

Assessment and verification of starvation suspected deaths in selected districts of Tigray, Northern Ethiopia

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- Tigray Bureau of Health
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Background

- Hunger and undernutrition are the greatest threats to public health.
- Globally, about 735 million people faced hunger in 2022.
- Each day, 25,000 people die of hunger and hunger-related causes.
- Nearly 98% of worldwide hunger exists in underdeveloped countries.

(FAO, 2023; John M, 2017)

Background....

- East Africa, hunger is expected to claim one life every second.
- Regrettably, this deprivation is not because of insufficient food production.
- Weather extremes, COVID-19 and **armed conflict**.

(WFP, 2022; John, 2017)

Background....

- Conflict and hunger are intertwined
- Fighting disrupts environmental security and hinders access:
 - ✓ Farmland and food production
 - ✓ Markets and flow of commercial food commodities
 - ✓ Humanitarian aid

(FAO, 2017 & Demeuse, 2022).

Background

- Combatants:
 - ✓ Burn down crops and grain stores
 - ✓ Steal and /or slaughter livestock
 - ✓ Intentionally loot and/or destroy food
 - ✓ Inflict displacement and starvation to death
- Conversely, hunger can also lead to violence and fuel conflict

(FAO, 2022; UN 2022; FAO, 2017)

Background.....

- ✘ There was a noticeable delay in the resumption of aid.
- ✘ The flow after resumption was infrequent and inadequate.
- ✘ The distribution process was very slow.
- ✘ A complete aid suspension ([Ben Farmer, 2023](#); [USAID, 2023](#)).
- ➡ Overall, the post-war engagement is insufficient.

Background

- Hunger is continuing in its worst form, and unverified death reports are mounting in relation to it.
- Disaster Risk Management (DRM) Commission- over 1400 starvation deaths has been reported ([Addis standard](#), [Reuters](#), [the Telegraph](#), [AP](#), 2023).
- However, the reported figures were not systematically collected.
- Therefore, a systematic study is warranted to verify the claimed hunger-related deaths and uncover new ones.

Rationale

Generating the hunger death statistics through this study would help:

- ❖ To understand the depth and breadth of the problem:
 - ▶ Parsimoniously target its limited resources
 - ▶ Intensify its advocacy efforts for further resource mobilization
- ❖ Public health planning
- ❖ Resource allocation
- ❖ Monitoring and evaluation of emergency response programs

Objective of the study

General Objective

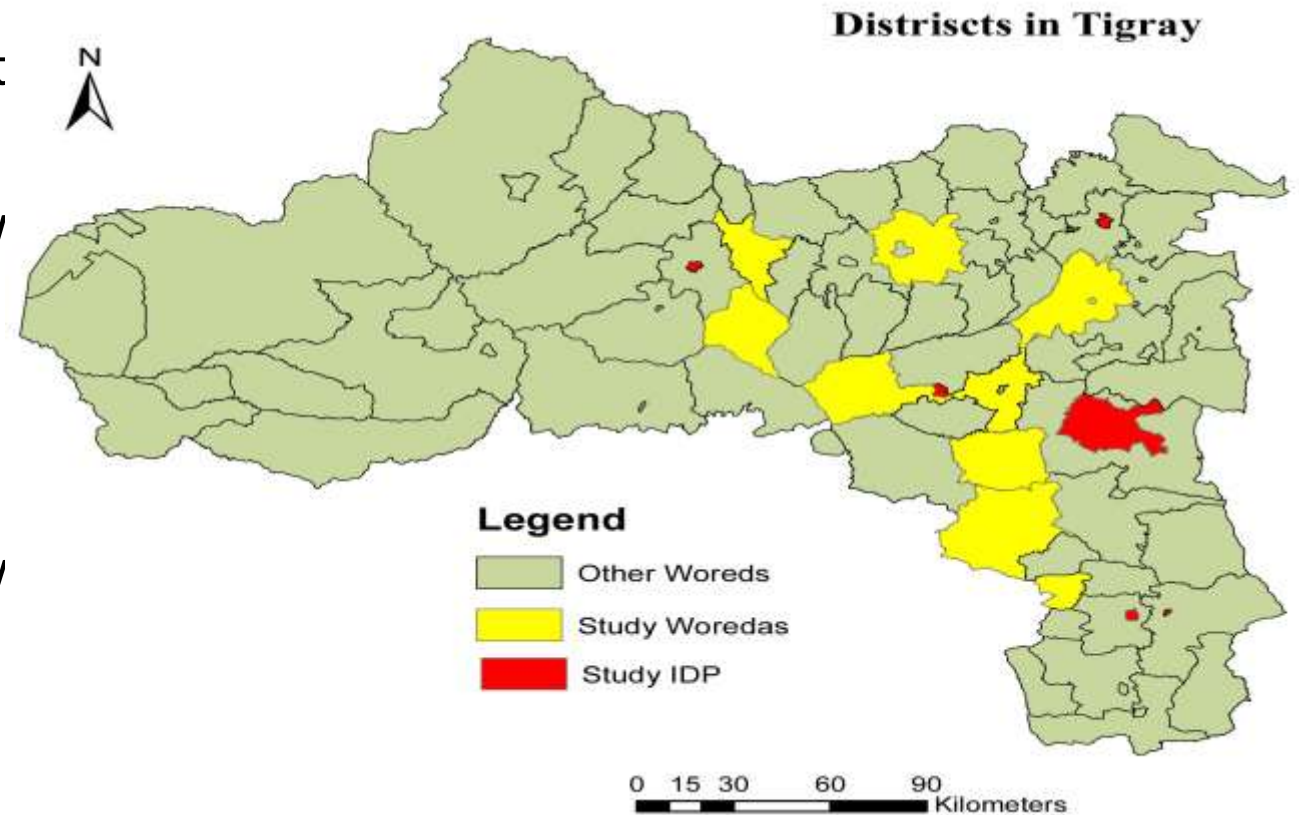
- To investigate and verify hunger and hunger related deaths among communities in Tigray.

