

**Consultant's Meeting on Severe Acute  
Malnutrition in sub-Saharan Africa  
IAEA Headquarters, Vienna**

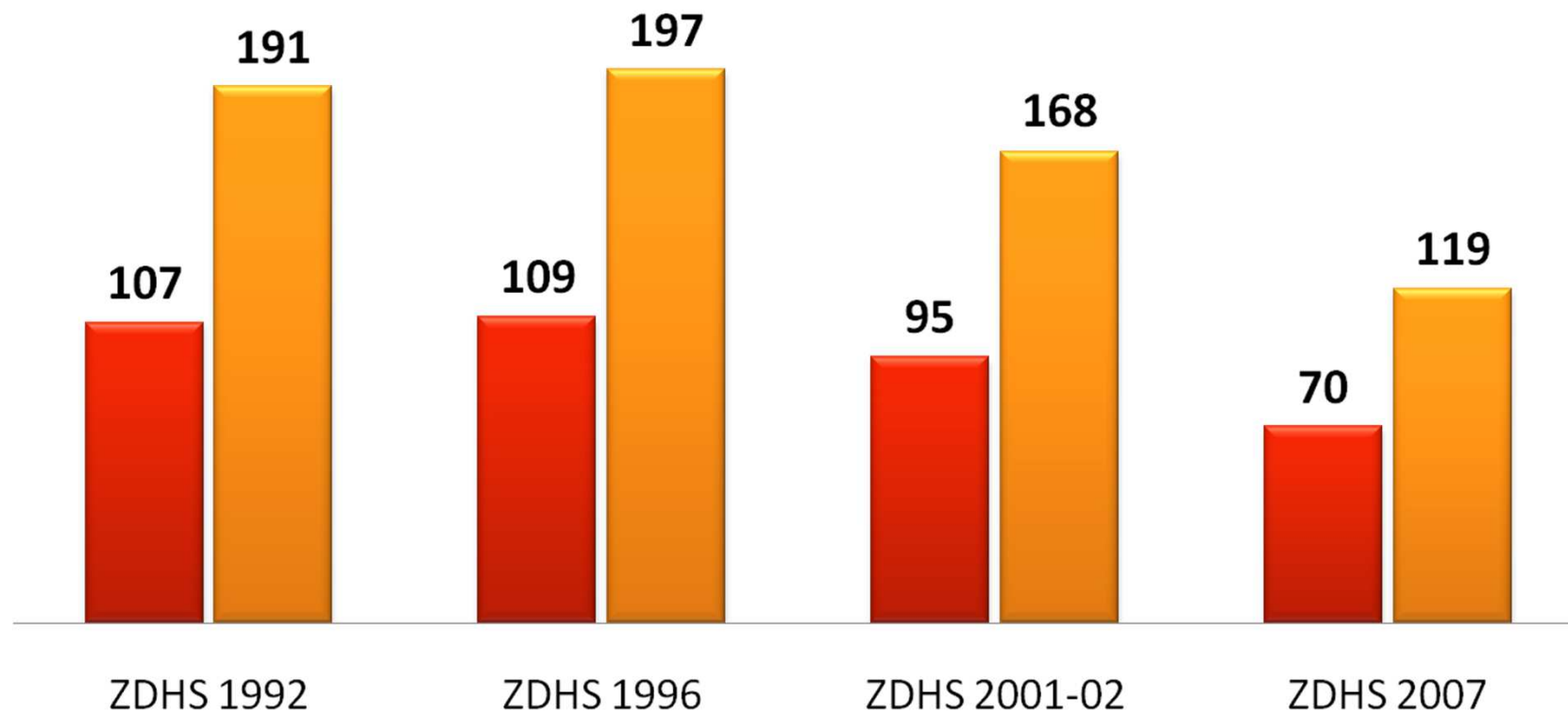
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# Trends in Early Childhood Mortality Rates in Zambia

