



**Predictors of nutritional recovery time in children aged 6–59 months  
with severe acute malnutrition in Mozambique:  
survival analysis approach**

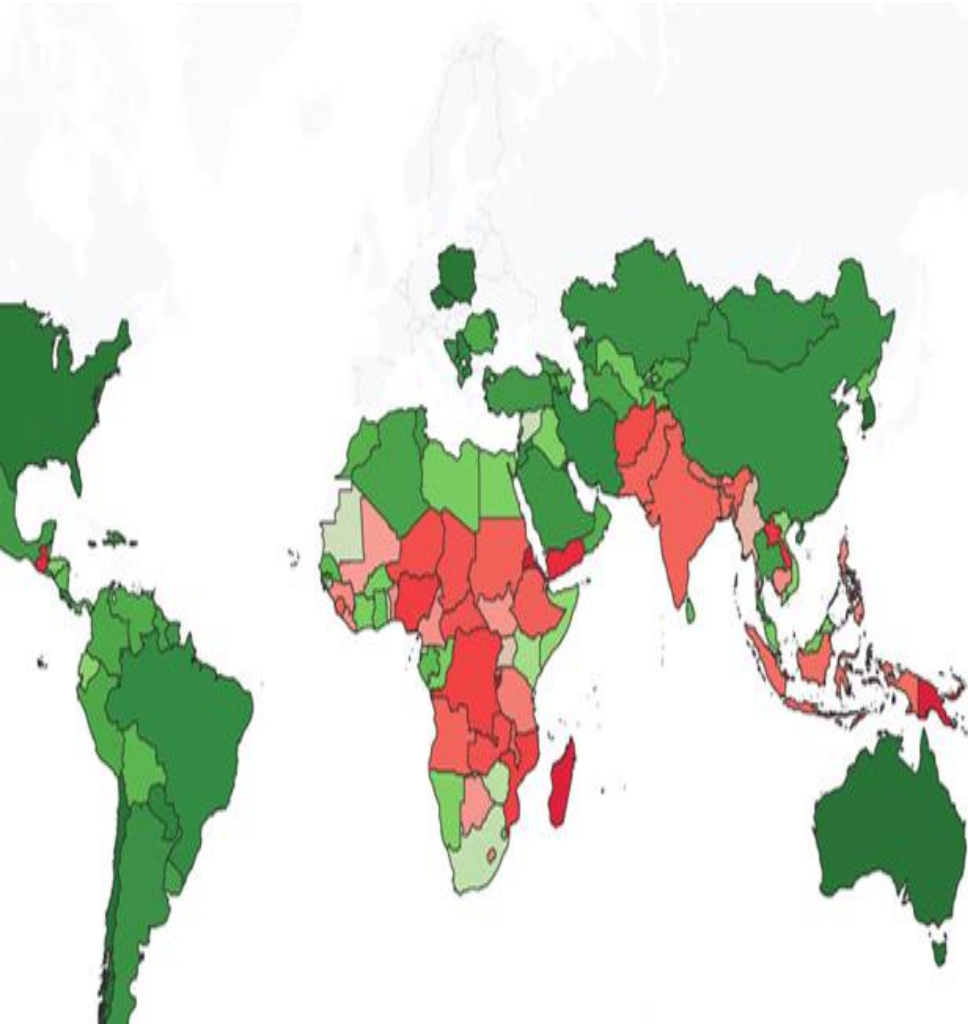
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# Summary

1. Introduction
2. Objectives
3. Methods
4. Statistical analysis
5. Results
6. Conclusions
7. Recommendations
8. References

# Introduction



- Malnutrition is a critical public health issue, particularly severe acute malnutrition (SAM), which leads to rapid deterioration in nutritional status.
- Increases susceptibility to diseases and reduces chances of independence.
- Factors such as: military insecurity, lack of healthcare access, poor socioeconomic conditions, inadequate sanitation, and poor diet.
- SAM affects 13.6 million children under five globally; 2.2 million in sub-Saharan Africa.
- In Mozambique Context 67,500 children under five need treatment for acute malnutrition, with 6,500 suffering from SAM
- Health Initiatives: Since 2016, initiatives like 'Centers of Excellence (CoE's)' have aimed to improve healthcare services in Sofala.

