

Cost-effectiveness of broadly neutralizing antibodies for HIV prophylaxis for infants born in settings with high HIV burdens

Appendix

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Supplementary Methods

These supplementary methods provide additional details regarding modeling methodology, input specification, and derivation of key parameters. The Cost-Effectiveness of Preventing AIDS Complications – Pediatric (CEPAC-P) model has previously been validated and additional information is available in previously published works.¹⁻¹¹ For further details regarding the mathematical formulas used in the model, model flowcharts, and opportunities for collaboration, we direct readers to the CEPAC website: <https://mpec.massgeneral.org/cepac-model/>.

Cohort weighting

For each country, we simulated four sub-cohorts of infants with varying risks of HIV exposure assessed at the time of birth:

- 1) infants with known, high-risk HIV exposure;
- 2) infants with known, low-risk HIV exposure;
- 3) infants with unrecognized HIV exposure; and
- 4) infants initially unexposed to HIV (but who may become exposed postnatally).

We used World Health Organization (WHO) criteria to define high-risk (i.e., mother was not on antiretroviral therapy [ART] in pregnancy, mother was on ART in pregnancy but had a viral load [VL] >1000 copies/mL near delivery, or mother was on ART for <4 weeks prior to delivery) and low-risk (i.e., mother was on ART and had VL ≤1000 copies/mL near delivery) exposure.¹²

Together, these four sub-cohorts include all infants born in a country. To estimate the proportion of infants within each sub-cohort, we used published data on country-specific estimates of maternal HIV prevalence/incidence during pregnancy, knowledge of HIV status, ART uptake, and probability of virologic suppression to populate the following equations:

$$\text{Known, high-risk proportion} = \left(\begin{array}{l} \% \text{ of mothers known to have} \\ \text{chronic HIV who were not} \\ \text{on ART during pregnancy} \end{array} \right) + \left(\begin{array}{l} \% \text{ of mothers known to have} \\ \text{chronic HIV who were on ART} \\ \text{with a VL} \geq 1000 \text{ copies/mL} \end{array} \right) + \left(\begin{array}{l} \% \text{ of mothers known to have} \\ \text{been acutely infected with HIV} \\ \text{during pregnancy} \end{array} \right)$$

$$\text{Known, low-risk proportion} = \left(\begin{array}{l} \% \text{ of mothers known to have} \\ \text{chronic HIV who were on ART} \\ \text{with a VL} < 1000 \text{ copies/mL} \end{array} \right)$$

$$\text{Unknown HIV-exposed proportion} = \left(\begin{array}{l} \% \text{ of mothers with unknown} \\ \text{chronic HIV during pregnancy} \end{array} \right) + \left(\begin{array}{l} \% \text{ of mothers with unknown} \\ \text{acute HIV during pregnancy} \end{array} \right)$$

$$\text{Unexposed proportion} = 1 - \left(\begin{array}{l} \text{known, high-risk} \\ \text{proportion} \end{array} \right) - \left(\begin{array}{l} \text{known, low-risk} \\ \text{proportion} \end{array} \right) - \left(\begin{array}{l} \text{unknown} \\ \text{HIV-exposed} \\ \text{proportion} \end{array} \right)$$

We used the proportion of infants within each of the four sub-cohorts to weight model outcomes and scale results representative of all infants born in a country.

Additional modeled strategies

To determine the potential impact of broadly neutralizing antibody (bNAb) infant prophylaxis, we modeled the standard-of-care alone and various strategies offering bNAbs, in addition to the standard-of-care, to subsets of infants. A bNAb strategy targeted one of three nested populations of infants: 1) infants with known, high-risk

HIV exposure at birth (*HR-HIVE* strategies); 2) infants with any known HIV exposure at birth (*HIVE* strategies); or 3) all infants regardless of known HIV exposure (*ALL* strategies). Infants in the target population were offered one of three dosing approaches: 1) one bNAb dose at birth (*1-dose*), 2) one bNAb dose at birth and one dose at three months (*2-doses*), or 3) one dose of bNAb at birth and one bNAb dose every three months thereafter for up to 18 months while breastfeeding (*Extended*). The combination of a target population and a dosing approach comprised a bNAb strategy. For example, *ALL-1-dose* would be the bNAb strategy in which all infants, regardless of known HIV exposure, are offered one dose of bNAb at birth.

In the primary analysis, we mainly examined strategies in which all infants in the target population received the same dosing approach. However, we also examined hybrid strategies in which subsets of the target population received different dosing approaches. For example, *ALL-1-dose plus HIVE-Extended* would offer one dose of bNAb to all infants at birth and an additional dose of bNAb to infants with known HIV exposure every three months for up to 18 months while breastfeeding. With the exception of *ALL-1-dose plus HIVE-Extended* all other hybrid strategies did not hold comparable value to non-hybrid strategies and are, thus, only presented in the appendix (Supplementary Table 5).

[Infant HIV prophylaxis model structure](#)

The infant HIV prophylaxis module (Supplemental Figure 2) is embedded within the CEPAC-P model and allows the user to simulate up to four concurrent and independent lines of HIV prophylaxis. The influence of infant HIV prophylaxis on reducing intrapartum (IP) transmission is reflected as a one-time multiplier on the IP component of the overall intrauterine (IU)/IP transmission risks at birth. For all months after birth, children who are breastfeeding, have not had a prior positive HIV test, and who do not have an active dose of prophylaxis from a prior month face optional user-specified prophylaxis eligibility criteria based on their age, maternal characteristics, and early infant diagnosis (EID) test results.

If the child meets eligibility criteria for that line of prophylaxis, they then face a probability of access and adherence to prophylaxis each month. If the child receives a dose of prophylaxis, an “efficacy multiplier” is applied to reduce postnatal transmission for a user-specified number of months during which the prophylaxis dose is active. Irrespective of efficacy, if a child receives prophylaxis in a given month, they also experience a probability of mild and/or severe drug toxicity in the month the dose was administered. Every toxicity event also carries a toxicity cost; when a severe toxicity is encountered, it also carries a probability of death in that month and triggers the prophylaxis regimen to be permanently stopped.

[Oral infant prophylaxis regimens and efficacy](#)

In the standard-of-care and in all bNAb strategies, infants with known HIV exposure were eligible for oral infant prophylaxis per WHO recommendations (i.e., six weeks of daily nevirapine [NVP] for infants who are low-risk, HIV-exposed and 12 weeks of daily zidovudine [ZDV] plus nevirapine for infants who are high-risk, HIV-exposed).¹² With conflicting data on the efficacy of one vs. multi-drug infant prophylaxis regimens, we modeled the same relative efficacy of both regimens.¹³

Modeled perinatal transmission risks among women on ART in pregnancy were largely derived from studies in which infants received short courses of antiretroviral prophylaxis after birth. Therefore, we did not model additional reductions in perinatal transmission among infants born to mothers on ART in pregnancy. However, among infants born to women who did not receive ART in pregnancy, we modeled a 69% relative reduction in the intrapartum component of perinatal transmission with oral infant prophylaxis based on data from the Post-Exposure Prophylaxis of Infants (PEPI) trial.¹⁴ In the PEPI study, the cumulative HIV acquisition rate at six weeks among breastfeeding infants who received a single NVP dose plus one week of ZDV was 5.10% compared to 1.58% among infants who received control plus extended dual prophylaxis (NVP + ZDV) (relative risk [RR]: 0.31).¹⁴ While transmission by six weeks may include some early postnatal transmission, we applied

this risk reduction to the intrapartum component of vertical transmission risks for high-risk infants in the model, to be conservative with respect to the relative incremental benefits of bNAbs.