*Deaths per 1,000  
live births*

■ Infant mortality

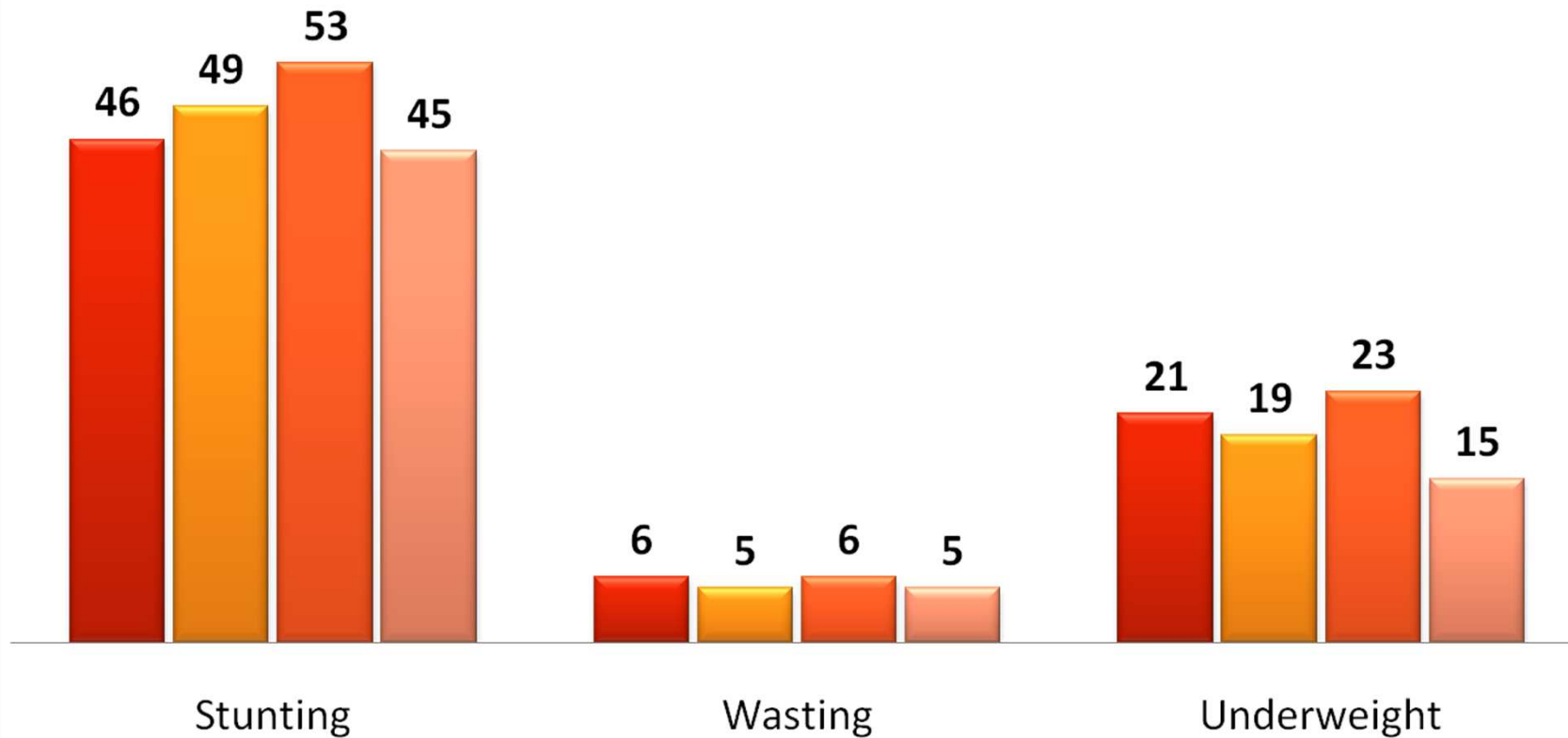
■ Under-five mortality



# Trends in Nutritional Status in Zambia

*Percentage of children under 5*

■ 1992 ■ 1996 ■ 2001-02 ■ 2007



\*Based on WHO Child Growth Standards

# Impact of HIV/AIDS

## **National Statistics:**

- Overall HIV prevalence 14% (higher before) {DHS 2007}

## **Hospital Settings (University Teaching Hospital):**

- Overall Prevalence in Paed. admissions 30% (Unit audit, 1999)
- In children admitted with persistent diarrhoea and malnutrition 54% (Amadi et al JPGN 2004)
- In admitted children to severe acute malnutrition ward 35% (ward audit 2009)