Specific objectives

- To determine the magnitude of all cause deaths in the selected districts.
- To verify hunger and hunger related deaths reported by the families of the deceased.
- To assess the current level of hunger in the deceased households.

Study setting

- The study was conducted from August
- Nine out of the 76 accessible Tigray W
- About 110 kebeles in nine Woredas.
- 53 IDP centers in five towns (Maichew



Time-frame

- We collected the data on:
 - Individuals who have died since the **Pretoria peace agreement**.
02 Nov 2022 (**24 Tikimti 2015 until Hamle 30/2015 Geez Calander**).
- We used social reminders.

Study population

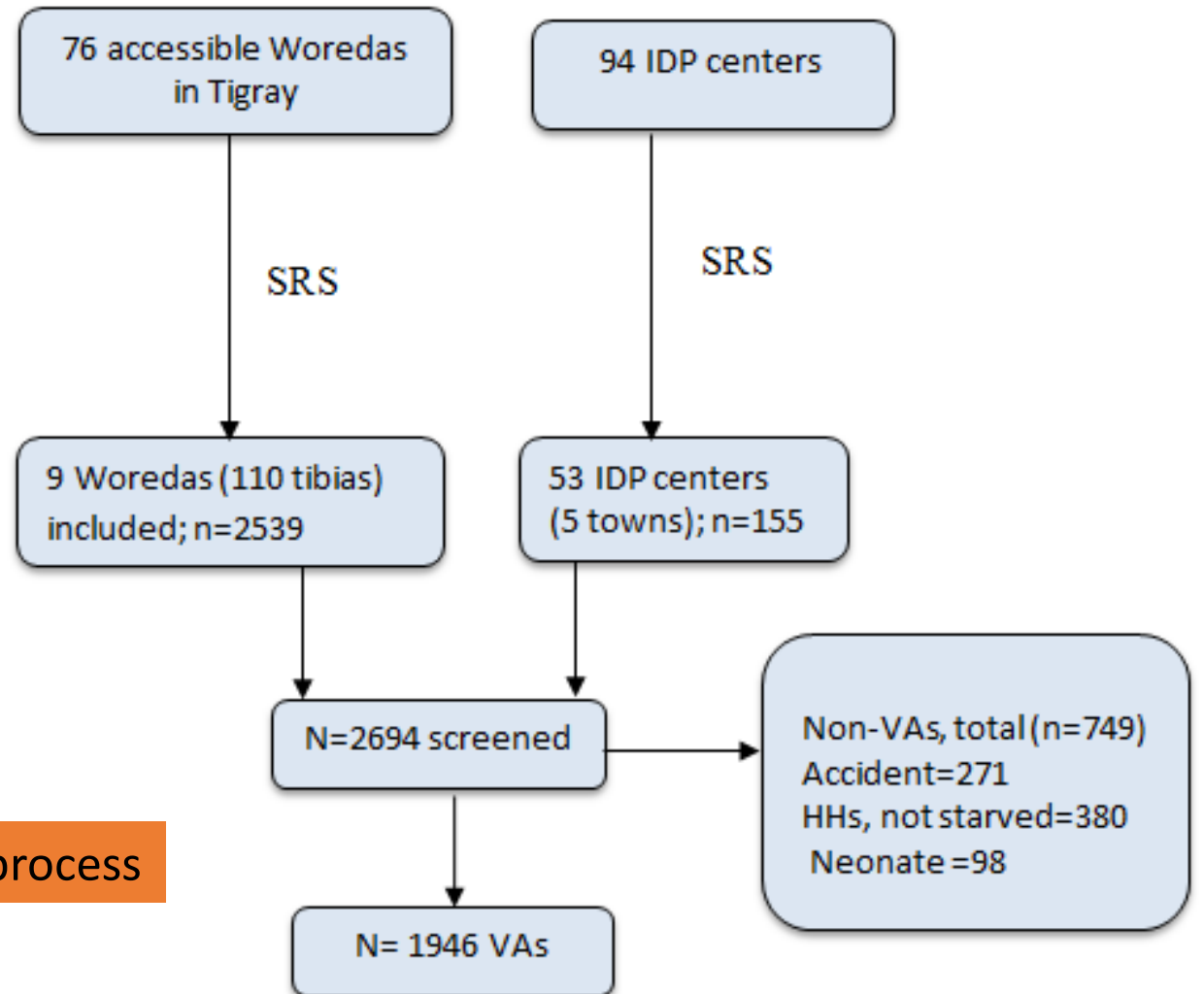
- All households who have deceased were assessed.
- People who died from accident/injury, poisoning, animal bite, or burn were excluded from Verbal Autopsy (VA).
- Neonates were excluded from VA.

