

# **MAMI: Management of At-Risk Mothers & Infants aged <6m**



LONDON  
SCHOOL of  
HYGIENE  
& TROPICAL  
MEDICINE



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# Vision

**Every infant u6m,  
*at every community / health-service  
contact point,*  
is nutritionally assessed &  
appropriately supported to  
*survive and thrive***

# INTERVENTIONS

- **BALANCES INDIVIDUAL & PUBLIC HEALTH PERSPECTIVE**
  - *Many* factors could underlie infant u6m 'malnutrition'
  - tailored assessment / treatment for individual patient
- **LOW RISK** intervention
  - can afford sensitive rather than specific case def
- **SIMPLE**
  - Scalable model
  - *For front-line community staff*
  - *Linking existing services*
- **PLAUSIBLE / ACCEPTABLE**
  - Learning from previous success (*IMCI*)



**Anthro. deficit = 'a finding on exam'**  
→ just the *START* of a diagnostic process

**e.g infant(s) with  
WAZ <3**

“low wt-for-age.”?

“severely  
underweight?”

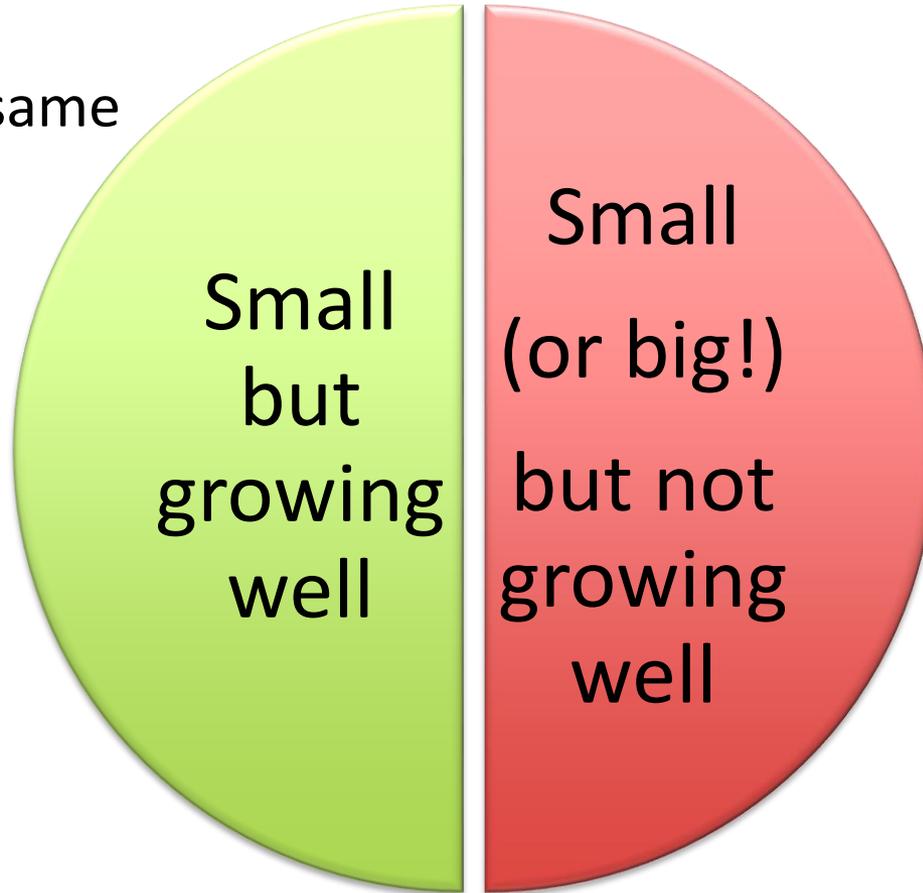
“malnourished?”

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All "malnourished"?

All needing the same management?

