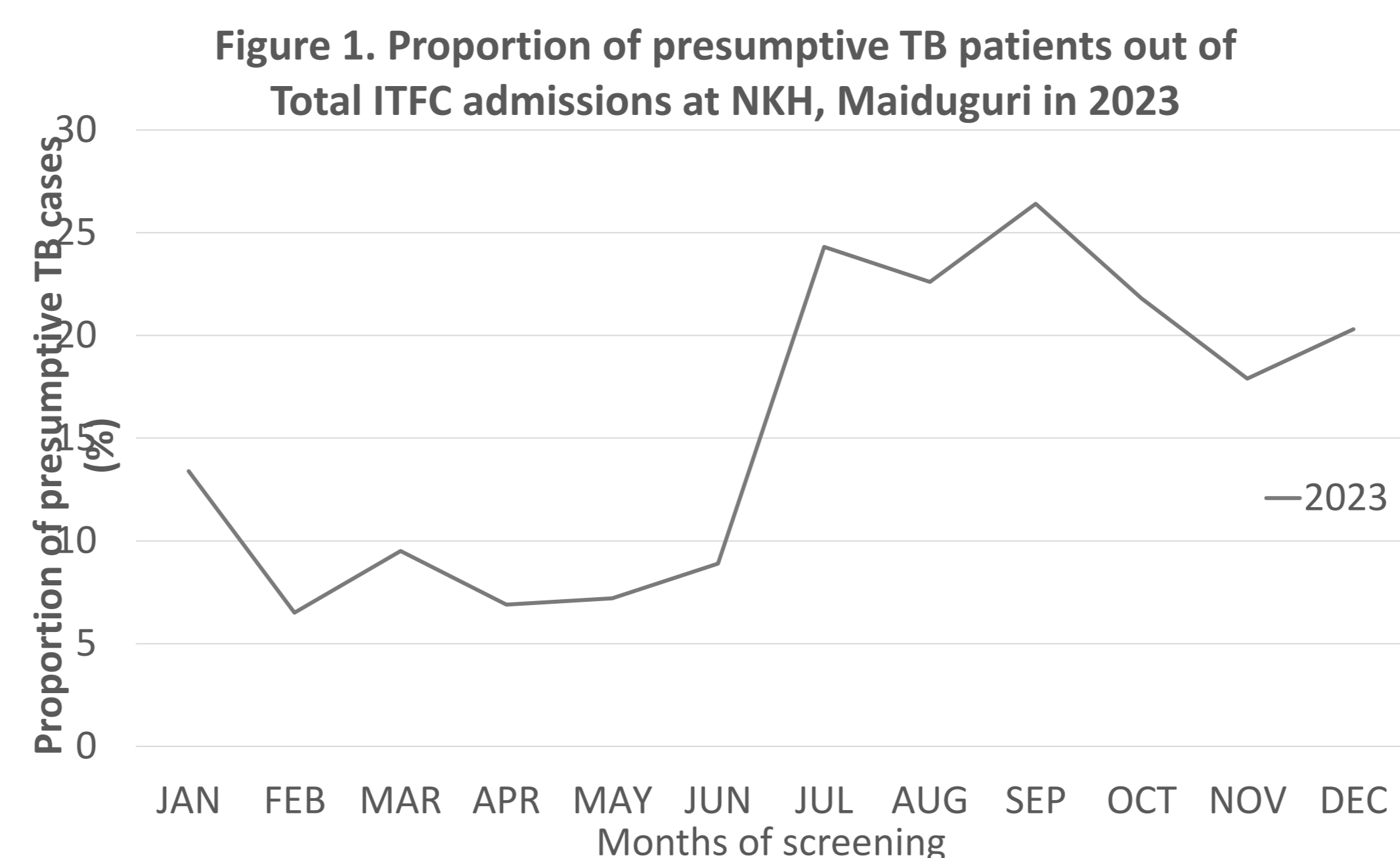
Since the implementation of the new algorithm in June 2023, the clinicians are more likely to 'THINK TB' leading to an increase in the proportion of presumptive TB patients (Figure 1).

