Management of acute malnutrition in infants >6 months

(MAMI)

Turning challenges into opportunity: moving forward

Minutes of a one day meeting of interested practitioners and experts

London, 7th December 2012

Powerpoint presentations from the meeting available via:

https://www.dropbox.com/sh/5q6lmji6z5fjdy5/5EwPH69WTp

BACKGROUND & AIMS

Malnutrition is a major global problem affecting not just children but also some 3.8 million infants world-wide (severe acute malnutrition, SAM), with an additional 4.7 million having moderate acute malnutrition. Since the original MAMI (Management of Acute Malnutrition Project http://www.ennonline.net/research/mami) investigated the management of this patient group in 2008-2010, there have been several major advances. Most notable is the inclusion of this group in forthcoming World Health Organization Guidelines on the Management of SAM.

This aim of this meeting was to review progress since 'MAMI-1' and, recognizing their new place in international policy, to continue existing work and initiate new programmes in this area. Specifically to:

1. Begin developing a common assessment framework for infants <6m: identifying 'checklist items'/ tools / questions for assessing this patient group: discussing what is available; what might be recommended as current 'best practice'; what is the priority for future research
2. Discuss the formation of an inter-agency, multi-professional MAMI 'network' for:
    a. Supporting current programmes (including M&E)
    b. Developing future programme (including research)

ACKNOWLEDGEMENTS

The meeting was organized and lead by Marko Kerac, University College London, together with Marie McGrath and Chloe Angood, ENN. It was supported by an Academy of Medical Sciences/Wellcome Trust/British Heart Foundation/Arthritis Research UK "Starter Grant" held by Marko Kerac. The ENN also gratefully acknowledge the support of Irish Aid to allow ENNs engagement in this meeting and to UNHCR for helping support some key individuals to attend.

This meeting was convened to piggy-back onto another two day technical meeting in London, for whose participants for whom the topic of MAMI was a known interest. We gratefully acknowledge the support of SCUK in allowing us to piggy-back onto the previous meeting and organize logistics. Additional and open invitations were also extended to others.

Minutes of the meeting are documented here. The agenda is included in Annex 1 and list of participants in Annex 2.

The morning comprised a series of presentations of initiatives and research around MAMI. The afternoon session comprised of working groups that focused on specific aspects of MAMI, in order to inform and move towards standardizing future assessment criteria.

Any queries, contact: **Chloe Angood, email: chloe@ennonline.net**

A. Presentations

Background and welcome – Marko Kerac

Key points from presentation:

MAMI is a challenge to be converted into an opportunity. A common assessment framework for infants<6 months is needed as well as an active, managed MAMI 'network' to support current and future programmes, possibly inspired by the Vermont Oxford Network (VON)[1].

Why do some things, like community based management of acute malnutrition (CMAM), fly? This is perhaps because they have a relative advantage, compatibility (e.g. with existing health systems), simplicity, ability to trial and easily observable benefits. Can we design interventions like this for MAMI?

Traditionally we have looked only at the infant, however, SAM is perhaps better seen as a symptom of problems elsewhere, notably problems in key relationships: between the infant and mother, the wider family and the health system.

Using the new growth standards, more infants <6 months are defined as having SAM. However, infants cannot be admitted on anthropometry alone, as the risk of supplementation is much greater in this age group. Feeding and clinical assessments are also necessary.

During the MAMI 1 project it was clear that merging datasets for this age group was very difficult. More harmonization in reporting is needed. Interpreting data is also not straightforward as, for example, programmes have infants and children at different stages of severe acute malnutrition (SAM) (uncomplicated versus complicated versus terminal). Interventions are needed for the whole population that are also directed to high risk populations. Challenges shown as difficult to manage include breastfeeding and HIV, orphans, managing steady supplies of formula, addressing maternal factors (mental health) and identifying cases.