# Introduction

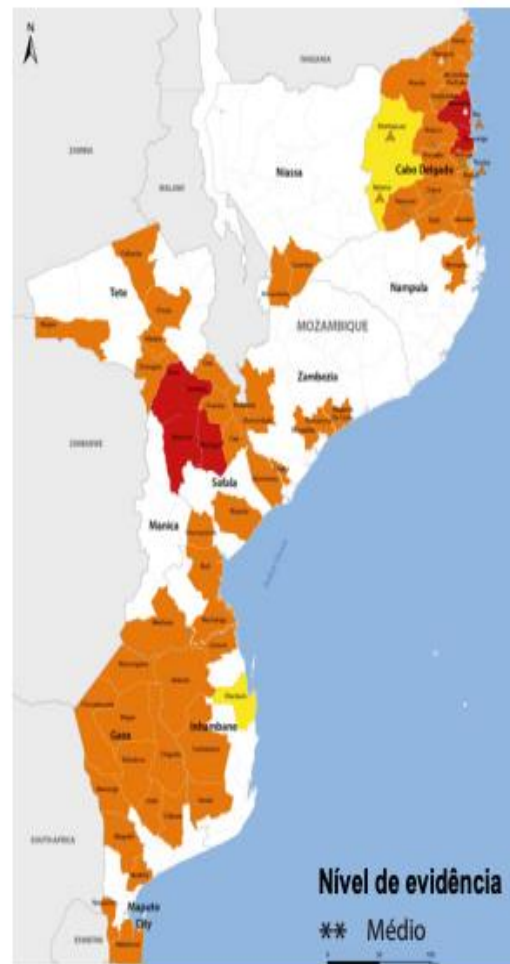
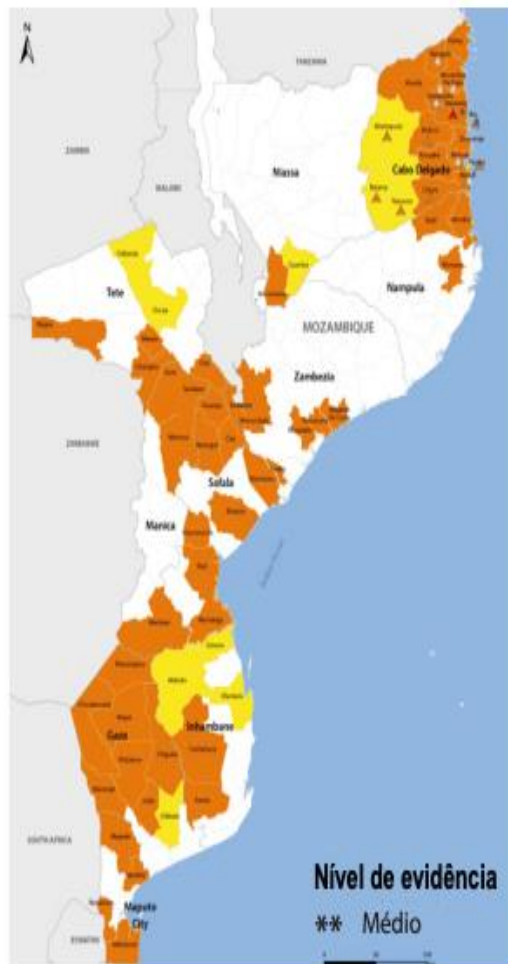


EM DESTAQUE Eleições em Moçambique Guerra Israel-Hamas

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## INSEGURANÇA ALIMENTAR AGUDA ACTUAL ABRIL - SETEMBRO 2024

## INSEGURANÇA ALIMENTAR AGUDA PROJEÇÃO OUTUBRO 2024 - MARÇO 2025



SAÚDE | MOÇAMBIQUE

## Desnutrição crónica em Moçambique têm números "muito altos"

Lusa  
26/10/2021

Dados do INE apontam que 38% das crianças moçambicanas com menos de cinco anos são afetadas por desnutrição crónica. Problema resulta da falta de alimentos adequados, retarda desenvolvimento e aumenta risco de morte.

