



# Impact of HIV on nutritional outcomes in Mozambican children hospitalized for reasons other than malnutrition

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## Background

- Malnutrition is a major cause of **morbidity and mortality** among children, contributing to 45% of under-five deaths.<sup>1</sup>
- HIV** is a significant risk factor for acute malnutrition.<sup>2</sup>
- Hospitalization** is often associated with deterioration of acute nutritional status.<sup>3</sup>
- Little is known about the prevalence of acute malnutrition and the impact of HIV on inpatient nutritional outcomes **on wards not specialized for the management of malnutrition**.

## Research Aims

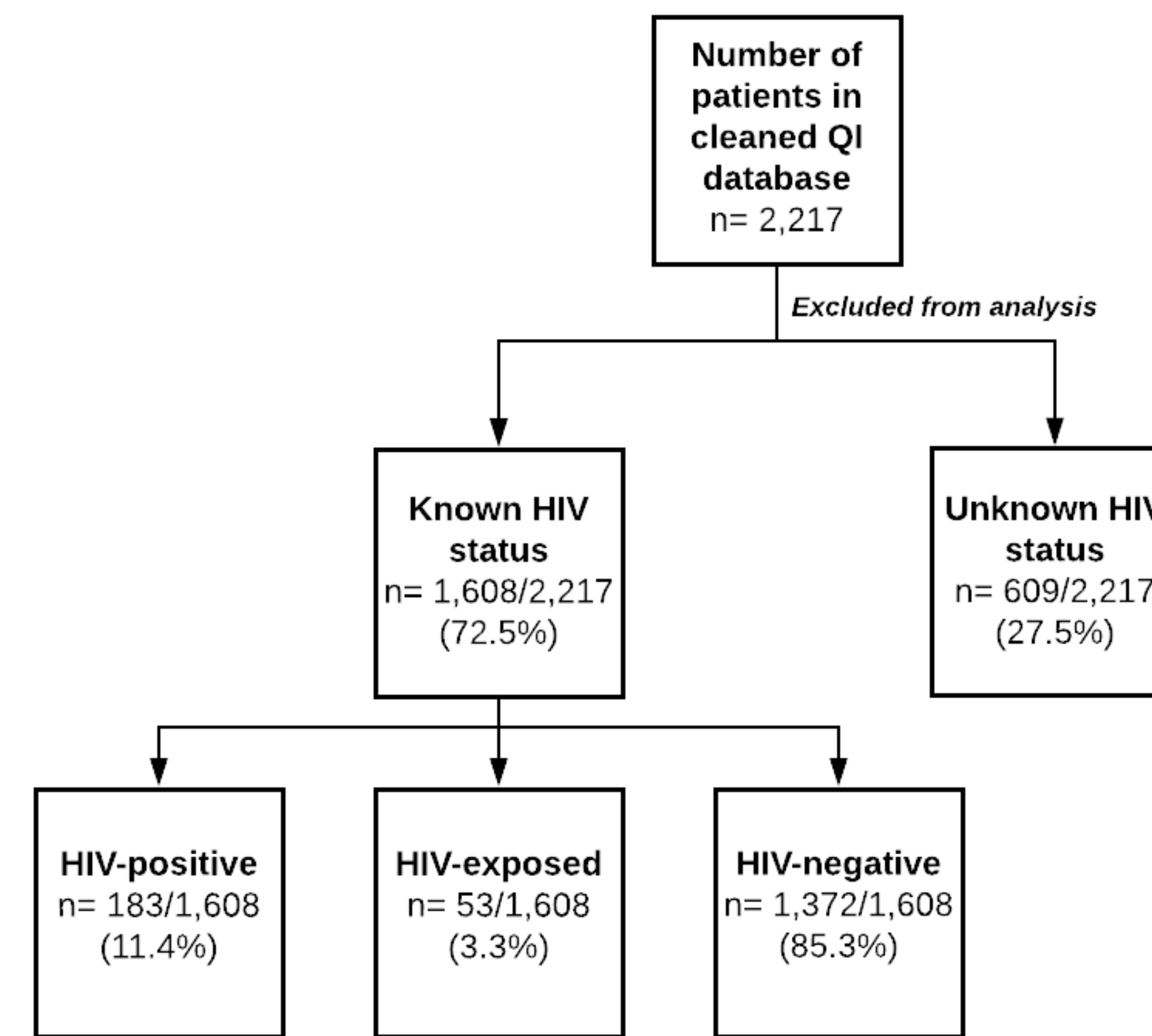
- Characterize the **baseline nutritional status** of hospitalized children according to HIV status
- Describe the **inpatient nutritional outcomes** of hospitalized children according to HIV status