MAMI is an opportunity to do something early on, during the first 1000 days of life. Research needs to be converted into policy. We know that we have low quality evidence at the moment but sometimes we may know what to do. We need to be asking the right questions with the right research design. Steps are being taken, for example, assessment tools will be tested in a research programme in Malawi.

Research priorities in infant <6 month SAM: MAMI CHNRI results – Chloe Angood

Key points from presentation:

A process was carried out, led by UCL and the ENN, to prioritize MAMI research questions using the Child Health and Nutrition Research Initiative (CHNRI) methodology. An informal 'core' research group defined the research area and came up with a short list of 60 research questions. This was put onto Survey Monkey and experts were contacted to carry the survey out.

64 experts took part. Generally all questions scored high, particularly those in the top set, which show that research in this area is seen as important. The top 10 research questions were as follows:

1. *How should infant <6 month SAM be defined?*
2. *What are the key opportunities/ timings where infant SAM management can be incorporated with other healthcare programmes?*

[1] http://www.vtoxford.org/

3. *What are the priority components of a package of care for outpatient treatment of infant<6 month SAM?*
4. *Having detected SAM in the community, what is the efficacy of providing targeted skilled breastfeeding support to caregivers of stable infants?*
5. *How can existing tools be adapted and/or linked together to better identify and manage infant<6 months SAM?*
6. *What are the most feasible tools and techniques for assessing treatment programme coverage for infant<6 month SAM?*
7. *What is the feasibility, effectiveness and cost (effectiveness) of different approaches to promote early initiation and exclusivity of breastfeeding?*
8. *What are the main barriers to existing inpatient interventions for infant <6 month SAM and how might they be best addressed?*
9. *What is the effectiveness, cost (effectiveness), and safety of an outpatient focused treatment model for <6 months uncomplicated SAM cases?*
10. *Which supervision tools and approaches are most effective towards improving the front-line case management of infant <6 month SAM?*

This research exercise has limitations, however, it represents a collaboration between different individuals and groups to create joint MAMI research priorities. Themes of the prioritized questions include measuring infants SAM, integration of MAMI, breastfeeding support and assessment of coverage. The challenge is raised.

Questions and comments:

Nigel Rollins expressed surprise at the bottom five questions. In the development of the WHO Nutrition Guidance Expert Advisory Group (NUGAG) guidelines for MAMI there is growing momentum towards breastmilk banking and consideration of early introduction of ready to use therapeutic foods (RUTF) at five months, as examples. Some of these are important issues. Marko Kerac responded by explaining that the questions had to be limited and those at the bottom of the list still scored relatively high; others may have scored lower.

Nigel Rollins also pointed out that there may have been selection bias in the process of selecting experts to take part in the survey. Were ministries of health and national programmers consulted, for example? Also, were the experts largely Africa-based, as issues in South East Asia are very different? It might be interesting to analyse data according to who the participants were, e.g. programmers, policy makers, donors, etc.

Nigel also asked if bias could have been avoided by shuffling the research questions? Chloe Angood and Marko Kerac answered that this was done in some ways by dividing the questions into two parts to be completed in a different order and also by asking people to judge by research criterion rather than question, so that questions are judged against each other. The group will submit the results online in the form of an excel spreadsheet so that people can look at other sub-analyses of the data by informant type for example

New WHO Guidelines on infant <6 month SAM: NUGAG update – Nigel Rollins

Key points from presentation:

Current guidelines for the management of SAM are spread across different documents which carry different weight. A GRADE approach[2] is being used to extract all statements, analyze the evidence and come up with recommendations. This takes time. Priority areas have been designated over the last two years and experts brought together to examine seven areas in the first round, including infants <6 months of age as one priority area. The intention of the GRADE process is to be clear about the evidence base behind the recommendations for transparency. If recommendations are based on experience and opinion, and not published gold standard evidence, then this should be stated.

