Association between HIV status and measles seronegativity in Malawi

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**Introduction**
After more than a decade of progress in measles control, a very large, unexpected outbreak of measles occurred in Malawi in 2010, with older people accounting for a relatively high proportion of cases. One factor that may have contributed to this outbreak is the high prevalence of HIV infection in Malawi. Infants born to HIV-infected women have lower levels of measles-specific transplacental antibody and are often susceptible to infection before receiving measles vaccine at 9 months of age. Further, HIV infection is associated with a greater severity of measles disease, higher measles mortality, and prolonged measles virus shedding. Few studies have addressed older children and adults.

**Methods**
We consecutively recruited (1) HIV-infected patients aged 18 months or older presenting for follow-up care, and (2) HIV-uninfected individuals presenting for voluntary testing and counseling, at Chiradzulu District Hospital between 12 January and 30 September 2012. We collected information on age, sex, measles vaccination and infection histories. Whole blood samples were taken to ascertain levels of measles antibodies and CD4+ count.

**Results**
1935 study participants were recruited: 501 were HIV-uninfected; 449 were HIV-infected with <350 CD4+ T-cells/µl; 363 were HIV-infected with 350-<499 T-cells/µl; and 622 were HIV-infected with 500+ T-cells/µl.

The majority (93%) of both HIV-infected and –uninfected participants aged 15 years and older were seroprotected against measles. However, half (51%) of the children aged less than 15 years recruited into the study were vulnerable to measles although crude numbers are small. A greater proportion of HIV-uninfected children were seroprotected against measles infection (66.7% vs. 43.7%).

HIV status, CD4+ count, and infection history were not associated with the likelihood of being measles seronegative. Younger age, male sex, and prior measles vaccination were independently associated with increased odds of being measles seronegative.

No association was observed between measles antibody titre and CD4+ count or time on HAART.

**Discussion**
We found no evidence that HIV-infection contributes to measles infection risk among adults, but HIV-infected children were at greater risk. This was true for children older than previously documented. CD4+ levels were not associated with measles seronegativity.

We investigated the relationship between HIV-infection and measles infection risk. HIV status and CD4+ count were associated with measles risk among children, but not adults.

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