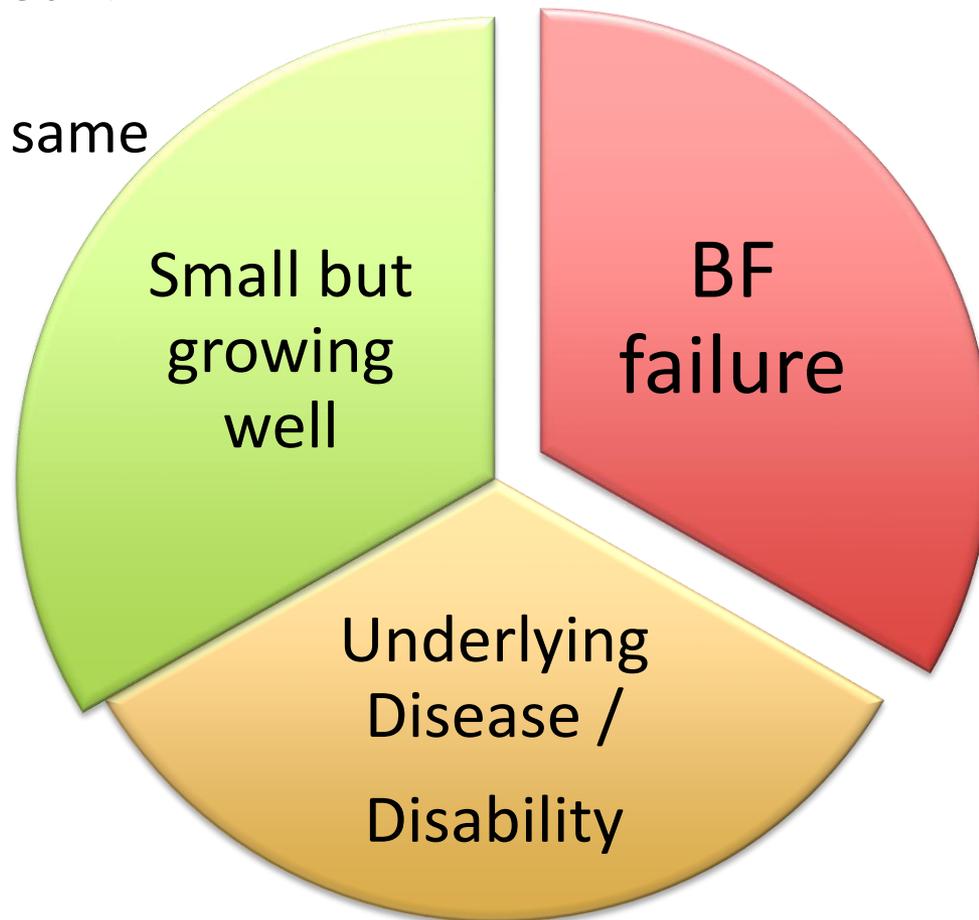


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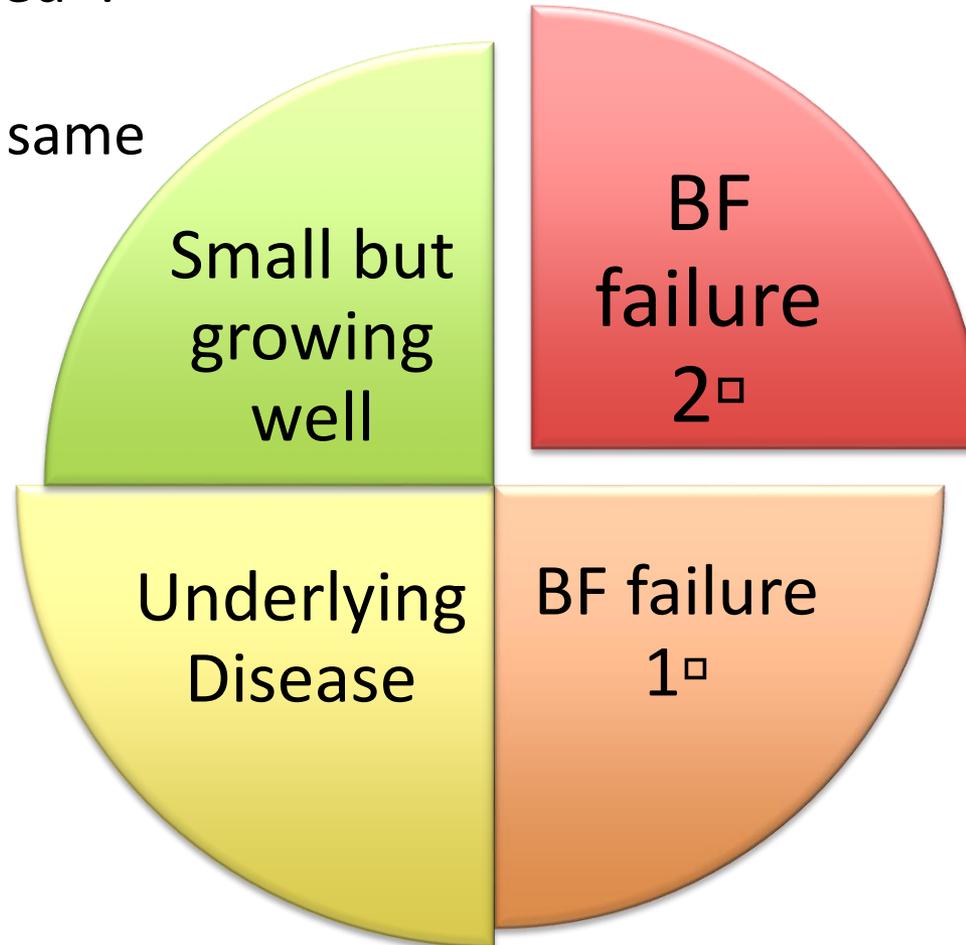