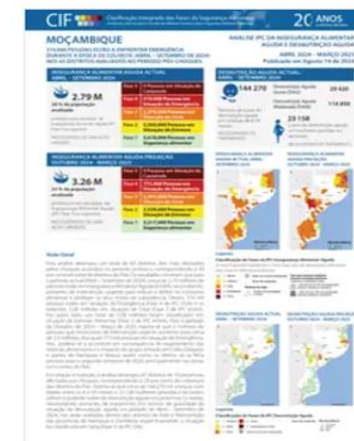
## Mozambique: Acute Malnutrition Situation for April - September 2024 and Projection for October 2024 - March 2025 [EN/PT]

Analysis • Source: [IPC](#) • Posted: 18 Aug 2024 • Originally published: 14 Aug 2024 • Origin: [View original](#)

### Key results

The acute malnutrition situation in Mozambique is worsening, with an estimated 144,270 children aged 6 to 59 months and 23,158 pregnant and breastfeeding women needing treatment over the next 12 months.

For the projection period (October 2024 to March 2025), the prevalence of acute malnutrition is expected to deteriorate, with most districts likely remaining within the same IPC AMN phases. However, Memba in Nampula province and Nicoadala in Zambézia province are expected to worsen from IPC AMN Phase 2 (Alert) to IPC AMN Phase 3 (Serious). Additionally, Monapo, Luabo, and Macossa are expected to shift from IPC AMN Phase 1 (Acceptable) to IPC AMN Phase 2 (Alert).



### Download Report

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Primary country:

[Mozambique](#)

Source:

[Integrated Food Security Phase Classification](#)

Disaster:

[Mozambique: Drought - May 2024](#)

Format:

[Analysis](#)

Themes:

[Food and Nutrition](#) / [Health](#)

# Study Aim

**To analyze predictors of recovery from SAM in children aged 6–59 months in Mozambique (2018-2022).**





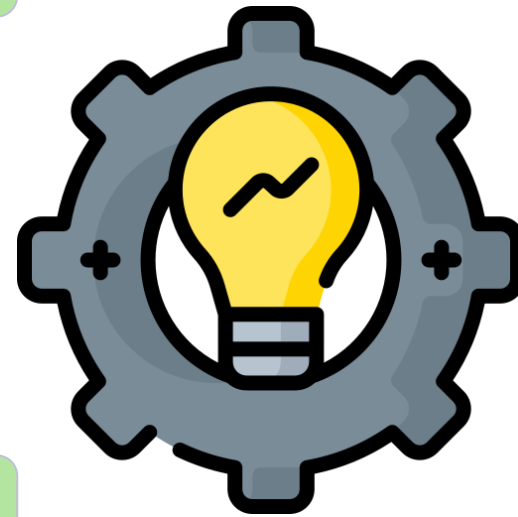
# Methods

## Retrospective cohort study

Children under 5 years old

## Hospital records

6 districts in Sofala, Mozambique



## Data collection

January 2020 - December 2022

## Study Population

Children with SAM

# Study variables



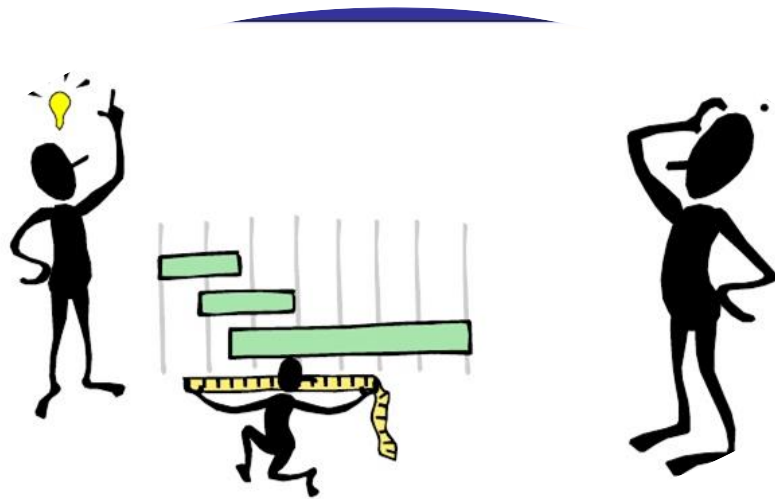
## Dependent Variable

Time to recovery for children with SAM.



## Independent Variables

Demographics, clinical conditions, and anthropometric measures. Age, weight, height, clinical conditions (diarrhea, HIV, TB, malaria), and comorbidities.



