Accuracy of Caregiver-Performed MUAC Measurements: A Community-Based Study in a Humanitarian Context in Amhara and Tigray Regions, Ethiopia

Funded by UNICEF Ethiopia

Presented by Mastewal Bekele. Medical Teams International, Ethiopia

Background & Rationale of the study

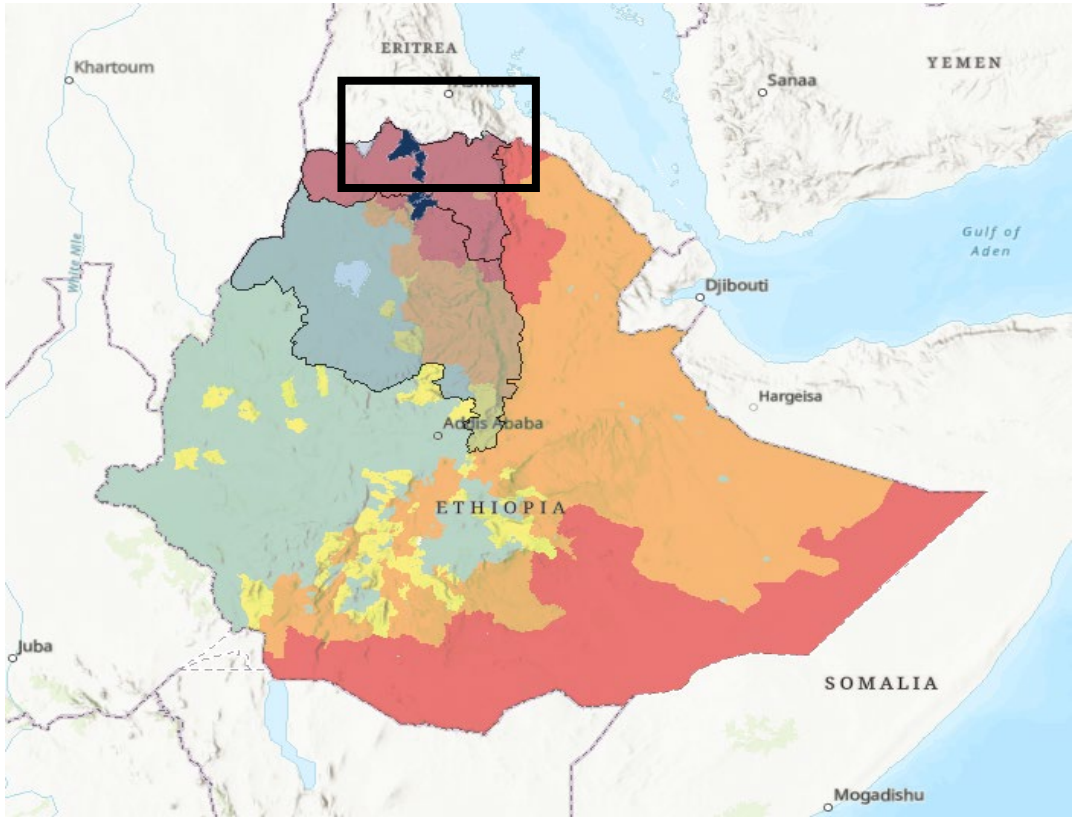
- Ongoing insecurity in Amhara and three year long war in Tigray has disrupted health systems, displaced populations, and created barriers to accessing essential nutrition services.
- Many health facilities were non-functional (close to 90% in Tigray) or difficult to reach due to damaged infrastructure, insecurity, and transportation challenges.
- In Ethiopia, malnutrition screening coverage remains very low(<10) coverage (2023 FNS baseline), while Community-based approaches such as Family MUAC reduce reliance on distant or inaccessible health facilities, ensuring continuity of care.
- This study aims to assess the accuracy of caregiver-performed MUAC and factors influencing correct use in Tigray & Amhara regions in the context of conflict.

Objective

The objective of this study was to assess:

- ❑ Accuracy of caregiver-performed MUAC in conflict context
- ❑ Identify factors influencing correct measurement in Tigray & Amhara

Methods and Materials



- Community based Cross-sectional study
- 390 caregivers
- Weighted Kappa for level of agreement and sensitivity (tested)
- Logistic regression for predictive variables of caregivers MUAC accuracy