# Historical background of management of SM in Zambia

- Prior to 1996 - **CFR 50%** in children admitted with severe malnutrition. No treatment protocols
- World Food Programm- supported acute moderate and severe acute malnutrition management in hospitals and outpatient facilities
- **WHO Manual on Management of Severe Malnutrition**  
- inpatients given skimmed milk based feed with no mineral/vitamin mix (**CFR 20 – 30%**)
- 2001-02 drought - UNICEF supported consultants conducted training on management protocols for moderate and severe malnutrition – F75, F100, ReSoMal used in hospitals in affected Districts and University Teaching Hospital in Lusaka

# management of severe malnutrition in Zambia

- Zambian Team Participated in Regional Training in Malawi in April 2003 using WHO Training Course on Management of Severe Malnutrition (participating countries: Malawi, Mozambique, South Africa, Lesotho, Zambia,)
- August 2003 – 1<sup>st</sup> Facilitator and Case Management training in Lusaka using WHO Training modules supported by WHO and UNICEF – nurses, doctors and nutritionists trained
- Implementation of WHO guidelines in several hospitals in Zambia and within the Southern African Region
- Medical students given lectures and tutorials on infant feeding and management of severe acute malnutrition
- All 5<sup>th</sup> and 7<sup>th</sup> year medical students spend 2 weeks in malnutrition ward during paediatric rotation

# Challenges of Inpatient Care

- All patients admitted for inpatient care
- Overcrowded wards, bed sharing
- Cross infection high, **CFR 20-40%**
- Erratic supplies of therapeutic feeds and antibiotics
- Inadequate staff – poor monitoring of patient
  - **Inpatient care - intensive**
  - **Implementation of WHO treatment guidelines without addressing staffing CANNOT reduce CFR**

# Challenges of Inpatient Care 2

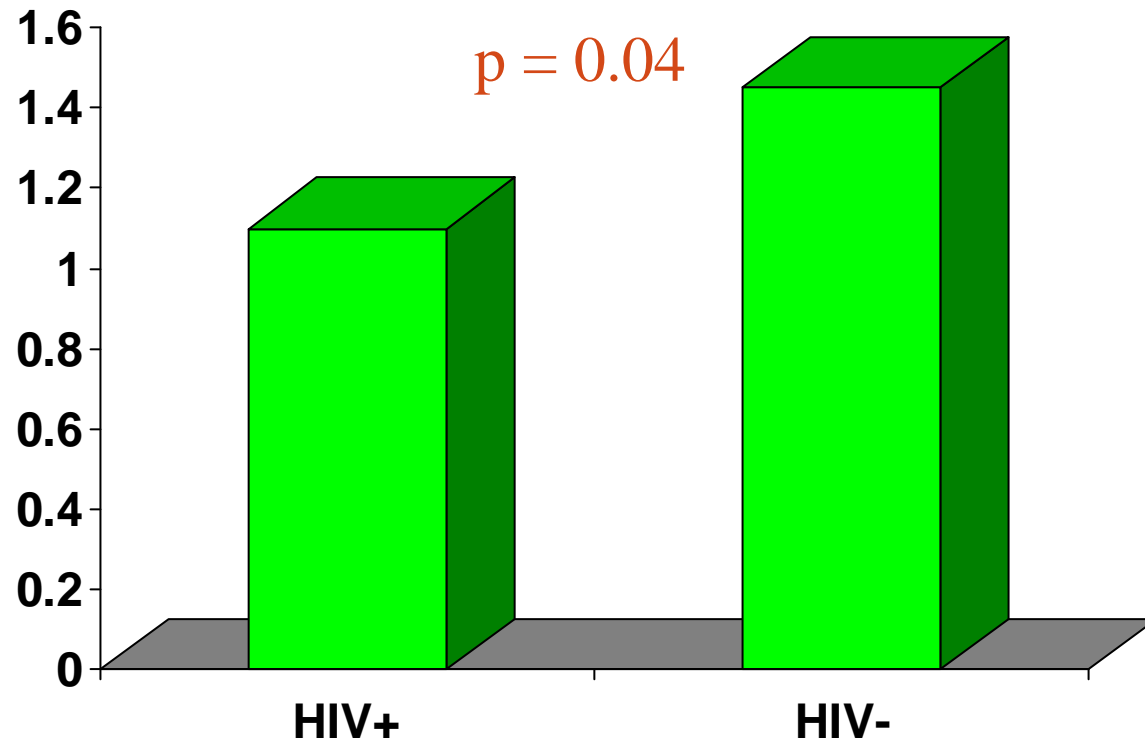
- Late presentation – most patients severely ill on admission
- Sepsis unresponsive to 3<sup>rd</sup> line antibiotics
- Co-morbidities, particularly in HIV infected presenting with TB and other opportunistic infections
- Sepsis unresponsive to 3<sup>rd</sup> line antibiotics
- Increased cases of 2<sup>o</sup> severe malnutrition, usually difficult to treat and occurring in older children aged >5 years
- Poor response to nutrition and medical management in patients infected with HIV – poorer weight gain in HIV infected