[2] http://www.gradeworkinggroup.org

Infant < 6 month questions were formulated into PICO[3]. There are no randomized control trials (RCTS) in all PICO areas. Nigel Rollins made a plea to researchers to always use the WHO criteria as the control so that evidence can be used to modify WHO guidelines. Existing questions include: what are the criteria for defining SAM in infants <6 months? What is the criterion for hospital admission? What are the essential interventions for this age group? What are the criteria for transferring infants <6 months from inpatient to outpatient care or to discharge?

There are seven relevant standing recommendations for the management of SAM in infants <6 months (described in the presentation). Research priorities include: what is the predictive value of population derived thresholds for weight for height (WFH), mid upper arm circumference (MUAC) and reduced growth velocity with or without oedema to identify infants at high risk of mortality (taking into account regional variations)?; What constitutes safe and effective therapeutic feeding? How is breastfeeding most effectively re-established? There are also other questions about adaptive changes in infants, use of RUTF in infants <6 months, the management of infants age 4-6 months, folic acid supplementation and drug dosage.

There is existing concern amongst IMCI (Integrated Management of Childhood Illness) practitioners in all regions about the complexity of a two stage process (MUAC and then appetite test) in primary care centres for all children. There is even more concern about trying to assess effective feeding in these settings. The issue of differentiating complicated from uncomplicated cases is deemed too complex and so all infants<6 months are referred for inpatient care. Negotiated compromises are needed in the meeting of evidence and practice.

Questions and comments:

Robert Stewart asked what is the rationale for diverting from low protein F75 to breastmilk as the first line intervention in this age group? Nigel answered that infants with or without oedema are distinct. The uncertainty around the metabolic environment of that infant is problematic. The 2004 report looked at whether feeding should be in two groups and the bottom line is that there is no primary data and recommendations are based on opinion.

Jay Berkley commented that he had never seen oedema in infants < 6 months. Laura Newberry commented that, in Malawi, she did observe it in her operational sites but rarely, maybe 1 out of every 50 infants. It was commented that other centres in Malawi have a significant caseload. Jay also commented that inpatient SAM treatment is enormously time consuming requiring multiple health professionals. How do we compress this care so that it works in a rural environment? Or into a deliverable public health strategy? Nigel agreed that, in terms of integration into health systems, the starting point should not be outpatient therapeutic programmes (OTPs) but primary health care facilities where resources are very limited.

Anthropometric Assessment – Martha Mwangome and Jay Berkley, Kenya

Key points from presentation:

Martha Mwangome: There are two papers that present data on the reliability and accuracy of anthropometry among infants< 6 months of age, one from rural Kenya and the other from rural Ethiopia. Conclusions from the papers are that community health workers can be trained to take reliable and accurate absolute MUAC, weight and length measurements for infants aged 0-6 months, but length related z-score indices are less reliable. With defined cut off values, MUAC can be used for community based screening of SAM in infants.

[3] The defined GRADE framework of patient/intervention/comparator/outcome (PICO)

In terms of MUAC cut-off points, only one study is available which points to the conclusion that MUAC taken around the time of vaccination is predictive of infant death at any cut off below 115mm. A lesser cut off point may be used to identify very sick children, e.g. 105mm, but if the programme is less intensive and non-therapeutic or to scale up breastfeeding then you may want to use 110mm

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Jay Berkley: Data from Kilifi, Kenya, of the MUAC of infants age 2 to 6 months and mortality data after discharge was merged. Cut offs for MUAC should be set where mortality starts to rise. In the 2-6 month age group low MUAC is associated with high risk of mortality and this risk becomes very high below 110mm. Modeling for ages 2-3 months and 4-5 months tells us that the cut off is the same. Therefore, it may be possible to use a single cut off for 2-6 months. If MUAC is less than 110mm, then this has a dramatic effect on mortality after discharge - 4% mortality above 110mm compared to 30% mortality below 110mm, which is highly significant.

Weight for Length (WFL) z scores show a similar pattern, but the curve goes up less steeply. However, age has a greater effect, so that there is a different mortality rate for age 2-3 months compared to age 4-5 months. HIV exposure reduces the effect of low MUAC on mortality.