## Methods

- In 2020-2021, a **nursing-led quality improvement (QI) project** was implemented at 2 central hospitals in Mozambique (Hospital Central de Maputo and Hospital Central de Beira), with a focus on the diagnosis and treatment of inpatient malnutrition for children admitted for other reasons.
- Clinical and demographic data were collected after inpatient chart closure in a **random sampling approach** and entered into a QI project database. Children ≤14 years admitted to wards other than Malnutrition were included.
- A **retrospective analysis** of the QI database was performed, including children with known HIV serostatus.
- Anthropometric z-scores were based on **WHO growth standards**. Classifications for moderate and severe acute malnutrition (MAM, SAM) were based on mid-upper arm circumference (MUAC) and weight-for-height z-score (WHZ) for children 0-4 years; MUAC and BMI for children 5-14 years.

## Results

**Figure 1:** Selection of study population and HIV status



**Table 1:** Admission nutritional characteristics by HIV status

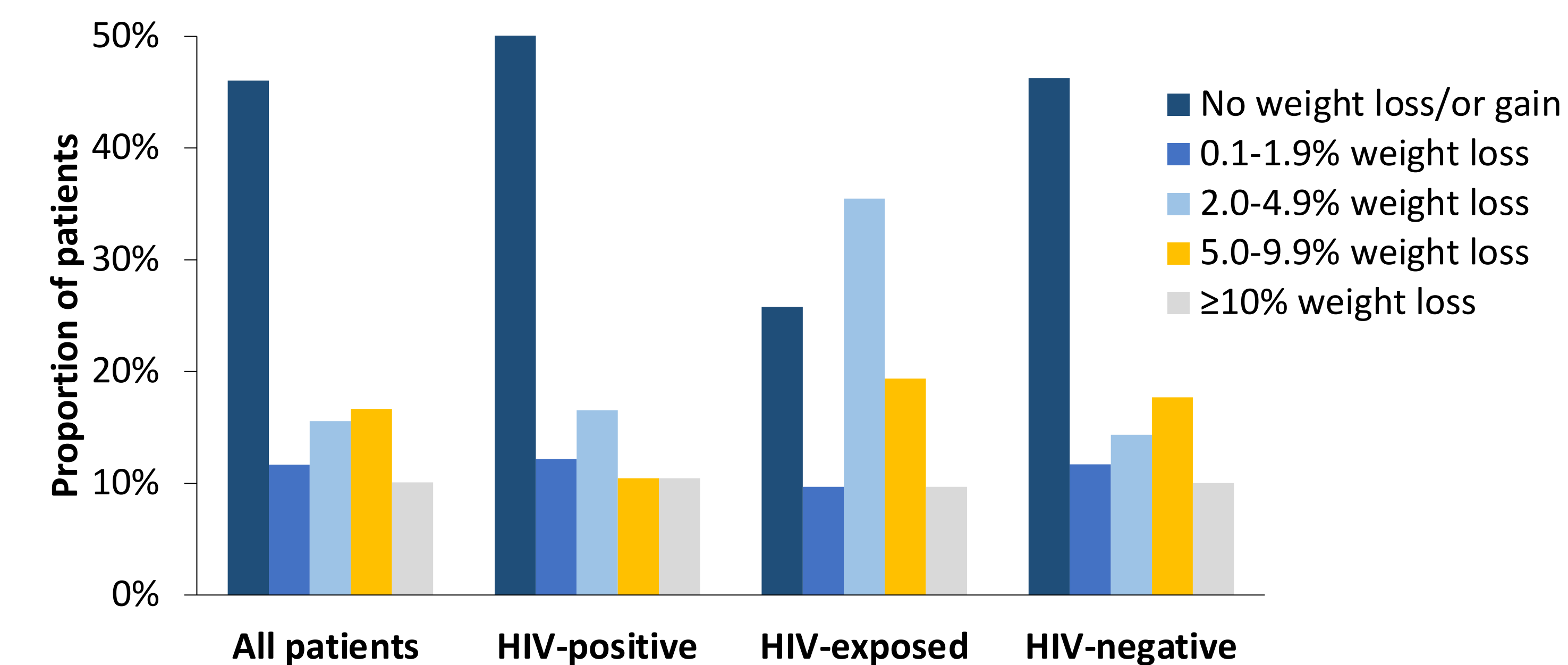
Variables	All patients	HIV-positive	HIV-exposed	HIV-negative	P value
Female, n (%)	664 (41%) n= 1,608	91 (50%) n= 183	22 (42%) n= 53	551 (40%) n= 1,372	<b>0.048</b>
Median age, months (IQR)	46 (16, 96) n= 1,608	48 (18, 108) n= 183	6 (2, 9) n= 53	36 (16, 85) n= 1,372	<b>&lt;0.001</b>
WHZ <5y, median (IQR)	-0.5 (-1.7, 0.0) n= 736	-1.4 (-2.3, -0.4) n= 68	-1.0 (-2.6, 0.6) n= 40	-0.3 (-1.6, 1.0) n= 628	<b>&lt;0.001</b>
BAZ 5-14y, median (IQR)	-0.5 (-1.7, 1.0) n= 462	-1.7 (-3.1, -0.2) n= 70	0 n= 0	-0.2 (-1.3, 1.3) n= 392	<b>&lt;0.001</b>
WAZ 0-10y, median (IQR)	-0.5 (-1.7, 0.6) n= 1,405	-2.1 (-3.2, -1.1) n= 148	-1.1 (-3.4, 0.1) n= 53	-0.3 (-1.4, 0.7) n= 1,204	<b>&lt;0.001</b>
HAZ, median (IQR)	-0.6 (-2.0, 0.8) n= 1,203	-2.0 (-3.1, -0.7) n= 138	-1.4 (-3.0, -0.1) n= 40	-0.4 (-1.6, 0.9) n= 1,025	<b>&lt;0.001</b>
<b>MUAC, n (%)</b>					
Normal/mild	889 (90%) n= 986	72 (71%) n= 102	21 (84%) n= 25	796 (93%) n= 859	<b>&lt;0.001</b>
Moderate	39 (4%) n= 986	9 (9%) n= 102	0 (0%) n= 25	30 (3%) n= 859	<b>0.012</b>
Severe	58 (6%) n= 986	21 (21%) n= 102	4 (16%) n= 25	33 (4%) n= 859	<b>&lt;0.001</b>
<b>Overall acute nutritional status, n (%)</b>					
Normal/mild	970 (76%) n= 1,275	72 (50%) n= 143	26 (62%) n= 42	872 (80%) n= 1,090	<b>&lt;0.001</b>
Moderate	150 (12%) n= 1,275	25 (17%) n= 143	6 (14%) n= 42	119 (11%) n= 1,090	0.064
Severe	155 (12%) n= 1,275	46 (32%) n= 143	10 (24%) n= 42	99 (9%) n= 1,090	<b>&lt;0.001</b>

