5.0 Discussion

These data clearly show that HIV infection is common among the children in this study sample. While this is an important finding with further research, policy and practice implications, it is important to put this finding into context, and try to determine how common HIV really is among malnourished children, in Malawi and other countries with high HIV prevalence.

Meta-analysis of data from similar studies in sub-Saharan Africa has shown that the HIV prevalence reported in this study is similar to that reported in other research (Fergusson & Tomkins, 2008). There are many factors, however, which influence the prevalence of HIV among children with SAM in the published literature. First, there is the actual prevalence of HIV among children with SAM at the population level. This will, in turn, depend on the prevalence of HIV in children at population level. Population level HIV prevalence in children is not nationally reported. For example, the Government of Malawi Office of the President and the Cabinet, Malawi HIV and AIDS Monitoring and Evaluation Report 2007 reports on the national adult prevalence, and the proportion of children who are orphaned, but not on the prevalence of HIV among children <5. The information that is available is the prevalence of HIV women at antenatal clinics. In 2005 15.9 and 10.2 per cent of urban and rural pregnant women respectively were HIV-infected. In 2007 the prevalence of HIV among urban pregnant women had fallen to 13.2 per cent while the prevalence among rural pregnant women remained almost unchanged at 10.6 per cent. This is one proxy indicator for prevalence of HIV among children at population level.

Prevalence among children will be affected by the incidence of mother to child transmission of HIV. In Malawi, only 10.3 per cent of antenatal facilities were offering PMTCT services (Malawi, 2007). MTCT in Malawi is, therefore much higher than what could theoretically be possible. This is true in many low resource settings, while in the UK and many other parts of Europe MTCT is now virtually unheard of. In 2007 Malawi introduced opt out HIV testing for women in antenatal care. This will hopefully improve early identification of HIV infection in pregnant women, and allow for improved follow up with MTCT.
High prevalence of HIV among children <5 at population level is likely to increase the incidence of SAM. Children with HIV will be more vulnerable to developing SAM because of the interaction between malnutrition and infection (Scrimshaw, 2003). Not all children who have SAM will be identified. Where care is facility-based, families will need to make the decision to bring children into the facility for treatment. This was the situation during the study. The decision to bring a child to an NRU for care has a high opportunity cost for families and some families may not be able to bring children in for nutritional rehabilitation (Guerrero, 2005).

When looking at the published literature and attempting to evaluate how findings could impact on national policy it is important to consider how research settings may differ from programmatic settings. Looking at the research on children with SAM, most of the publications are related to research conducted in a few, large teaching hospitals. In particular a number of papers have been published from Queen Elizabeth Central Hospital, Blantyre, Malawi, and University Teaching Hospital, Lusaka, Zambia. These centres are both located in large cities, with a high prevalence of HIV. These hospitals also act as referral centres, where children with SAM complicated by co-morbidities are referred. The fact that most of the research published on children with HIV and SAM comes from these types of centres means that findings cannot always be generalised to the rural NRU setting, or to the community setting. This makes creating national, evidence based, policy and programmes challenging.

Although HIV prevalence in this research was high (17.4%), and there are many other examples of published research where HIV prevalence among children with SAM was high (Akenami, Koskiniemi, Ekanem, Bolarin, & Vaheri, 1997; Bachou, Tumwine, Mwadime, & Tylleskär, 2006; Bachou, Tylleskär, et al., 2006; Kessler, et al., 2000; Ticklay, Nathoo, Siziya, & Brady, 1997; Yeung, et al., 2000) there are also important examples of low HIV prevalence among children with HIV at community level (Bahwere, et al., 2008). This discrepancy makes it clear that assumptions about HIV prevalence at population level cannot be made based solely on research outcomes from studies set in large teaching hospitals.
Although this is the case, this study still presents important information about HIV prevalence. First, in this research there are three study sites, and the HIV prevalence varies widely between the three NRUs. KCH, a central teaching hospital in Lilongwe had an HIV prevalence of 36.4%, while Mitundu, a small rural hospital had an HIV prevalence of 4.5% among children with SAM. These data may be useful in giving the MOH an idea of the range of HIV prevalence they may see across different NRU settings, even in close proximity to one another. Secondly, it is important to remember that in the context of integrated care at facility and community level for children with SAM the proportion of complicated cases seen in facility-based nutritional rehabilitation will continue to increase. With increasing cases of complicated SAM being referred for facility-based care, the proportion of children in the NRU with HIV is likely to increase.