Comments and questions:

Nigel Rollins commented that Jay analyzed the follow up of children who had been admitted, treated and discharged using their admission MUAC, i.e. a sub population of all children. What was the mortality risk of those infants not admitted to hospital? What happened in the non-admitted population? Jay responded that he sees that limitation, which is the primary motivation for using a Gambia dataset for further analysis.

Nigel commented further that MUAC 105mm represents a z score of <-5, which is extreme. Jay agreed that this is indeed very severe and that 110mm would look right for the Gambian population and this population. However, this represents a large proportion of the population in some countries. The question here is, what intervention will this lead to? Can we intervene for 14% of the population?

Patrick asked if there is any information on causes of death? Mortality has been identified but we don't know the cause. We may assume that this is SAM but it may not necessarily be so. Jay responded that all of these deaths are caused by infection.

Breastfeeding assessment tools – Karine Le Roch, ACF France

Key points from presentation:

Karine presented a review of breastfeeding assessment tools for use in low resource settings with a high burden of under nutrition. This is an updated literature review since a similar review in the MAMI 1 report. A total of 45 tools were identified and 24 selected and included in the review. Four tools were finally selected, including the Breastfeeding evaluation and education tool (not validated), CARE guidelines (not validated), UNICEF Breast feeding initiation guidelines (a good tool, though based on weak evidence) and the WHO/UNICEF b-r-e-a-s-t checklist (in spite of its limitations).

There is no clear gold standard tool for assessing breastfeeding. The effectiveness of these tools in low resource settings with high burden under nutrition is not known. It may not be realistic to have a single tool.

Comments and questions:

Marko commented that we need something simple that could be slotted into the IMCI questionnaire, perhaps the equivalent of the appetite test. The big problem is that those tools that exist are not well validated.

Nigel Rollins suggested that another option would be, within the WHO tool, to combine different elements to be more efficient. To what extent is the problem with breastfeeding one of positioning and attachment or other things that these assessments will not pick up? Marko commented that pediatricians are not trained to assess breastfeeding. Perhaps a simple checklist will help, but maybe we should also continue with other assessments. Another comment was made that pediatricians can't get it right in a neonatal unit in the UK; how will we get it right in low resource settings?

Making a clinical distinction between complicated and uncomplicated SAM in infants <6 months – Isioma Onyekpe, UCL

Key points from presentation:

The objective of this study was to find out which infants <6 months with SAM can be safely treated in the community. Clinical signs are needed that are simple, objective and that can be easily taught to community health workers.

All of the studies selected for the review were observational studies, not specifically designed to answer the research question. Findings therefore had to be extrapolated. Most studies were carried out in Africa and therefore results are not necessarily representative of infant SAM in other continents.

Clinical signs with high association with death include abnormally slow pulse, impaired consciousness, hypothermia (<45 degrees), pallor (very pale), diarrhea (symptom not sign, but found to be associated), signs of shock, signs of septicemia and signs of dehydration. Other clinical signs were presented with the highest odds for mortality. The data have limitations. The studies were not designed to answer the research question, numbers are small and results have not been stratified or disaggregated by age group. Studies are also not always comparable. Therefore, reliable conclusions are difficult.

Questions and comments:

Jay Berkely urged caution in using signs from papers, as data are from hospital patients where somebody has already decided to admit them, rather than in the context of deciding whether or not to admit them. Real caution is therefore needed in using them. Marko commented that, in spite of these limitations, some commonality is a helpful first step.

Maternal mental health and infant undernutrition – Robert Stewart, University of Manchester

Key points from presentation:

Robert reported the results of a study into the prevalence of maternal common mental disorder (CMD) in Africa. High levels of psychological morbidity were found antenatally and postnatally. Postnatal levels were found to be 14-18%. Therefore this is a common problem. Similar issues have been found on the Indian subcontinent.