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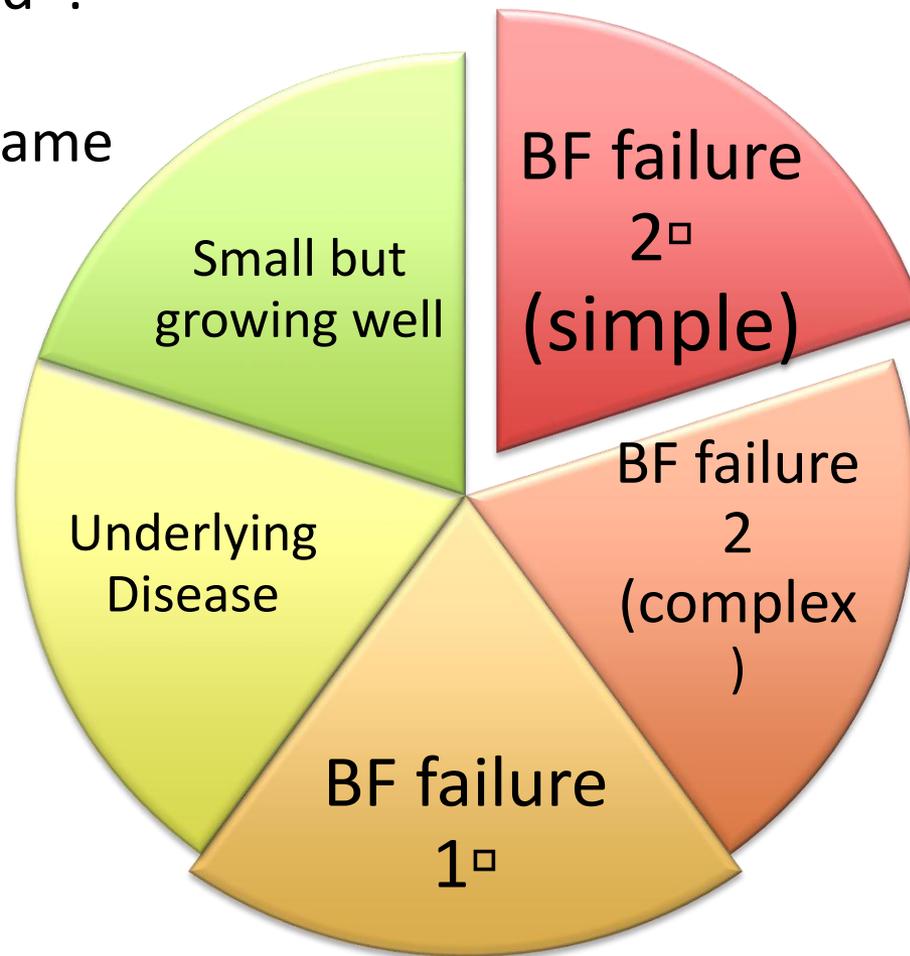


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# MAMI

## 'Labelling' all small babies (as 'SAM')

### Risks

- ↓ Exclusive  
breast  
feeding?



### Benefits

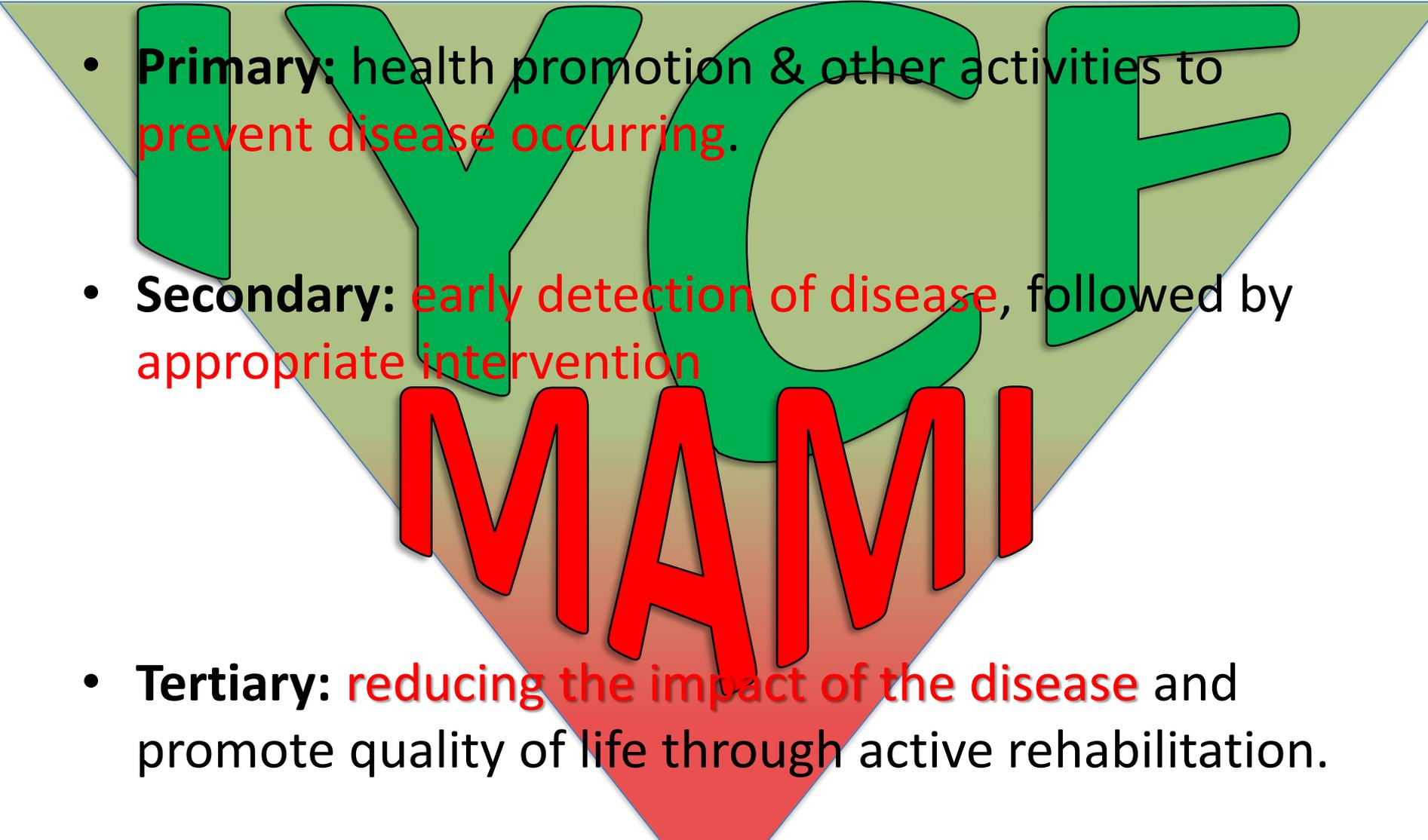
???