## Stabilized Recovery

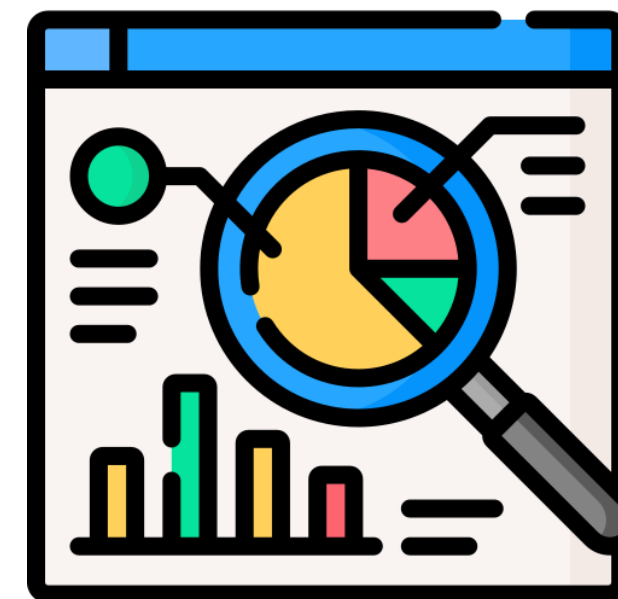
Time spent in hospital until 30 days.

## Censored Observations

Lost to follow-up, transferred, missing data, deceased, no recovery observed.

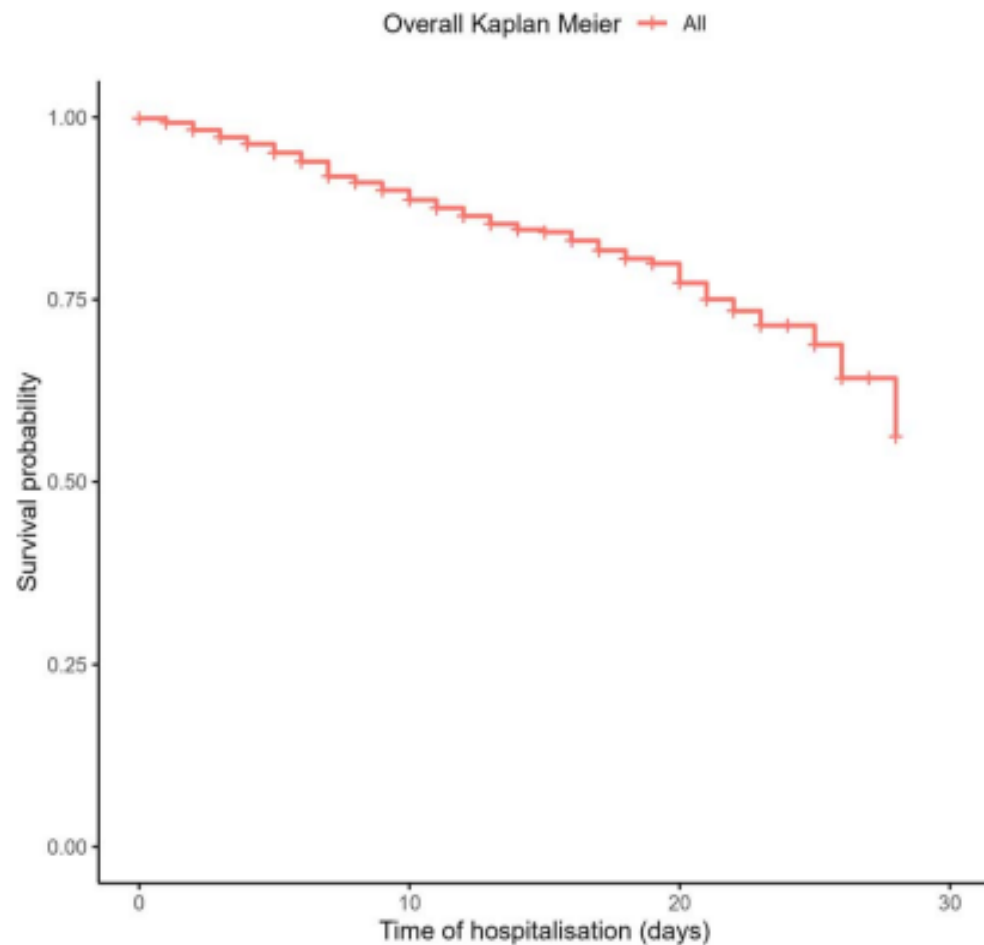
# Statistical analysis

- Descriptive statistics, life tables, survival curves;
- Kaplan–Meier and log–log plot methods;
- Schoenfeld's residual test;
- Bivariable and multivariable Cox proportional hazard regression analyses were performed;
- The analyses were conducted using R statistical software and RStudio software.





