



# The Effect of a Mentor Mothers Program on Maternal and Infant PMTCT Outcomes in Zambézia Province, Mozambique

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## Background

- Mentor Mothers (MM)** are HIV-affected women who provide intensive peer support to pregnant and lactating women living with HIV (PLW) and their HIV-exposed infants (HEI).
  - MM conduct monthly home visits and/or phone calls (preventative and problem-focused) to PLW.
  - MM services begin at enrollment in antenatal care and continue through the cascade of prevention of mother-to-child transmission (PMTCT) services.
  - MM conduct these and other activities through linkage with a dedicated health facility (HF), at a ratio of 1 MM to approximately 20 PLW.
- The MM program was gradually implemented across Friends in Global Health supported HFs in Zambézia Province, Mozambique starting in August 2017.
- Zambézia has an estimated HIV prevalence of 15.1% and vertical transmission rate of 6-18%.<sup>1-3</sup>
- Objectives:** This evaluation aimed to determine the effect of the MM program on:
  - Retention of PLW in antiretroviral therapy (ART)
  - HIV viral suppression among PLW
  - HIV DNA PCR positivity rates among HEI (a proxy for vertical transmission)

## Methods

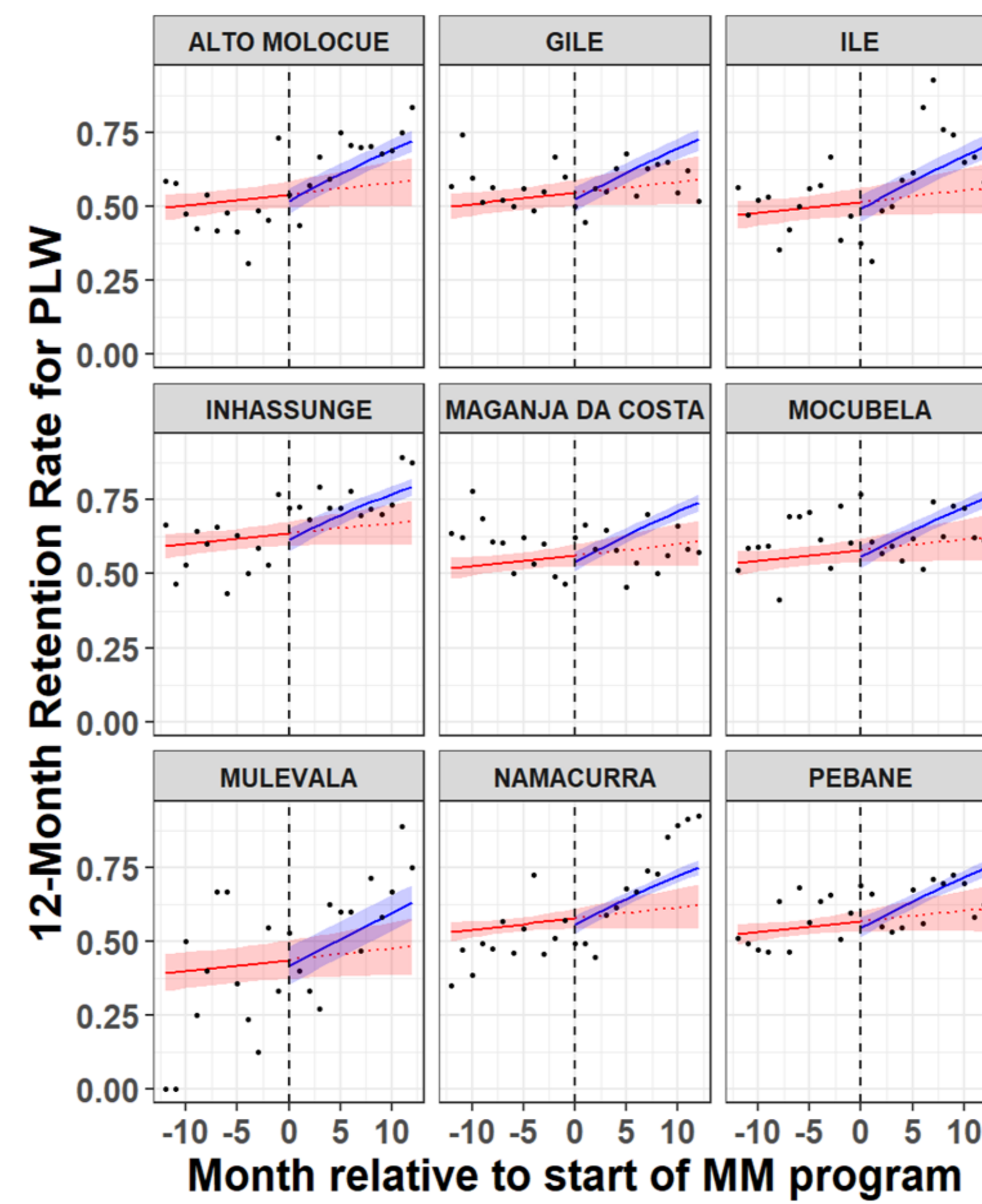
- Evaluation Design:**
  - A retrospective interrupted time series analysis was done using routinely collected aggregate data from 85 HFs in 9 districts of Zambézia.
  - Data were captured from August 2016 (1-year pre-MM program implementation) through April 2019 (end of evaluation period; however, the MM program continues at all sites).
- Inclusion & Exclusion Criteria:**
  - All PLW who enrolled in PMTCT services and initiated ART, and their HEI were eligible.
  - We excluded districts/HFs that:
    - Did not support maternal-child health services
    - Were supported by Mothers 2 Mothers (M2M; a non-governmental organization that also provides MM services)
    - Were not supported by VUMC/FGH during the pre-MM period (e.g., Quelimane District)
    - Were noted to have systematic (non-random) missingness in their data

