6.0 Recommendations and conclusions

The high prevalence of HIV among children with SAM in Malawi and throughout sub-Saharan Africa demonstrated in this study, and in other research, makes the care of children with SAM an important entry point for paediatric HIV care. All HIV-infected children with SAM should undergo nutrition rehabilitation using therapeutic feeds and should be assessed and treated for opportunistic infections and other co-morbidities (WHO, 2006). In particular, improved paediatric diagnosis and treatment for tuberculosis is urgently needed (Heikens, 2007).

In order to offer specialised care for HIV-infected children with SAM (Fergusson, Kerac, & Tomkins, 2009), and thereby reduce the risk of mortality for HIV-infected children with SAM, HIV infection must first be identified. All children with SAM in countries of high HIV-prevalence should be tested for HIV.

The critical first adaptation for routine SAM management in HIV prevalent settings is for TFPs, to adopt routine, opt-out testing policies. As HIV prevalence among children with SAM is high, TFPs are an important entry point for HIV care. Knowing HIV status has important benefits (Eley, et al., 2006): malnutrition is a clinical criterion for advanced HIV and eligibility for antiretroviral (ARV) treatment (WHO, 2006); performance of clinical diagnostic algorithms is especially poor in high prevalence settings due to lower positive predictive values (van Gend, Haadsma, Sauer, & Schoeman, 2003); and lastly, ruling out HIV infection can be as useful to clinical decision-making as ruling it in.

Opt-out testing can involve challenges. Even today, some cite risks of stigma and discrimination (Asante, 2007). Ultimately, risks of testing must be weighed against the benefits, for the SAM-affected child, and for his or her entire family. Illustrating acceptance of testing and the increasingly favourable benefit/risk balance, this research shows a high uptake of testing. These findings are not unique to this study setting; a study exploring HIV and SAM at national level in Malawi found that 523 (91.7%) of parents consented for their malnourished child to be tested; and 368 (70.6%) accepted an offer of testing for themselves (Thurstans, et al., 2008).
Early infant diagnosis of HIV is possible using DNA PCR testing (WHO, 2006). This was the testing used in this study for all children <18 months of age. This type of testing is, however, expensive; although commonly used in the research setting it is not yet available in the programmatic setting. The laboratory facilities required are not yet widely available in southern Africa. DNA PCR provides an opportunity to confirm paediatric HIV infection and to initiate ARV therapy at any age when clinical and/or CD4 per cent criteria are met. This study showed that 69.2 per cent of HIV-infected children with SAM required ART, according to the 2006 WHO criteria and that these children with low CD4 per cent and no access to ART were at increased risk of mortality (Chinkhumba, et al., 2008).

Rapid HIV testing is now widely available and inexpensive in southern Africa. This type of testing relies on the detection of HIV antibodies. This presents challenges for paediatric care, as rapid HIV testing can lead to false positives due to the presence of maternal HIV antibodies in children <18 months of age (Read, 2007). Children with SAM who have a positive rapid test for HIV should be initiated on cotrimoxazole therapy, which has been proven beneficial for both prophylaxis and treatment of HIV in children (Zachariah, Harries, Luo, Bachman, & Graham, 2007).

Where a child with SAM is confirmed to be HIV-infected either through rapid testing over eighteen months of age or through PCR testing at less than eighteen months of age, clinicians must make the decision when to begin ART. Where CD4 percentage testing is available, this can aid decision making. Where CD4 percentage is not available, children should almost universally begin ART, as severe acute malnutrition is a clinical criterion for diagnosis of paediatric stage IV, and WHO guidelines recommend ART initiation (WHO, 2006). Recent ground breaking research from the CHER (Children with HIV Early Antiretroviral Therapy) study, South Africa, confirms the need to begin treatment early. The CHER study has shown that administering ART to infants immediately after diagnosis, rather than waiting for their CD4 counts to drop or other symptoms to prompt treatment, reduced mortality by 76% (from 16% to 4%). ART also dramatically reduced the disease progression. The findings were so conclusive that after review of the preliminary data, the trial was stopped and all of the children were started on a programme of ART (Violari, et al., 2008).
Where DNA PCR is not available, clinicians must decide whether to initiate ART in HIV antibody-positive children <18 months of age. In some cases, clinicians in resource-limited settings may have access to CD4 percentage testing, even in the absence of DNA PCR. CD4 percentage, where available, along with the clinical picture of the child, including presence of opportunistic infections, can assist with making decisions regarding the initiation of ART. Risks for initiating ART in an infant who, when re-tested at eighteen months of age is found not to be HIV-infected, must be balanced against the risks of early mortality in untreated HIV-infected children.

Without treatment, 35 – 59 per cent of HIV-infected children in sub-Saharan Africa will die before their second birthday (Dabis & Ekpini, 2002). Many children admitted for the treatment of severe acute malnutrition are <18 months of age and potential delays in treatment could contribute to increased mortality. The sensitivity and specificity of rapid HIV testing in children with SAM <18 months of age should be explored in further research.

