Vertical HIV transmission – substantial reductions but not elimination with universal ART

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BACKGROUND

- Vertical transmission (VT) is a preventable adverse outcome of HIV that may occur during pregnancy, delivery and post-partum
- Using routine provincial public sector individuated data, we evaluated the temporal effectiveness of vertical transmission prevention (VTP) over three maternal antiretroviral treatment (ART) policy periods in the Western Cape, South Africa:
  1. CD4 count <200 cells/µl (January - March 2010)
  2. CD4 count <350 cells/µl (April 2010 - April 2013)
  3. Lifelong ART/Option B+ (May 2013 onwards)

METHODS

- Retrospective cohort study with **child HIV acquisition** as primary outcome
- Pregnancies with a **live birth outcome** between 2010 and 2020 were enumerated using the Provincial Health Data Centre (PHDC) Maternity Cascade
- **HIV exposure** was defined as a child whose mother had electronic records of HIV antenatally or up to 2 years after delivery
- Multivariable logistic regression was used to explore **associations with VT** using 4 different models

RESULTS

- **842 641 pregnancies** identified over 10 years (1.9%, 16.7% and 82.1% in Policy Periods 1, 2 and 3 resp.)
- Median **maternal age 26.7** years (IQR 22.4 – 31.6)
- Proportion of women initiating ART prior to pregnancy increased (Fig 1a) and proportion of exposed children with **unknown HIV status decreased** (Fig 1b)
- Of all children with maternal HIV exposure, **2.1% (95% CI 2.1 – 2.2) were diagnosed with HIV** (Fig 2 illustrating characteristics of VT in later years)
- 16.5% of children with HIV (2017 – 2020) did not have records of maternal HIV (negative/unknown exposure) (Fig 2)
- Children born in policy period 3 (vs 2) were less likely to be diagnosed with HIV (aOR 0.66; 95% CI 0.60 – 0.72)
- Delayed/absent antenatal ART, younger maternal age, previous tuberculosis (TB) and no record of antenatal visits were associated with VT across all periods (Fig 3)

Figure 1a: Proportion of maternal antenatal ART initiation 2010 – 2020 (n = 134 944)

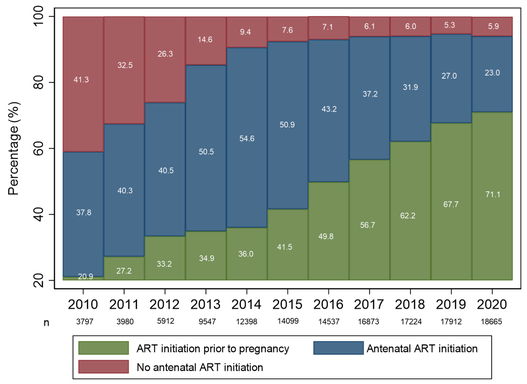
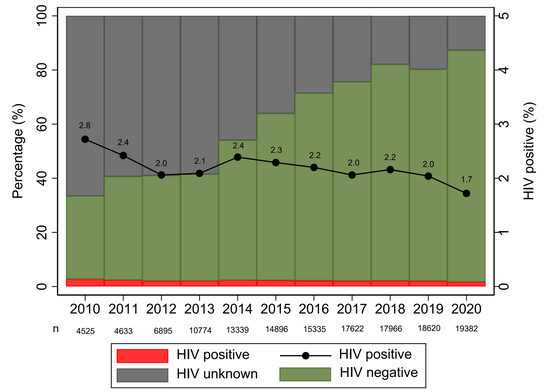
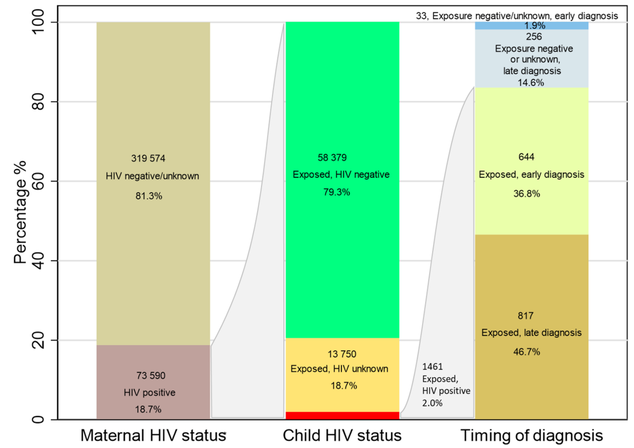


Figure 1b: HIV status by 24 months (based on last available test) among children HIV exposed 2010 – 2020 (n = 143 987)



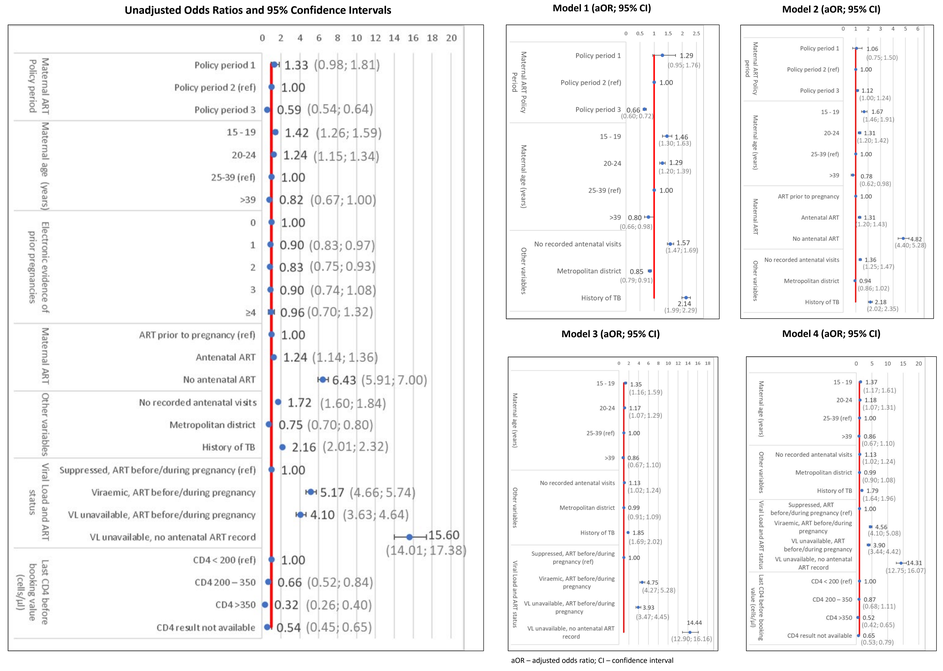
Changes in maternal ART policy have **reduced vertical transmission (VT)** in the last decade, but it remains high among **younger women** and those **without antenatal care**.

Figure 2: Vertical transmission characteristics 2017 – 2020*



*Maternal HIV status is mother's HIV status during the index pregnancy or within 2 years after delivery.
Late diagnosis > 7 weeks of age

Figure 3: Comparison of different models for factors associated with VT**



aOR – adjusted odds ratio; CI – confidence interval

Model 1 includes maternal ART policy period without adjustment for maternal ART, VL and CD4 count which are all impacted by the policy period. **Model 2** includes both maternal ART policy period and maternal ART status. **Model 3** includes VL status combined with ART status into a composite variable. **Model 4** includes combined VL and ART status as well as CD4 status. Models 3 and 4 are restricted to policy period 3.

CONCLUSION

- We demonstrate the positive impact of maternal ART policy change on VTP
- We highlight the need for targeted interventions for high-risk groups
- The number of new diagnoses in children without established exposure emphasizes the importance of repeat antenatal and postnatal testing

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