We also modeled a 71% decrease in postnatal transmission risk with oral infant prophylaxis based on an analysis of pooled individual data from five randomized trials of infant NVP prophylaxis demonstrating an adjusted hazard ratio (in time-varying analyses) of 0.29 (95% CI: 0.20-0.42) for vertical transmission while NVP was administered.¹⁵

BNAb efficacy and duration

Anti-HIV bNAbs, such as VRC01, VRC01-LS, and VRC07-523LS, have demonstrated safety, tolerability, and favorable pharmacokinetics in infants.¹⁶⁻¹⁸ Current bNAbs under investigation for use as infant HIV prophylaxis include:

Study	BNAb(s) investigated	Target site	Trial type	Included populations	Trial status
IMPAACT P1112	VRC01	CD4-binding site	Phase 1 study on safety and pharmacokinetics	Infants with HIV exposure	Completed
	VRC01LS	CD4-binding site			
	VRC07-523LS	CD4-binding site			
PedMAB	VRC07-523LS <i>plus</i> CAP256V2LS	CD4-binding site V1/V2 loop	Phase 1/2 study on safety, pharmacokinetics, and dose finding	Newborns with HIV exposure	Enrolling
SAMBULELO	VRC07-523LS	CD4-binding site	Phase 2 study on safety and pharmacokinetics	Newborns with HIV exposure, without HIV exposure, and with HIV	In development
EDCTP Neo bNAb Trial	VRC07-523LS	CD4-binding site	Proof-of-concept on effectiveness, efficacy, and operational feasibility	Newborns with HIV exposure	In development
IMPAACT 2037	PGT121.414.LS <i>with or without</i> VRC07523-LS	V3 glycan CD4-binding site	Phase 1 study on safety and pharmacokinetics	Newborns with HIV exposure	In development

Table adapted from ¹⁹.

Since there are currently no published human infant HIV prophylaxis efficacy studies, base case efficacy was estimated using data from human adult, non-human primate, and *in vitro* studies. In the Antibody Mediated Prevention (AMP) trials, VRC01 did not prevent overall sexual acquisition of HIV among populations of cisgender men and transgender adults in the Americas and Europe, or among women in sub-Saharan Africa.²⁰ However, acquisition of VRC01-sensitive isolates was 75.4% lower among individuals who received VRC01 compared to individuals who received placebo ($IC_{80} < 1 \mu\text{g/mL}$).²⁰ Other bNAbs under investigation, such as 3BNC117-LS, VRC07-523LS, 1-18, and 10-1074-LS are more potent and have greater breadth than VRC01.²¹ For example, VRC07-523LS neutralized 91% of primary African isolates in a multiclade panel with an IC_{80} of 4.4 $\mu\text{g/mL}$ compared to VRC01 neutralizing 66% with an IC_{80} of 18.4 $\mu\text{g/mL}$.²¹

By applying the 75% efficacy against acquisition of sensitive isolates found in the AMP trial to the 91% neutralization coverage of VRC07-523LS found in the multiclade panel, we estimate VRC07-523LS could potentially have 68% overall efficacy. Similar to combination ART, a final bNAb infant prophylaxis product will likely be a combination of bNAbs, such as the VRC07-523LS+PGT121+PGDM1400 combination currently being studied as adult prophylaxis (NCT03205917, NCT03928821, NCT04212091, and NCT03721510), to achieve high breadth and potency. As such, we assumed a three-bNAb combination would have 70% efficacy in the base case, only slightly higher than the implied efficacy of VRC07-523LS alone to be conservative of the clinical impact a bNAb combination could have as prophylaxis. Given the uncertainty in final product characteristics, bNAb efficacy was varied widely in sensitivity analyses.

While the AMP studies investigated bNAb efficacy when delivered as pre-exposure prophylaxis, non-human primate studies have also observed efficacy of bNAbs as post-exposure prophylaxis if given within 24-30 hours of exposure.^{22,23} Based on these data, we assumed that a bNAb given at birth would reduce the risk of IP HIV transmission as post-exposure prophylaxis, in addition to acting as pre-exposure prophylaxis for postnatal transmission.

Pharmacokinetic data from HIV-exposed infants suggest that with an 80mg dose of VRC07-523LS delivered subcutaneously at birth, concentrations of the bNAb would remain sufficiently high to achieve protective efficacy through at least 12 weeks of life.¹⁶ In the base case, we assumed a three-month effect duration following each bNAb dose, and we also varied this assumption in sensitivity analyses.

BNAbs cost estimates

The base case average bNAb cost was modeled as \$20 per dose, including the estimated costs of production (assuming a 100mg bNAb dose), as well as delivery (including training, personal protective equipment, and cold-chain), personnel, and facility/overhead needed to administer vaccines in low- and middle-income countries. The midpoint of the estimated cost range for all components was rounded to the nearest dollar and summed to reflect the total cost of bNAbs if they were produced, delivered, and administered at scale.

Itemized costs included in modeled bNAb cost per dose

Cost component	Cost estimate or range*	Rounded midpoint cost*
BNAbs production costs per 100mg dose ²⁴	\$2·00 - \$20·00	\$11
Supply and delivery costs per dose, including: training, social mobilization, hand hygiene, personal protective equipment, waste management, and cold-chain costs ²⁵	\$1·66	\$2
Service personnel costs ²⁶	\$0·68 - \$1·45	\$1
Facility overhead and capital costs ²⁷	\$1·92 - \$4·21	\$3
Total estimated cost	\$6·26 - \$27·32	\$17

*All costs are reported in 2020 USD.

To conservatively estimate the cost-effectiveness of bNAb infant prophylaxis, the total estimated cost was rounded up to the nearest ten (\$20/dose). The bNAb cost was varied widely in sensitivity analyses (\$5/dose - \$100/dose) to capture the total estimated cost using the lower bound of each cost component and to account for scenarios in which there are additional unforeseen costs or if bNAbs are not produced at scale.

Determining cost-effectiveness

We calculated incremental cost-effectiveness ratios (ICERs; USD/year of life saved [YLS]) by ordering strategies by increasing discounted life expectancy and dividing the difference in discounted costs by the difference in discounted life expectancy of consecutive, non-dominated strategies. Life expectancy and costs were discounted at 3%/year per standard cost-effectiveness practices.²⁸ bNAb strategies were dominated if they

resulted in shorter life expectancy than a less costly strategy or resulted in higher costs per YLS (i.e., higher ICER) than the next best-performing, non-dominated strategy. We considered a bNAb strategy cost-saving if it was non-dominated and resulted in the same or greater life expectancy than the standard-of-care at lower lifetime HIV-related costs.