# HIV infection and weight gain

(Amadi et al, JPGN 2001)

Wt gain  
from nadir  
(kg)

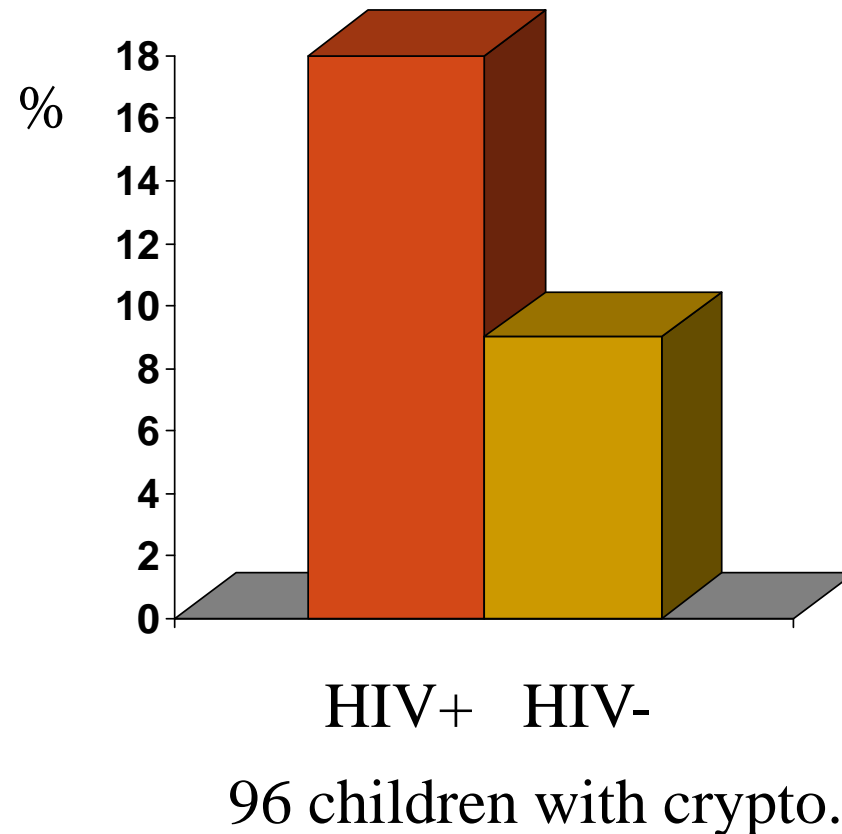
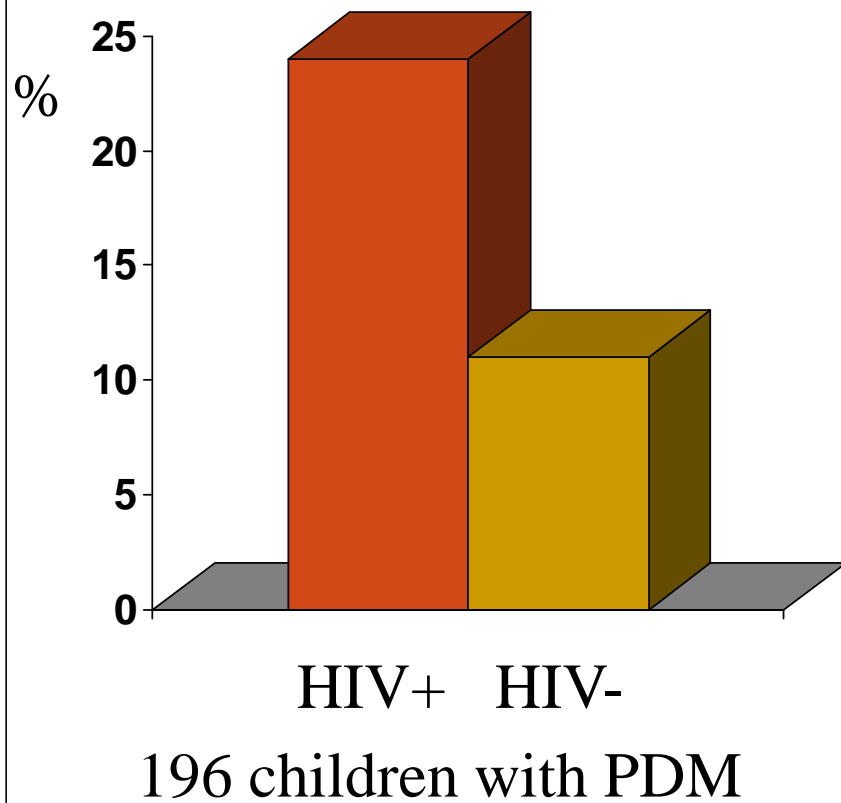