→ *Vulnerable /at-risk  
infants*

→ *BF support is key  
emphasis on feeding quality  
over size:*

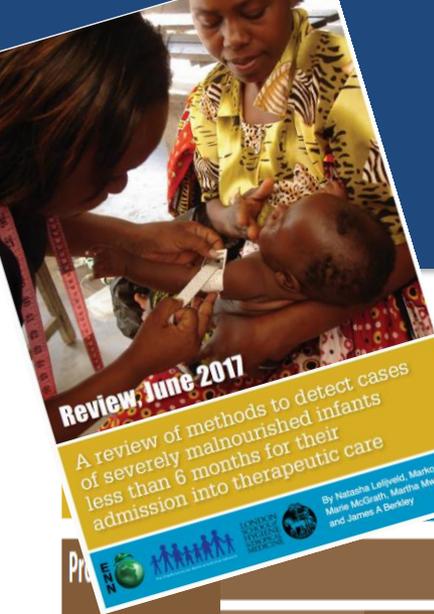
*treat the patient not the z-score!*

# The context (prevention types...)

- 
- **Primary:** health promotion & other activities to prevent disease occurring.
  - **Secondary:** early detection of disease, followed by appropriate intervention
  - **Tertiary:** reducing the impact of the disease and promote quality of life through active rehabilitation.

# MAMI

## Which anthropometric indicator?



**Review, June 2017**  
 A review of methods to detect cases of severely malnourished infants less than 6 months for their admission into therapeutic care

of infant SAM against properties for detection methods in community settings

By Nabasha Laliyed, Marko Kerac, Maria McGrath, Martha Mwangome and James A Bentley

| Indicator               | Indicator          |                    |     |     |     |      |        |
|-------------------------|--------------------|--------------------|-----|-----|-----|------|--------|
|                         | Clinical* (infant) | Clinical* (mother) | W/A | L/A | W/L | MUAC | MUAC/A |
| Simplicity              | No                 | No                 | No  | No  | No  | Yes  | No     |
| Acceptability           | No                 | No                 | Yes | Yes | Yes | Yes  | Yes    |
| Cost                    | No                 | No                 | No  | No  | No  | Yes  | Yes    |
| Objectivity             | No                 | No                 | Yes | Yes | Yes | Yes  | Yes    |
| Quantitativeness        | No                 | No                 | Yes | Yes | Yes | Yes  | Yes    |
| Independence of age     | Yes                | Yes                | No  | No  | No  | Yes  | No     |
| Precision (reliability) | Unknown            | Unknown            | Yes | No  | No  | Yes  | Yes    |
| Accuracy                | Unknown            | Unknown            | No† | No  | No  | Yes  | No     |
| Sensitivity             | No                 | No                 | Yes | No  | No  | Yes  | Yes    |
| Specificity             | No                 | No                 | Yes | No  | No  | Yes  | Yes    |
| Predictive value        | Unknown            | Unknown            | Yes | No  | No  | Yes  | Yes    |

### Weight-for-age:

- WAZ <-3 and/or faltering growth
- Best identifies infants at high risk of death
- Captures 3 main groups:
  - a. In-utero risk (LBW, prem, IUGR)
  - b. Early growth failure <6 weeks
  - c. Later failure
- Avoids SAM/MAM split
- SIMPLE / already done in GMP

**MUAC in infants >6 weeks (coming soon!)**

[http://s3.enonline.net/attachments/2615/MAMI-June-2017\\_Final-SHARE.pdf](http://s3.enonline.net/attachments/2615/MAMI-June-2017_Final-SHARE.pdf)

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# 'c-MAMI' assessment / management tool