While the WHO-CHOICE 100% GDP per capita-based cost-effectiveness threshold has been widely cited, there is growing concern that spending to this threshold may not offer good value, particularly in resource-limited settings.²⁹⁻³⁵ Due to budget constraints, investing in interventions at this GDP-based cost-effectiveness threshold may result in substantial opportunity costs (e.g., forgone health benefits) relative to other investments in health care that offer better value.²⁹⁻³⁵ Cost-effectiveness thresholds accounting for these additional considerations have been estimated in the published literature:

Cost-effectiveness thresholds for LMICs proposed in published literature

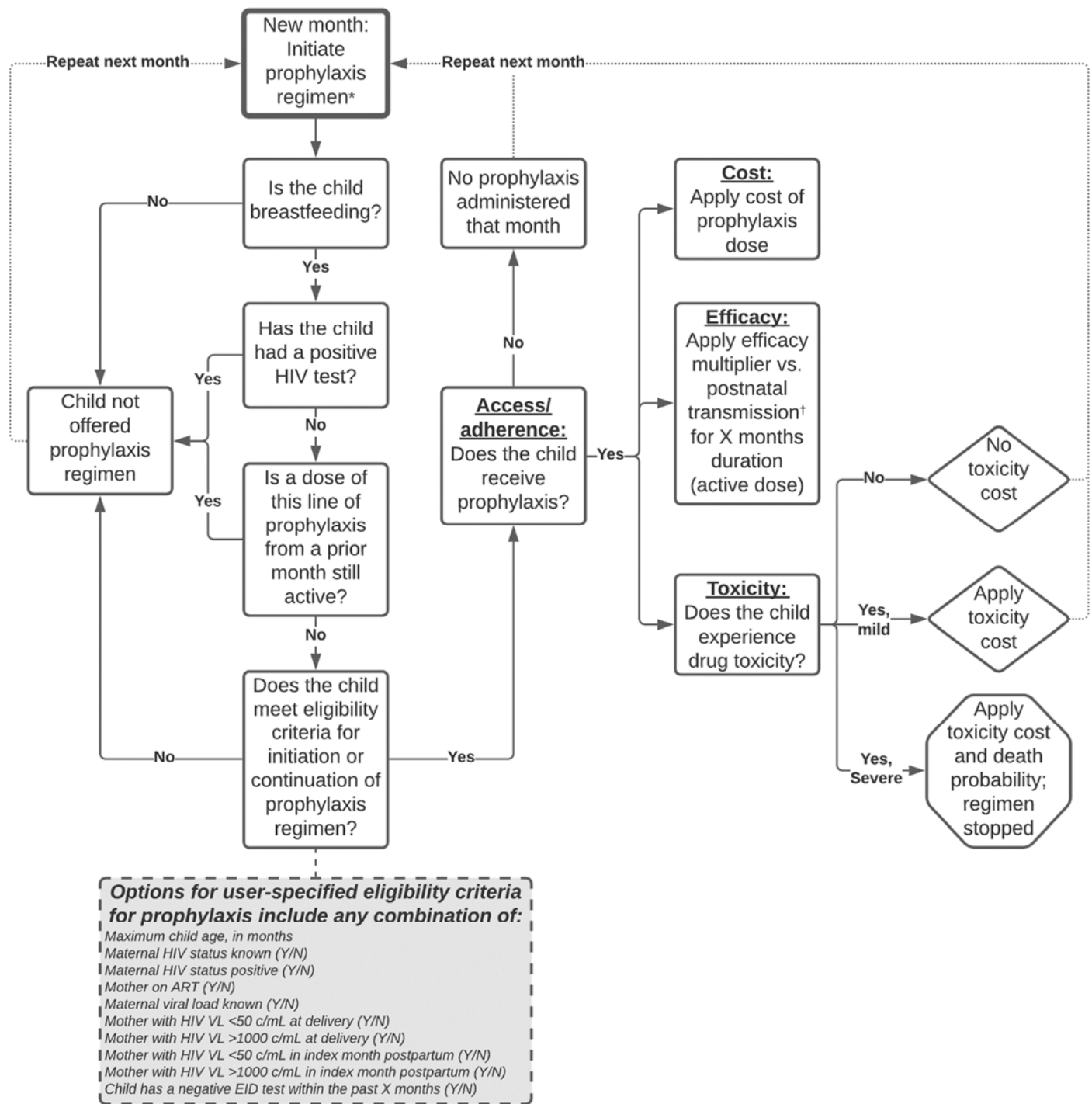
Source	Cost-effectiveness threshold (in % GDP per capita)		
	Côte d’Ivoire	South Africa	Zimbabwe
Woods B, Revill P, Sculpher M, Claxton K, 2016 ²⁹	4-52%	17-69%	1-32%
Ochalek JM, Lomas J, Claxton KP, 2018 ³³	15-19%	43-58%	22-30%
Jit M, 2021 ³⁴	30-40%	30-40%	30-40%
Edoka EP, Stacey NK, 2020 ³⁵	-	53%	-
Meyer-Rath G, Rensburg C, Larson B, Jamieson L, Rosen S, 2017 ³¹	-	10-17%	-

Table adapted from ³⁶.

As such, we used a more conservative cost-effectiveness threshold of 50% of GDP per capita in our base case analysis. Strategies that resulted in the greatest clinical benefit with an ICER \leq 50% of a country’s GDP per capita (Côte d’Ivoire: \$1163/YLS, South Africa: \$2828/YLS, Zimbabwe: \$607/YLS)³⁷ were considered cost-effective. Given that a 50% GDP per capita cost-effectiveness threshold may still require donor-support, we also assessed the impact of using a 20% GDP per capita cost-effectiveness threshold in a sensitivity analysis. Since the cost-effective bNAb strategy did not change using the 20% GDP per capita cost-effectiveness threshold in any of the three settings modeled under base case bNAb cost and efficacy assumptions, we chose to only present the 50% GDP per capita cost-effectiveness threshold in the main manuscript.