An association has been found between maternal CMD and infant stunting and underweight. Results of cohort studies suggest that this peaks 4-6 months postnatally but lessens after this. There is also evidence for an

association between maternal mental health and breastfeeding (early cessation of breastfeeding) and increased frequency of infant episodes of diarrhea.

Maternal depression may be associated with poor infant growth in both ways. Having a child that is growing poorly may lead to stigma and depression. There are also shared factors, such as socioeconomic disadvantage, that may impact on both.

One study showed that cognitive behavior therapy by community health workers for mothers with depression and their infants in rural Pakistan was good at treating depression, but didn't have a significant impact on infant weight (although it did reduce the frequency of diarrhea).

Risk factors for postnatal CMD may include antenatal CMD, lack of social support, marital conflict and gender based violence, amongst other factors.

A number of screening tools are needed for maternal depression and CMD, adapted and validated for this purpose such as the Patient Health Questionnaire (PHQ); PHQ2 (which is the first two questions of PHQ 9[4]) is not validated, but may be useful as a very simple tool.

The relationship between maternal wellbeing and nutrition of child is not straight forward and cannot be looked at in isolation from assessment of risk factors associated with CMD e.g. situation at home and interaction between the mother and child (e,g. has the depression impacted on breastfeeding?).

Comments and questions:

Andre Briend commented that the presentation did not cover maternal diet; there is lots of literature about fatty acids status of mother and depression which may be relevant in places with low access to fish or access to the wrong kinds of fats; B vitamins are also important. Robert commented that this may be a confounding issue as mother and child have impaired nutrition and this is causing the relationship between the two. It would therefore indeed be important to look at this.

Disability and malnutrition - Chipo Githinji, London

Key points from presentation:

The presentation looks at the angle of disability causing malnutrition. Traditionally it is seen that children with disabilities inevitably suffer from malnutrition, however, in high income settings, work is put in to optimize nutrition in these children. How much of this can we use in other settings?

Experiences from the Cheshire Disability Unit in London, UK were shared. One of most common causes of disability is cerebral palsy. Up to 50% have difficulties with feeding in first year of life. There are underlying reasons for this link, including: structural abnormalities (e.g. cleft lip, or more complex conditions affecting the face, jaw and mouth), abnormality of tone, posture and movement, (e.g. unable to support head or trunk control, disorders of muscles, etc, and some congenital problems).

It has been shown that in children with disabilities the nutrition status is in general poorer than in non disabled children. There could be some modifiable factors that could be addressed.

The aim of assessment would be to identify undiagnosed contributory factors and identify severity/ complications (relies a lot on clinical acumen at the moment for physical examination) and feeding

[4]PHQ 9 at http://www.ncbi.nlm.nih.gov/pubmed/11556941

assessments (i.e. how the child feeds, reflux, constipation, etc). Can some of these things be tied into other assessments? The challenge is to conduct disability assessment without the level of resources available in the UK in low resource settings. What are the 1 or 2 key questions to ask?

Comments and questions:

Marko commented that managing disability is a complex area, even in resource rich settings. However, just because we can't do everything, we shouldn't not do anything. Disability is an important area to explore in future work.

B. Working Groups

The aim of the working groups was to come up with a shortlist for first line assessment in each area of anthropometry, breastfeeding and maternal mental health, and clinical assessment (best current options) and ways forward. Feedback from working groups was as follows:

Working Group 1: Anthropometry

Preamble:

- At risk of growth faltering, MAM and SAM. There is a need to recognize the period of vulnerability
- SAM/MAM = 'at risk'
- Predictive value of single measure (MUAC/WFL) for growth velocity?
- Cost & risks & benefits of interventions should be considered in relation to anthropometric cut offs
- All of this is at RESEARCH stage.

