

Malnutrition in <6 months old infants:

Disease burden in developing countries
& implications of WHO Child Growth Standards



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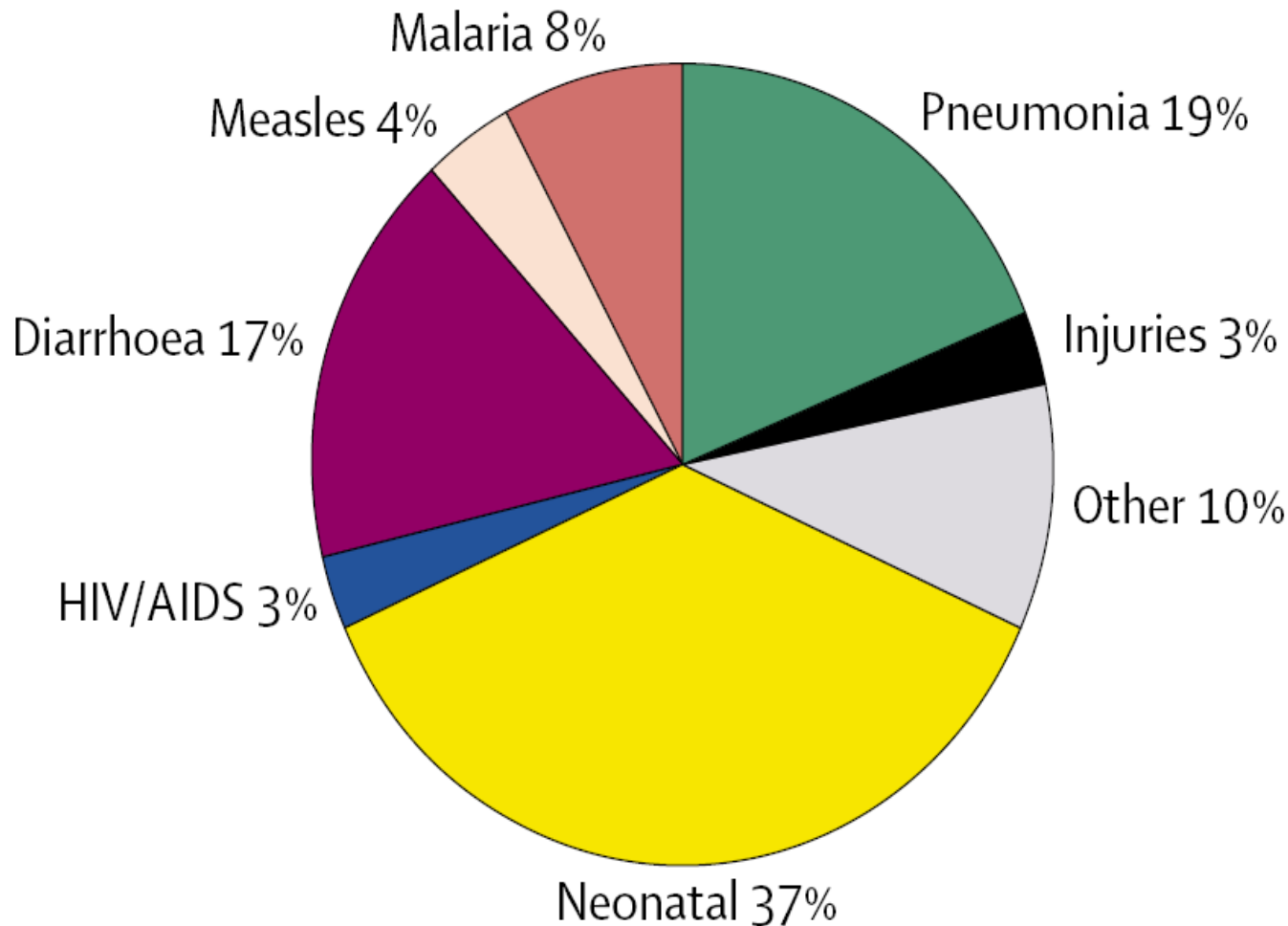
3. Emergency Nutrition Network, Oxford UK

Funding body: MAMI Project - UNICEF Nutrition Cluster



BACKGROUND

10.8 million child deaths / year

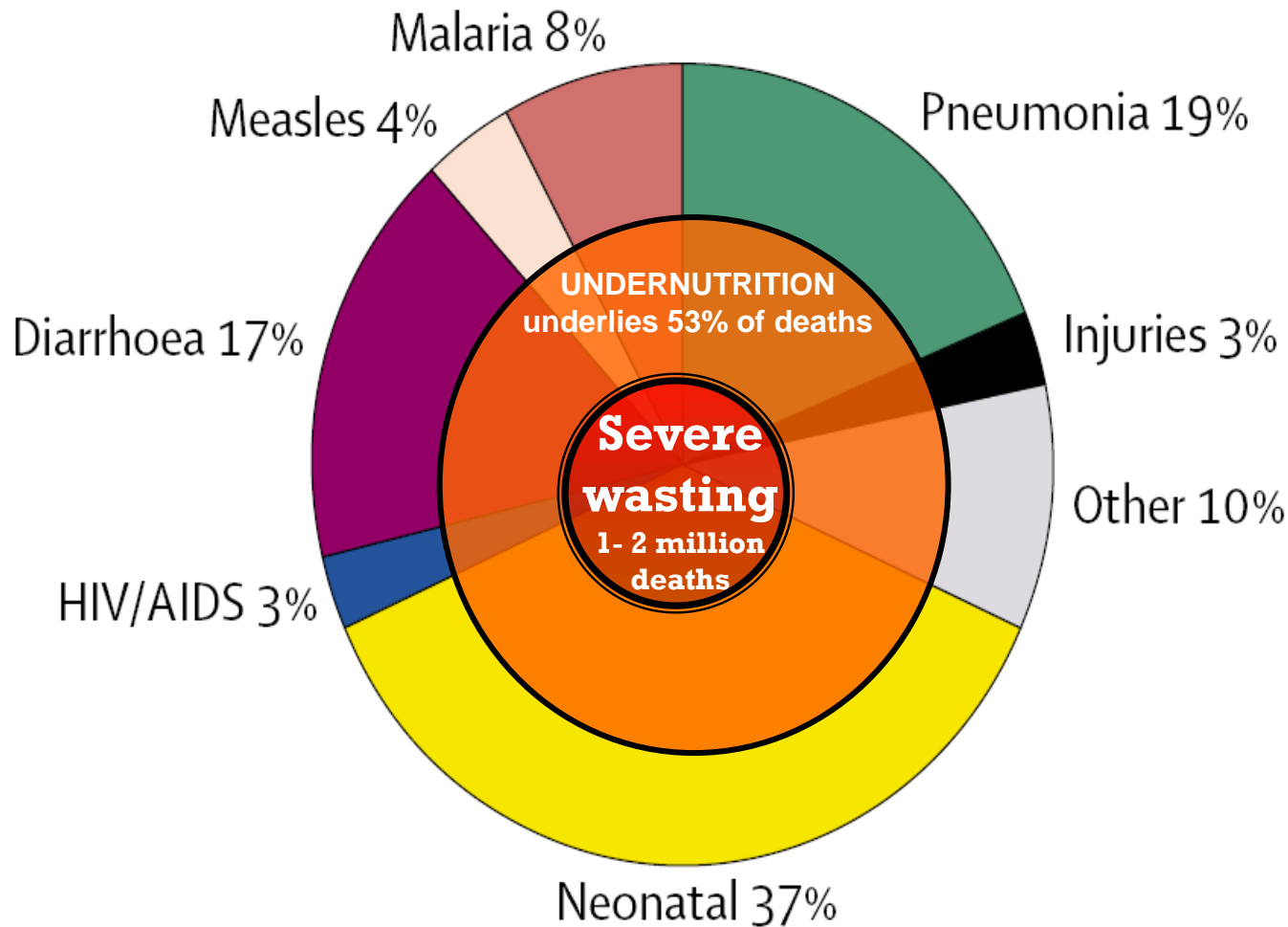


Causes of Death in under-5 children (Worldwide)

Modified from: WHO estimates of the causes of death in children *Lancet* 2005; 365: 1147-52

Jennifer Bryce, Cynthia Boschi-Pinto, Kenji Shibuya, Robert E Black, & WHO Child Health Epidemiology Reference Group*