Supplementary Figure 1. CEPAC-P infant prophylaxis module flowchart

CEPAC-P Infant HIV Prophylaxis Module

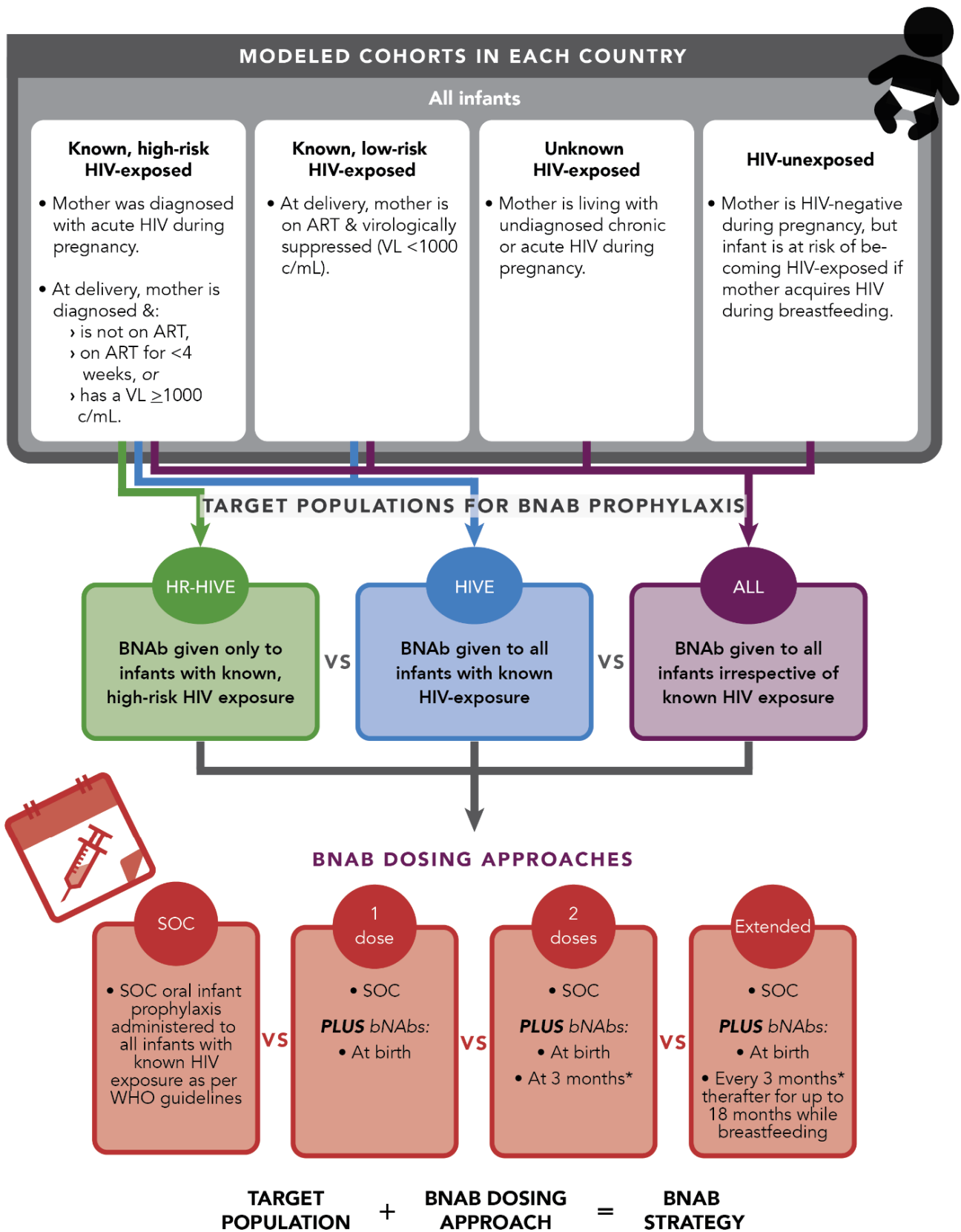


CEPAC-P, Cost-Effectiveness of Preventing AIDS Complications–Pediatrics Model; Y, yes; N, no; ART, antiretroviral therapy; VL, viral load; EID, early infant diagnosis.

* This process is repeated separately for each line of prophylaxis each month.

† Efficacy of prophylaxis against intrapartum transmission is applied directly as a one-time multiplier against the intrapartum component of the intrauterine/intrapartum transmission risk.

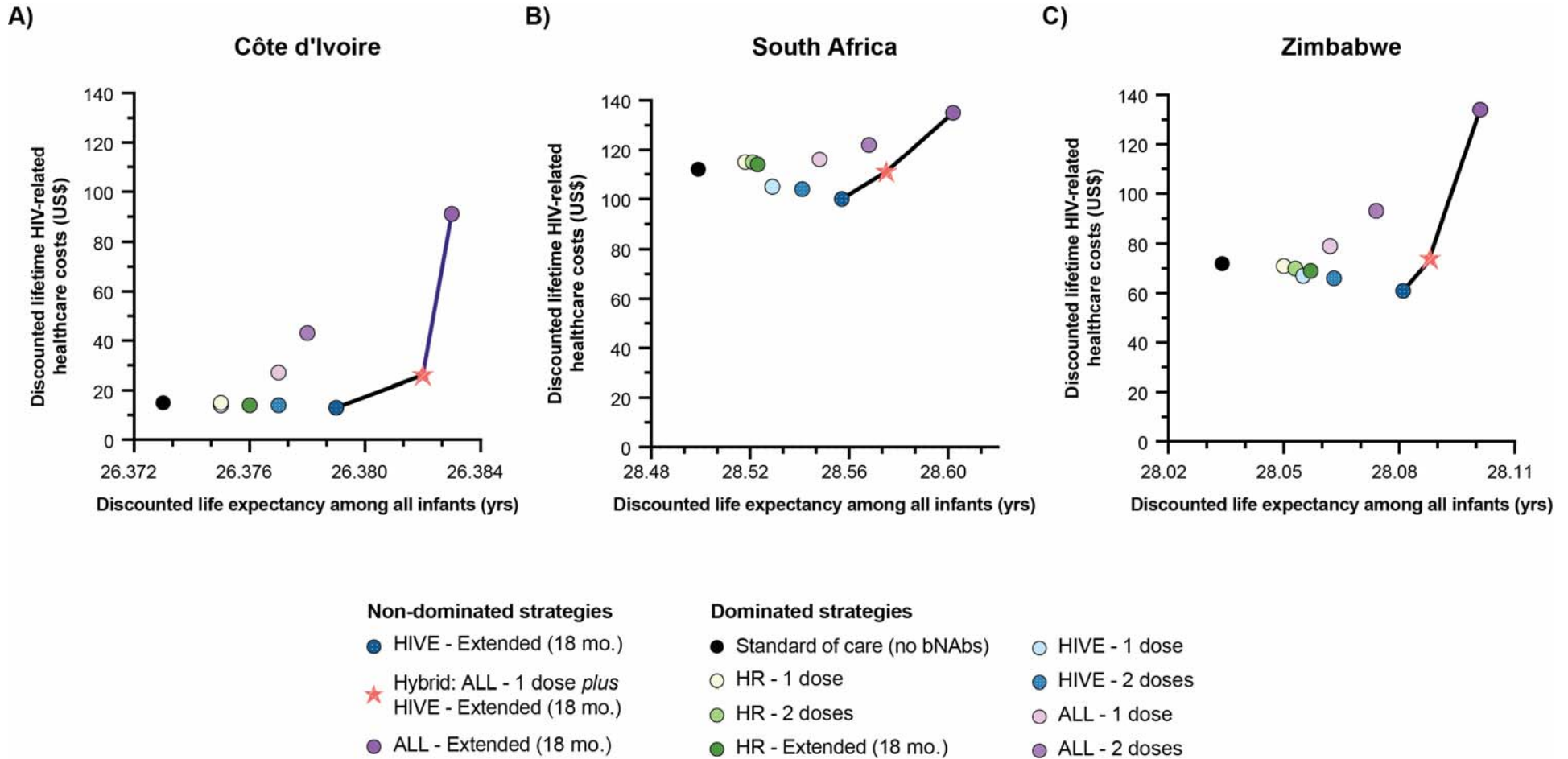
Supplementary Figure 2. Schematic of modeled cohorts and bNAb strategies



ART, antiretroviral therapy; VL, viral load; SOC, standard-of-care.

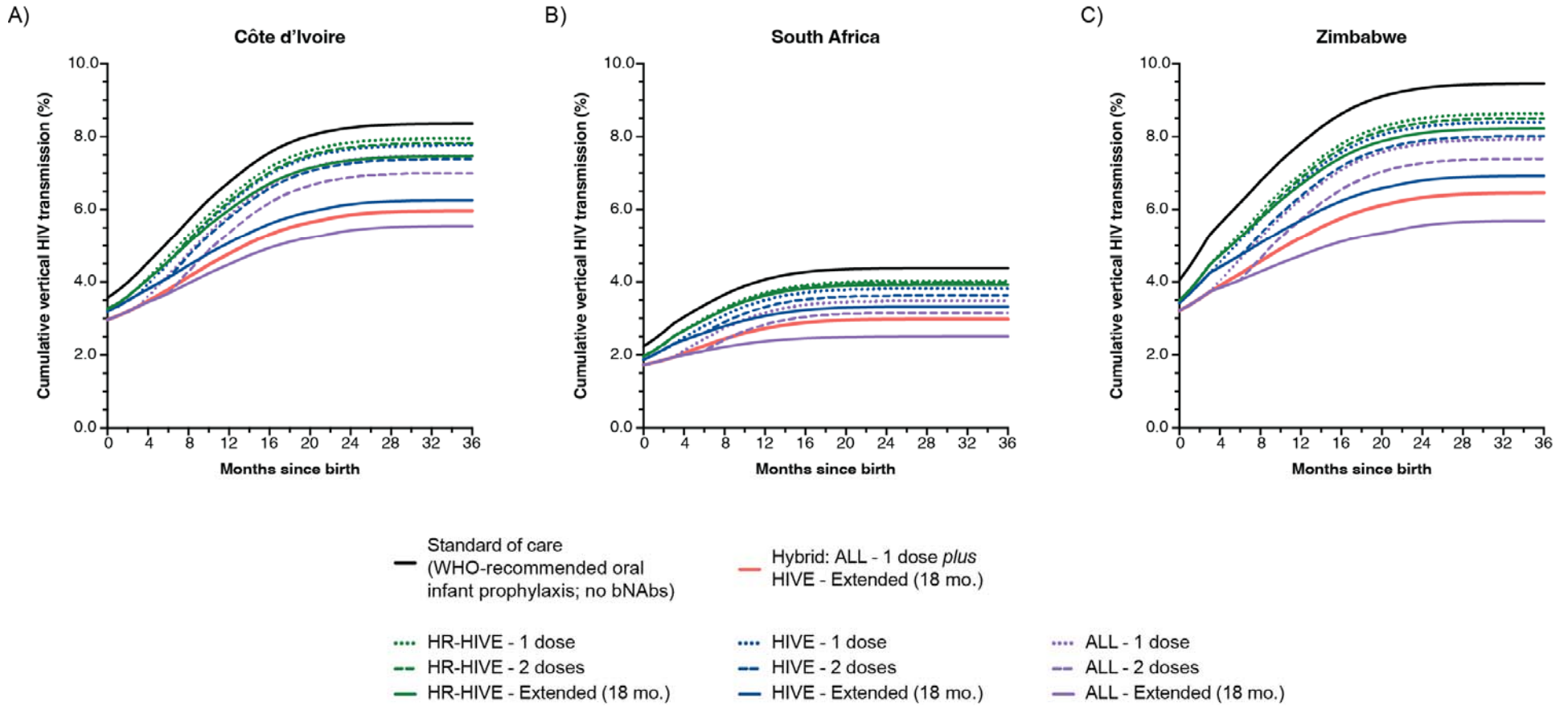
* The bNAb effect duration was varied during sensitivity analysis, and the frequency of administration was adjusted accordingly.