Population cont'd

- Hunger-suspected deaths were eligible for VA interview.
 - Adult deceased: ≥ 15 years old \Rightarrow [Adult VA](#)
 - Child deceased: < 15 years old \Rightarrow [Child VA](#)

Enumeration: census/no sampling

- All households who have deceased in the past nine months were included.
- A total of **2694** deceased were identified.



Flow chart: Research process

Data collection procedure

- ❖ Fifty data collectors were deployed.
- ❖ The study tool had three components:
 - Screening tool: to identify hunger-suspected deaths.
 - Verbal autopsy (child & adult): to verify the hunger suspected deaths.
 - Household hunger scale: to assess the current level of hunger of HHs.
- ❖ Face-to-face interview with family members of the deceased.

Data collection tool

- We used Verbal Autopsy tool adapted from Hunger Watch Group of Jan Swasthya Abhiyan (JSA) and Public Health Resource Network (PHRN) of India which was adapted from the WHO verbal autopsy tool.
- It was developed as a guideline for investigating suspected starvation deaths (Vandana Prasad, 2003).
- The tool development was led by Vandana Prasad who is a community pediatrician and public health professional.
- The questionnaire was reviewed and enriched with inputs from other experts from the area of forensic medicine and National Nutrition Institute of India . Available at https://www.researchgate.net/publication/313571351_Guidelines_for_Investigating_Suspected_Starvation_Deaths.

Activities

- Met Woreda health office/social affair to record the number of deaths (all-cause).
- We collected primary data on socio-demographic information, feeding condition, clinical data of the deceased, one month prior to death.
- Conducted verbal autopsy to verify starvation-related death among HHs with suspected ones.
- Screened all HHs with a deceased for current hunger using a household hunger scale.
- GPS data

Operational definitions

- **Suspected starvation death:** any death where family members report that the deceased had significantly reduced food intake due to non-availability of food, during the month before death.
- **Starvation deaths:** are those deaths that have been identified as being due to starvation/ malnutrition based on the Verbal Autopsy process by physicians.

Operational definitions...

❖ **Hunger Scale:** Three occurrences and three frequency questions.

✓ 0-1: Little or no hunger

✓ 2-3: Moderate hunger

✓ 4-6: Severely hungered

Ascertaining cause of death

- A panel of physicians (three) reviewed the collected VA.
- The physicians made individual decisions regarding the probable cause of death (immediate and underlying).
- The final diagnosis was made based on consensus.
- Cause of death was declared only for those approved by the panel.
- If the collected data were insufficient to diagnose the cause, deaths were labeled as undefined.

Quality assurance

- We recruited experienced health professionals as data collectors.
- Training was given to data collectors and supervisors for four days.
- The study team closely supervised the data collection process.
- Data were collected using smartphones/ODK.
- Daily data submission to a server and was monitored daily.

Data analysis

- We made a descriptive analysis.
- Proportion of people who were suspected of starvation and are verified by the verbal autopsy.
- Household hunger scale was determined.
- We performed a stratified analysis for IDP, community.