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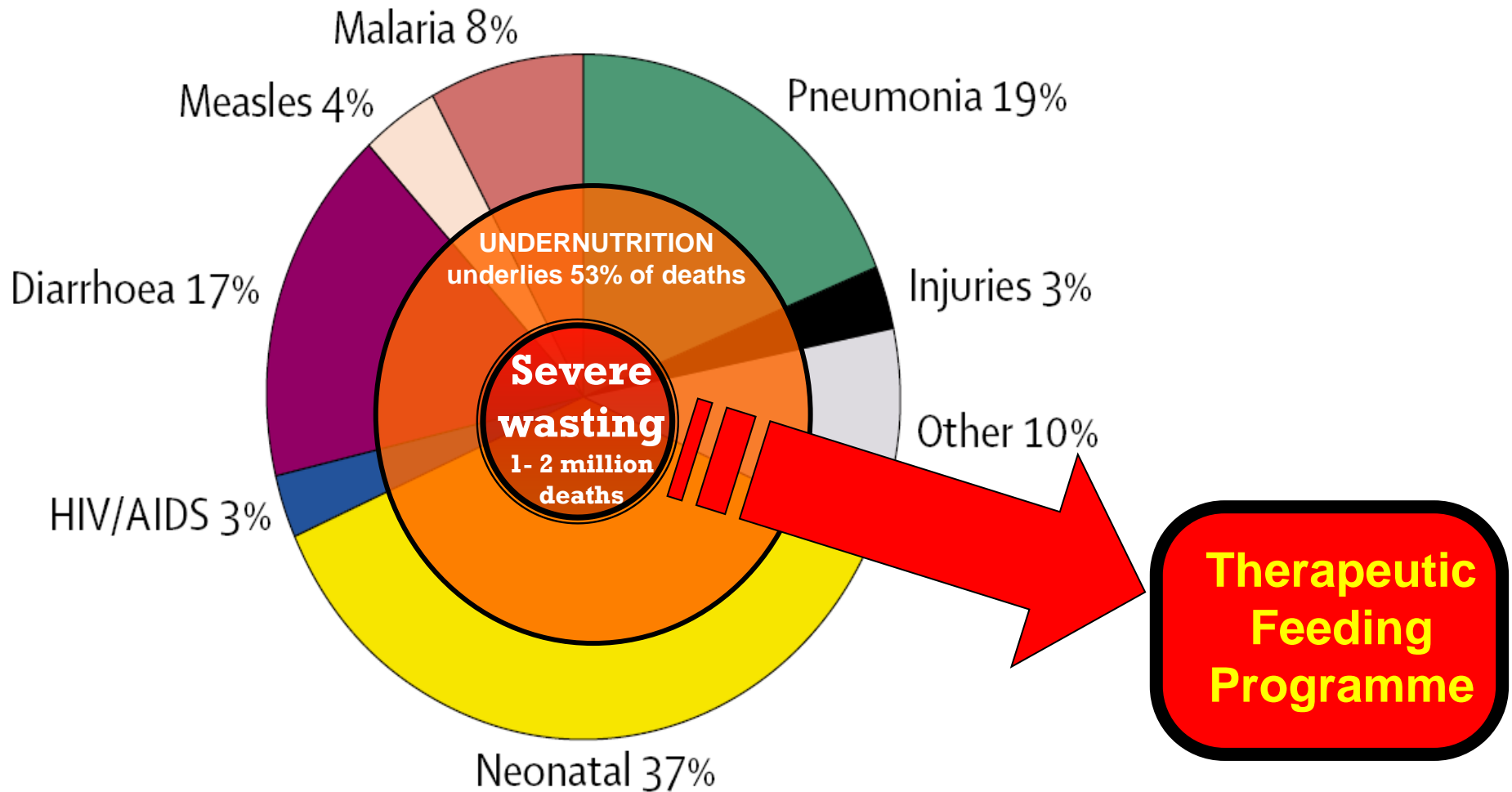


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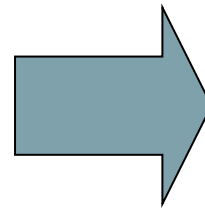
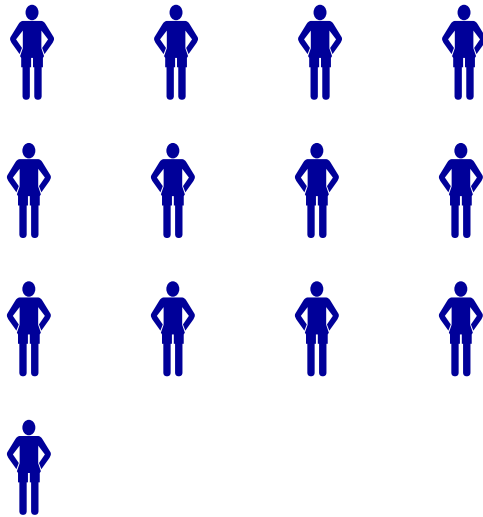
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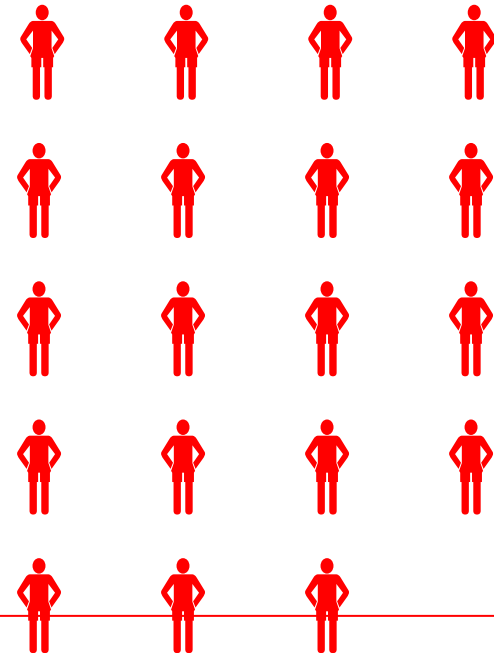
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Diagnosis of severe wasting (children)

13 million
(NCHS)



19 million
(WHO)



Lancet 2006 (Collins et al)

Lancet 2008 (Black et al)

The 1995 WHO 'Field Guide to Nutrition Assessment' states that:

“...children under 6 months of age, apart from being more difficult to measure, are often still breast-fed and therefore satisfactorily nourished...”

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Common Held Assumption

Managing wasted <6 month infants is challenging:

- Unique needs (exclusive breast feeding)
- Resources (inpatient treatment)
- Staff time
- Staff skills
- Magnitude of the problem

(individual vs. public health focus)

Poor evidence-base →

1. Describe prevalence of wasting among <6 months infants, in nutritionally vulnerable settings.
2. Examine effect of WHO-GS on burden of disease.
3. Discuss possible risk/benefit implications

METHODS

- Study Design:
 - Secondary data analysis
- Reference population
 - 36 countries identified in 2008 Lancet Nutrition series
- Study population
 - 21 countries with available Demographic & Health Survey (DHS) in last 10 years
 - 163,228 children 0 to 59.9 months (15,534 infants <6 months)
 - Mean 7771 per country, range 1710 to 45,398

Countries:

Ethiopia

Madagascar

Mozambique

Zambia

Egypt

Cote D'Ivoire

Mali

Nigeria

India

Turkey

Peru

Kenya

Malawi

Tanzania

Cameroon

Burkina Faso

Ghana

Niger

Bangladesh

Cambodia

Guatemala

- **Definitions** (based on weight-for height – WHZ)
 - * Wasting $WHZ < -2$
 - * Severe wasting $WHZ < -3$
 - * Moderate wasting $-2 > WHZ < -3$

- **Integrated Food Security Phase Classification (IPC) - Food Security**
 - * Moderately insecure $>3\%$ to $<10\%$
 - * Acute crisis $10 - 15\%$
 - * Humanitarian Emergency $> 15\%$
 - * Famine $> 30\%$