Supplementary Figure 3. Efficiency frontier of all bNAb strategies assessed, by country



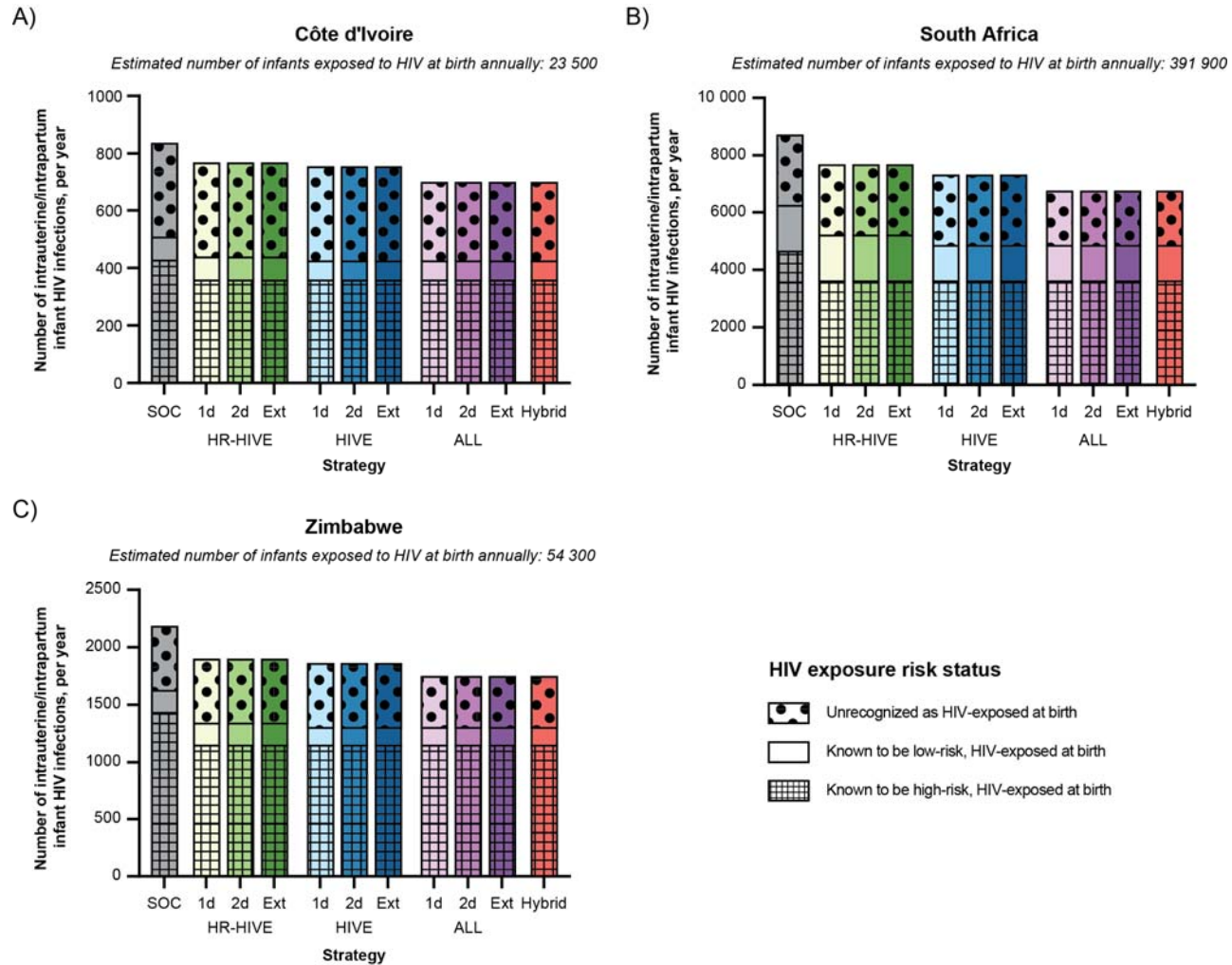
US\$, United States dollar; yrs, years; HIVE, bNAb strategy offering bNAb to infants with known HIV exposure at birth; ALL, bNAb strategy offering bNAb to all infants regardless of HIV exposure; mo., month.

Supplementary Figure 4. Cumulative vertical transmission in standard-of-care and bNAb strategies, by country



BNAb, broadly neutralizing antibody; WHO, World Health Organization; HR-HIVE, bNAb strategy targeting infants with known, high-risk HIV exposure at birth; HIVE, bNAb strategy targeting infants with known HIV exposure at birth; ALL, bNAb strategy targeting all infants regardless of known HIV exposure; mo., month.

Supplementary Figure 5. Breakdown of intrauterine/intrapartum infections occurring in each exposure group



SOC, standard-of-care; 1d, one bNAb dose; 2d, two bNAb doses; Ext, extended bNAb dosing (one dose every three months through 18 months of life while breastfeeding); HR-HIVE, bNAb strategy targeting infants with known, high-risk HIV exposure at birth; HIVE, bNAb strategy targeting infants with known HIV exposure at birth; ALL, bNAb strategy targeting all infants regardless of known HIV exposure.

The estimated number of infants at risk of intrauterine/intrapartum HIV acquisition in each exposure group varies by country. In Côte d'Ivoire, an estimated 6900 infants have known, high-risk HIV exposure at birth; 14 800 infants have known, low-risk HIV exposure at birth; and 1400 infants have unrecognized HIV exposure at birth. In South Africa, an estimated 66 200 infants have known, high-risk HIV exposure at birth; 295 700 have known, low-risk HIV exposure at birth; and 11 600 infants have unrecognized HIV exposure at birth. In Zimbabwe, an estimated 12 600 infants have known, high-risk HIV exposure at birth; 35 500 infants have known, low-risk HIV exposure at birth; and 2600 infants have unrecognized HIV exposure at birth.