Figure 2. Number of TB diagnosis by month in 2022 vs 2023

Figure 3. Proportion of TB cases enrolled in ITFC out of total ITFC admissions at Nilefa Kiji Hospital, Maiduguri, by month, 2022 vs 2023
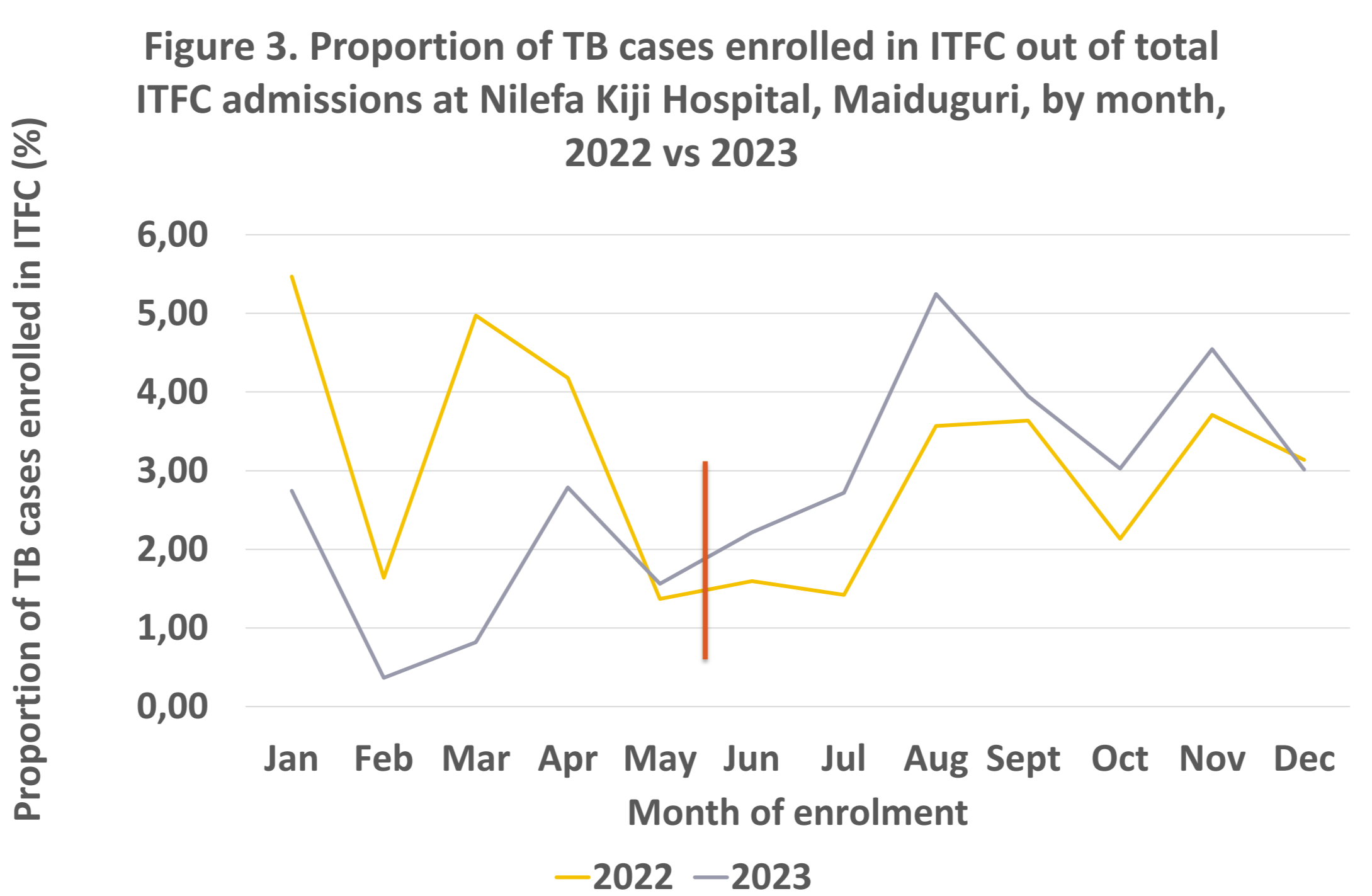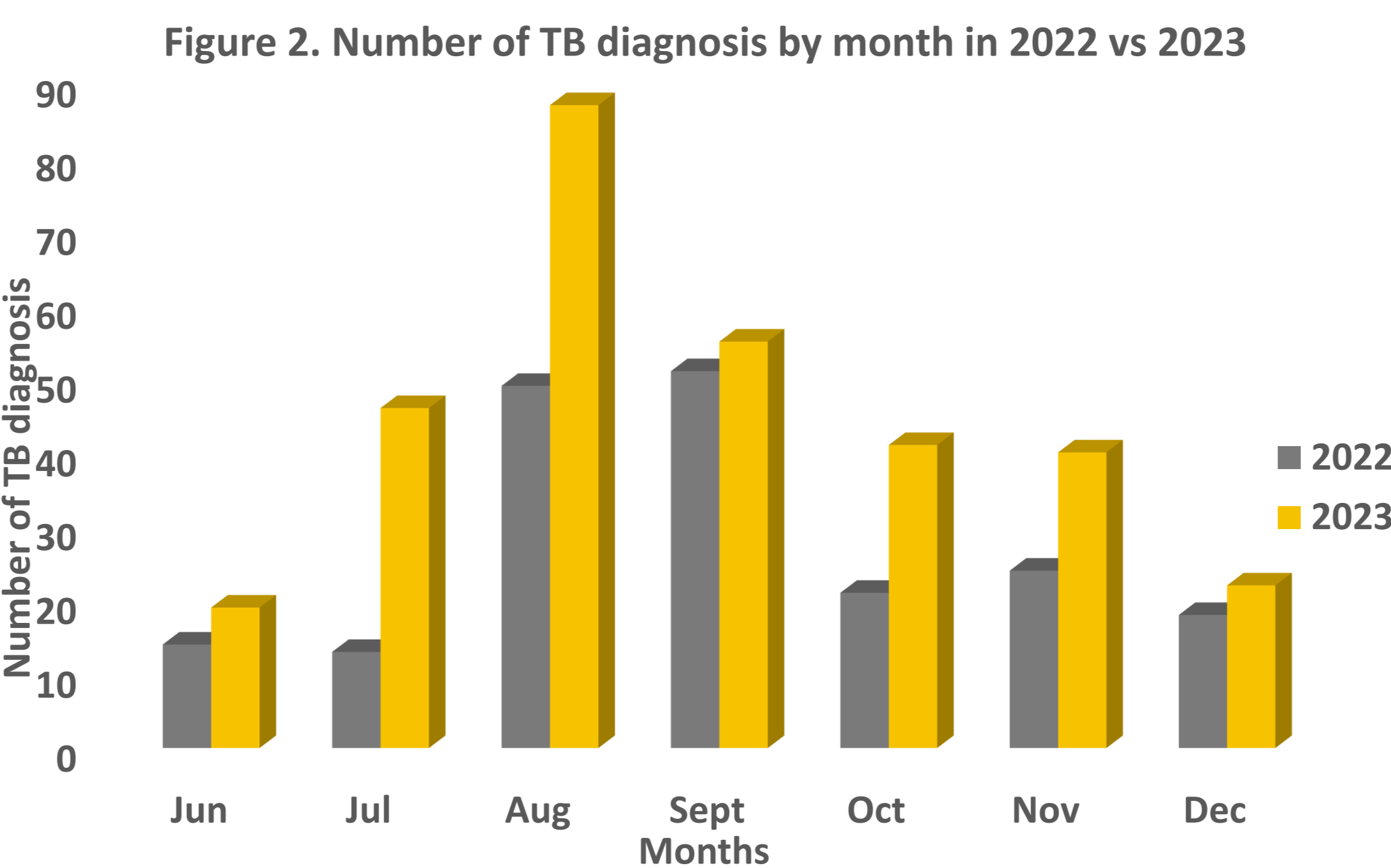