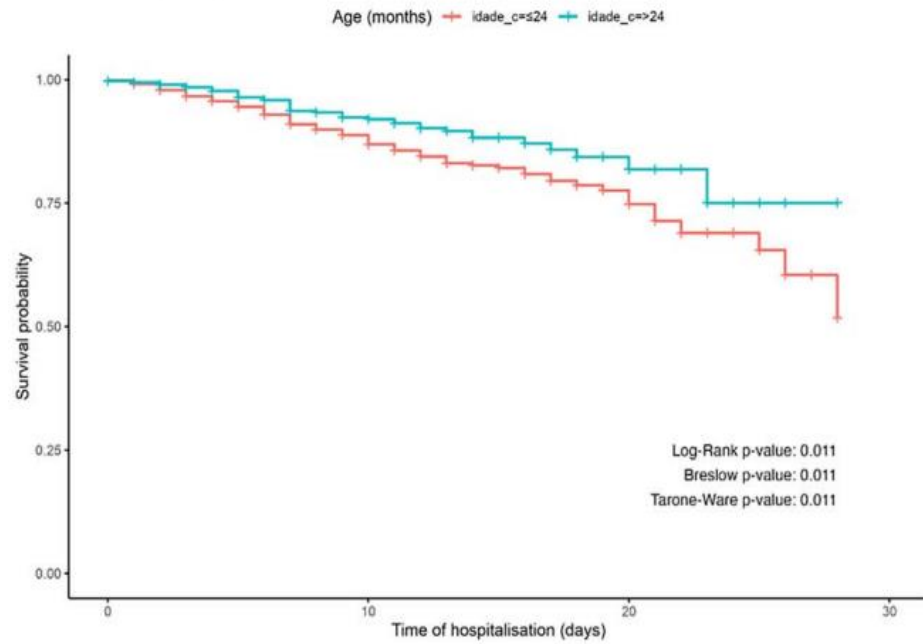
# Results



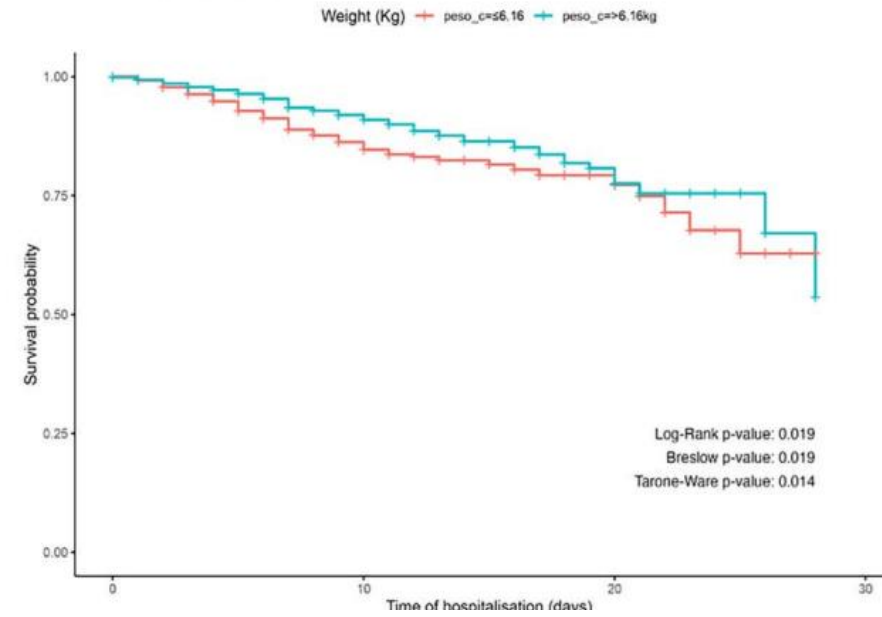
- A total of 1208 children were monitored in inpatient clinics across Sofala Province, Mozambique.
- The median recovery time was 11 days, with an interquartile range (IQR) of 8-14 days.
- The majority of the participants were male (67%) and aged  $\leq 24$  months.
- Of the children followed up, 84% recovered from SAM.
- The recovery rate after treatment was statistically associated with age, weight, height, malaria, diarrhea and dehydration.