In summary, HIV infection among children in this cohort was high. Findings in other sub-Saharan African nutritional rehabilitation programmes indicate that prevalence of HIV can vary; but generally it is higher in large referral hospitals in areas of high HIV prevalence. HIV prevalence among children with SAM at facility level should not be generalised to population level. The implications of high prevalence of HIV among children with SAM in Malawi, and other regions of sub-Saharan Africa are many, and are discussed below.

In this cohort of children with SAM, mortality was significantly increased among HIV-infected children when compared with HIV-uninfected children (RR = 3.41 [CI 2.24 – 5.20]). This finding was consistent with all other research reviewed of nutritional rehabilitation programmes at both the facility and community level (Fergusson & Tomkins, 2008). HIV-infected children with severely impaired immunity as measured by CD4 percentage were at particularly high risk of mortality. The author believes that this is reflecting increased risk of mortality due to complicated SAM, rather than HIV infection specifically. This means that any group of children with SAM complicated by co-morbidities will be at increased risk of mortality.

While increased mortality due to complicated SAM does not occur exclusively in children with HIV, HIV infection is an important marker of risk of mortality, in particular where children with SAM and HIV also have low CD4 percentage and
opportunistic infections. Further research is also needed to determine the prevalence of children with HIV and oedema who may be presenting with, rather than SAM. It is urgent to determine the aetiology of the oedema in order to prescribe the correct course of treatment, as both SAM and HIVAN are linked with high mortality (Anochie, et al., 2008; Fergusson & Tomkins, 2008; Schofield & Ashworth, 1996).

High incidence of mortality among children with SAM is a longstanding problem. There is some evidence to suggest that poor staff performance may contribute to increased mortality (Ashworth, et al., 2004; Puoane, et al., 2008; Puoane, et al., 2004). Further, along with the impact of operational factors on mortality and quality of care this study demonstrated the importance of psychosocial issues like stigma within the NRU. The importance of designing nutritional rehabilitation programmes which take into account community perspectives and values has been demonstrated in the community-based nutrition rehabilitation literature (Guerrero, 2005). This study demonstrates that these values of community mobilisation, sensitisation and inclusion are also necessary in the inpatient setting.

Operational factors like guideline implementation, staff motivation, adequate staffing and improved sanitation are essential to reducing mortality in children with SAM, particularly in the inpatient setting (Ashworth, et al., 2004; Fergusson, Chikahupha, et al., 2009; Heikens, Amadi, et al., 2008; Puoane, et al., 2008; Puoane, et al., 2004).

While psychosocial and operational factors are clearly important, this study shows that children with SAM complicated by HIV are more likely to die (Chinkhumba, et al., 2008). Poor quality of care cannot be assumed universally where NRUs are reporting high mortality. Some children arrive at the NRU with intractable complications, and mortality is unavoidable. This research calls for a change in thinking on this issue. Much energy has been spent in the wider scientific and programmatic community speculating about the relationship between poor quality care and mortality. It is important to recognise the additional role of complications in determining incidence of mortality.
While this study, and a review of the wider literature has established conclusively that HIV infection does significantly increase mortality among children with SAM (Chinkhumba, et al., 2008; Fergusson & Tomkins, 2008), it is essential to recognise that (as this study shows) many of the children with SAM and HIV do nutritionally recover (Fergusson, et al., 2008). To increase the proportion of children with SAM who nutritionally recover, particularly for those children who are HIV-infected the following recommendations could be implemented; based on the findings in this study, set on the context of the wider literature.

The strategies fall into four categories: HIV testing and treatment; coverage, follow-up and integrated care; research, policy and programmes; improved care for all children; and the importance of prevention. These are discussed below in the recommendations section.