<https://www.enonline.net/c-mami>

## Guiding principles:

- “CHECKLIST” manifesto
- INTEGRATES IMCI & Nutrition (WHO 2013) guidance
- Considers support for MOTHER (+ family) as well as infants
- Individualised/tailored interventions

| 2. FEEDING ASSESSMENT  |  |   |   |   |
|--|--|---|---|---|
| ASSESS   | CLASSIFY   | ACT (MANAGE)  | CLASSIFY  | ACT (MANAGE)  |
| Breastfed Infant and Mother  | Moderate Feeding Problem: C-MAMI criteria  | C-MAMI Enrolment (Outpatient): Infant-Mother Pair   | No Feeding Problem: C-MAMI criteria   | Home Care   |
| <b>Breastfed Infant</b> <ul style="list-style-type: none"> <li>• Look: Is the infant well attached?                             <ul style="list-style-type: none"> <li>- Mouth wide open</li> <li>- Lower lip turned outwards</li> <li>- Chin touching breast</li> <li>- More areola above than below nipple</li> </ul> </li> <li>• Look: Is the infant suckling effectively?                             <ul style="list-style-type: none"> <li>- Slow deep sucks</li> <li>- Pausing</li> <li>- Audible swallowing</li> </ul> </li> <li>• Ask &amp; Listen: Find out how many breastfeeds in 24 hours</li> <li>• Ask &amp; Listen: Does the infant receives plain water, other liquids or foods?</li> <li>• Ask &amp; Listen: Does the infant refuse to breastfeed?</li> <li>• Look for thrush in infant's mouth</li> </ul> | <b>Any of the following</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Not well attached to the breast</li> <li><input type="checkbox"/> Not suckling effectively</li> <li><input type="checkbox"/> &lt;8 breastfeeds in 24 hours</li> <li><input type="checkbox"/> Receives plain water, other liquids or foods</li> <li><input type="checkbox"/> Refuses to breastfeed</li> <li><input type="checkbox"/> Check for oral thrush (candida)</li> </ul>   | <b>Refer to Breastfeeding Counselling and Support Actions</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Attachment: Section A: 1</li> <li><input type="checkbox"/> Effectively suckling: Section A: 2</li> <li><input type="checkbox"/> Frequency of breastfeeds: Section A3</li> <li><input type="checkbox"/> Exclusive breastfeeding: Section A: 4</li> <li><input type="checkbox"/> Oral thrush (candida): Section A: 11</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Plot and examine growth chart to monitor progress, including birth weight, if available</li> </ul>  | <b>Well Attached: all the following</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Mouth wide open</li> <li><input type="checkbox"/> Lower lip turned outwards</li> <li><input type="checkbox"/> Chin touching breast</li> <li><input type="checkbox"/> More areola above than below nipple</li> </ul> <b>AND</b> <b>Suckling well: all the following</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Slow deep sucks</li> <li><input type="checkbox"/> Pausing</li> <li><input type="checkbox"/> Audible swallowing</li> </ul> <b>AND</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> ≥8 in 24 hours</li> <li><input type="checkbox"/> No plain water/ liquids/foods</li> <li><input type="checkbox"/> No thrush in infant's mouth</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Praise, support, reassure</li> <li><input type="checkbox"/> General advice/counselling on:                             <ul style="list-style-type: none"> <li>- general age appropriate feeding and nutrition recommendations</li> <li>- routine healthcare services e.g. vaccinations, growth monitoring</li> </ul> </li> <li><input type="checkbox"/> Advise to return if new problem develops</li> </ul> |
| <b>Mother</b> <ul style="list-style-type: none"> <li>• Listen: Find out if the mother thinks she hasn't enough breast milk</li> <li>• Listen: Find out if the mother lacks confidence about feeding</li> </ul> <b>Breast Condition: Identify any of the following</b> <ul style="list-style-type: none"> <li>• Ask &amp; Look: Engorgement</li> <li>• Ask &amp; Look: Sore &amp; cracked nipples</li> <li>• Ask &amp; Look: Plugged ducts</li> <li>• Ask &amp; Look: Mastitis</li> <li>• Ask &amp; Look: Flat, inverted, large or long nipples</li> <li>• Ask &amp; Look: Itching of nipples or breasts (thrush)</li> </ul>  | <b>Mother: either of the following</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Perception of not having enough breast milk</li> <li><input type="checkbox"/> Lack of confidence about feeding</li> </ul> <b>OR</b> <b>Breast Condition: any of the following</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Engorgement</li> <li><input type="checkbox"/> Sore &amp; cracked nipples</li> <li><input type="checkbox"/> Plugged ducts</li> <li><input type="checkbox"/> Mastitis</li> <li><input type="checkbox"/> Flat, inverted, large or long nipples</li> <li><input type="checkbox"/> Itching of nipples or breasts (thrush)</li> </ul> | <b>Mother</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Perception of not having enough breast milk: Section A: 5</li> <li><input type="checkbox"/> Lack of confidence about feeding: Section A: 6</li> </ul> <b>Breast Condition</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Engorgement: Section A: 7</li> <li><input type="checkbox"/> Sore &amp; cracked nipples: Section A: 8</li> <li><input type="checkbox"/> Plugged ducts: Section A: 9</li> <li><input type="checkbox"/> Mastitis: Section A: 9</li> <li><input type="checkbox"/> Flat, inverted, large or long nipples: Section A: 10</li> <li><input type="checkbox"/> Thrush: Section A: 12</li> </ul> | <b>Mother</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Confident about infant condition, and breastfeeding</li> <li><input type="checkbox"/> Reports no breastfeeding problem and no concern</li> </ul>  | <ul style="list-style-type: none"> <li><input type="checkbox"/> Praise, support, reassure</li> <li><input type="checkbox"/> General advice/counselling on:                             <ul style="list-style-type: none"> <li>- general age appropriate feeding and nutrition recommendations</li> <li>- routine healthcare services e.g. vaccinations, growth monitoring</li> </ul> </li> <li><input type="checkbox"/> Advise to return if new problem develops</li> </ul> |

