



Cost-effectiveness of Tenofovir/Lamivudine/Efavirenz versus Tenofovir/Lamivudine/Dolutegravir for Preventing Mother-to-child Transmission of HIV in Nigeria

Asinamai Ndai, B. Pharm., M.S.¹, Yi Guo, Ph.D.³, Tianze Jiao, Ph.D.^{1,2}, Rupal Aroza Pharm.D.¹, Scott Martin Vouri, Pharm.D., Ph.D.^{1,2}, Haesuk Park, Ph.D.^{1,2}, Hui Shao, Ph.D.^{1,2}
¹ Department of Pharmaceutical Outcomes & Policy, University of Florida College of Pharmacy, Gainesville, FL
² Center for Drug Evaluation and Safety, University of Florida, Gainesville, FL
³ Health Outcomes & Biomedical Informatics, College of Medicine, University of Florida, Gainesville, FL

UF

College of Pharmacy
UNIVERSITY of FLORIDA

UF

Center for Drug
Evaluation and Safety
UNIVERSITY of FLORIDA

INTRODUCTION

- HIV/AIDS is still the leading cause of disease burden in sub-Saharan Africa and Nigeria has the second largest burden in the world, with the prevalence of 1.4% (NACA, 2019) .
- The World Health Organization (WHO) recommended using Tenofovir/Lamivudine/Dolutegravir (TLD) over Tenofovir/Lamivudine/Efavirenz (TLE) in pregnant women living with HIV.

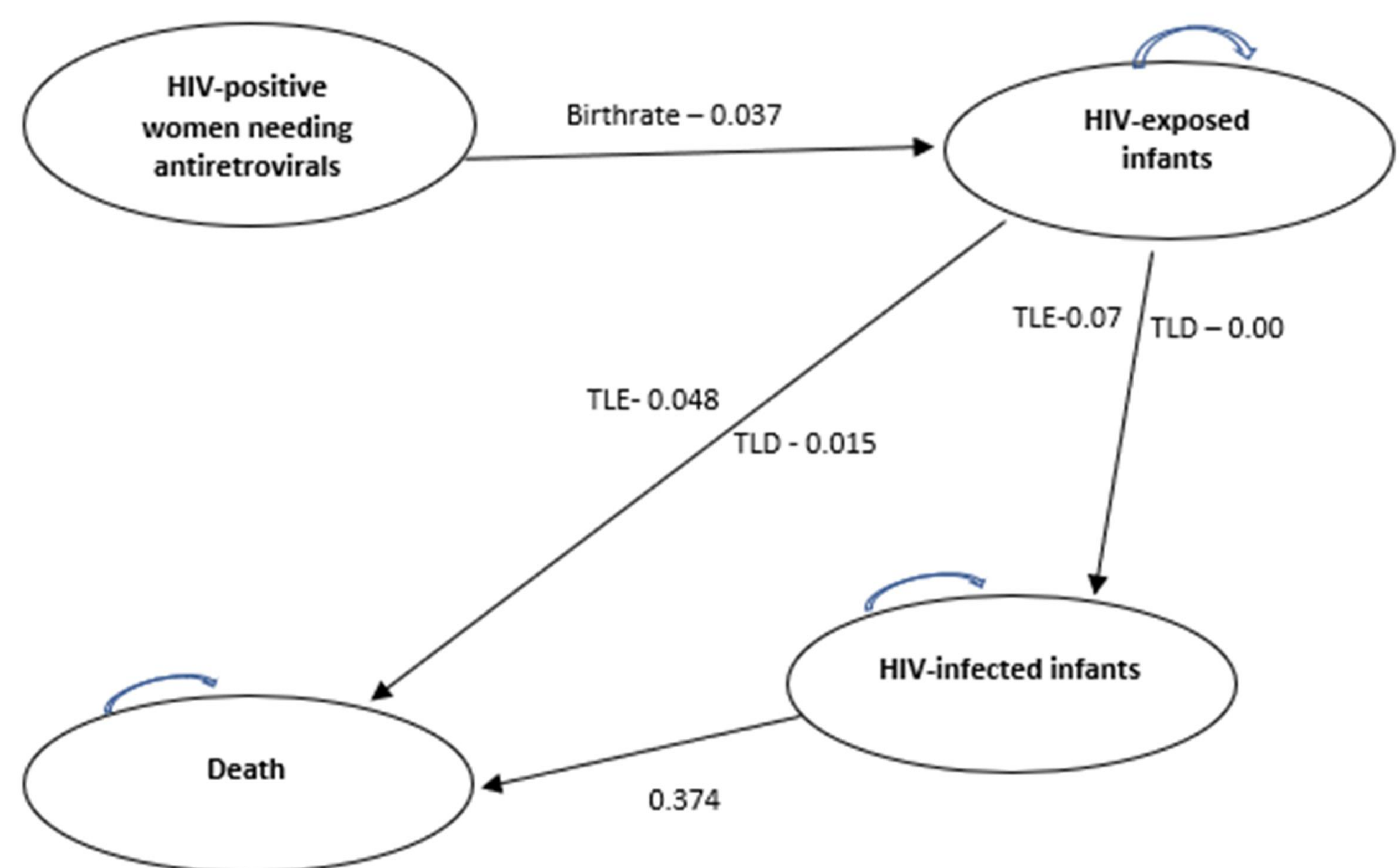
Objective: We evaluated the cost-effectiveness of TLD vs. TLE to prevent mother-to-child transmission of HIV in pregnant women in Nigeria.

