

# [“Adherence to Combination Prophylaxis for Prevention of Mother-to-Child-Transmission of HIV in Tanzania” \(2011\), by Inga Kristen, Julius Sewangi, Andrea Kunz, Festo Dugange, Judith Ziske, Brigitte Jordan-Harder, Gundel Harms, and Stefanie Theuring](#) [1]

By: Jones, Sierra Hope Keywords: [HIV prophylaxis](#) <sup>[2]</sup> [HIV during pregnancy](#) <sup>[3]</sup>

In 2011, Inga Kristen, Julius Sewangi, Andrea Kunz, Festo Dugange, Judith Ziske, Brigitte Jordan-Harder, Gundel Harms, and Stefanie Theuring published the article, “Adherence to Combination Prophylaxis for Prevention of Mother-to-Child-Transmission of HIV in Tanzania,” in *PLoS ONE*. Hereafter, “Adherence to Combination Prophylaxis,” the article details the authors’ investigation into the efficacy of a medication regimen called combination prophylaxis to prevent mother-to-child, or MTC, transmission of Human Immunodeficiency Virus, or HIV, before, during, and after delivery. They included pregnant women who had HIV in Kyela, Tanzania. However, through interviews and surveys, the authors found that many women had difficulty adhering to the regimen, which made the medication less effective. Kristen and colleagues suggest that healthcare professionals who treat HIV-positive pregnant women increase hospital resources and prescribe medication to those women early in the [pregnancy](#) <sup>[4]</sup> to reduce MTC transmission of HIV.

In their article, “Adherence to Combination Prophylaxis,” the authors discuss mother-to-child-transmission of HIV in rural Tanzania. HIV is a virus that attacks the human immune system. It infects specific immune cells, called CD4 cells, and gradually decreases the immune system’s ability to defend the body from other microorganisms that may cause illness. HIV can spread from an HIV-positive pregnant woman to her offspring before, during, and after delivery. Before delivery, the [fetus](#) <sup>[5]</sup> can come into contact with HIV-positive CD4 cells in the [womb](#) <sup>[6]</sup> if there is a physical trauma to the [womb](#) <sup>[6]</sup>. During delivery, the neonate can come into contact with the pregnant woman’s blood and vaginal secretions, both of which can contain HIV-positive CD4 cells. After delivery, the infant can come into contact with the woman’s HIV-positive CD4 cells during breastfeeding. To protect the [fetus](#) <sup>[5]</sup> or infant from contracting HIV, pregnant women can take medicine that prevents MTC transmission of HIV. While medical professionals often prescribed one single dose of a medication to HIV-positive pregnant women to avoid MTC transmission at the time of the article’s publication, other medical professionals were beginning to prescribe a combination of drugs, known as combination prophylaxis, to further decrease the number of infants and young children with HIV. In their article, Kristen and colleagues sought to gain insight and observe the challenges associated with prescribing combination prophylaxis in a hospital in Tanzania.

The collaborating team members who wrote, “Adherence to Combination Prophylaxis,” came from three separate institutions at the time of the study. Kristen, Kunz, Ziske, Jordan-Harder, Harms, and Theuring were associated with the Institute of Tropical Medicine and International Health located in Berlin, Germany. Sewangi worked with an HIV [reduction](#) <sup>[7]</sup> program in the Mbeye Region of the Ministry of Health and Social Welfare located in Kyela, Tanzania, and Dugange worked with the Kyela District Hospital of the Ministry of Health and Social Welfare located in Kyela, Tanzania.

The authors divide their article, “Adherence to Combination Prophylaxis,” into four main sections. In the introduction, the authors describe how Tanzania altered their medical policy in 2008 to switch from giving HIV-positive pregnant women one dose of an HIV preventative medicine to combination prophylaxis. In the methods section, the authors explain that they used interviews and surveys to gauge the adherence of pregnant women to combination prophylaxis. In that same section, they also provide detailed descriptions of how they collected the data, how they defined adherence, and the ethical considerations for the study. In the results section, the authors conclude that only about eight percent of pregnant women were able to maintain almost full adherence to combination prophylaxis throughout all the periods before, during, and after delivery. In the discussion section, Kristen and colleagues discuss risk factors that may have resulted in decreased adherence to combination prophylaxis, such as suboptimal hospital staff performance and the stage of [pregnancy](#) <sup>[4]</sup> at which medical providers gave women medications. The authors also provide possible solutions to those risk factors and make recommendations on how adherence can increase among HIV-positive pregnant women in Tanzania and other resource-limited communities around the world.

In the first part of the introduction, the authors explain that, prior to 2008, medical professionals administered nevirapine to HIV-positive pregnant women in Tanzania to decrease MTC transmission of HIV. According to the authors, most new HIV infections

are contracted by infants due to MTC transmission of HIV, but those transmission rates can decrease through effective medications and optimal adherence to the regimens. Whereas infants born to HIV-positive women with no medical intervention have a twenty-five to forty-eight percent risk of getting HIV, transmission risks decrease by forty percent with a single dose of nevirapine. Nevirapine was the standard medication prescribed to pregnant women in Tanzania until the Tanzanian Ministry of Health switched their recommendation to combination prophylaxis at the end of 2008 to follow 2006 World Health Organization guidelines. Combination prophylaxis consists of three different drugs that women must take on a set schedule before labor beginning at twenty-eight weeks [gestation](#) <sup>[8]</sup>, at the onset of labor, and following labor. Those medications included zidovudine, lamivudine, and nevirapine.