- Outcomes & Definitions:** Primary outcomes included the *proportion per month per district* of:
  - PLW retained in care
    - 1 month after ART initiation
    - 3-4 months after ART initiation
    - 6-9 months after ART initiation
    - 12 months after ART initiation
  - PLW with viral suppression (HIV RNA PCR [viral load] <1,000 copies/ml)
  - HIV DNA PCR test positivity rates among HEI tested for HIV by 2- and by 9-months of age

- Statistical Analysis:**
  - To account for the phased implementation of MM, outcomes were assessed at the HF-level, given the implementation dates, and looked at 12 months before ("pre-MM") and 12 months after ("with-MM") MM implementation.
  - Since outcomes varied temporally (i.e., 12 months before and after MM implementation) and spatially (i.e., across 9 districts), descriptive statistics across time were obtained within each district for the pre-MM and with-MM periods, then statistics were compared across districts.
  - Temporal trends in outcomes were stratified by district, and differences in outcomes one year before and one year after MM implementation were assessed using logistic regression.

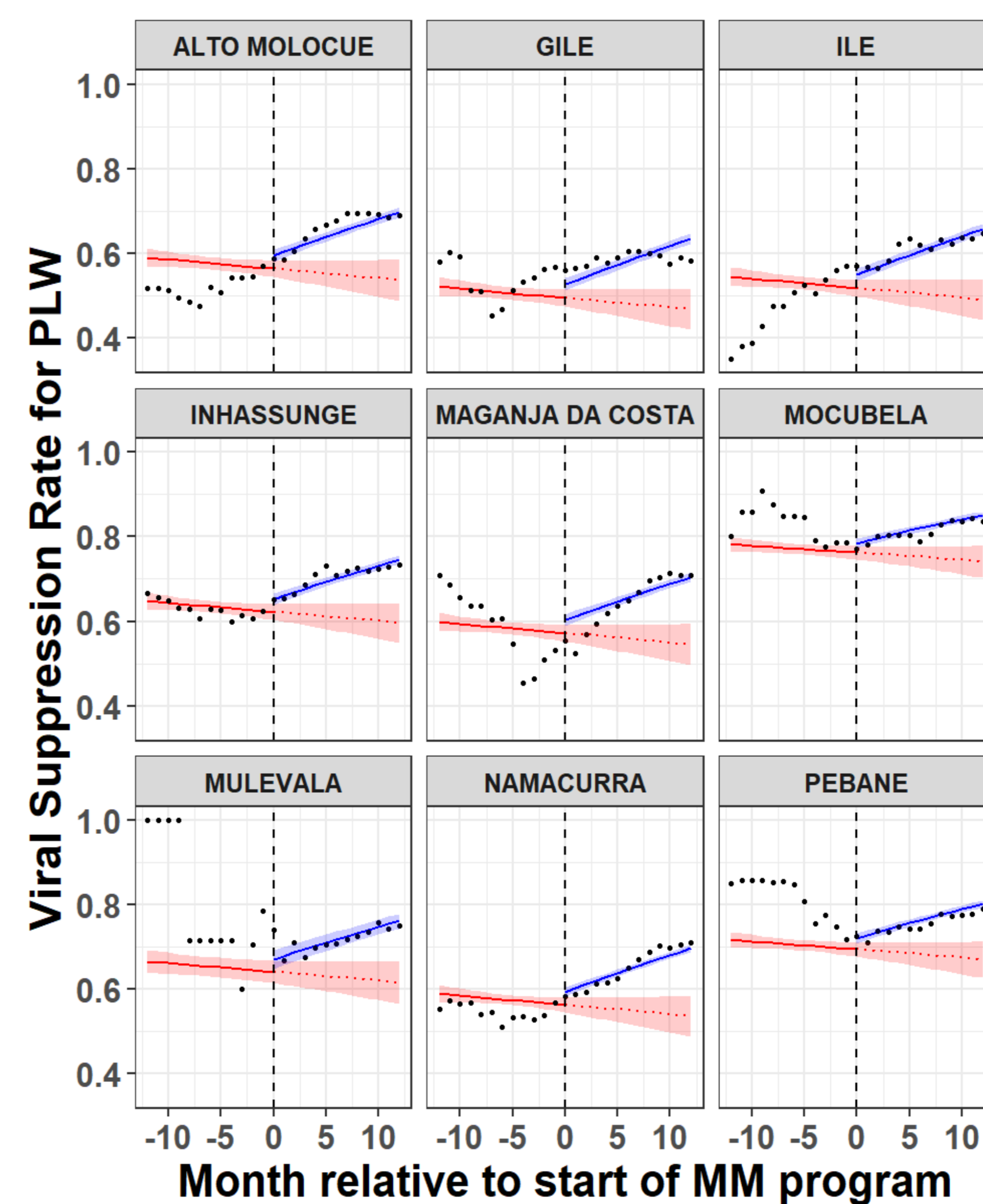
## Results

- Retention:**
  - Median district-level 12-month retention rates among PLW ranged from 35-61% in the year before MM implementation and 56-72% in the year during MM implementation.
  - Odds of 12-month retention increased 1.5% per month pre-MM, compared to an increase of 7.6% per month with-MM (**p<0.001; Figure 1**).
  - Similar statistically significant improvements in retention were observed at 1-, 3- and 6-months After ART Initiation (*data not shown*).



**Figure 1.** Twelve-month retention rate for PLW. The vertical dashed line represents the start of MM implementation, with the 12 months prior to MM implementation to the left and 12 months with MM to the right. The **red line** represents what happened in the pre-MM period and projects what would have happened if MM had never been implemented. The **blue line** represents what was actually observed since MM was implemented.