# 'c-MAMI' assessment / management tool

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## Infant AND mother

TRIAGE: danger signs of very severe disease

**(A)**nthropometric/Nutritional Assessment

**(B)**reastfeeding Assessment

**(C)**linical Assessment

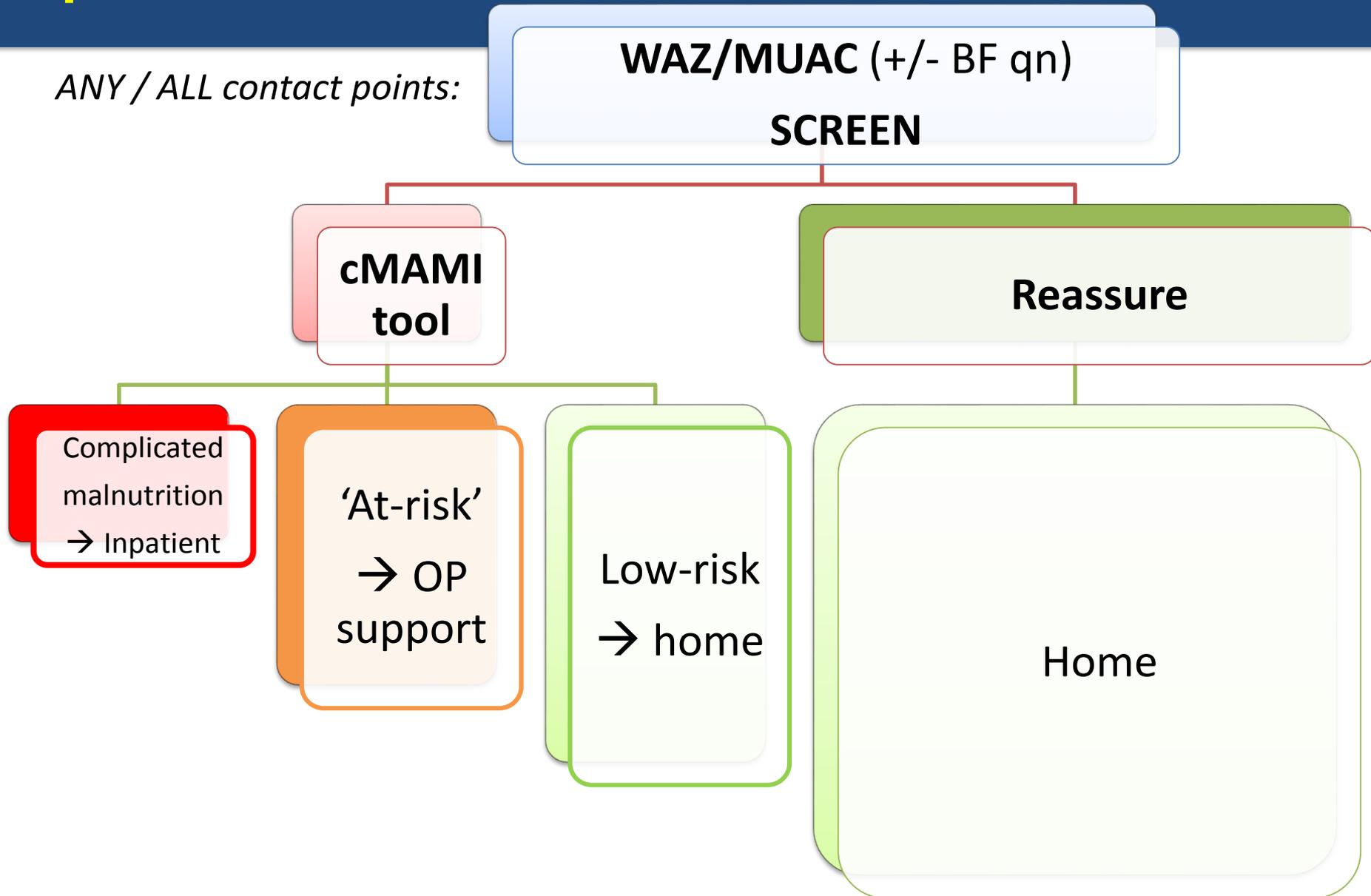
*+ for mother/carer only:*