Anthropometry research questions are as follows:

- Longitudinal measurement: use weight for age (GM)
- MUAC/ WFL Z/oedema
- Complicated/uncomplicated cases
- Maternal perception – self identified nutrition / illness
- LBW to identify 'at risk' child
- MUAC work; To identify high risk mortality:
    - – Introduce into programs/camps, assess survival
    - – Use existing datasets
    - – MUAC at immunisations?
    - – To identify children 'at risk'? … eg by CHWs
    - – Start recording for research where possible
- There is some evidence for the use of MUAC but no validated anthropometric measure for community screening for SAM in u6M
- MUAC changes slowly during normal growth.
- CCM and CIMCI CHWs, GMP
- Early identification, package of assessment
- Growth velocity standards for weight for age correlated to outcomes?

Standardised measurements would be really useful in data collection. The chances of a child being at risk may be increased if the mother/ caregiver feels there is a problem with the child. Maternal perception and how this adds to anthropometry needs to be looked at. There is also a need to look at infants <2 months and the relationship with low birth weight. The conclusion was that the use of MUAC in this age group needs validation and a package of measures is needed.

Comments and questions:

A plea was made to find mechanisms to analyse datasets in a standardized way. Marko commented that we should try to standardize and people should also start collecting other kinds of data including MUAC and growth velocity.

Nigel Rollins commented that, without good analysis and good data then it is hard for WHO to make recommendations, e.g. for MUAC. The nature of the analysis should be clearly described so that we know what we have. If we had five or six groups with substantial datasets then we could convene something amongst the groups and get agreement on the analysis approach. It would then be easier for WHO to take these findings into a guideline. Researchers should be very clear and precise in the research question otherwise we end up with data that isn't helpful.

Andre Briend commented that WHO should be proactive. Very large sample sizes are needed, as mortality is a rare event. Nigel responded that people will either have MUAC in their datasets or not. Demographic

surveillance is ideal as it has longer term survival data. There are some large datasets in the HIV community, which include MUAC, due to the interest in HIV and nutrition. There may be more, but it's true that it needs a proactive search. A centralized database may be useful to search out existing data and start a process of a common protocol across agencies. The 'grey zone' in <6 months will take more work to prove it's worth and rightly so. But the potential value of it is also greater, so it is worth the investment. Marie McGrath agreed that this would avoid disparate research that isn't helpful.

A question was posed: Do we look at maternal factors? Nigel responded that SAM 0-2 months tends to reflect a different story, as it is influenced by low birth weight, maternal and birth issues. These are also important and valid. Jay commented that they have data on this age group that could be analyzed, as well as a birth cohort which could be followed.

Marko commented that a technical group is needed so that, for example, when work is begun in Malawi, the team can get input to make sure the data are valid.

Working Group 2: Breastfeeding and maternal mental health

The group came up with the following assessment questions:

Cross-cutting (also inform clinical assessment, etc):

1. Why did you come here?
2. What other help have you looked for?
3. Who is the primary caregiver?

Infant feeding/ maternal mental health:

These questions were based on a working presumption by the group that for any infant <6m presenting with SAM, skilled breastfeeding support is indicated – different cases would require different types/levels of intervention (reflected in brackets below).

1. Is your baby breastfed: yes (receive breastfeeding support) No (designate as high risk)
2. If no, when did you stop and why did you stop? (go to re-lactation or breastfeeding replacement support)
3. If yes, are there any problems? (go to clinical support for mother e.g. mastitis, other support for mother, e.g. nutrition, psychosocial)
4. Depression screening with validated tool (go to psychosocial support) example questions: is she worried or sad? Does she feel she has good sleep? Any fear? Anyone helping her? Does she have physical pain?

Comments and questions:

A comment was made that maternal physical health needs to be included, as well as maternal nutrition (although there is little evidence that food to the mother improves lactation). Caroline Wilkinson commented that getting full nutrition support may help mothers to feel that they have enough milk and may therefore be important anyway. It may also help with depression.

