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Programmatic Implementation of WHO Option B in Botswana Associated with Increased Projected MTCT

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Background

- 2013 WHO guidelines for prevention of mother-to-child transmission (MTCT) recommend 3-drug antiretroviral therapy (ART) for all HIV-infected pregnant women (Option B or B+)
  - Programs offering antenatal zidovudine for women with high CD4 counts (Option A) to transition to Option B/B+
- In 2009, Botswana became one of the first African countries to transition from Option A to Option B
  - Pilot Option B program (NVP or LPV/r-based depending on CD4) started in 5 rural districts, 2009
  - Following change in national guidelines, country-wide implementation (EFV-based) began in 2011
- Although midwives at antenatal clinics administered Option A, women were referred to ART clinics to start ART under Option B. Few women opted to breastfeed.

Objective

- To evaluate the impact of programmatic transition from Option A to Option B on projected MTCT in Botswana

Methods

Antenatal and Maternity Data Extraction

- Surveillance occurred at principal maternity wards in Gaborone (2009-2012), and Molepolole, Mochudi, Francistown, Maun, and Ghanzi (2009-2011)
  - Individual obstetric records abstracted at delivery

Projecting Expected MTCT Rates

- Published estimates of MTCT rates (summarized in Ciaranello AL *et al.* Plos Med 2012) were used to estimate risk of transmission by maternal receipt of antiretrovirals
- Based on gestational age of initiation, maternal CD4 strata (imputed when not measured), and intended infant feeding method a projected MTCT rate assigned for each delivery (see Table 1)

Methods

* source studies reviewed in Ciaranello AL *et al.* Plos Med 2012	Projected Peripartum/Intrauterine MTCT Rate (%) CD4>350 / CD4≤350	Projected 6-Month Breastfeeding MTCT Rate (%) CD4>350 / CD4≤350
Maternal ART		
Initiated ≤ 28 weeks GA	0.4 / 1.1	1.1 / 2.1
Initiated 29-34 weeks GA	1 / 3.3	1.1 / 2.1
Initiated >34 weeks GA	2.8 / 4.1	1.1 / 2.1
Maternal ZDV monotherapy		
Initiated ≤ 34 weeks GA	2.4 / 9.1	1.5 / 4.7
Initiated >34 weeks GA	4.1 / 15.7	1.5 / 4.7
Maternal sdNVP/ZDV in labor	7.3 / 17.6	1.5 / 4.7
No maternal antiretrovirals	17.5 / 27.3	1.5 / 4.7

- A summary MTCT prevention score (MPS) was calculated from the projected risk, standardized to the WHO/UNAIDS target of <5% MTCT

Analytic Methods

- Date of transition from Option A to Option B defined as the earliest of either the date of sustained ART use for women with CD4≥350 in the district or 1 January 2012
- LOESS regression utilized to describe longitudinal trends
- Multivariable logistic and linear regression models accounted for clustering at antenatal clinic and district

Results

- 36,597 deliveries of Botswana citizens during surveillance (29.7% HIV+, 69.1% HIV-, 1.2% unknown HIV status)

	Registering under Option A N=7008	Registering under Option B N=3859
Maternal Age < 25yrs	35.3%	36.3%
Maternal Secondary Education	83.1%	81.6%
Gestation age at antenatal clinic registration, median	19.6 (15, 24)	20.3 (16, 25)
Onsite ART clinic	26.2%	42.4%
Rural/Peri-urban location	32.8%	61.6%

Results

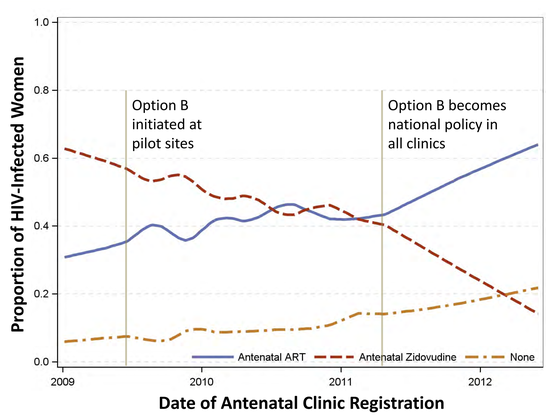


Figure 1: Antenatal antiretroviral use by women delivering at surveillance sites, 2009 to mid-2012.

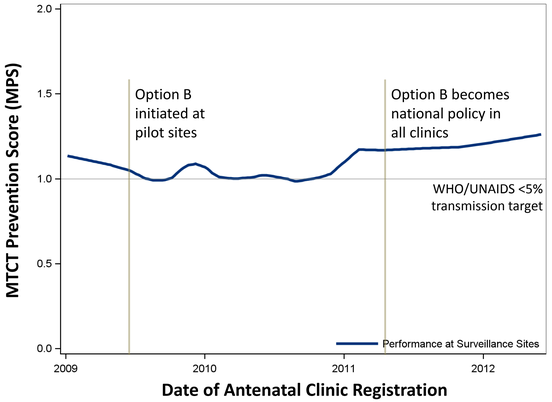


Figure 2: MTCT Prevention Score (MPS) for women delivering at surveillance sites, 2009 to mid-2012.
* MPS indexes projected risk of transmission to the WHO/UNAIDS target of <5% transmission. MPS above 1.0 indicates projected transmission above target.

	Adjusted Odds Ratio (95%CI)
ART by delivery	
Registering under Option A	—
Registering under Option B	2.68 (2.32, 3.10)
No antenatal antiretrovirals	
Registering under Option A	—
Registering under Option B	2.05 (1.69, 2.47)

* Models adjusted for surveillance site, gestational age at antenatal care registration, timing of HIV diagnosis, rural location, presence of onsite ART clinic, registration during general strike, and maternal age and education.

- In multivariable model, registering under Option B associated with a 17% relative increase in risk of MTCT, MPS +0.14 (P<0.001)
- Limited interviews with women and clinic staff indicated logistical difficulties at ART clinic and decreased acceptance of ART vs. ZDV monotherapy among pregnant women

Limitations

- Findings may not be applicable beyond the initial transition period
- Unable to differentiate between no receipt of ART during delivery and no recording in patient chart of ART receipt

Conclusions

- During initial 3yrs of implementation, Option B associated with increased projected rate of MTCT
  - While ART use in pregnancy increased, more women delivered without any antenatal antiretrovirals
  - Logistical challenges at ART clinics and possible reluctance among women to start ART may explain higher numbers of women receiving no antiretrovirals
- Programs transitioning to Option B or B+ should ensure that ART can be initiated at antenatal clinics and that ZDV monotherapy remains an option if ART delayed