

Study explores the association of malaria, HIV with anemia during pregnancy

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Satellite imagery of Africa. Credit: Public Domain

Pregnant women from sub-Saharan Africa with malaria and human immunodeficiency virus (HIV) have a higher prevalence of anemia than pregnant women without infections, according to Penn State College of Medicine researchers. The findings may have implications for reducing the risk of death in pregnant women and preventing low birth weights and neurocognitive impairment in their children as a result of anemia.

Coinfections of HIV and [malaria](#) are common among expectant mothers in sub-Saharan Africa. Dr. Paddy Ssentongo, a doctoral student in epidemiology, led a study, published in *BMC Pregnancy and Childbirth*, that assessed the association of malaria with anemia and the effects

of malaria and HIV on anemia in pregnant women.

The researchers analyzed demographic and health surveys from 2012 and 2017 across seven countries in sub-Saharan Africa and examined [blood samples](#) from 947 pregnant women, ages 15 to 49 years old. Their results show that malaria was associated with an increased prevalence of anemia during pregnancy. The prevalence of anemia was higher in pregnant women with malaria and HIV coinfections (60%) than in pregnant women without infections (45%).

"Pregnant women in sub-Saharan Africa suffer a double burden of malaria and HIV infections, and these infections interact with each other to cause anemia," Ssentongo said. "Multipronged strategies to prevent and treat malaria and HIV in pregnant [women](#) are critical to ensure the survival of mothers and their unborn babies."

Anemia is a condition where the body lacks enough healthy red blood cells to carry adequate oxygen to body tissue, resulting in fatigue. Diseases like HIV and malaria can destroy red blood cells and cause a person to become anemic.

The interaction between malaria and HIV leading to anemia in dually-infected patients is synergistic and bidirectional. Malaria leads to an increase in HIV viral load, a decline in the level of immune cells and an increase in inflammation. In addition, malaria increases the rate of disease progression from HIV to AIDS. HIV contributes to more frequent and more severe cases of malaria and increases the density of malaria parasites, which leads to either the destruction of the red blood cells, reduced iron absorption or reduced rate of formation of new red blood cells in the bone marrow.

According to the researchers, preventative strategies for anemia in pregnancy due to malaria and HIV include the use of trimethoprim-sulfamethoxazole (co-trimoxazole), a malaria

[prophylactic treatment](#), in addition to antiretroviral therapy, which both lower the odds of coinfection. In addition, vector control using insecticide-treated bed nets and residual spraying is effective. Although intermittent preventive treatment with sulfadoxine/pyrimethamine has been shown to be effective in parts of Africa, intermittent preventive treatment should be avoided in [pregnant women](#), who are on antiretroviral therapy and co-trimoxazole prophylaxis, because of the risk of adverse drug reactions.

More information: Paddy Ssentongo et al. Associations of malaria, HIV, and coinfection, with anemia in pregnancy in sub-Saharan Africa: a population-based cross-sectional study, *BMC Pregnancy and Childbirth* (2020). [DOI: 10.1186/s12884-020-03064-x](#)

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