Supplementary Figure 6. Cost-effective bNAb strategy across influential univariate sensitivity analyses, by country

	Côte d'Ivoire Cost-effectiveness threshold: ICER ≤ \$1163/YLS		South Africa Cost-effectiveness threshold: ICER ≤ \$2828/YLS		Zimbabwe Cost-effectiveness threshold: ICER ≤ \$607/YLS	
Base case	1468 (6.3%)		9814 (2.5%)		3752 (6.9%)	
	Low	High	Low	High	Low	High
BNAb cost <i>\$5/dose - \$100/dose; base case: \$20/dose</i>	1468 (6.3%)	1468 (6.3%)	9814 (2.5%)	13 045 (3.3%)	3507 (6.5%)	4551 (8.4%)
BNAb effect duration <i>1 - 6 mo.; base case: 3 mo.</i>	1863 (7.9%)	1465 (6.2%)	12 336 (3.1%)	9793 (2.5%)	3757 (6.9%)	3733 (6.9%)
BNAb efficacy <i>10 - 100%; base case: 70%</i>	1935 (8.3%)	1256 (5.3%)	16 564 (4.2%)	6621 (1.7%)	5013 (9.3%)	3161 (5.8%)
Maternal HIV prevalence and incidence <i>Pregnancy prevalence: varies by country*</i> <i>Incidence postpartum: varies by country*</i>	561 (6.3%)	2794 (6.3%)	4933 (2.7%)	12 551 (2.4%)	1569 (7.1%)	6755 (6.2%)
Maternal knowledge of acute HIV infection <i>During pregnancy: 25 - 95%; base case: varies by country†</i> <i>Postpartum: 0 - 15%/mo.; base case: varies by country†</i>	1493 (6.4%)	1381 (5.9%)	10 766 (2.8%)	8377 (2.1%)	4157 (7.7%)	3201 (5.9%)
Maternal knowledge of chronic HIV infection <i>Côte d'Ivoire: 56 - 100%; base case: 93%</i> <i>South Africa: 75 - 100%; base case: 99%</i> <i>Zimbabwe: 80 - 100%; base case: 98%</i>	3839 (17.5%)	1039 (4.4%)	23 654 (6.2%)	9548 (2.4%)	5290 (9.9%)	3539 (6.5%)

 HIVE - 1 dose	 Hybrid: ALL - 1 dose <i>plus</i> HIVE - Extended (18 mo.)	# ← Number of pediatric HIV infections (%) ← Total vertical transmission rate
 HIVE - Extended (18 mo.)	 ALL - Extended (18 mo.)	



ICER, incremental cost-effectiveness ratio; YLS, year of life saved; bNAbs, broadly neutralizing antibodies; mo., month; HIVE, bNAb strategy targeting infants with known HIV exposure at birth; ALL, bNAb strategy targeting all infants regardless of known HIV exposure.



* Maternal HIV prevalence at the time of delivery is inclusive of chronic HIV infection and incident infection during pregnancy. Maternal HIV prevalence was varied according to the lowest and highest subnational estimates in each country (Côte d'Ivoire: 1-5%, base case: 3%; South Africa: 15-45%, base case: 33%; and Zimbabwe: 5-25%, base case: 12%). Postpartum maternal HIV incidence was also decreased (Côte d'Ivoire: 0.001%/month, South Africa: 0.107%/month, Zimbabwe: 0.022%/month) or increased (Côte d'Ivoire: 0.005%/month, South Africa: 0.331%/month, Zimbabwe: 0.116%/month) proportional to the change in prevalence.

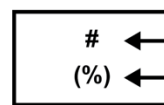
† In the base case, maternal knowledge of acute HIV infection in Côte d'Ivoire is 56% for infection acquired during pregnancy and 2% per month postpartum, in South Africa is 55% during pregnancy and 9% per month postpartum, and in Zimbabwe is 70% during pregnancy and 5% per month postpartum.

Supplementary Figure 7. Cost-effective bNAb strategy across non-influenza univariate sensitivity analyses, by country

	Côte d'Ivoire Cost-effectiveness threshold: ICER ≤ \$1163/YLS		South Africa Cost-effectiveness threshold: ICER ≤ \$2828/YLS		Zimbabwe Cost-effectiveness threshold: ICER ≤ \$607/YLS	
	Low	High	Low	High	Low	High
Base case	1468 (6.3%)	1468 (6.3%)	9814 (2.5%)	9814 (2.5%)	3752 (6.9%)	3752 (6.9%)
BNABs have no intrapartum efficacy	1549 (6.6%)	1549 (6.6%)	11 728 (3.0%)	11 728 (3.0%)	4070 (7.6%)	4070 (7.6%)
Infants receive either bNABs or standard of care oral infant prophylaxis, but not both	1518 (6.5%)	1518 (6.5%)	10 213 (2.6%)	10 213 (2.6%)	3928 (7.2%)	3928 (7.2%)
ART costs <i>0.5 - 2.0x; base case: 1.0x</i>	1468 (6.3%)	1468 (6.3%)	9814 (2.5%)	9814 (2.5%)	3752 (6.9%)	3752 (6.9%)
BNAB uptake* <i>Côte d'Ivoire: 56 - 83%; base case: varies by age South Africa: 85 - 96%; base case: varies by age Zimbabwe: 71 - 92%; base case: varies by age</i>	1578 (6.7%)	1392 (5.9%)	10 461 (2.7%)	9655 (2.5%)	3978 (7.3%)	3634 (6.7%)
Breastfeeding duration <i>Duration among women with/without HIV: Côte d'Ivoire: 8/8 - 24/24 mo.; base case: 14/19 mo. South Africa: 2/2 - 18/18 mo.; base case: 6/12 mo. Zimbabwe: 8/15 - 20/20 mo.; base case: 13/18 mo.</i>	1114 (4.8%)	1974 (8.4%)	7957 (2.1%)	14 640 (3.7%)	3265 (6.1%)	4428 (8.1%)
Cost of ascertaining high-risk status <i>\$0 - \$31.66; base case: \$31.66</i>	1468 (6.3%)	1468 (6.3%)	9814 (2.5%)	9814 (2.5%)	3752 (6.9%)	3752 (6.9%)
Maternal ART coverage during pregnancy† <i>Côte d'Ivoire: 70 - 100%; base case: 95% South Africa: 60 - 100%; base case: 97% Zimbabwe: 65 - 100%; base case: 89%</i>	2140 (9.4%)	1346 (5.7%)	25 351 (6.7%)	8752 (2.2%)	5078 (9.6%)	3112 (5.7%)
Oral infant prophylaxis efficacy <i>Intrapartum efficacy: 40 - 90%; base case: 69% Postnatal efficacy: 58 - 90%; base case: 71%</i>	1491 (6.4%)	1452 (6.2%)	10 002 (2.6%)	9681 (2.5%)	3860 (7.1%)	3676 (6.8%)
Postnatal vertical transmission risk <i>0.5 - 2.0x; base case: 1.0x</i>	1119 (4.8%)	2129 (9.1%)	8299 (2.1%)	12 770 (3.3%)	2831 (5.2%)	5431 (10.0%)
Postpartum maternal ART retention <i>50% - 100% at 6+ mo. among mothers with known status; base case: varies by month and country</i>	1729 (7.4%)	1359 (5.8%)	10 658 (2.7%)	9 528 (2.4%)	4203 (7.8%)	3574 (6.6%)
Postpartum maternal HIV incidence <i>0.5 - 2.0x; base case: 1.0x</i>	1433 (6.2%)	1544 (6.5%)	9293 (2.4%)	10 830 (2.6%)	3435 (6.6%)	4576 (7.9%)

 HIVE - 1 dose
 HIVE - Extended (18 mo.)