# Results

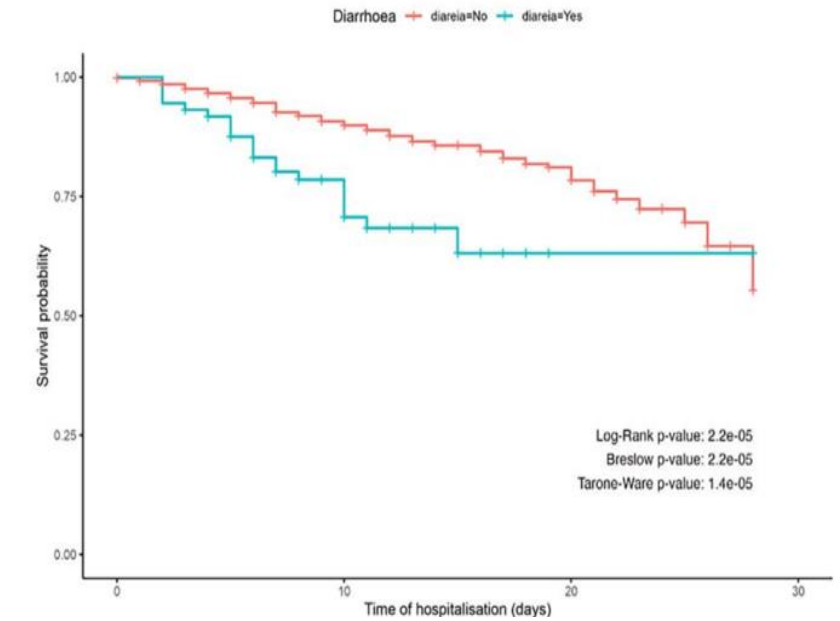
Survival by Age (months)



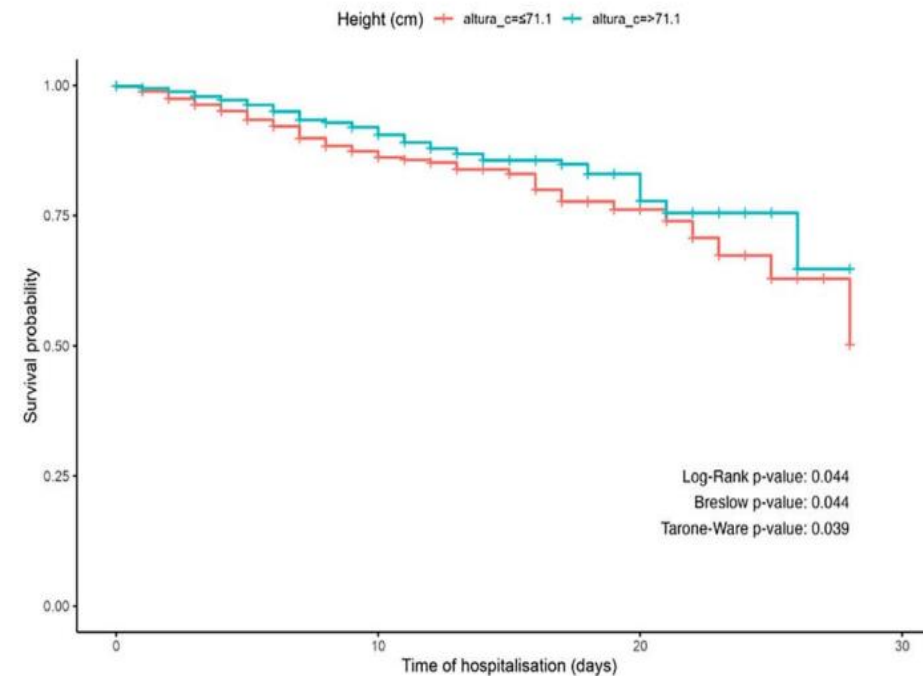
Survival by Weight (Kg)