Although rapid HIV tests are now inexpensive and widely available, access to CD4 percentage and DNA PCR testing continues to be limited in southern Africa. Limiting factors include the costs of testing, and the availability of required laboratory facilities, equipment and trained staff. Furthermore, even when the need for treatment for HIV is established, not all facilities have cotrimoxazole or paediatric ART available. Access to cotrimoxazole and ART are an important part of the package of care for children with SAM and HIV. The impact of cotrimoxazole and ART on mortality in HIV-infected children with SAM remains unknown. Further research in this area is urgently needed.

While ART will almost certainly reduce mortality among HIV-infected children with SAM, this research shows that many children with SAM are identified late in the HIV infection, with very low CD4 per cent (Bachou, Tylleskär, et al., 2006; Chinkhumba, et al., 2008). ART may not be successful in preventing mortality in children with SAM who present with a poor appetite and HIV, complicated by multiple opportunistic infections.
Figure 41: The importance of coverage in responding to SAM and HIV in sub-Saharan Africa
This research was conducted in an inpatient hospital setting. Most of the data available related to severe acute malnutrition and HIV are also drawn from studies with children recruited in nutrition rehabilitation programmes at the facility level. It is important to recognise that these data does not reflect HIV and SAM prevalence and mortality at the community level. Nutrition rehabilitation programmes run at hospital facilities usually provide services to a large catchment area. This requires patients to travel long distances to access care, and inpatient nutrition rehabilitation requires the child with SAM and their carer to remain at the facility until nutritional recovery is attained. Patients who live far away from the facility may be less likely to access care. Moreover, some regions, even in areas of high SAM prevalence, may not have any nutrition rehabilitation programmes. Figure 41 illustrates this problem of coverage. Even in countries where paediatric nutrition, rehabilitation and/or HIV care programmes are reporting good rates of survival and nutritional recovery, if they are only reaching a small proportion of those in need at the population level, their success is limited.

Changes in health service design have already answered some of the problems of coverage. In 2006 the Government of Malawi introduced community-based management of SAM as national policy in Malawi. In this programme children with complicated malnutrition are treated at facility level, while those with uncomplicated malnutrition are treated in the community (Collins & Yates, 2003). An integrated programme of facility- and community-based management of severe acute malnutrition (WHO, 2007) means increased coverage and service provision for SAM at a community level, including community-based case finding. This system increases the proportion of all of the children with SAM who are identified and treated. As HIV-infected children are more likely to become malnourished, community-based nutrition rehabilitation may also increase the proportion of HIV-infected children identified. As demonstrated in this research, HIV-infected children with SAM often present late to nutrition rehabilitation programmes, with complicated malnutrition related to low CD4s and opportunistic infections (Bachou, Tyleskär, et al., 2006; Chinkhumba, et al., 2008). Community-based nutrition rehabilitation may assist in identifying HIV-infected children earlier in their disease, and referring them for appropriate treatment (Sadler, et al., 2006).
Integrating HIV testing into programmes for the treatment of SAM at the community level is challenging; HIV testing required supplies and trained staff, and HIV testing at community level may increase the risk of stigma (Roura, et al., 2008). Strong community links and credibility built through CMAM can assist with improving community HIV education and testing uptake (Valid, 2006), and uptake of testing at community level has already been demonstrated to be high in CMAM programmes (Bahwere, et al., 2008). Bahwere et al. (2008) report that HIV infection was more common in children with low MUAC. It is important to continue to share lessons learnt in this emerging area of practice, and integrate these into CMAM guidelines.

Children with SAM who are identified as HIV-infected must be linked to HIV services, both for immediate assessment and treatment and also further follow-up and care after nutritional recovery. Children who are not initiated on ART upon assessment should be followed up to track their growth, CD4 count and clinical characteristics, with regular reassessments of the need for ART. HIV testing should not be limited only to the child with SAM. Data from one study has shown that 23.6 per cent of carers of children with SAM in Malawi were HIV-infected (Fergusson, 2008b). The parents and siblings of HIV-infected children should be provided with HIV testing and treatment, either directly or by referral. This will allow for the initiation of a family plan of care, including HIV treatment for those with HIV infection, and education and initiatives to prevent HIV transmission.

Although it is now well-established that children with SAM in sub-Saharan Africa (especially those treated in large, urban referral hospitals) have a high proportion of HIV infection, little is known about the proportion of HIV among moderately-malnourished children. Integrating HIV testing and treatment services into supplementary feeding and growth-monitoring programmes may help to identify HIV-infected children earlier in their infection. If these moderately-malnourished children are then able to access supplementary feeding, as well as HIV treatment, this could prevent these children from developing SAM, and delay HIV progression.

One of the most important interventions for reducing mortality among HIV-infected and uninfected children with SAM is an improvement in quality of care. Provision of good quality care for HIV-infected and uninfected children in resource-limited
settings is a challenge, despite the efforts of dedicated staff. Staff training, as well as raising staff awareness and engagement with nutrition rehabilitation and the implementation of WHO guidelines for nutrition rehabilitation, has been shown to reduce mortality in children with SAM (Ashworth, et al., 2004; Deen, et al., 2003). Many nutrition rehabilitation programmes have a low staff to patient ratio, and a trained workforce may be difficult to maintain, as staff often rotate between departments. Resources may be further stretched through interruptions in supplies of therapeutic feeds and medications. Facilities may even lack adequate basic hygiene facilities such as access for carers to soap and to clean toilets.