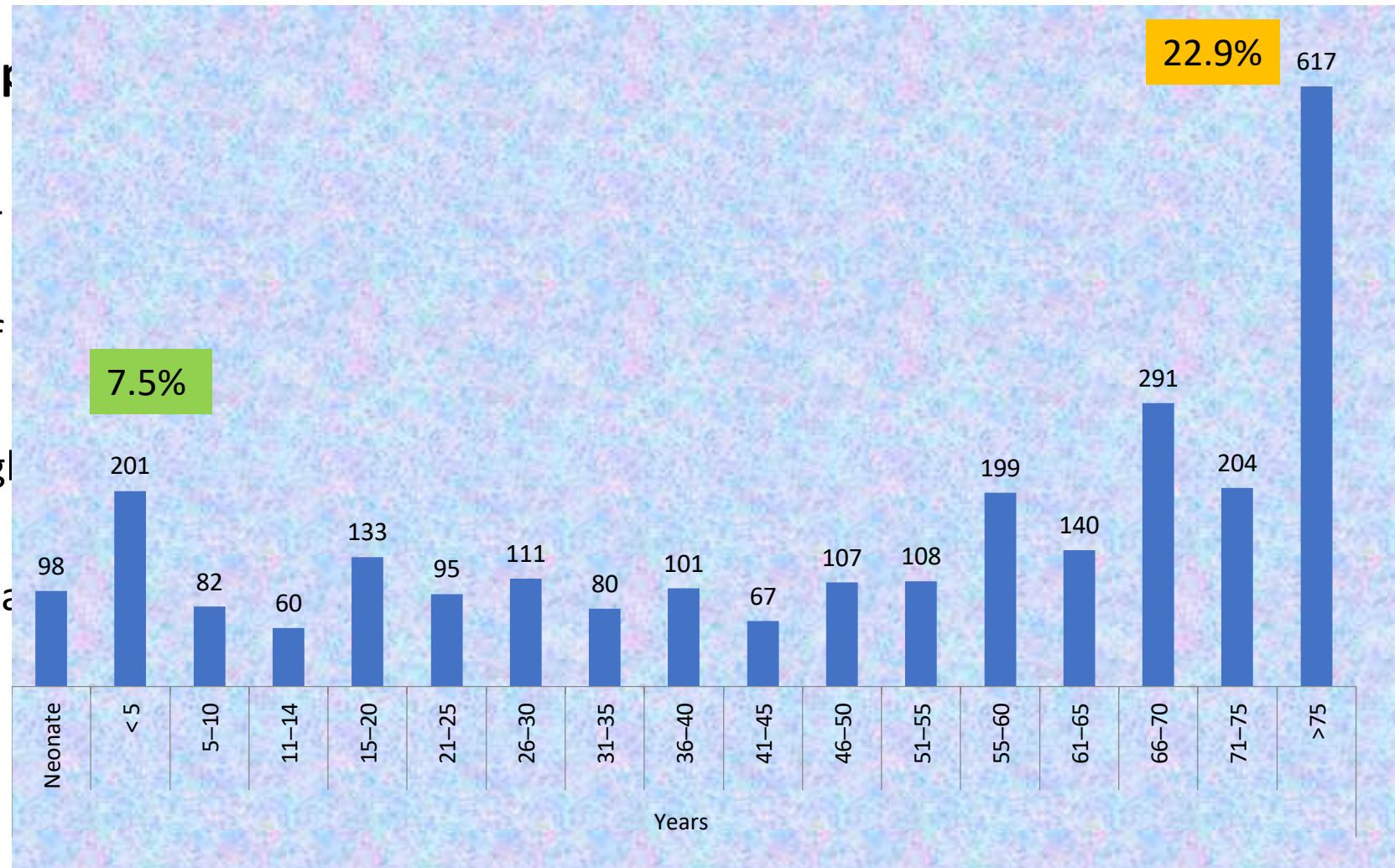
Ethics and data confidentiality

- Research was conducted under standard ethical research procedures.
- Ethical clearance obtained from THRI
- Informed consent
- Data deidentified and secured
- Support letter from regional health bureau

Results

Socio-demographic

- A total of 2694
- From a total of
- There were high
- The highest dea



Cont'd

Name of <u>weredas</u>	Number of population	Total death	Mortality rate Per 100K
Samre	64669	214	331
Seharti	86374	326	377
D/Temben	16643	261	1568
Bora	33452	229	685
Hawzen Rural	113410	381	336
Adwa Rural	120000	372	310
Kola Temben	85986	279	324
L/Qoraro	72760	166	228
Zanna	71571	311	435
Mekelle IDP	49712	14	28
Miachew IDP	350	2	571
Adigrat IDP		10	-
Abiadi IDP	8136	34	418
Shire IDP	39931	95	238