 Hybrid: ALL - 1 dose *plus*
HIVE - Extended (18 mo.)
 ALL - Extended (18 mo.)

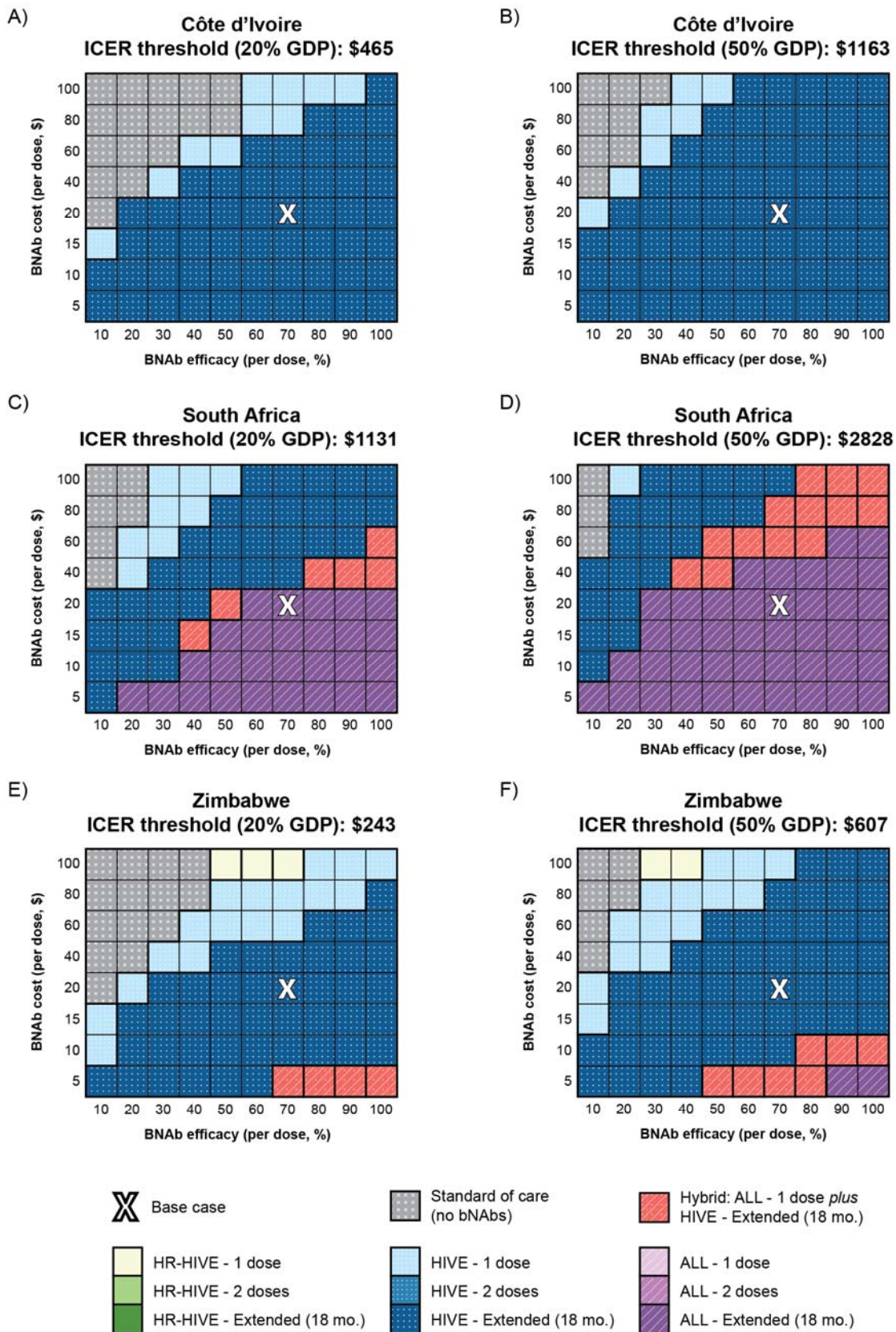
 # ← Number of pediatric HIV infections
 (%) ← Total vertical transmission rate

ICER, incremental cost-effectiveness ratio; YLS, year of life saved; bNABs, broadly neutralizing antibodies; ART, antiretroviral therapy; mo., month; HIVE, bNAB strategy targeting infants with known HIV exposure at birth; ALL, bNAB strategy targeting all infants regardless of known HIV exposure.

* In the base case, bNAB uptake varies by age informed by the country-specific percentage of infants delivered in a healthcare facility and uptake of vaccines in the routine infant vaccination schedule. In sensitivity analyses, the lowest and highest of each country's age-specific uptake was used as the uptake at every timepoint for the low and high scenarios, respectively.

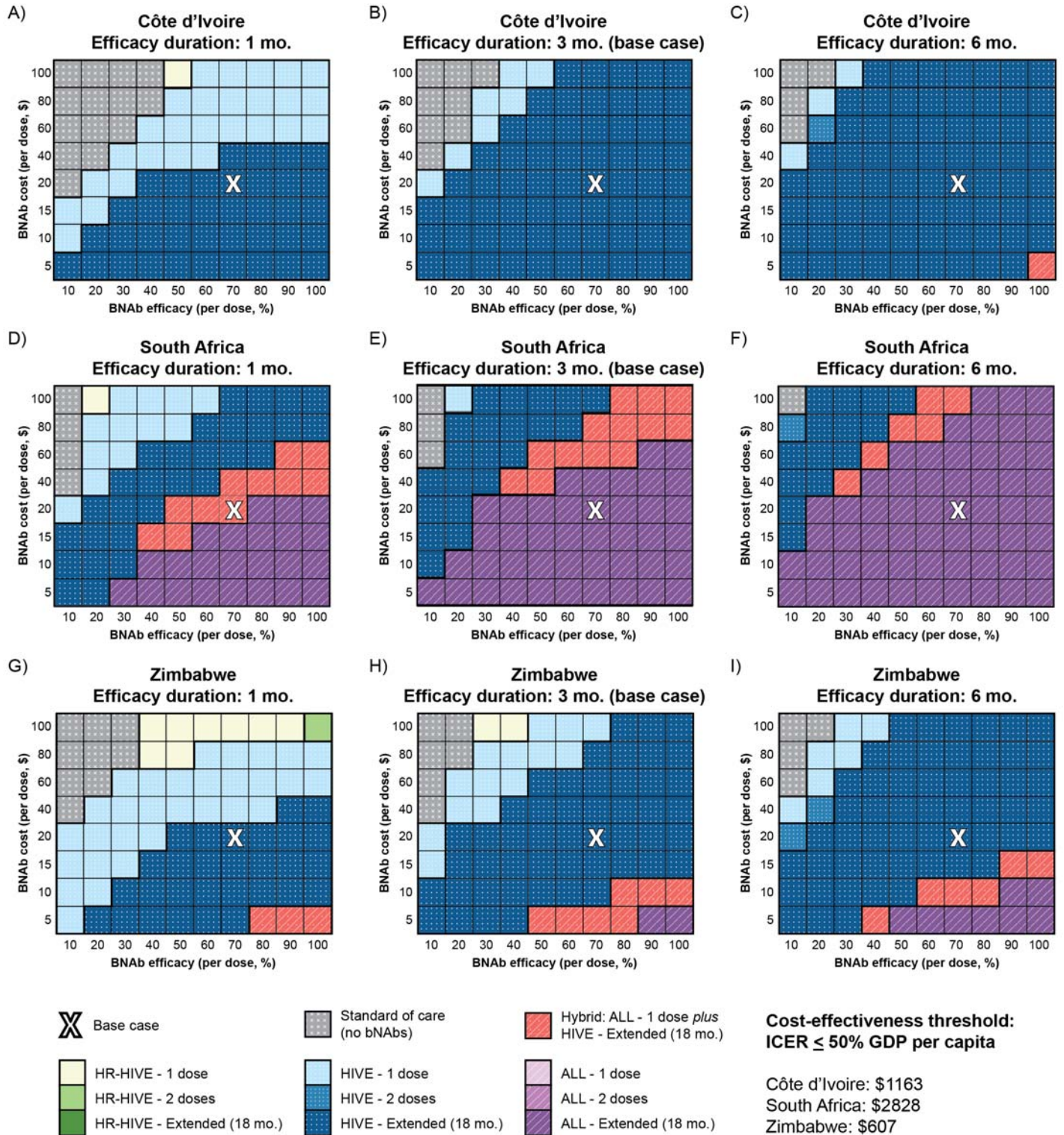
† Maternal ART coverage during pregnancy is a proportion of all women known to have HIV during pregnancy.