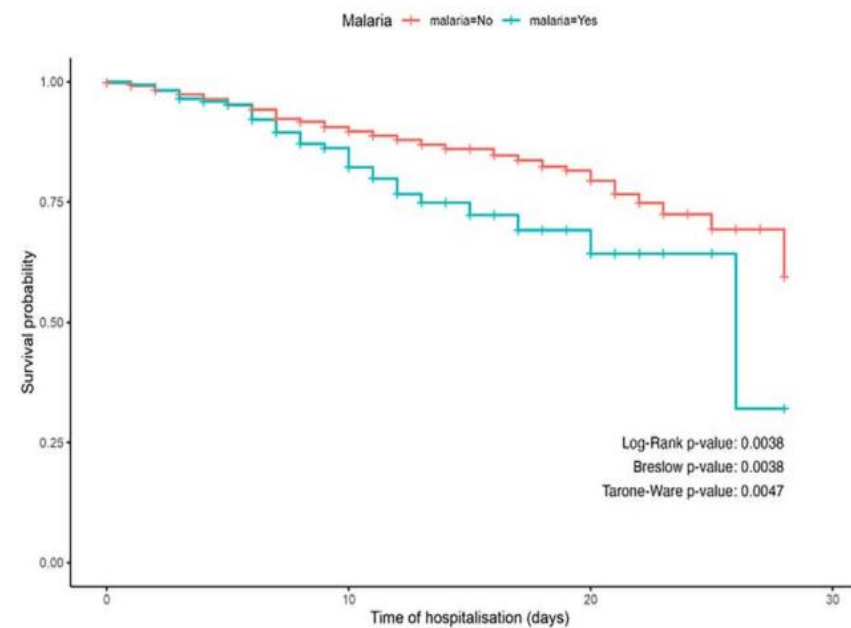
Survival by Diarrhoea



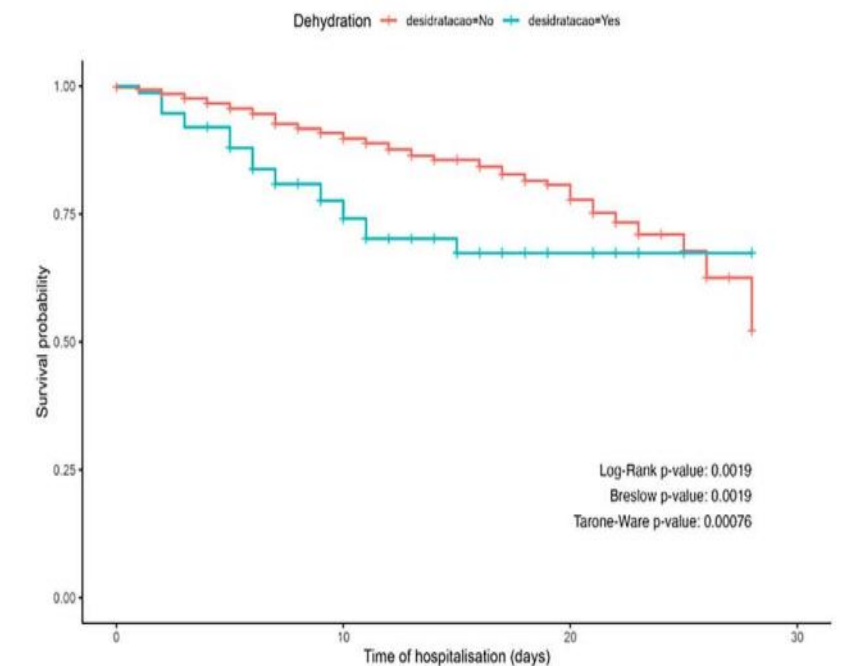
Survival by Height (cm)



Survival by Malaria



Survival by Dehydration

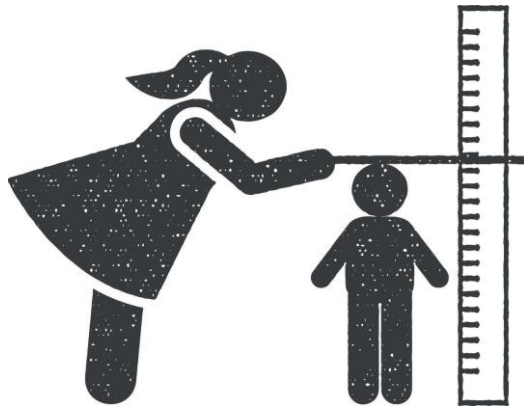


# Results

## Predictors of nutritional recovery

### Crude analysis

- Several factors were found to be significant predictors.
- Age, weight, and height were found to be negatively associated with recovery.