A comment was also made that a question about what else the baby is eating or drinking may be important. The group responded that they chose not to ask questions about exclusive breastfeeding on the basis that all SAM infants should receive some breastfeeding support (whether or not an actual problem with feeding is identified), at which point more detailed feeding assessment can take place. The approach was to minimize the questions and skill level required at this level of assessment to enable triage for further assessment and target to intervention. A comment was made that, within breastfeeding support, assessment of disability and its impact on feeding should be included.

Marko asked how much depth of breastfeeding questions to go into if individuals are going to be referred for breastfeeding support anyway. Marie McGrath felt that they need to be referred anyway and therefore probing after referral (within the breastfeeding support) should focus on the nature of that support. Whether breastfeeding is a cause or effect of SAM, breastfeeding support is still needed. Therefore, the initial assessment should be straight forward.

The group explained that they had worked backwards from five treatment options:

1. Support for the mother
2. Breastfeeding support
3. Relactation support
4. Clinical/ medical support for mother or child
5. Replacement feeding support

The group felt that there are limited treatment options and therefore the tool should be fit for this purpose.

Working Group 3: Clinical Assessment tool

Objectives: Acute resuscitation, specialist nutrition support (referral) or general inpatient support.

Existing tools:

- WHO ETAT (Emergency Triage Assessment and Treatment) protocol
- IMCI chart (questionnaire)
- WHO clinical questionnaire

Most can also be used for <6 months, but specific information that needs adding includes:

1. TB
2. HIV
3. Developmental milestones
4. Disability red flags
5. Mother: mental health and support network, nutritional status, physical health, socioeconomic status.

Questions that need to be answered:

- Is it enough to add to the existing IMCI questionnaire for infants <6 months or do we need to completely modify the form for <6 months?
- Do we need a specific form for assessment of malnourished <6 months or is a generic form okay?

Clinical assessment pro forma for infants age 2-6m diagnosed with SAM: this was the initial starting list which was then refined down as above; perhaps this is a list that could be gone through in more detail if the patient is admitted:

- Danger signs
- Birth: gestation, complications, birth-weight
- Developmental milestones
- HIV status – antenatal screening, PMTCT adhered?
- TB risk factors
- Previous hospitalizations
- Breastfeeding, complementary foods
- Immunizations
- Medications
- Socioeconomic status

There are also some things that could be taken out of IMCI as we already know that they have SAM, e.g. do they have sunken eyes? (as this is less discerning for SAM infants), although it may on balance be better to keep them in so as not to create confusion of different algorithms for different sets of children.

Comments and questions:

All tools are developed for children from 2 months, so what do we do with children 0-2 months? In reality, we see newborns as well. What do we do with these? Below 2 months, can we use the same tool or is it different? An answer was given that maybe it could be adapted to include 0-2 months as well. Nigel Rollins responded that the individual IMCI is being adapted to suit infants aged 0-6 months. We will see greater inclusion of 0-2 months from here on. This is a well recognized gap.

Caroline Wilkinson commented on the feasibility and simplicity of identifying children in the first phase (community or facility); the assessment seems complex with different stages and lots of different subject areas; how long would it take to go through the assessment? The group responded that the assessment could be a set of tick boxes with a guide towards different outcomes. The group responded that it struggled with the starting point and with what level of health worker would be making these decisions.

WAY FORWARD

1) Presentations from the day will be available for reference online via https://www.dropbox.com/sh/5q6lmji6z5fjdy5/5EwPH69WTp

2) Marie McGrath commented on the need to come up with a structure or mechanism for sharing research protocols and for collective thinking. What could this look like? Some kind of investment and structure would be needed to enable this initiative and we will need to broaden out who is engaged with this.

> **ACTION:** ENN/UCL/other interested partners (*please contact Marie/Marko if interested to work closer on this – or any of the below action points*) to explore funding opportunities for a "MAMI-network" to support future meetings and information/ knowledge sharing activities. (*Timeline:* Over 2013, as opportunities arise)

3) A suggestion was made to utilize the CMAM forum, by making MAMI a sub group. Marie responded that we have cross-linkages with the CMAM forum, but we want to go across sectors and that this involves not just CMAM but IYCF across the board. Jay reflected on a recent comment by Carmel Dolan, ENN about leadership issues within the nutrition sector, made at an earlier meeting on MUAC and WFH, and that we should not have too many separate groups doing different things. If we were to integrate we would need recognition that we could cross cut from within that.