**(D)**epression/Anxiety/Distress (+Social issues)

# 'c-MAMI' assessment / management tool

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*ANY / ALL contact points:*



# Many problems → simple solutions

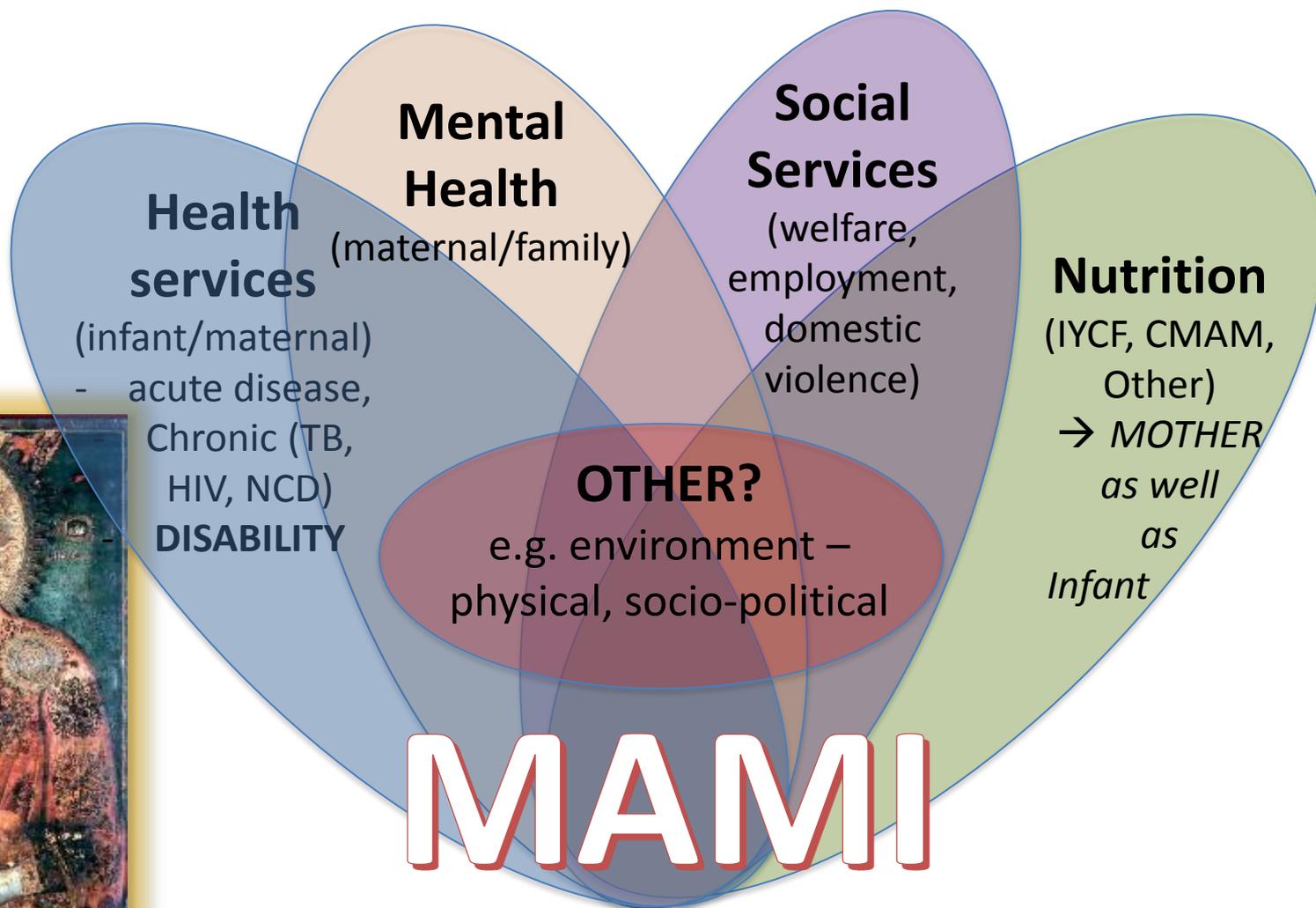
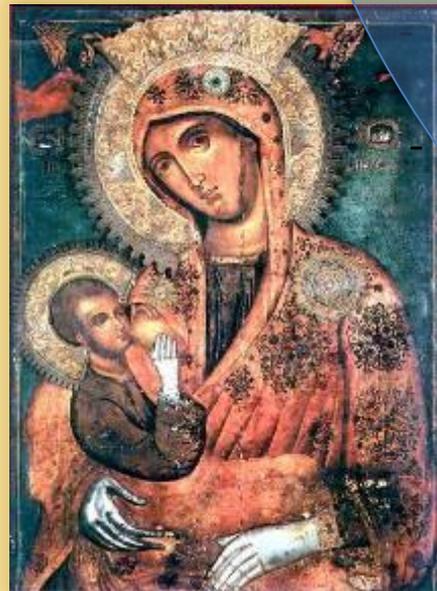
(deliverable at community-level)