86 children  
on standard  
nutritional  
therapy  
followed for  
4 weeks

# HIV infection and mortality

(Amadi et al, JPGH 2001; Lancet 2002)

One month mortality rates in 2 studies 1998 - 2001



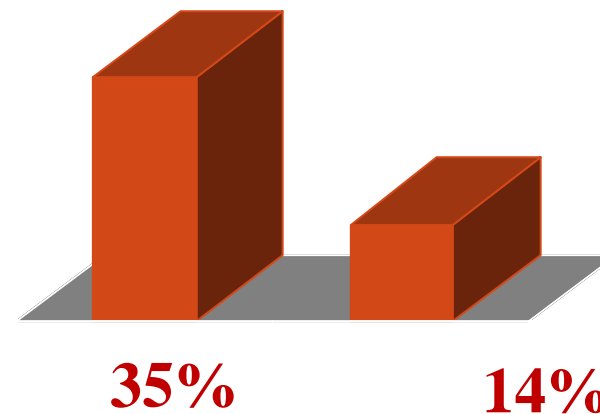
# COMPLICATIONS OF SEVERE MALNUTRITION - DIARRHOEA

Some children present with unusually severe and profuse diarrhoea with high purging rates and difficult to manage complications:

- Dehydration
- Shock
- Acidosis
- lactose intolerance
- Major contributor to high CFR
- Usually caused by *Cryptosporidium parvum*, *Salmonella* spp, *Vibrio cholerae*

# Cryptosporidiosis as a risk factor for mortality (Amadi et al JPGN 2001)

- 200 children with persistent diarrhoea and malnutrition
- Crypto a risk factor for death within 28d (OR3.3, 1.6-8.9; p=0.001 regardless of HIV)
- Consistent with studies from Guinea-Bissau and Brazil



# COMPLICATIONS OF SEVERE MALNUTRITION - Anorexia

- Some children present with severe and prolonged anorexia
- Require prolonged NGT feeding
- Common in children with HIV/AIDS
- Usually present with difficult to treat opportunistic infections
- Has implications for duration of Phase 1 management of severe malnutrition

# Community Therapeutic Care – 2005 onwards

- Community management of uncomplicated severe acute malnutrition implemented in Lusaka Clinics, supported by VALID International in September 2005
- Roll out of community management of severe acute malnutrition to other provinces in Zambia
- **CMAM IN 2006 (WHO, UNICEF STATEMENT)**
- **WHO/UNICEF STATEMENT OF 2009 – WHO GROWTH STANDARDS, USE OF diagnostic criteria MUAC, WT/HT, OEDEMA**