Children with SAM and HIV often present with complex medical issues (Heikens, 2007; Heikens, Bunn, et al., 2008). Treatment of these multiple infections may require staffing and equipment resources that are not available. Many programmes for the treatment of SAM in sub-Saharan Africa run without the support of a paediatrician or medical officer. Improvement of operational capacity has been identified as a key issue in preventing mortality in children with SAM (Heikens, Amadi, et al., 2008).

International guidelines and recommendations exist for nutrition rehabilitation for children with SAM (WHO, 1999, 2003b; WHO, UNSCN, 2007). These can be adapted at a country level for the local context. It is important that nutrition services and HIV services work cooperatively. In high HIV prevalence countries, HIV testing should be integrated into guidelines for the nutritional rehabilitation of children with SAM, and these guidelines should be put into practice. Children who are identified as HIV-infected should receive treatment, including cotrimoxazole and ART. Provision of cotrimoxazole and paediatric ART in resource-limited settings continues to be limited and challenging (Eley & Nuttall, 2007; Zachariah, et al., 2007); however, these therapies present a powerful opportunity to increase survival and nutritional recovery among HIV-infected children with SAM, especially those who are identified early. Research is urgently needed to determine the effects of ART on mortality and recovery in children with SAM.

Although nutritional rehabilitation programmes are becoming an entry point for paediatric HIV services, little is known about the prevalence of malnutrition among
children in HIV treatment programmes. Screening and treatment, or referral for treatment for both moderate and severe acute malnutrition, should be incorporated into all paediatric HIV programmes.

Research is an important part of improving quality of care for HIV-infected children with SAM. It is essential that practice be based in evidence. Where gaps in the evidence base are evident, further research is necessary. This requires the donor community to recognise the importance of research within HIV and SAM. Research networks and links between researchers and policy makers could be strengthened. Research capacity in high HIV-prevalence countries could be fostered through partnerships. Holding research conferences and meetings in high HIV-prevalence countries, as well as offering scholarships for attendance, are potential ways to build research capacity in HIV-endemic countries.

Whilst HIV-infected SAM patients may be at most individual risk of death, it is important to remember that the majority of children with SAM are HIV-uninfected, and still carry a high risk of mortality (Chinkhumba, et al., 2008; Schofield & Ashworth, 1996). Maximal child survival impact remains dependent on overall improvements in SAM outcomes. Both inpatient and outpatient TFP staff need to be well-trained, well resourced and committed to assessing and managing sick children whatever their HIV status.

In nutritional rehabilitation programmes, HIV-specific activities should enhance and complement previous WHO 10 steps and CMAM attempts at quality / outcome improvement, not distract or displace resources from the (usually) much larger numbers of HIV negative patients. While some new elements of HIV-specific care will be necessary to improve survival in HIV prevalent settings, an overall focus on improving care for all children is also essential.

When considering ways to improve survival among children with HIV and SAM, prevention should be at the centre of strategies. Both malnutrition and also HIV prevention are important to reduce mortality due to HIV and SAM at the population level, rather than programmatic level. This research was confined to facility-based care for children with SAM. Discussing mortality prevention at the facility level only is
misleading. If the international community is working toward meeting the millennium goals, the population level strategies must be put in place.

The UNICEF conceptual framework for malnutrition puts the causes of malnutrition into a wider context. Preventing malnutrition requires a reduction in both risk of infection and also risk of food insecurity. Incidence of HIV infection in children can be reduced through improved PMTCT programmes. Reducing these risks requires political, economic, social, cultural and environmental interventions. Both SAM and HIV prevention efforts can be integrated into nutritional rehabilitation programmes at the facility or community level through family HIV testing and treatment and education about safer feeding for infants and young children,

This research shows that HIV infection is pervasive among children with SAM in sub-Saharan Africa. Mortality among HIV-infected children with SAM remains high. Children with low CD4 per cent are at particular risk. Although mortality is high, however, most children do nutritionally recovery. Among children who survive, HIV-infected children can achieve and maintain growth and weight gain as well as HIV-uninfected children with SAM.

Urgent steps can be taken to continue to reduce mortality in high HIV prevalence settings in Malawi and across the sub-Saharan African region. This includes integrating family HIV testing and treatment services, as well as improving overall quality of care including operational factors like staffing and hygiene as well as treating patients and their families with respect and dignity.

By improving coverage and care, including integrating HIV testing and treatment into nutritional rehabilitation programmes, mortality can be reduced. For many children with SAM and HIV, however, ART may come too late to prevent mortality, due to medical complications. Integrated programmes at the community and facility level offering high coverage and early identification of both moderate and severe acute malnutrition and HIV testing are essential to improve child survival.