| Image   | Symptoms/Signs of Good Practice   | Good Practice: Yes or No | Counselling and Support Actions  |
|---|---|--------------------------|--|
| <b>1.1 Good Attachment</b>  |   |                          |  |
| <p><b>Observe breastfeeding:</b></p>   | <ol style="list-style-type: none"> <li>1. Infant's mouth wide open</li> <li>2. Lower lip turned outwards</li> <li>3. Chin touching breast</li> <li>4. More areola visible above than below the mouth</li> </ol> |                          | <p><b>Note:</b> A good position is comfortable for the mother</p> <p><b>Show mother how to position the infant:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Infant's body should be in a <b>straight line (head, neck, trunk, and legs)</b>. <ul style="list-style-type: none"> <li>• Illustrate how vital this is by asking the mother/caregiver to drink or eat something herself with her head and neck flexed forward or turned to the side: swallowing will be difficult. Try the same with head/neck/body straight or tipped very slightly back – swallowing is much easier. Infants will similarly swallow much easier when held straight.</li> </ul> </li> <li><input type="checkbox"/> Infant's body should be <b>facing the breast</b>.</li> <li><input type="checkbox"/> Infant should be held <b>close to mother</b>.</li> <li><input type="checkbox"/> Position infant <b>nose to nipple</b> as infant is brought onto breast.</li> <li><input type="checkbox"/> Mother should <b>support</b> the infant's whole body, not just neck and shoulders.</li> </ul> <p>See video: <a href="http://globalhealthmedia.org/portfolio-items/breastfeedingpositions/?portfolioID=10861">http://globalhealthmedia.org/portfolio-items/breastfeedingpositions/?portfolioID=10861</a></p> <p><b>Show mother how to help the infant attach deeply:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Touch her infant's lips with her nipple.</li> <li><input type="checkbox"/> Wait until her infant's mouth is opening wide.</li> <li><input type="checkbox"/> Move her infant quickly onto her breast, aiming the infant's lower lip well below the nipple, so that the nipple goes to the top of the infant's mouth and infant's chin will touch her breast.</li> </ul> <p>See video: <a href="http://globalhealthmedia.org/portfolio-items/breastfeeding-attachment/?portfolioID=10861">http://globalhealthmedia.org/portfolio-items/breastfeeding-attachment/?portfolioID=10861</a></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> If infant not alert/doesn't open mouth, hand express drops of milk and apply on infant's lips to stimulate mouth opening.</li> <li><input type="checkbox"/> If latch is inadequate, try alternative positions.</li> <li><input type="checkbox"/> If not able to attach well immediately, demonstrate breastmilk expression and feeding by a cup.</li> </ul> |

FUTURE E-TOOLS → More sophisticated support

# Other (complex) issues:

- “Right relationships & links with other (existing) services



“Longpath” thinking:

→ ‘Goldilocks’ zone of infant growth



Too slow → 😞 (risk death/illness in short term)

“Just right” → ?? 😊 ??

Too rapid → 😞 (risk NCD → adult prem. death & disability)

In ONE generation or over several?

# “Longpath” thinking: Teleos (purpose)

## THRIVE as well as survive

What’s measurable / **WHAT MATTERS**

Development

→ ***Education,***

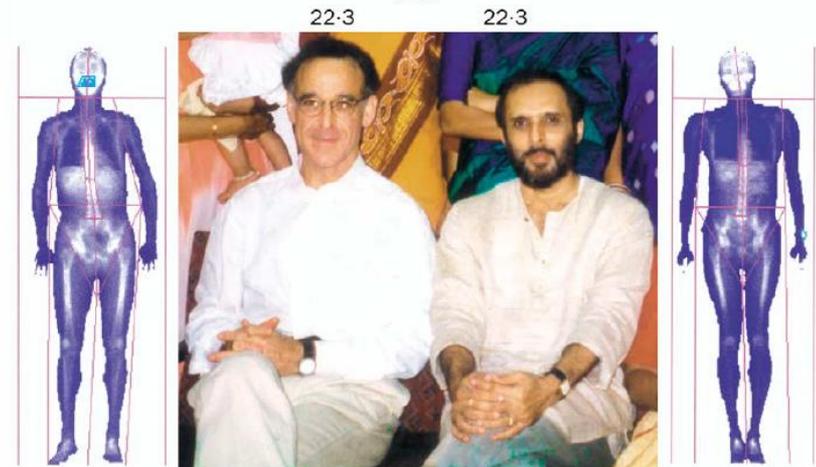
***human potential/capacity***



<http://www.globalfnirs.org/13-shedding-light-on-brain-development-in-gambian-infants>

Body Composition

→ ***later life NCD / disability/prem. death***



Body fat  
9.1%      21.2%

Yajnik CS, and Yudkin JS. 2004. The Y-Y paradox. *Lancet* 363:163. 10.1016/S0140-6736(03)15269-5

# Key messages

## ***Challenge → Opportunities (“Choppportunities”)***

### ***1. Low anthro (WAZ/MUAC) is a SIGN/SYMPTOM***

- *NOT a final diagnosis → individualized assessment/Mx is important*

### ***2. Coverage / community → capacity → impact***

- *MAMI treatment for high-risk infants <6m a GAP in nut services*
- *Simple, scalable interventions are key*
- *cMAMI tool:*
  - *Offers simple solutions to common problems (focus on BF support)*
  - *is link / entry point to other services*
  - *Draws on lessons from CMAM, IMCI*

### ***3. ‘Longpath’ thinking***

- *transgenerational: growth “just right”*
- *teleos – ultimate purpose = mortality, health, development, NOT size*

## *To discuss:*

- *Infants <6m in current (SAM) guidelines*
  - *Next update when?*
- *Infants <6m in local IM(N)CI guidelines*
- *Current IYCF capacity*
- *Current links btw nutrition<>other services*
- *Weight-for-age (MUAC) as main indicator of at-risk*
- ***Does YOUR country have interest/capacity for leading on implementation / evaluation of cMAMI?***