### Adjusted analysis

- Diarrhea remained a significant predictor.
- Children without diarrhea were 1.68 times more likely to recover.



# Conclusion



## Diarrhea and SAM

Significant predictor of nutritional recovery

## Public health

Prevent or reduce occurrence of SAM and diarrhea

## Early detection

Community health agents and healthcare professionals

# Discussion

## Key findings

- Diarrhea was a significant predictor of nutritional recovery.
- Children without diarrhea were more likely to recover.
- Overall recovery rate was high.

## Potential Mechanisms

- Diarrhea can lead to impaired absorption.
- Malnourished children may have a compromised immune system.
- Dehydration is a major concern in children with diarrhea.

## Similar findings

Similar results were found in other studies.

Asres et al. *BMC Nutrition* (2018) 4:17  
<https://doi.org/10.1186/s40795-018-0224-0>

BMC Nutrition

RESEARCH ARTICLE

Open Access



Recovery time and associated factors of severe acute malnutrition among children in Bahir Dar city, Northwest Ethiopia: an institution based retrospective cohort study

Degnet Teferi Asres<sup>1\*</sup>, Reddy P. C. J. Prasad<sup>1</sup> and Tadesse Awoke Ayele<sup>2</sup>

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PLoS one

**Diarrhoea Complicating Severe Acute Malnutrition in Kenyan Children: A Prospective Descriptive Study of Risk Factors and Outcome**

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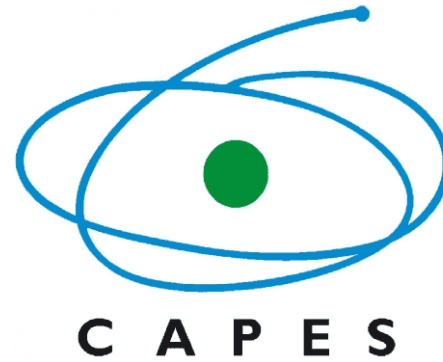
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# References

1. Dera M, Woodham D. Treating malnutrition in the community. *Br J Community Nurs* 2016;21:558–62.
2. Getahun MB, Teshome GS, Fenta FA. et al. Determinants of severe acute malnutrition among HIV-positive children receiving HAART in Public Health Institutions of North Wollo Zone, Northeastern Ethiopia: unmatched case-control study. *Pediatr Heal Med Ther* 2020; 11:313–21.
3. MISAU. Manual de Tratamento e Reabilitação Nutricional: 0 aos 14 anos. 2018;1:174. Available from: <https://fi-admin.bvsalud.org/document/view/rc86e>.
4. MISAU. Manual de Tratamento e Reabilitação Nutricional Volume II: Adolescente E Adultos ≥ 15 Anos. The Ministry of Health of Mozambique, 2017;2:135.
5. World Health Organization. WHO Guideline: Updates on the Management of Severe Acute Malnutrition in Infants and Children, Vol. 148. Geneva: World Health Organization, 2013, 2013.
6. Adal TG, Kote M, Tariku B. Incidence and predictors of mortality among severe acute malnourished under five children admitted to Dilla University Referral hospital: a retrospective longitudinal study. *J Biol Agric Heal* 2016;16:114–27.
7. World Health Organization. United Nations Children's Fund. WHO child growth standards and the identification of severe acute malnutrition in infants and children. *World Heal Organ* 2009;11.
8. Desyibelew HD, Bayih MT, Baraki AG. et al. The recovery rate from severe acute malnutrition among under-five years of children remains low in sub-Saharan Africa. A systematic review and meta-analysis of observational studies. *PLoS One* 2020;15:1–18.



# Acknowledgements



Ministério da Saúde

# Thank You

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