WHZ (weight-for-height z-score), BAZ (BMI-for-age z-score), WAZ (weight-for-age z-score), HAZ (height-for-age z-score), MUAC (mid-upper arm circumference)

- Severe acute malnutrition** and **stunting** (defined by low HAZ) were seen in all serostatus groups, but were significantly more prevalent in the **HIV-positive** children ( $p < 0.001$ ).

## Results

**Figure 2:** Weight change during hospitalization by HIV status



- In patients admitted ≥5 days, the HIV-positive cohort had the highest proportion with **no weight loss/weight gain** ( $p < 0.001$ ).

## Discussion and Next Steps

- Patients with HIV had the highest rates of acute and chronic malnutrition at admission, but were less likely to have weight loss during hospitalization. Analyses that include the duration of hospitalization and inpatient nutritional therapy are planned to investigate this **unexpected finding**.
- 12% of all patients had MAM or SAM, and 54% of all patients lost weight during hospitalization. Enhanced nutritional care on non-Malnutrition wards is needed, and the introduction of **nutritional risk assessment tools** and **preventive nutritional therapy** should be considered, regardless of HIV status.
- There is evidence that **HIV-exposure** (without infection) is a risk factor for **poor health outcomes**, and analyses are planned to compare this group to age-matched HIV-negative infants.

## Limitations

- This study used a QI database made for non-research purposes. Extensive **data cleaning** exercises were needed before analysis. And there was poor documentation of **inpatient HIV testing results** at HCB, which reduced the sample size for this analysis.

## Acknowledgments

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