Figure 2 compares the absolute number of TB diagnoses since the implementation while Figure 3 compares the proportion of TB cases to number of ITFC admission per month. In both graphs, the absolute number and the proportion are relatively higher following the implementation of the new algorithm in 2023.

From June to December as seen in Figure 2, when the systematic implementation of the algorithm began, the number of TB cases diagnosed was consistently higher than the previous year of 2022.

In Figure 3, between June to December 2023, from when the algorithm was implemented (indicated by the red line), there was consistent increase in the number of TB cases identified and started on treatment as compared to the previous year 2022.

Table 1: Distribution of Pulmonary TB diagnostic methods

	AUG-DEC 2023	PERCENTAGE
TOTAL TB DIAGNOSED	240	
CONTACT*	25	10.4%
GENEXPERT**	35	14.6%
ALGORITHM A	46	19.2
ALGORITHM B	137	57.1

*there are 3 patients with contact but also GeneXpert
**majority diagnosed with stool sample

Table 1 above shows how the cases diagnosed with TB from August to December 2023 were diagnosed. Among those diagnosed via contact, 3 of them had MTB detected on GeneXpert. 183 children (75%) were diagnosed using the algorithm scoring system, with X-ray (18.8%) and without X-ray (55.9%). While 5 patients were clinically diagnosed with extrapulmonary TB.

If TB diagnosis were only to have been established by bacteriological diagnosis, about 85% of the patients would have been missed. This amplifies not only clinical diagnosis as the cornerstone in TB diagnosis especially in children, but that using an algorithm, systematically applied, can give consistency in diagnosis.

DISCUSSION and CONCLUSION

These results show a substantial increase in the number of children diagnosed and started on treatment after the WHO TB algorithms' systematic implementation. The systematic implementation led to better capturing and following up of presumptive cases than the traditional approach. This ensured less paediatric TB cases were missed.

Despite the difficulty of using GeneXpert and its low sensitivity in paediatric age group, it is still an important test in detecting positive and potential resistant cases. These algorithms when systematically used will help in reducing the gap of undiagnosed and untreated children with TB and can be used successfully in nutritionally insecure contexts and in therapeutic feeding centres.

ETHICS STATEMENT

This study received Local Ethical clearance from the Borno State Ethical Review Committee as part of the TB Algorithm study and also met MSF ERB exemption criteria.

WORLD TB DAY 2024. MAIDUGURI, NIGERIA