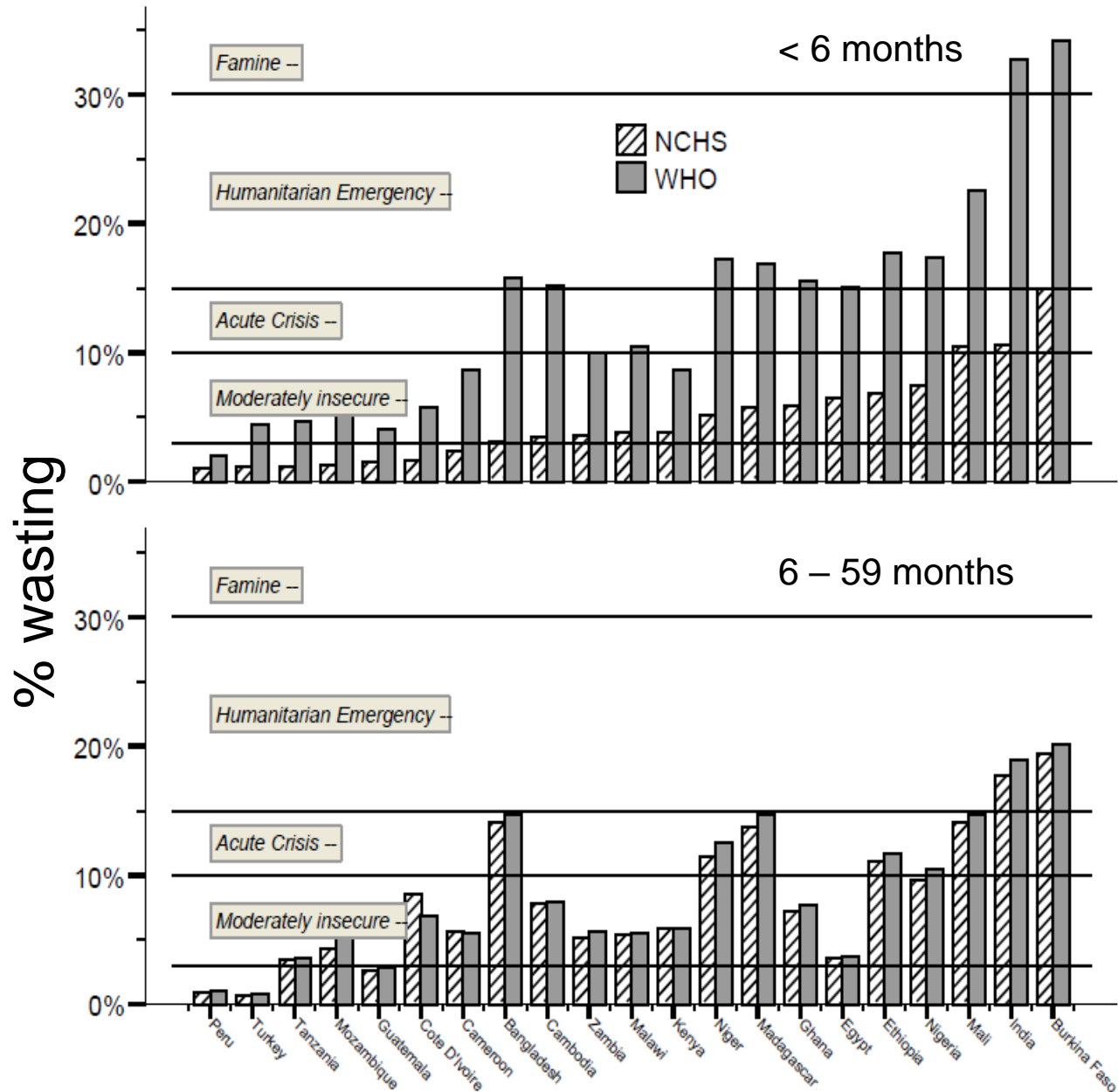
- Data handling & analysis
 - * Calculated z-scores using ENA for SMART
 - * Excluded patients with extreme z-scores (Epi-Info criteria)

 - * Calculated country prevalence of wasting using:
 - NCHS growth references (NCHS)
 - WHO Growth Standards (WHO-GS)

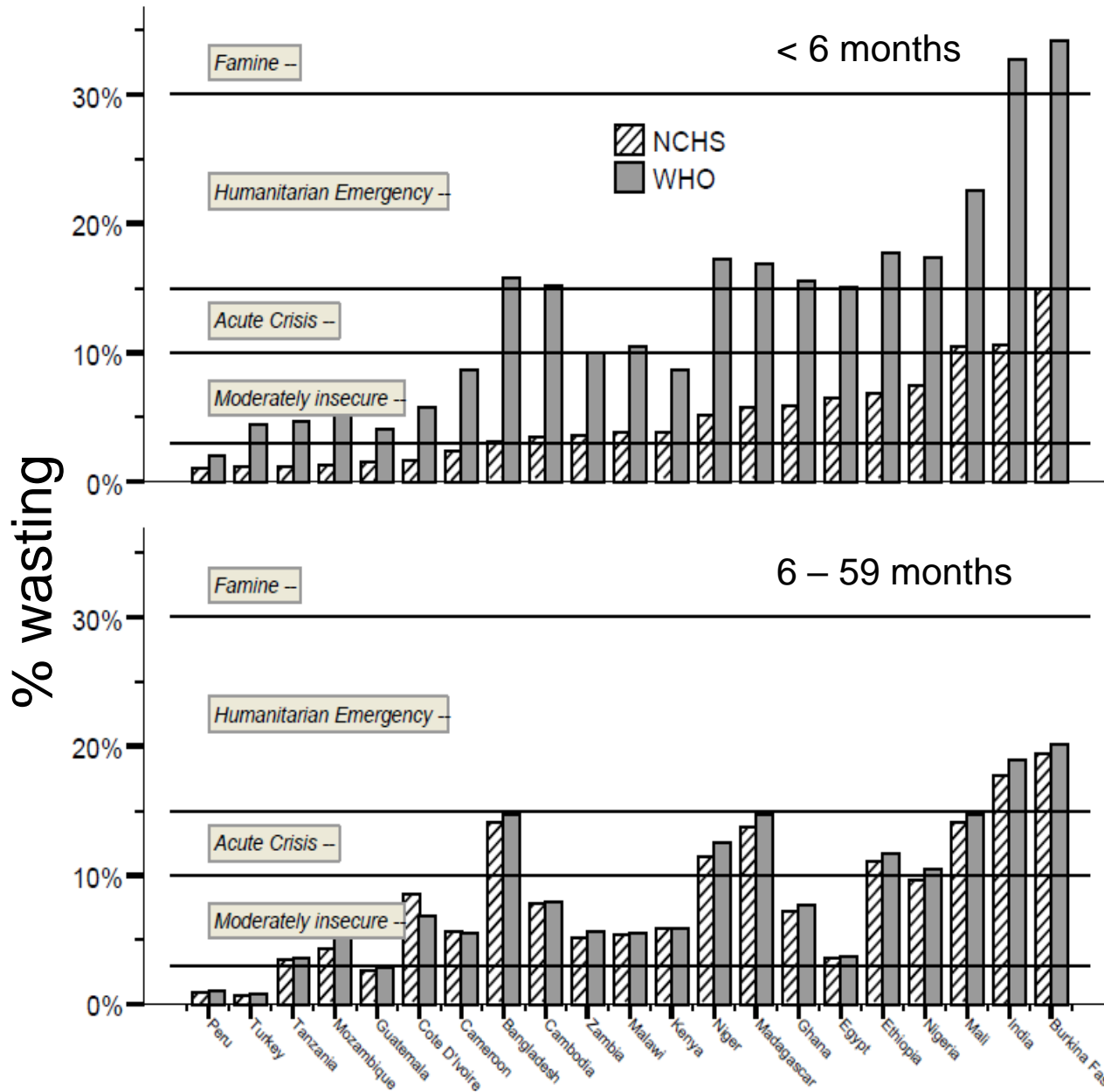
 - * Grouped by age group
 - Infants 0 – 5.9 months
 - Children 6 – 59 months