> **ACTION:** ENN/UCL/CMAM forum leads/other interested partners to explore how such links would operate:(*Timeline: as above)*

4) Nigel Rollins agreed that we need to come together to advance certain pieces of evidence, for example questions around MUAC. We need one strong single message done well. Marie McGrath agreed that we want to take opportunities going forward in a cohesive way and referred back to the opening presentation that made this very point. Marko summarized that there are so many opportunities in this area of infants <6 months; it is important to standardize what we do as much as possible to standardize data and extrapolate data; we need to build across sectors; we need to link lots of health services and use infants as an entry point going outwards.

> **ACTION:** Learning from discussions at this meeting, UCL/ENN/other interested partners to draft an initial 'infant assessment' framework. To share this online (approx. April 2013) for further feedback. Pilot test the framework in field project due to begin collecting data in Malawi mid 2013. After 6/12 follow-up, this project to report early 2014.

Marko thanked all participants of the meeting.

Annex 1: Agenda

Time	Session	Speaker
8.45	Arrival and registration	
9.15	Background and Welcome	Marko Kerac, UCL and Marie McGrath, ENN
9.30	Research priorities in Infant < 6m SAM: MAMI CHNRI Results	Chloe Angood, ENN
10.00	New WHO Guidelines on Infant <6m SAM: NUGAG Update	Nigel Rollins, WHO
10.30	Coffee	
11.00	A – Anthropometric Assessment	Martha Mwangome & Jay Berkley, Kilifi, Kenya
11.20	B – Breastfeeding Assessment Tools	Karine Le Roch, ACF France
11.40	C – Clinical Assessment	Isioma Onyekpe, UK
11.55	D – Depression and maternal mental health	Robert Stewart, College of Medicine Malawi/ Manchester University
12.10	E – Disability	Chipo Githinji, London, UK
12.25	Lunch	
13.15	Introduction to working group objectives and format	Marko Kerac, UCL
13.30	Group work: Assessment options, M&E and future research:	
	Group 1: Anthropometry	
	Group 2: Breastfeeding assessment tools (including maternal mental health)	
	Group 3: Clinical assessment (infant and maternal, including disability)	

14.55	Coffee	
15.15	Feedback from groups and discussion (3 x 20 mins)	
16.15	Summary	
16.30	Close	

Annex 2 – Participants

Name	Organisation
Tamsin Walters	ENN
Chloe Angood	ENN
Marie McGrath	ENN
Geraldine le Cuziat	SCUK
Pascale Delchevalerie	MSF
Karine Le Roch	ACF
Anne-Dominique Israel	ACF
Allison Oman	UNHCR
Ismail Kassim	UNHCR
Caroline Wilkinson	UNHCR
Mara Myawo	UNICEF
Margaret Lancaster	Concern
Kate Golden	Concern
Jay Berkley	Kilifi, KEMRI, Wellcome
Andre Briend	Independent
Patrick Kolsteren	ITG
Marko Kerac	UCL
Andrew Seal	UCL
Hedwige Deconnick	Independent
Martha Mwangome	Kilifi, KEMRI, Wellcome
Mel Adams	UCL
Isioma Onyepke	UCL
Rosie Crane	Oxford
Chipo Githinji	UCL/Lambeth
Rogers Wanyama	UCL
Gemma Buxton	ACF London
Laura Newberry	CoM Malawi
Nigel Rollins	WHO
Alice Molinier	CIFF
Amy Mayberry	
Sylvia Garry	London Deanery
Smith, Louise	UCL
Natasha Lelijveld	UCL
Concetta Brugetta	UCL