• There is a considerable

✓ High proportion

(14.1%) are

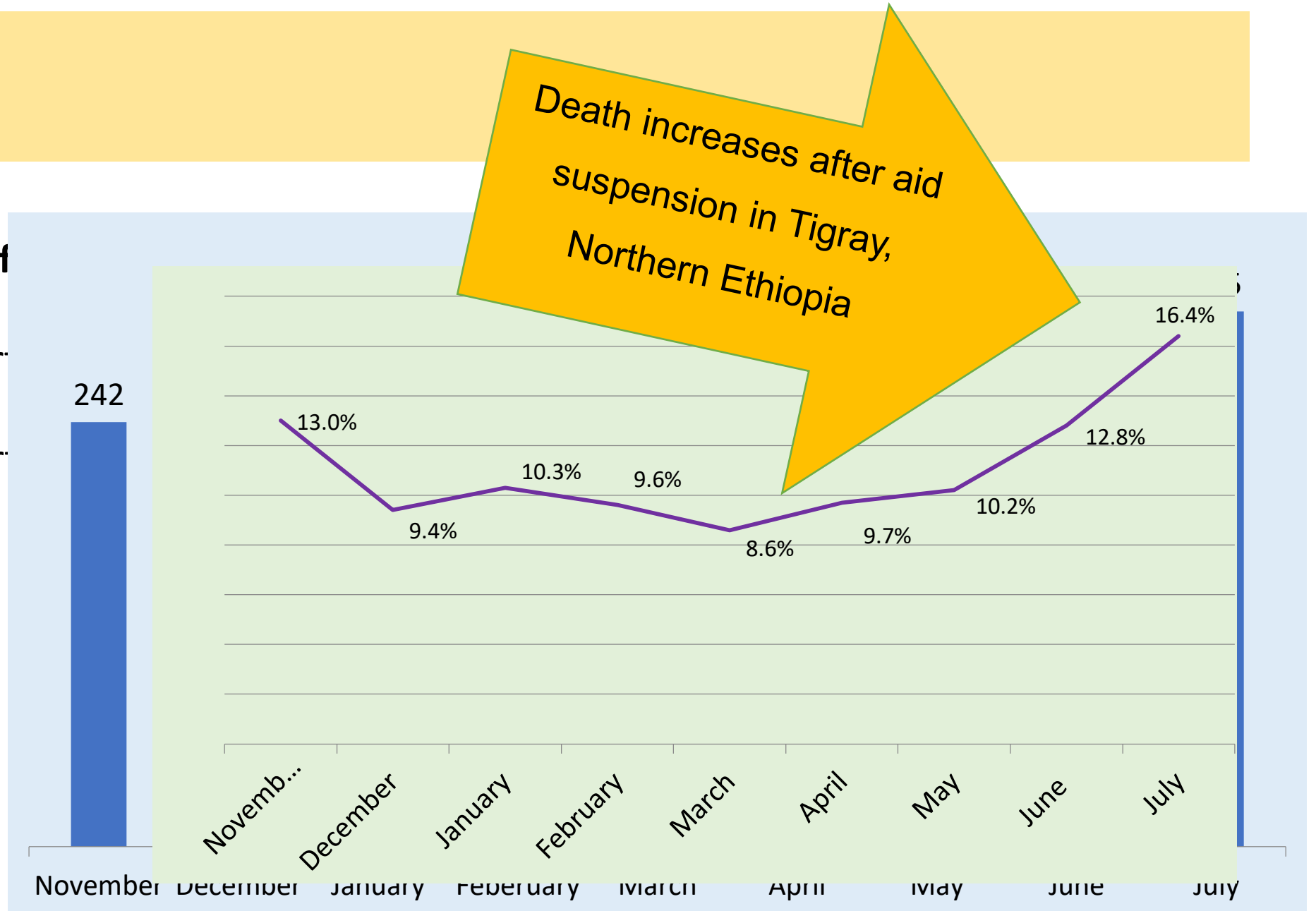
✓ But the crude

inhabitant

Cont'd

Monthly variations of

- The pattern of mor
 - The highest propor
- the month of July.