RESULTS

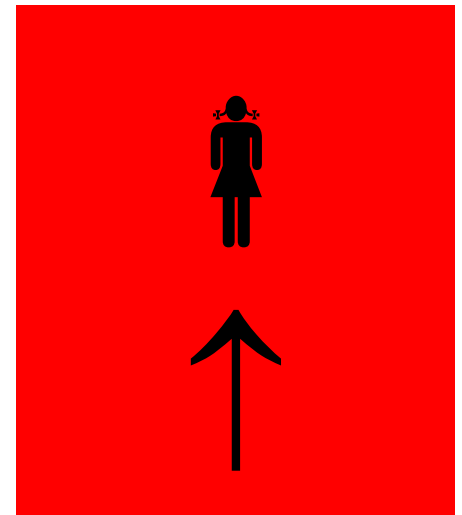
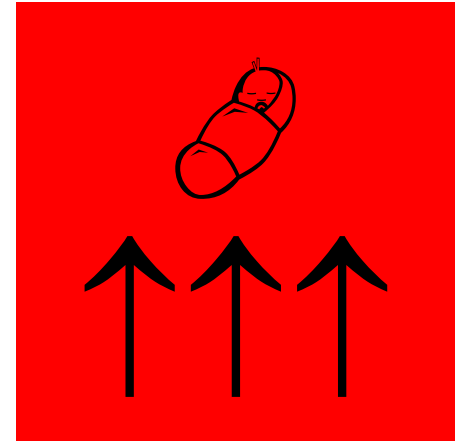
Results (1) - wasting



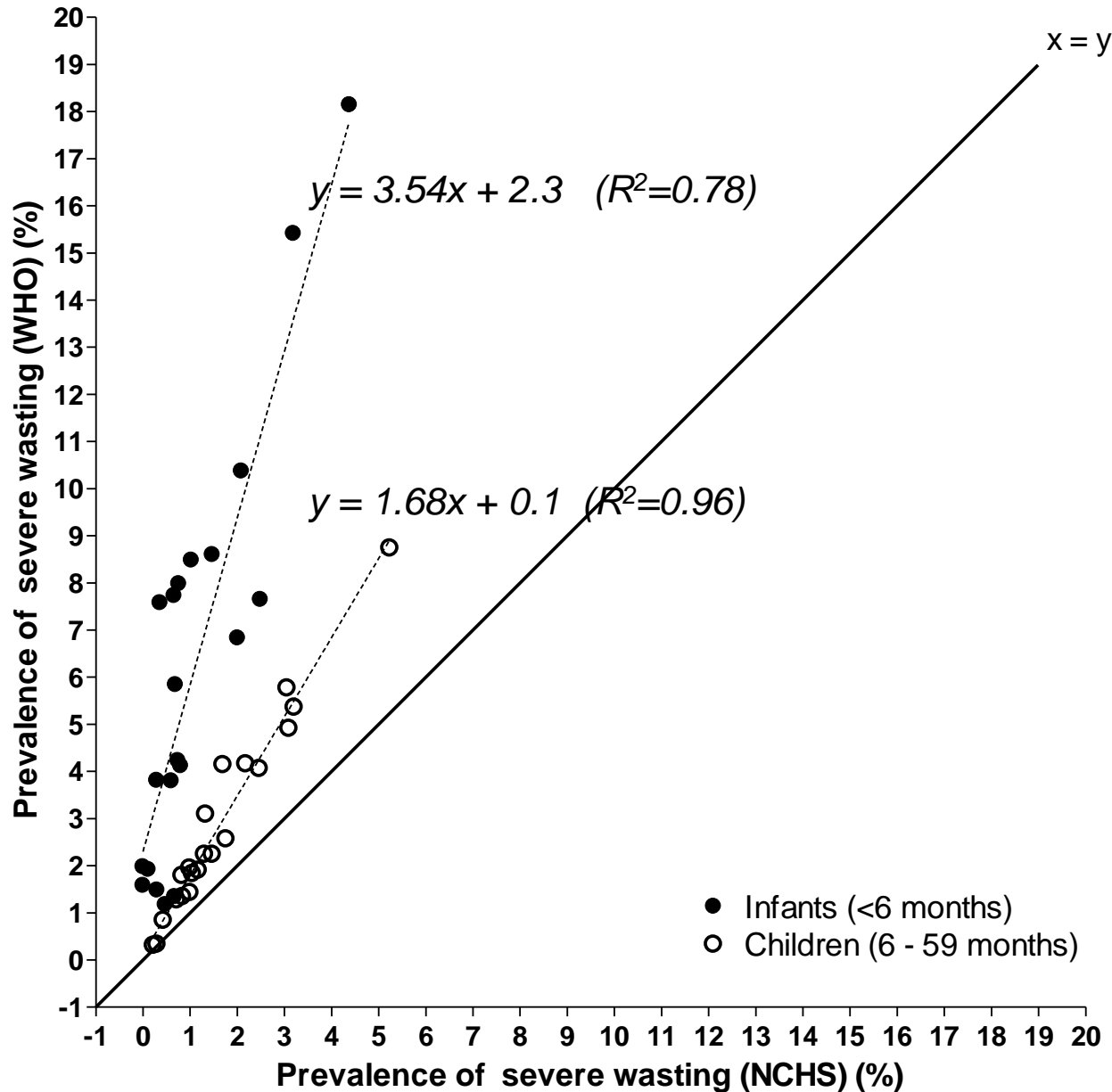
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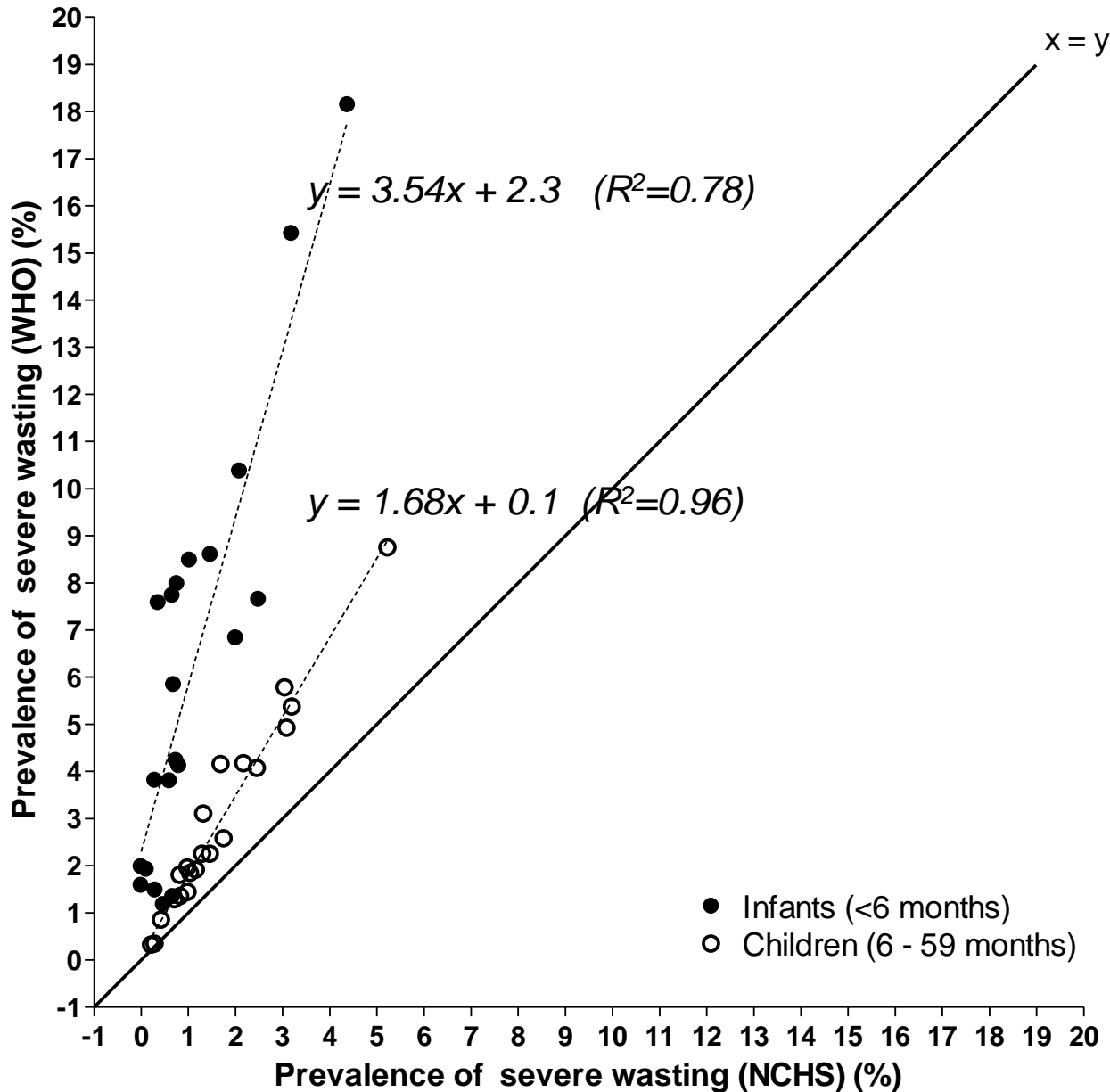
NCHS → WHO