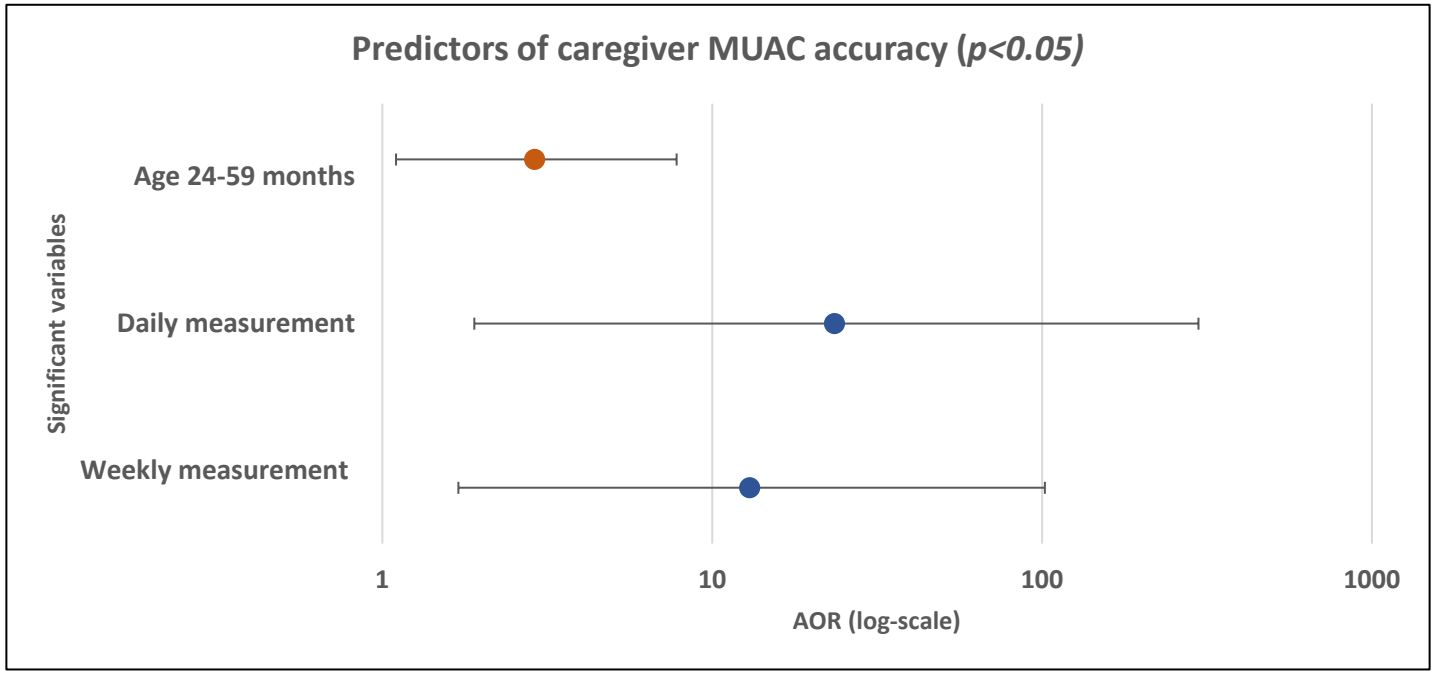
Result and discussion

- Found strong agreement between gold standard (health worker) and caregiver with weighted Kappa (0.902), consistent agreement was found in SAM identification
- Very High agreement for “Normal” and “MAM”
- Low agreement for “SAM”

Caregiver classification	Expert classification (“gold standard”)			Total
	Normal (Green)	MAM (Yellow)	SAM (Red)	
Normal (Green)	267 (97.8%)	6 (2.2%)	0 (0%)	273
MAM (Yellow)	14 (6.9%)	188 (93.9%)	0 (0%)	202
SAM (Red)	0 (0%)	2 (20.0%)	8 (80.0%)	10
Total	281	196	8	244

Result and discussion

Variable	AOR	P- value
Child age 24–59 months vs. 6–23 months	2.9 (1.1-7.8)	0.035
Daily MUAC practice vs. irregular	23.5 (1.9-298)	0.015
Weekly MUAC practice vs. irregular	13 (1.7-102)	0.015



Result and discussion

High caregiver engagements, 96.4% Measures MUAC past month

Strong agreement with health care workers Kappa, 0.90

Determinants of accuracy-

- Older child age (24–59m) → 3× more accurate (Abera et al. 2020).
- Regular MUAC practice (daily/weekly) 13–24 times more accurate (Tamirat et al. 2025)

Conclusion

- Caregivers can identify malnutrition, Good MUAC tape placement and color interpretation regardless of literacy rate
- Study found that having older childern and regular MUAC measurement practice are significant predictors
- Caregivers are supporting in early SAM identification at Home
- Regular demonstration of MUAC for caretakers

Operational Significance

- Caregivers can identify malnutrition in conflict context where insecurity made access impossible – increasing nutrition service coverage and is a recommended approach for scale up in the following operational customizations
  - Develop visual and practical training materials that are accessible to low-literacy populations.
  - Encourage routine MUAC checks at home through behavior change communication (BCC).
  - Provide reminder tools (e.g., calendars, mobile prompts, peer reminders) to reinforce regular practice.
  - Tailor training to address challenges in measuring younger children (6–23 months).
  - Consider age-specific guidance and support during caregiver training sessions.

PAEDIATRIC DAYS
AMMAN 2025

MEDICAL TEAMS International