However, despite the directions from the World Health Organization, the authors of “Adherence to Combination Prophylaxis,” imply that the adoption of combination prophylaxis in Tanzania may pose a greater risk than using only single dose nevirapine. The authors note that there were few studies examining issues and solutions surrounding decreased combination prophylaxis adherence among pregnant women in rural, resource-limited communities. Additionally, Kristen and colleagues note that other data had revealed low adherence rates among women living in the surrounding countries of Uganda and Zambia. Due to those findings, the authors propose that pregnant women in Tanzania may also experience difficulties adhering to the combination prophylaxis schedule.

In the methods, the authors describe how they enrolled pregnant women into their study from October 2008 to September 2009 at the Kyela District Hospital in the Mbeya Region of Tanzania. Their main goal was to gauge at what extent pregnant women were able to adhere to the combination prophylaxis regimen. The authors conducted the study soon after medical professionals at the hospital adopted the World Health Organization’s 2006 combination prophylaxis recommendations. Kristen and colleagues note that approximately eighteen percent of pregnant women who visit the Kyela District Hospital are HIV-positive. They also note that the Kyela District Hospital was one of the only hospitals in that region that offered the combination prophylaxis regimen.

The authors then indicate that their study included 122 HIV-positive pregnant women. Hospital nurses interviewed and surveyed the women in the local language throughout all stages of their care at the hospital. In the article, the authors explain that they also obtained both the hospital and pharmaceutical records of the participants during their time in the study. All participants who consented to treatment began combination prophylaxis at twenty-eight weeks [gestation](#) <sup>[8]</sup>. They recorded adherence to the combination prophylaxis treatment for each participant during all stages of [pregnancy](#) <sup>[4]</sup>, including before, delivery, and after delivery. Participants had to be older than eighteen years of age, provide written [informed consent](#) <sup>[9]</sup>, and show no signs of a psychological disorder. The authors also note that ensuring that all the different medications were taken at the correct time and in the correct manner was not possible since they could not directly observe the women taking the medications in most stages of the [pregnancy](#) <sup>[4]</sup> and delivery. Therefore, they measured adherence based on how often medical professionals dispensed the drugs to the participants.

In the results section, Kristen and colleagues explain that most of the pregnant women had difficulty maintaining full adherence of the combination prophylaxis regimen before delivery, during delivery, and after delivery. During the study period, approximately 202 HIV-positive pregnant women sought care at the Kyela District Hospital, though seventy-two did not meet eligibility criteria and eight others withdrew. After accounting for the women who were later lost to follow-up, the authors followed seventy-four women through the entirety of the study. They found that only approximately eight percent of participants achieved at least eighty percent adherence rates. Only one pregnant woman achieved a ninety-five percent adherence rate.

In the discussion, Kristen and colleagues identify risk factors that may explain low adherence and why some women declined treatment. The interviews and surveys provided information about the age and income of the pregnant woman. Women who were young or who did not have any means of generating an income were less likely to begin combination prophylaxis treatment prior to delivery. Women who were earlier on in the progression of [pregnancy](#) <sup>[4]</sup> also were less likely to decline prophylaxis medications. The authors hypothesize that since the women were asked to wait until gestational week twenty-eight prior to receiving treatment, the pregnant women did not perceive the treatment as important, resulting in a higher probability they would decline treatment.

According to the authors, the World Health Organization revised its guidelines in 2010 based on that problem, stating that HIV-positive pregnant women can begin prophylaxis as early as gestational week fourteen. According to the authors, that decreases the gap between the pregnant woman’s initial visit and the point at which she begins prophylaxis, thereby increasing her adherence. The authors additionally found that women had a higher rate of adherence if they told a partner or family member about their HIV-positive status. They mention that women disclosing their status, especially to their partners, may enable better access to healthcare, noting that husbands are often decision-makers in Tanzania and can interfere with a pregnant woman’s ability to obtain care.

Also in the discussion, the authors explain that the performance of hospital staff could hinder adherence rates among HIV-positive pregnant women. They state that upon discharge, only about eighty percent of participants received the correct amount of medication by hospital staff to take home. Furthermore, during interviews, some women noted they experienced incorrect scheduling and difficulty obtaining medications from the pharmacy. Kristen and colleagues propose that increased demands in providing those new medications may have led to errors in oversight. The authors suggest that proper training and close supervision of the hospital staff may increase women’s adherence to combination prophylaxis, thereby decreasing the impacts

of their actions. The authors conclude their article by stating that guidelines current to the time at which they held their study did not account for women who lived in rural, resource-limited settings. They suggest that health governance organizations take into account the unique needs of women in rural communities when refining future guidelines.

As the authors alluded to throughout their article, adherence to combination prophylaxis is imperative for its effectiveness. As previously stated, the World Health Organization changed their guidelines in 2010 to account for an earlier point during pregnancy<sup>[4]</sup> at which women can begin taking the combination prophylaxis medications. However, as national and international guidelines continue to change, other researchers continue to encounter barriers for reducing MTC transmission of HIV. A 2016 study revealed that only forty-six percent of women in Tanzania have adequate knowledge on MTC transmission of HIV. Additionally, a 2017 study asserts that current guidelines do not account for gender norms in Tanzania which those authors assert is a major barrier in women's adherence to the drug regimen. As of 2021, the World Health Organization and similar organizations continue to revise their recommendations.

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## Subject

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