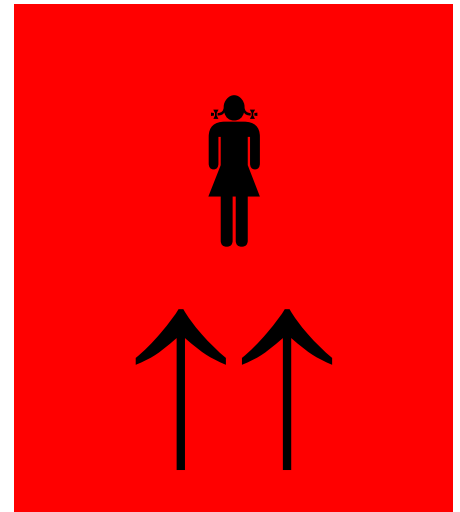
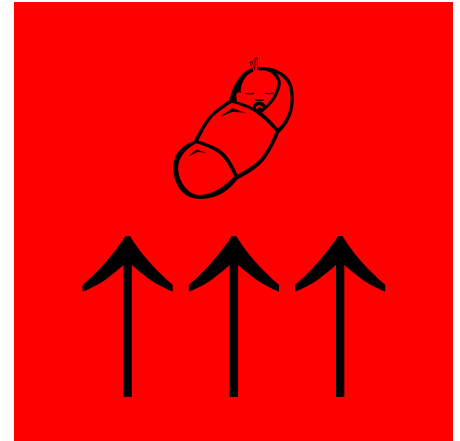
Results (2) - severe wasting