# Related Developments - Zambia

- August 2005 Free Anti-retroviral Treatment in Lusaka (Pepfar / Government scheme)
- September 2005, Provider initiated HIV Testing and Counselling, free ART in whole country (Pepfar / CDC / Government of Zambia partnership)
- 2006 Infant HIV diagnosis service established at UTH (DNA PCR)
- Post exposure prophylaxis to allow longer breastfeeding in 2011

## Achievements

- Low case fatality rates (<4%) achieved in outpatient therapeutic centres
- Severely malnourished children with HIV infection children are being identified and referred for HIV care (cotrimoxazole prophylaxis and ART if eligible)
- The country has a pool of trainers and health workers trained in CMAM



# Ongoing work in Zambia

## Piloting:

- Early identification of undernourished children through house to house screening (MUAC, Oedema checks)
- Community HIV diagnosis and referral into care (including Dry Blood Spots for DNA PCR in HIV-exposed children <18mo)
- Community identification and follow up of infants < 6 months – prevent malnutrition and HIV diagnosis with referral into care of HIV infected

# Experience in many African countries - ACHIEVEMENTS

- Many countries have adopted CMAM and rolling out (Ethiopia, Malawi, Sudan, Niger, Nigeria, Ghana, South Africa etc)
- In outpatient settings, low CRFs achieved (<4%) in children with uncomplicated SAM
- Local production of RUTF – Malawi (2 factories), South Africa and RUSF for moderately malnourished children (Kenya)

# Regional & International Collaborations

- 2006 Meeting in Tanzania – launch of WHO growth standards and community management of acute malnutrition
- 2007 Blantyre meeting and launch of Blantyre Working Group
- Several meetings by WHO Regional and HQ
- In country training on WHO guidelines for inpatient care and CMAM (Malawi, Tanzania, Nigeria, Ghana)
- IPA Conference in South Africa 2010 – Severe Acute Malnutrition symposium (IMTF/IAEA)
- NUGAG by WHO HQ

# Regional Publications on severe malnutrition in high HIV settings

- Manary et al, *Arch dis Child* 2004
- Amadi et al, *JPGN* 2001, *Lancet* 2004
- Collins et al review, *Lancet* 2006
- Heikens et al – (*PloS Medicine* 2007)
- Heikens et al (Blantyre Working Group), *Lancet* 2008
- Maitland et al, *NEMJ*
- Review by Brewster
- Musoke and Fergusson, *Am J Clin Nutr* 2011
- De Maayer & Saloojee, *Arch Dis Child* 2011
- And others

# Challenges inpatient care still exist!

Case fatality rates in inpatient facilities remain high (10-40%) in many African countries due to

- High HIV prevalence ( studies from Zambia, Malawi, Kenya, Uganda, South Africa)
- Multiple infections unresponsive to 3<sup>rd</sup> line antibiotics ( HIV-related bacterial infections, TB)
- Diarrhoea complicated with dehydration, acidosis and shock
- Shortage of staff (nurses, doctors) in hospitals resulting in poor monitoring of patients
- Erratic supplies of therapeutic feeds, essential drugs

# WAY FORWARD

- Review Diarrhoea Management protocol in SAM and management of Shock - **Through multi-centre RCTs**
- Address other Research questions raised:
  - management of HIV / AIDS in children with SAM including pharmacokinetics of ARVs
  - lactose free diets
  - management of SAM in children <6months who are HIV exposed
  - Infantile SAM

# SUMMARY

- WHO guidelines implemented in many countries with some good results despite high CFR ( a more children do survive)
- CMAM in several countries and successfully treating uncomplicated SAM with CFR <4%
- More needs to be done to improve inpatient care in high HIV prevalence settings
- There is need to promote local production of RUTF
- Promote Supplementary Feeding Programmes - prevent severe acute malnutrition and reduce CFR
- Integrate HIV diagnosis and treatment with management of acute malnutrition at community level
- Need to conduct multi-centre research to improve care and management of acutely malnourished children

THANK YOU