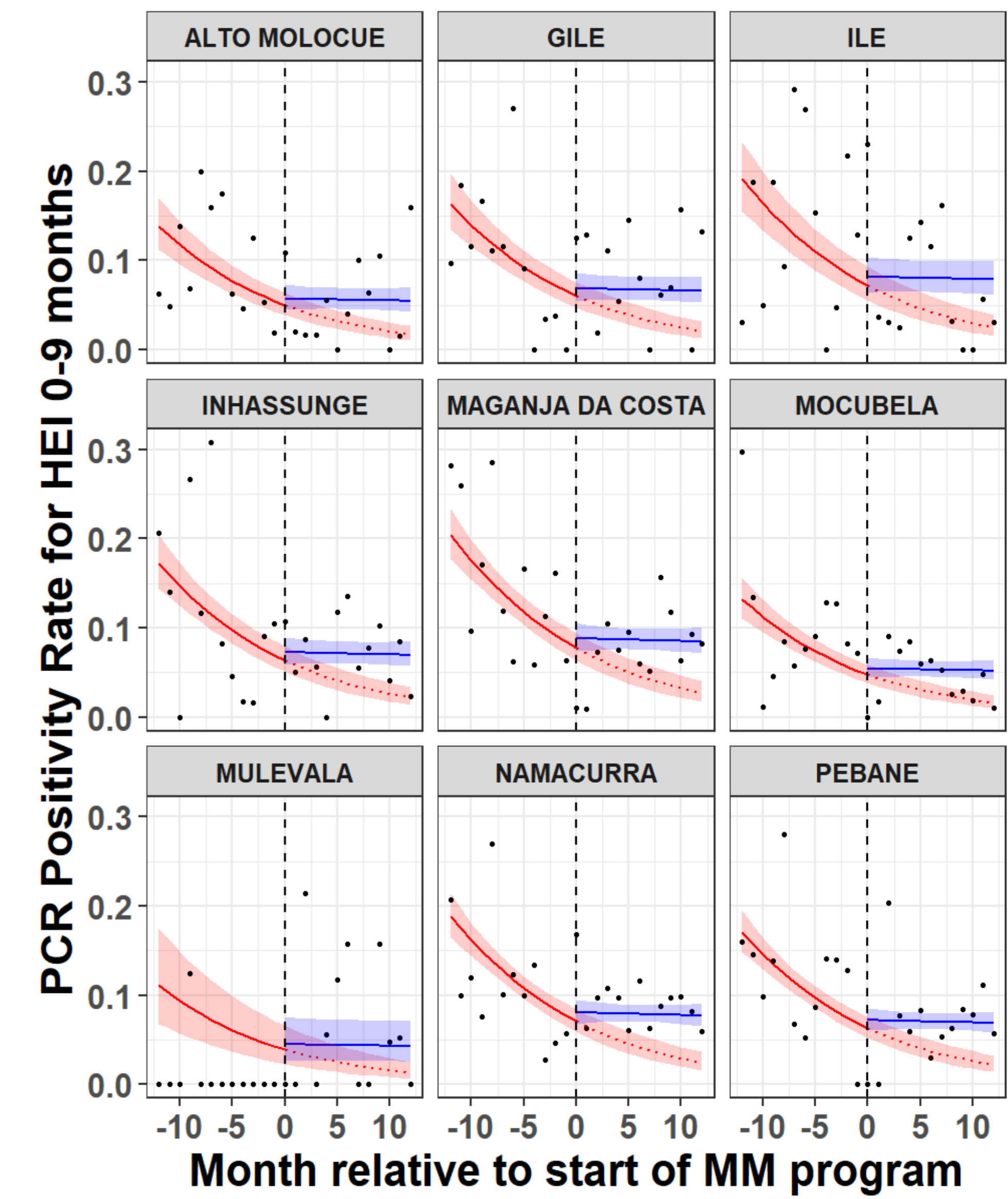
- Viral Suppression:**
  - Median viral suppression rates among PLW were 49-85% pre-MM and 59-80% with-MM.
  - Odds of viral suppression decreased 0.9% per month pre-MM, compared to an increase of 3.9% per month with-MM (**p<0.001; Figure 2**).



**Figure 2.** Viral suppression rate for PLW. The vertical dashed line represents the start of MM implementation, with the 12 months prior to MM implementation to the left and 12 months with MM to the right. The **red line** represents what happened in the pre-MM period and projects what would have happened if MM had never been implemented. The **blue line** represents what was actually observed since MM was implemented.

## HIV DNA PCR Positivity:

- Median DNA PCR positivity rates among HEI 0-9 months of age were 0-14% in the pre-MM period and 4-10% during the with-MM period.
- The odds of DNA PCR positivity among HEI 0-9 months of age decreased 8.9% per month in the pre-MM period, compared to a decrease of 0.4% per month with-MM (**p<0.001; Figure 3**).
- Similar statistically significant trends in DNA PCR positivity before and after MM implementation were observed among HEI aged 0-2 months of age (*data not shown*).
- The odds of DNA PCR uptake (the proportion of HEI who received DNA PCR testing) by 2-months and 9-months of age were significantly higher in the with-MM period compared to the pre-MM period (**p<0.001**).



**Figure 3.** DNA PCR positivity among HEI tested from 0-9 months of age. The vertical dashed line represents the start of MM implementation, with the 12 months prior to MM implementation to the left and 12 months with MM to the right. The **red line** represents what happened in the pre-MM period and projects what would have happened if MM had never been implemented. The **blue line** represents what was actually observed since MM was implemented.

## Limitations

- We were unable to assess for other programmatic changes or individual-level confounders.
- We were unable to assess whether intensity of or fidelity to MM services modulate outcomes.

## Conclusions

- Implementation of a MM program was associated with improved retention in ART services and higher viral suppression rates.**
- There was ongoing but diminishing improvement in DNA PCR test positivity rates following MM implementation. This might be explained by having reached a plateau or increased uptake of HIV testing among high-risk HEI.
- Further research is needed to understand the type of MM interactions that best serve the complex needs of HIV-affected mother-infant dyads, and organizational factors that will allow for high-fidelity implementation of MM strategies.

## References

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