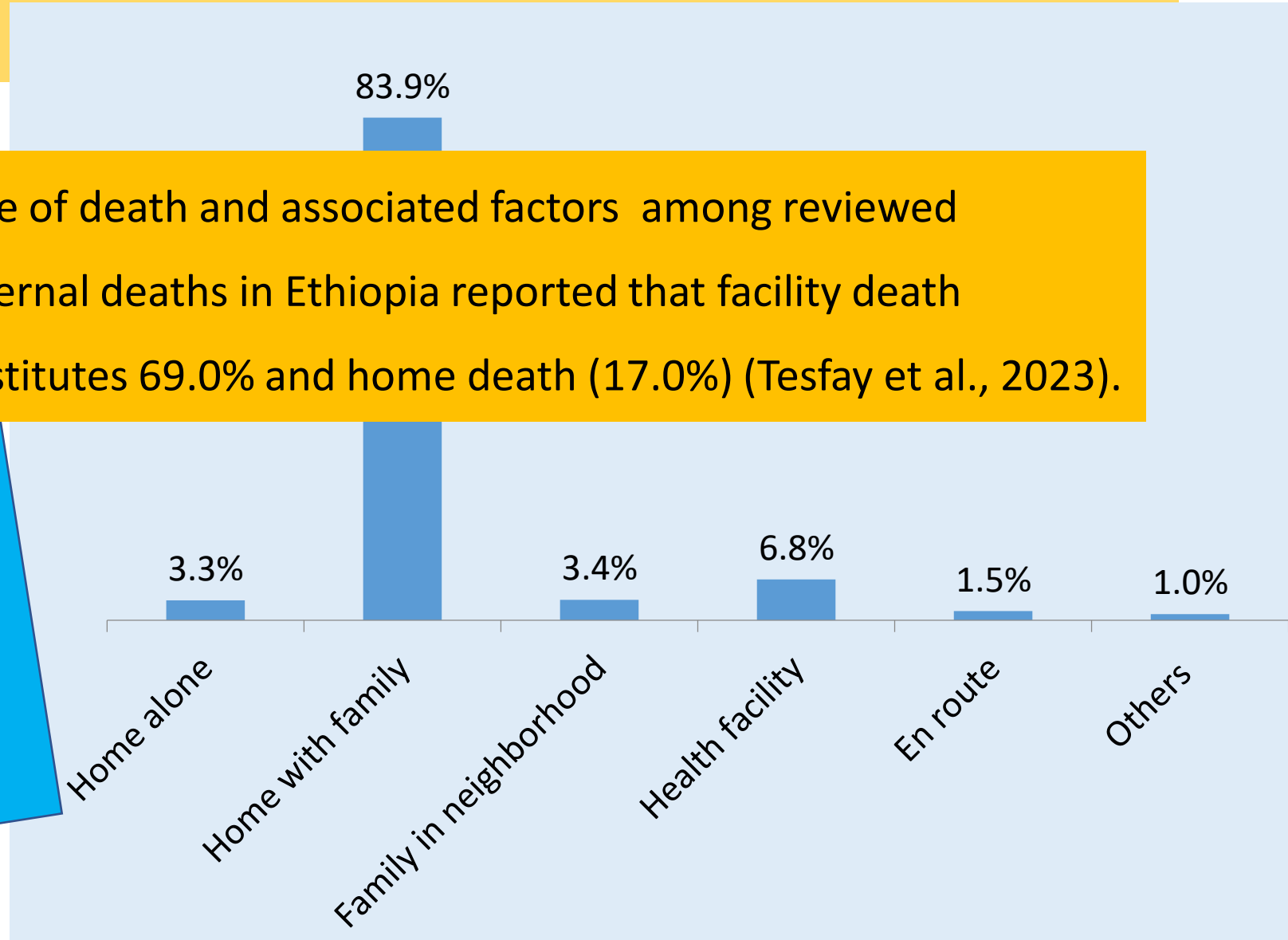


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Place of death

Place of death and associated factors among reviewed maternal deaths in Ethiopia reported that facility death constitutes 69.0% and home death (17.0%) (Tesfay et al., 2023).

- Nearly, nine out of ten deaths (90.6%, n = 1495) occurred at home.
- Non -availability of drugs
 - Lack of skilled personnel
 - No transport access
 - No medical equipment