METHODS

We developed a Markov model to estimate health outcomes (Disability-Adjusted Life Years (DALY)) of TLD vs. TLE in pregnant women living with HIV from a payer’s perspective.

- Three health states of children born to HIV-infected mothers were included; healthy, HIV-infected (vertical transmission), and death (stillbirth and neonatal death).
- The annual cost of TLD, TLE, and antiretroviral for pediatrics were \$66, \$69, and \$236, respectively.
- The Willingness to Pay (WTP) was estimated at \$2097 per DALY averted.
- Costs and DALYs discounted at an annual rate of 3%.
- Outcomes were modeled for 5 years, incremental cost-effectiveness ratios (ICERs) were calculated for TLD compared to TLE.

MARKOV MODEL



Parameters	Estimates	Source
Annual costs of TLD	\$66	USAID-GHSC Program
Annual costs of TLE	\$69	USAID-GHSC Program
Annual costs ARVs for Pediatric ART for HIV-infected children	\$236	USAID-GHSC Program
Infant mortality (all infants)	0.117	UNICEF
Infant mortality (HIV infected)	0.374	Newell et al. (2004)
TLE transmission probability (%)	0.07	Davey et al., (2020)
TLD transmission probability (%)	0.00	Davey et al., (2020)
Mortality rate among women with HIV (0.366 among women on TLE, 0.44% difference)	0.371	World Bank, UNAIDS, Dugdale et al., 2019
Birthrate HIV-positive women	0.037	World Bank
PMTCT coverage (%)	0.427	UNADIS
Annual discount rate (%)	0.03	
DALYs associated with one vertical transmission of HIV	23.70	Kuznik et al., 2012
Excess medical cost associated with stillbirth	\$750	Gold, Sen, & Xu, 2013
DALYs associated with stillbirth	31.57	Goodman et al., 2017
DALYs associated with neonatal death	31.55	Goodman et al., 2017
Stillbirth associated TLE	0.019	IMPACT, 2010
Stillbirth associated TLD	0.052	IMPACT, 2010
Neonatal death associated TLE	0.048	IMPACT, 2010
Neonatal death associated TLD	0.015	IMPACT, 2010
Number of women needing ARV	147,942	Spectrum, 2020

RESULTS

	TLD	TLE
Estimated number of HIV-positive pregnant women	63615	63615
Estimated number of HIV-exposed infants	4705	4667
Cost/patient	\$101.26	\$103.92
Stillbirths	190	68
Vertical transmission of HIV	0 (0.00%)	296 (6.35%)
Neonatal deaths	55	173
DALYs/patient	0.12	0.22
Incremental Outcomes (TLD vs TLE)	Dominant	