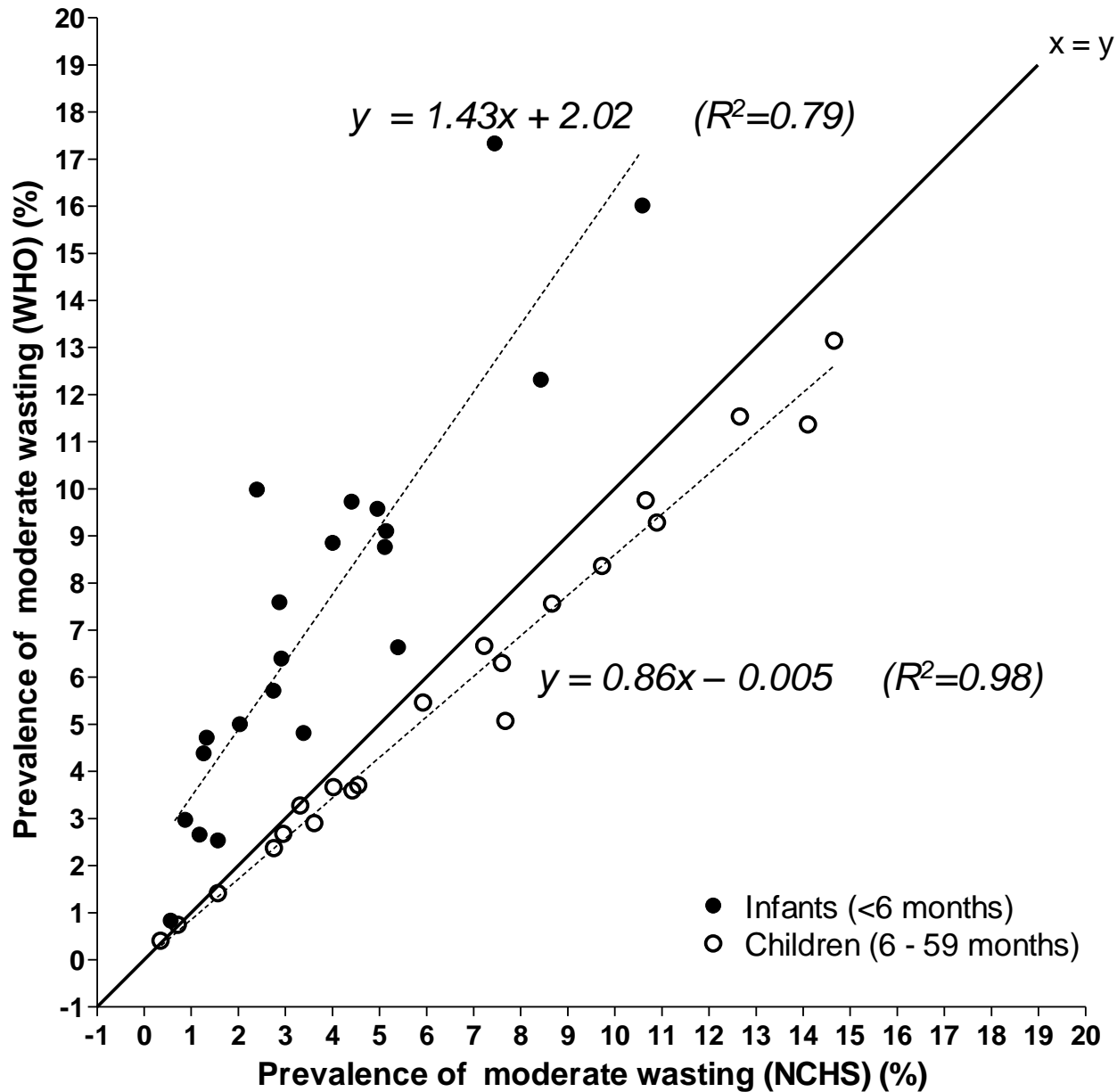
Results (2) - severe wasting



NCHS → WHO

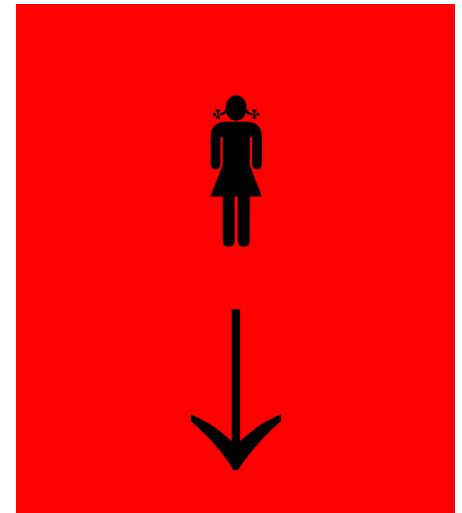
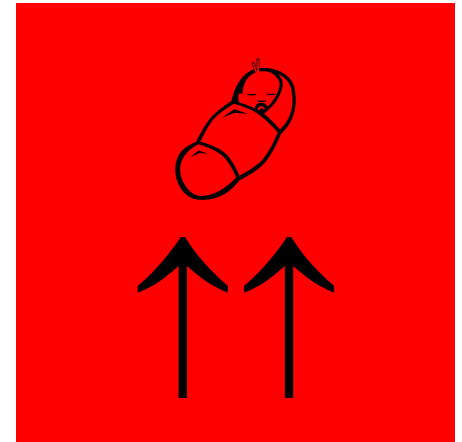
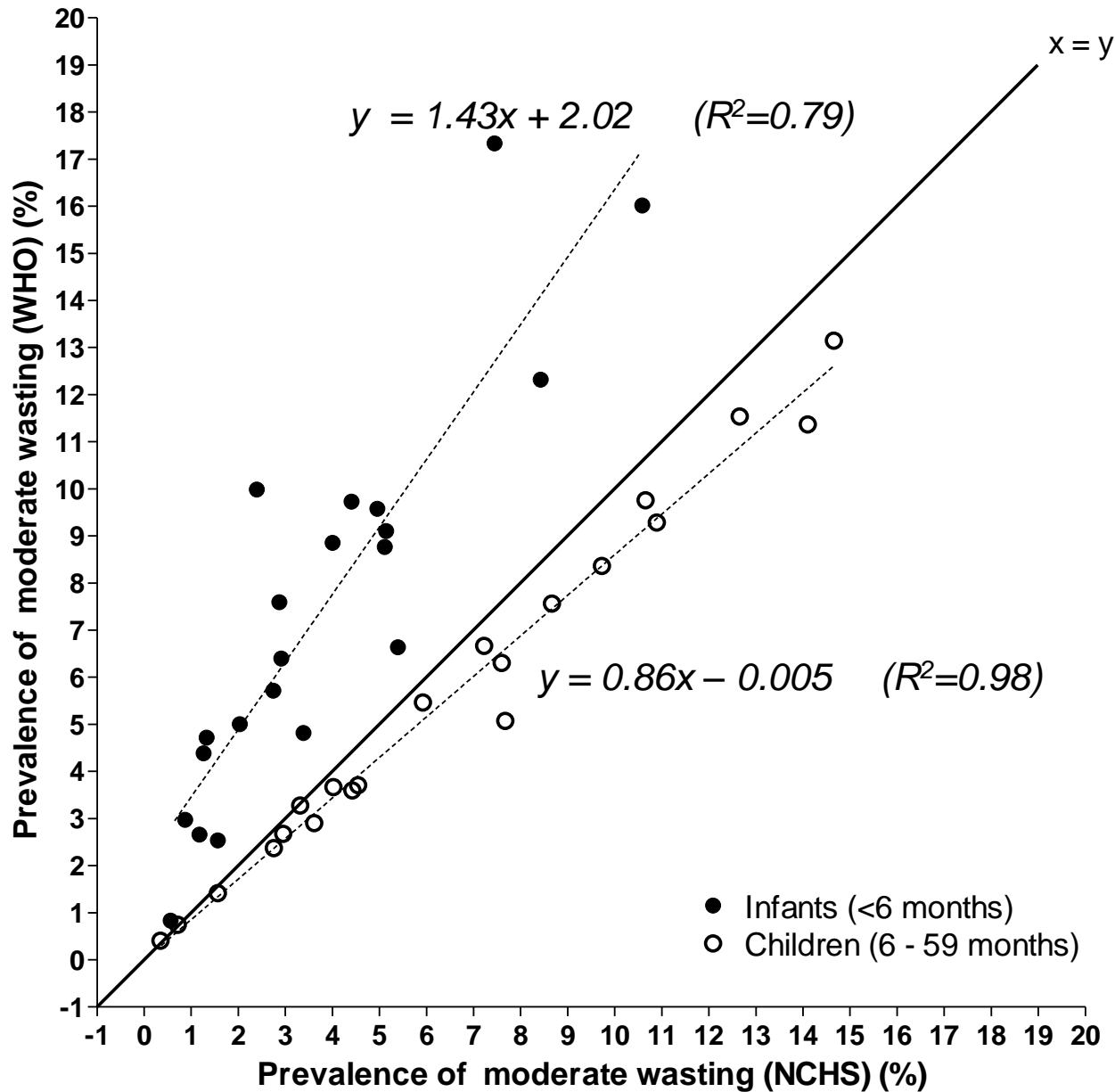


Results (3) - moderate wasting



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NCHS → WHO



Extrapolating to 55.8 million infantsU6m in all developing countries:

NCHS

Severe wasting:

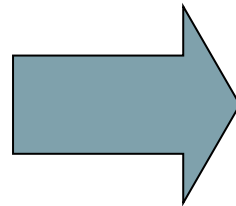
920,000

(95%CI 812,000 to 1,036,000)

Moderate wasting

2,757,000

(95%CI 2,571,000 to 2,951,000)



WHO

Severe wasting:

4,799,000

(95%CI 4,558,000 to 5,050,000)

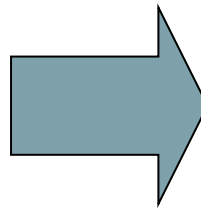
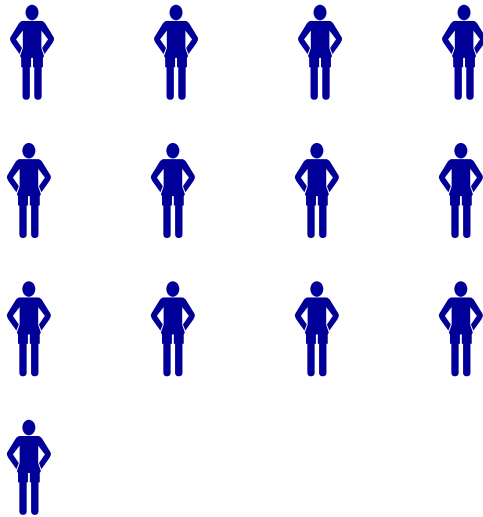
Moderate wasting

5,446,000

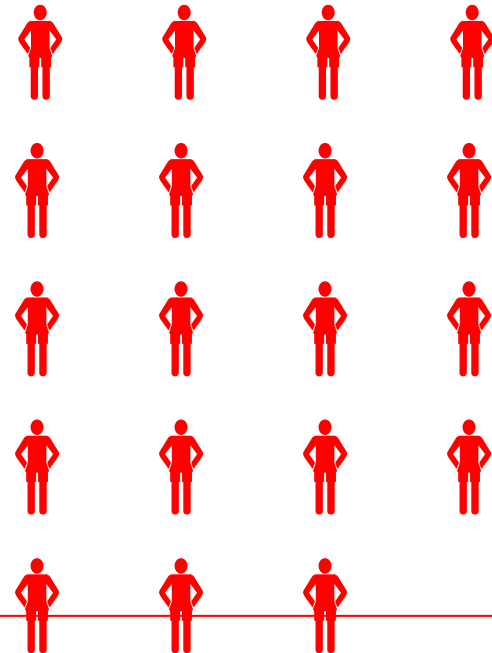
(95%CI 5,189,000 to 5,710,000)

Effect of WHO-GS:

13 million
(NCHS)

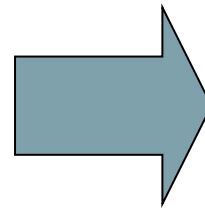
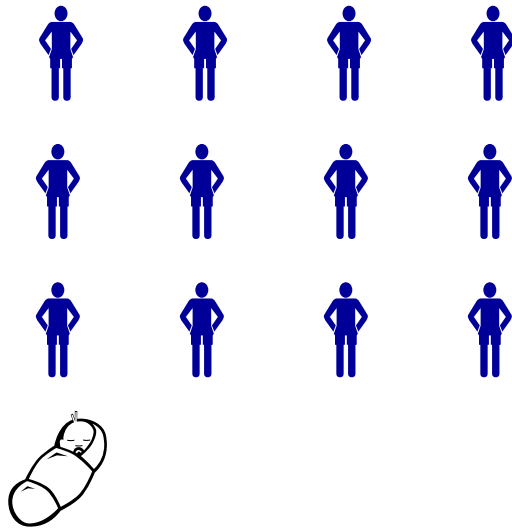


19 million
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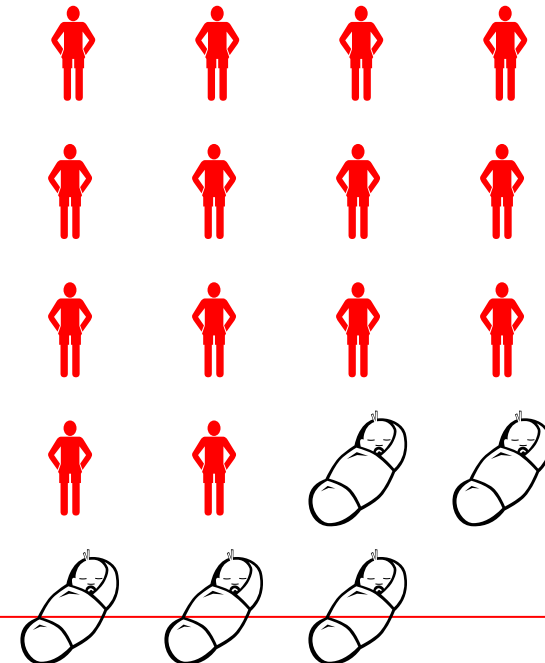