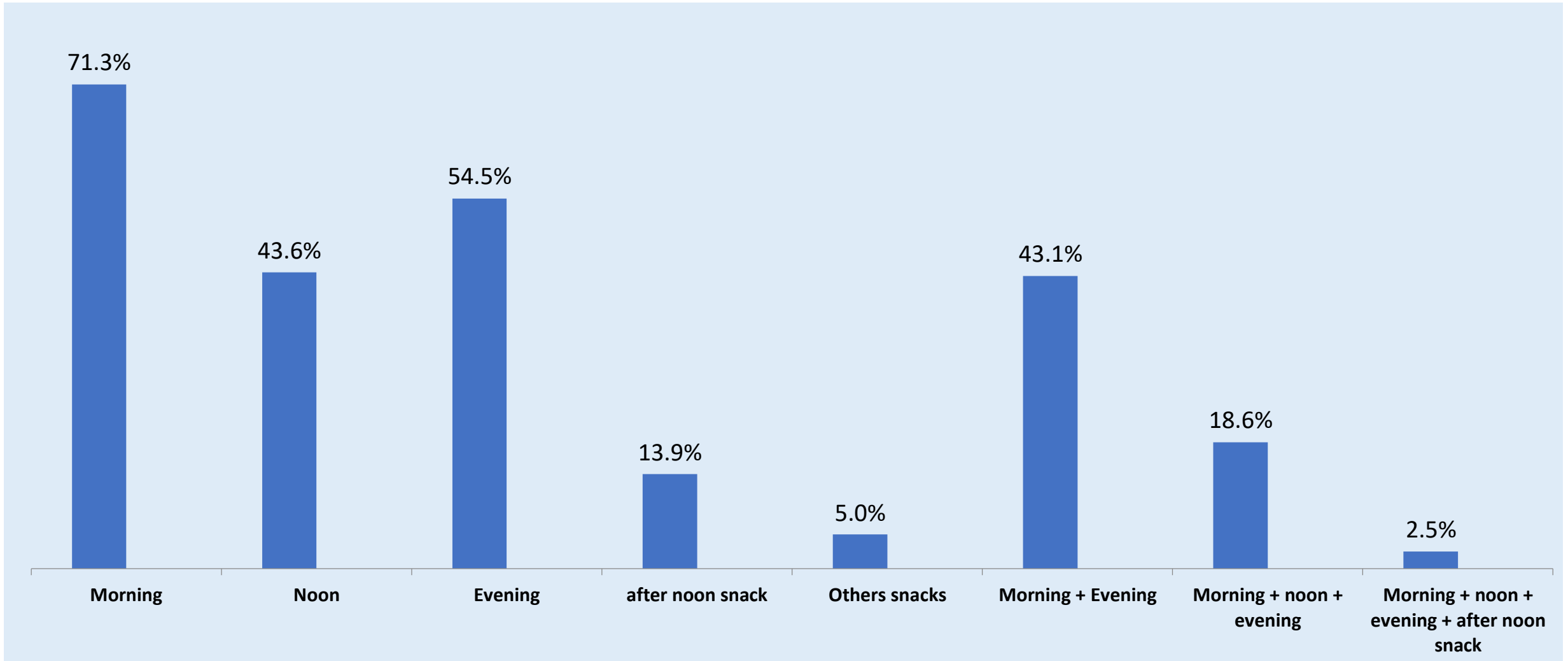
Contextual factors

Contextual factors	Frequency	Percent (%)
One month prior to the death, the household/deceased often deprived of food.	1797	66.7%
One month prior to death, the household/ deceased often have to eat fewer meals in a day.	1811	67.2%
One month prior to the death, the household/ deceased often have to eat a smaller meal than they needed.	1841	68.3
Distress sale of cattle, vessels (goods), implements and other belongings to obtain food.	1072	62.5

Deceased information related to starvation

Deceased information		Frequency	Percent (%)
Family/deceased information (one month prior to the death)	Constant complaint of hunger	1053	61.4
	Dizziness on standing up	944	55.1
	Extreme weakness and inability to walk	744	43.4
	Inability to see at night	1526	89.0
Daily food intake during the month prior to death	Not sufficient enough to satisfy his/her hunger	1527	89.1
Unusual or 'famine' foods being eaten (roots, tubers, leaves etc.)	Yes	421	24.6

Cont'd



Starvation

- Response as:

Observation of the family members		Frequency	Percent (%)
Eyes	Sunken	1186	69.2
	Normal	462	27
Skin	Scaling or peeling	1088	63.5
	Normal	297	17.3
Hair	Normal	916	53.4
	Dry or discolored	662	38.6
Cheeks	As usual	533	31.1
	Very sunken	1097	64.0
Ribs	As usual	522	30.5
	Very prominent	1097	64.0
Limb bones	As usual	532	31.0
	Prominent	1094	63.8
Hip bones	As usual	533	31.1
	Prominent and projecting	1086	63.4
Lips	Normal	579	33.8
	Dry or cracked	1002	58.5
Gums	Normal	961	56.1
	Loose teeth	260	15.2
	Bleeding	184	10.7
Palms and nails	Normal pink color	495	28.9
	Very pale or whitish	912	53.2

Cause of death

Disease condition/abnormality (child)	Frequency		Total Frequency
	Immediate	Underlying	
Starvation			1046
Single org			
SAM	29	129	158
Multi-org			
SAM+ (Pneumonia, diarrhea/ dysentery, Anemia + Infection sepsis)	-	7	7
Respirator			
Meningitis	4	-	4
Dehydrati			
Pneumonia	8	7	15
Acute kidn			
Diabetes, Severe dehydration, hypovolemic shock, Hypertens shock	31	-	31

- ❖ When it is projected to 76 accessible Woredas with total estimated population of 4,858,845 (projected from the 2014 census).

- ✓ A total of 16,342 deaths were estimated with 95% CI: 15718-16987.

- ✓ Of all deaths, 7,949 were due to starvation with 95% CI: 7531-8411.