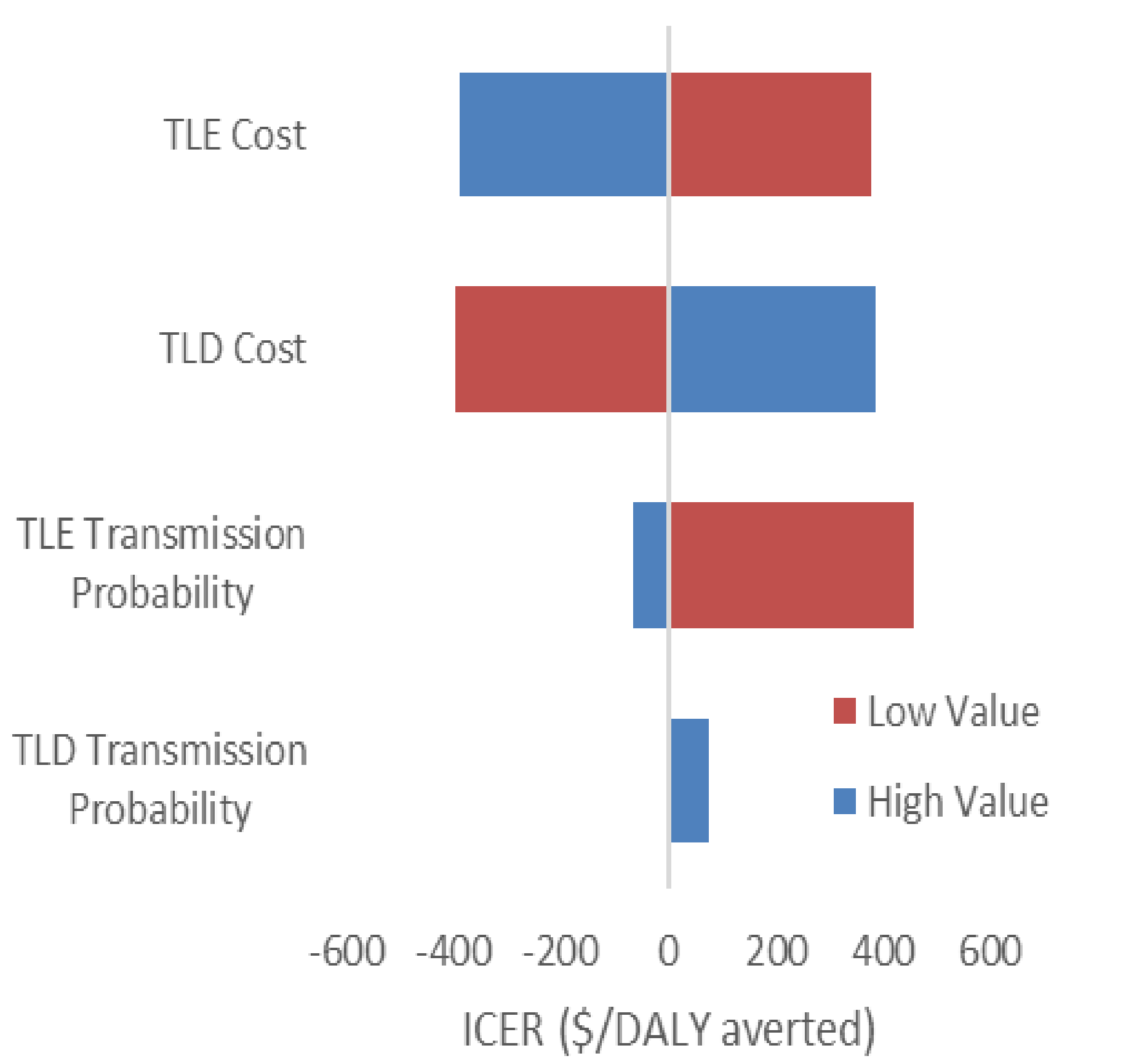
MAIN FINDINGS

At the ART coverage of 42.7%, the study sample included 147,942 women. The total cost of TLE and TLD was \$104 and \$101 per patient. Compared to TLE, TLD averted 296 vertical transmission of HIV infection and 118 neonatal death, but increased stillbirth by 122. TLD was a dominant choice over TLE. Results from sensitivity analysis show that our conclusion is robust to parameter uncertainties.

LIMITATIONS

The limitations of this study include the assumption of 100% adherence, viral load suppression before delivery, constant ART coverage and birthrate among HIV-positive pregnant women over the study period.

ONE-WAY SENSITIVITY ANALYSIS



CONCLUSION

The results suggest that use of TLE over TLD for pregnant women living with HIV will improve the health of children born to HIV-infected mothers with reductions in cost in Nigeria. Additionally, provides the needed evidence to advocate and mobilize resources for elimination of mother to child transmission of HIV.

REFERENCE