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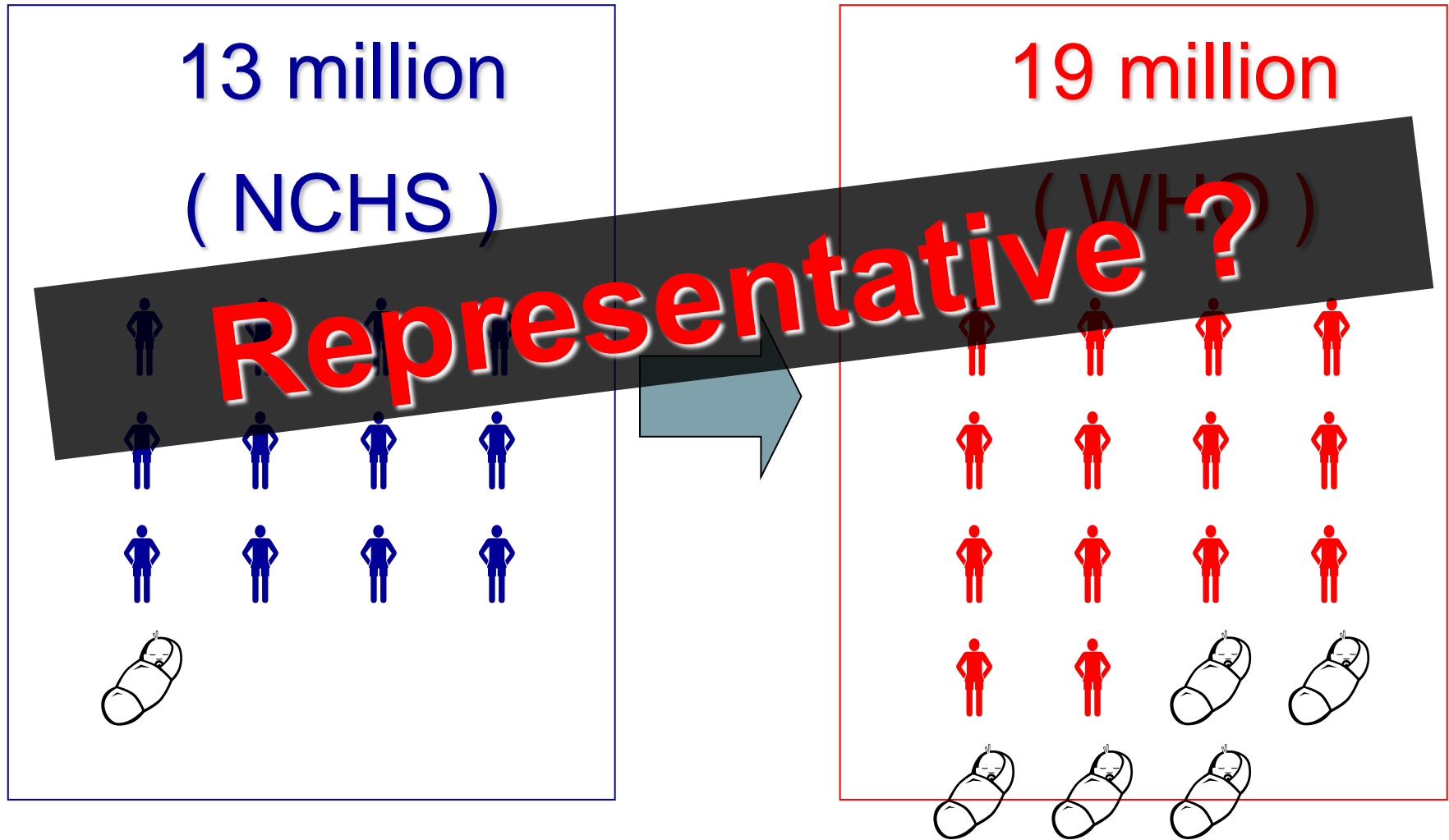


19 million
(WHO)



DISCUSSION

Urgent further work (including <6 month infants in surveys)



Preparedness

13 million

(NCHS)



19 million

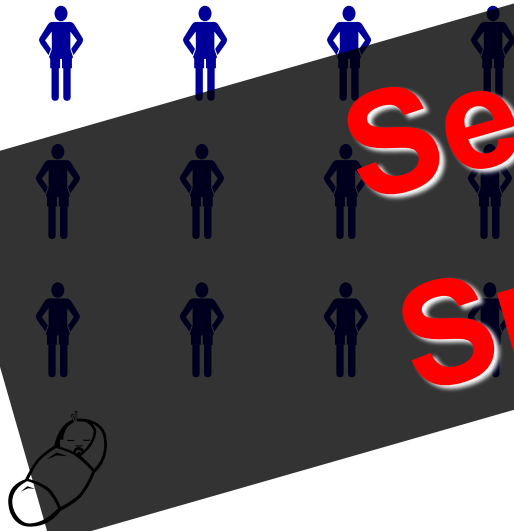
(WHO)



PLANNING ?
RESOURCES ?

Preparedness

13 million
(NCHS)



19 million
(WHO)



Sensitivity ?
Specificity ?



Risk/benefit analysis (children > 6 months)

Risks
minimal



Benefits

evidence based
programmes

- community-based
feeding programmes
can be scaled up

Risk/benefit analysis (infants <6 months)

Risks

- ↓ Exclusive
breast
feeding?



Benefits

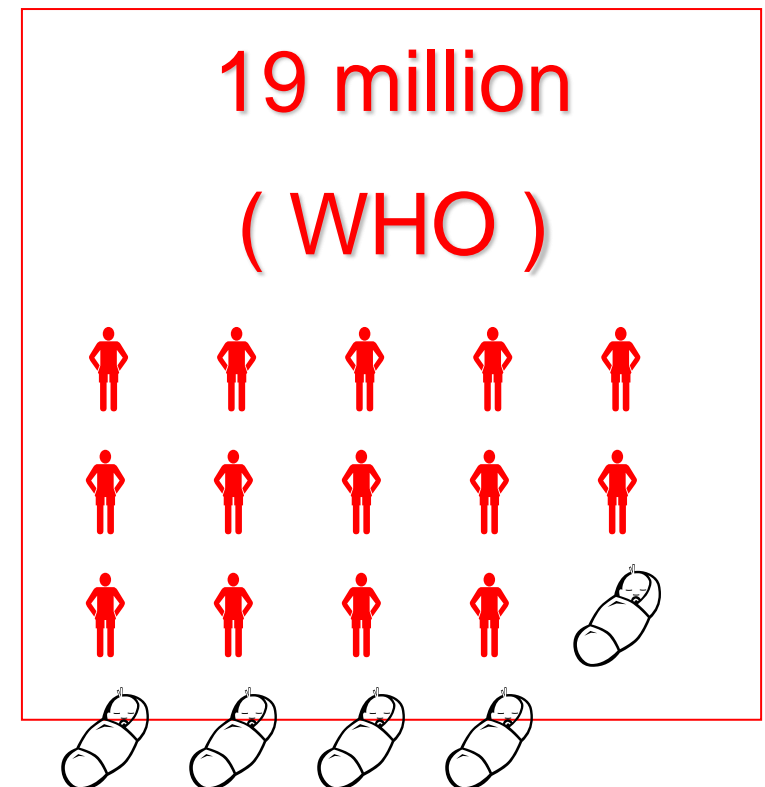
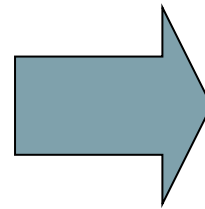
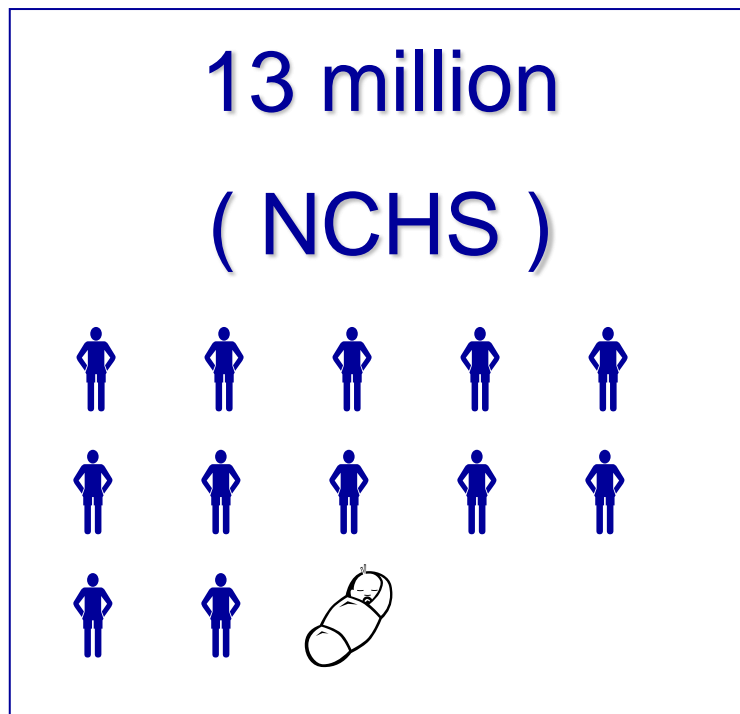
Possible early detection and
referral to:



CONCLUSIONS

Conclusions

- 1) Infant wasting is a public health scale problem
- 2) Increase in Dx wasting using WHO-GS → planning / resources
- 3) Post-rollout surveillance

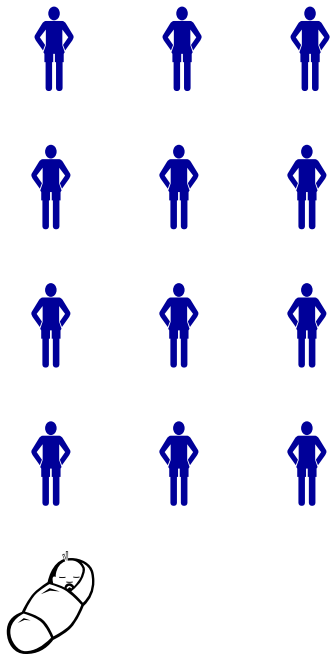


THANK YOU

We thank:

- UNICEF led Inter Agency Standing Committee (IASC) Nutrition Cluster for funding the MAMI project (Management of Acute Malnutrition in Infants), from which this work arose.
www.humanitarianreform.org/humanitarianreform/Default.aspx?tabid=74,
www.ucl.ac.uk/cihd/research/nutrition/mami
- MEASURE DHS (Macro International Inc., Calverton, USA) & all countries surveyed for DHS datasets

13 million
(NCHS)



sacn
Scientific Advisory Committee on Nutrition



The Royal College
of Paediatrics
and Child Health

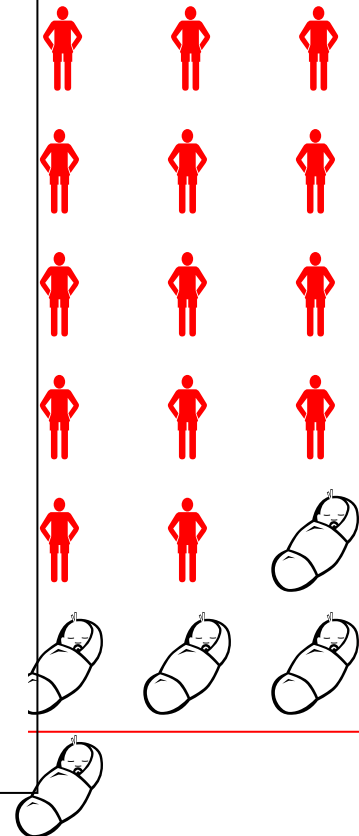
Application of WHO Growth Standards in the UK

Report prepared by the Joint SACN/RCPCH
Expert Group on Growth Standards.

August 2007

London: TSO

19 million
(WHO)



- 38 against the WHO Growth Standards, UK populations appear large at birth and show apparent ‘catch-down’ growth by around one centile band (0.67 SD) during the first 2 to 4 months. There is a risk that such an early growth pattern might discourage some families from continuing breastfeeding. Thus it is suggested that WHO Growth Standards be used only beyond that point.
39. It is therefore appropriate to consider the adoption of WHO Growth Standards from 2 weeks of postnatal age...

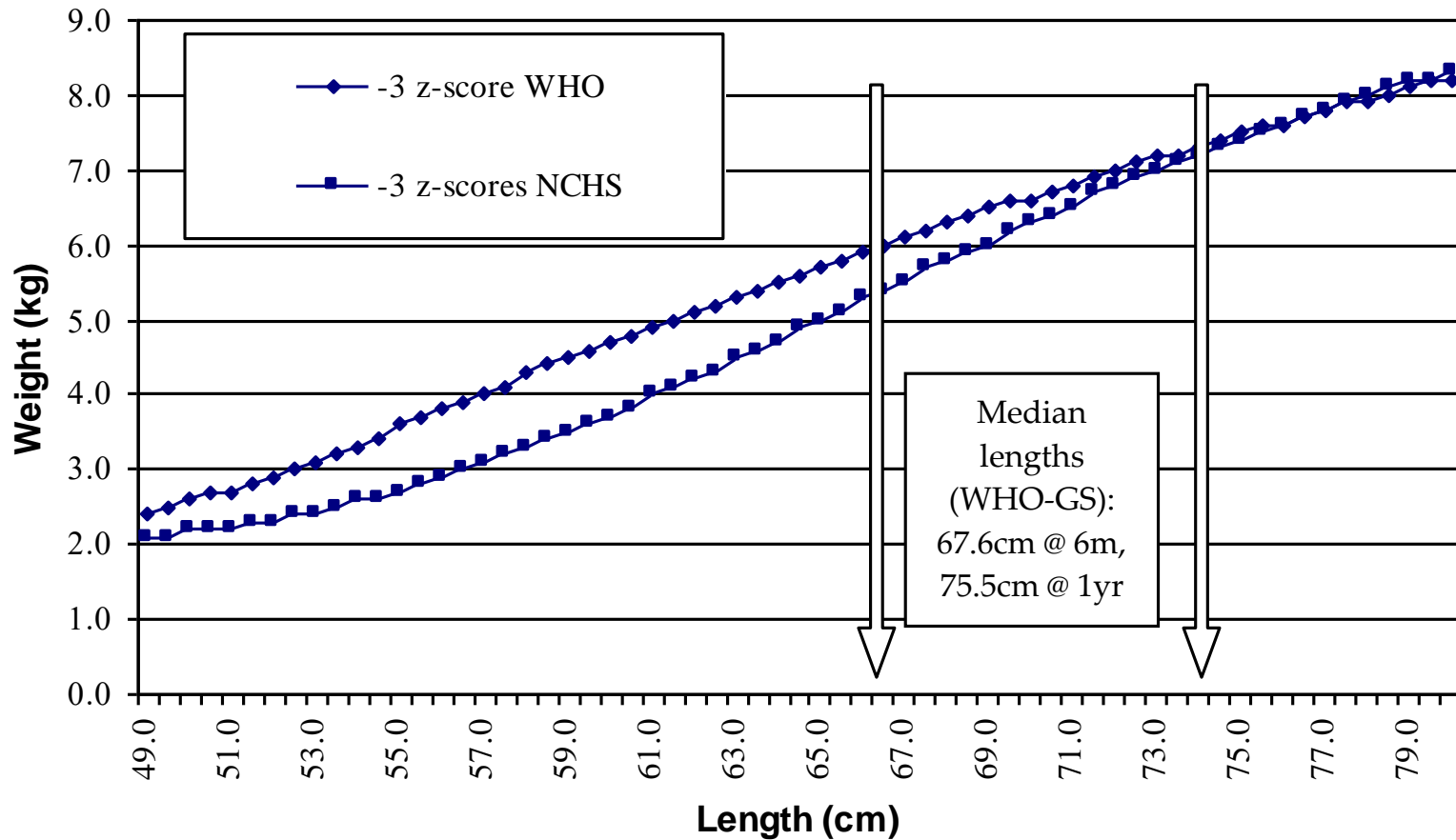


Figure 2. Weight cut-offs used to define wasting by either NCHS or WHO criteria. Arrows show median lengths at age 6 months and 1 year. The chart is for boys: girl’s charts follow a similar pattern.

March 2009

IASC Global Nutrition Cluster, and

*Standing Committee on Nutrition (SCN) Task Force on
Assessment, Monitoring, and Evaluation*

*Fact sheet on the implementation of 2006 WHO Child Growth
Standards for emergency nutrition programmes*

for children aged 6-59 months

Results (5) - feeding centre burden