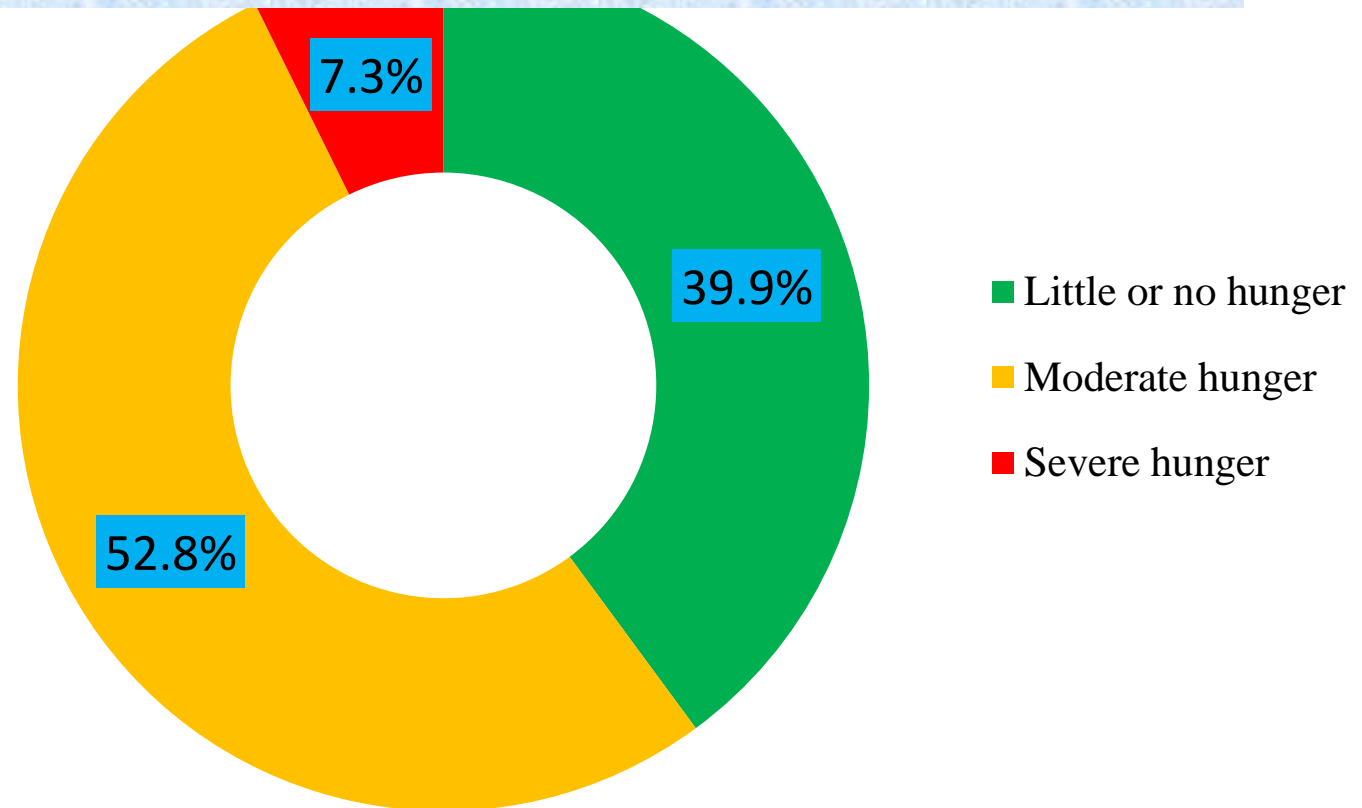
Gastroent	Cancer	-	1	1
Other chr	Undefined cause of death	51	-	51
Undefined				
NA			31	31

Household hunger scale

According to the household hunger scale, 60.1% of the households had moderate or severe hunger.

- About 3.3% of the households had moderate or severe hunger during the prewar period and 35.9% during the war period.
- In comparison to war / prewar, it increases above 24-50% points (Aregawi et al., 2023).

The second goal of the Sustainable Development Goals (SDGs) set by UN Member States to be reached by 2030 is to achieve zero hunger.



Conclusion

- The findings of this study confirm **starvation** as the main causes of death.
- Starvation contributed to more deaths in the IDPs than in the community.
- Current Household **hunger rate** in the study area was unacceptably high, suggesting more starvation deaths to unfold.

Recommendation

- ❖ The findings reflect a serious humanitarian emergency.
 - Continuous advocacy is expected from the government side.
 - Expedited humanitarian response is warranted from aid agencies to prevent more deaths.
 - Rehabilitation activities including return of the displaced communities to their home should be strengthened to rescue those facing moderate to severe hunger.

Strengths of the study

- Interviews were conducted in subject's home.
- The use of large sample size for representativeness of the study findings.
- Health professional data collectors.
- VA tool contextualized and translated into Tigrigna to assess starvation deaths.

Limitation of the study

- Recall bias (we ask individuals whose family members died months ago).
- Church and mosque leaders were not communicated.
- Census or a complete enumeration survey method was not applied.
- We were not able to verify whether the neonates died of hunger or not.

Acknowledgements

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- Data collectors
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