Supplementary Figure 8. Cost-effectiveness results of a three-way sensitivity analysis assessing bNAb efficacy, cost, and cost-effectiveness threshold, by country



ICER, incremental cost-effectiveness ratio; GDP, gross domestic product; bNAb, broadly neutralizing antibody; HR-HIVE, bNAb strategy targeting infants with known, high-risk HIV exposure at birth; HIVE, bNAb strategy targeting infants with known HIV exposure at birth; ALL, bNAb strategy targeting all infants regardless of known HIV exposure; mo., month.

Supplementary Figure 9. Cost-effectiveness results of a three-way sensitivity analysis assessing bNAb efficacy, cost, and efficacy duration, by country



mo., month; bNAb, broadly neutralizing antibody; HR-HIVE, bNAb strategy targeting infants with known, high-risk HIV exposure at birth; HIVE, bNAb strategy targeting infants with known HIV exposure at birth; ALL, bNAb strategy targeting all infants regardless of known HIV exposure; ICER, incremental cost-effectiveness ratio; GDP, gross domestic product.

Supplementary Table 1. Consolidated Health Economic Evaluation Reporting Standards (CHEERS) checklist

Topic	No.	Item	Location where item is reported
Title			
Title	1	Identify the study as an economic evaluation and specify the interventions being compared.	Title, Page 1
Abstract			
Abstract	2	Provide a structured summary that highlights context, key methods, results, and alternative analyses.	Abstract, Pages 4-5
Introduction			
Background and objectives	3	Give the context for the study, the study question, and its practical relevance for decision making in policy or practice.	Introduction, Pages 6-7
Methods			
Health economic analysis plan	4	Indicate whether a health economic analysis plan was developed and where available.	n/a
Study population	5	Describe characteristics of the study population (such as age range, demographics, socioeconomic, or clinical characteristics).	Methods, Third Paragraph
Setting and location	6	Provide relevant contextual information that may influence findings.	Methods, First Paragraph
Comparators	7	Describe the interventions or strategies being compared and why chosen.	Methods, Fourth Paragraph
Perspective	8	State the perspective(s) adopted by the study and why chosen.	Methods, Tenth Paragraph
Time horizon	9	State the time horizon for the study and why appropriate.	Methods, Tenth Paragraph
Discount rate	10	Report the discount rate(s) and reason chosen.	Methods, Tenth Paragraph
Selection of outcomes	11	Describe what outcomes were used as the measure(s) of benefit(s) and harm(s).	Methods, Tenth Paragraph
Measurement of outcomes	12	Describe how outcomes used to capture benefit(s) and harm(s) were measured.	n/a
Valuation of outcomes	13	Describe the population and methods used to measure and value outcomes.	n/a
Measurement and valuation of resources and costs	14	Describe how costs were valued.	Methods, Sixth and Ninth Paragraphs
Currency, price date, and conversion	15	Report the dates of the estimated resource quantities and unit costs, plus the currency and year of conversion.	Methods, Ninth Paragraph
Rationale and description of model	16	If modelling is used, describe in detail and why used. Report if the model is publicly available and where it can be accessed.	Methods, First paragraph; Appendix Supplementary Methods; Supplementary Figure 1
Analytics and assumptions	17	Describe any methods for analysing or statistically transforming data, any extrapolation methods, and approaches for validating any model used.	Methods, Second Paragraph; Appendix Supplemental Methods; Supplementary Table 2
Characterising heterogeneity	18	Describe any methods used for estimating how the results of the study vary for subgroups.	n/a
Characterising distributional effects	19	Describe how impacts are distributed across different individuals or adjustments made to reflect priority populations.	Methods, Third Paragraph
Characterising uncertainty	20	Describe methods to characterise any sources of uncertainty in the analysis.	Methods, Last Paragraph
Approach to engagement with patients and others affected by the study	21	Describe any approaches to engage patients or service recipients, the general public, communities, or stakeholders (such as clinicians or payers) in the design of the study.	n/a
Results			
Study parameters	22	Report all analytic inputs (such as values, ranges, references) including uncertainty or distributional assumptions.	Table 1; Supplementary Table 2
Summary of main results	23	Report the mean values for the main categories of costs and outcomes of interest and summarise them in the most appropriate overall measure.	Results, First and Second Paragraphs; Table 2
Effect of uncertainty	24	Describe how uncertainty about analytic judgments, inputs, or projections affect findings. Report the effect of choice of discount rate and time horizon, if applicable.	Results, Third through Eighth Paragraphs; Figures 4-5; Supplementary Figures 5-7; Supplementary Tables 6-22
Effect of engagement with patients and others affected by the study	25	Report on any difference patient/service recipient, general public, community, or stakeholder involvement made to the approach or findings of the study	n/a
Discussion			
Study findings, limitations, generalisability, and current knowledge	26	Report key findings, limitations, ethical or equity considerations not captured, and how these could affect patients, policy, or practice.	Discussion, First through Ninth Paragraphs
Other relevant information			
Source of funding	27	Describe how the study was funded and any role of the funder in the identification, design, conduct, and reporting of the analysis	Title, Pages 2-3
Conflicts of interest	28	Report authors conflicts of interest according to journal or International Committee of Medical Journal Editors requirements.	Title, Page 3

Supplementary Table 2. Extended model input parameters

Parameter	Côte d'Ivoire	South Africa	Zimbabwe	Reference(s)
Maternal characteristics				
Proportion of mothers with chronic infection, %				
High-risk cohort	98	79	62	Derived from ³⁸⁻⁵⁵
Low-risk cohort	100	100	100	Assumption
Unrecognized exposed cohort	94	12	27	Derived from ^{38-50,53-56}
Unexposed cohort	0	0	0	Assumption
Probability of acute HIV infection in pregnancy, %	0.03	3.30	1.94	^{55,45-48}
Probability of acute HIV infection postnatally, %/mo.	0.003	0.240	0.056	^{52,55,57-59}
Probability of known HIV status in pregnancy, %				Derived from ^{38-41,49,52,56,60,61}
Among mothers with chronic infection	93	99	98	^{42,43,49,53,55,62}
Among mothers with acute infection	56	55	70	^{38-44,56}
Probability of learning HIV status postnatally, %/mo.	2	9	5	^{43,53,55}
Probability of being on ART during pregnancy, %				
High-risk cohort				
Among those with chronic infection	86	84	41	Derived from ^{42,43,49-55}
Among those with acute infection	95	97	89	Derived from ^{38-50,53-56,63}
Low-risk cohort	100	100	100	Assumption
Unrecognized exposed and unexposed cohorts	0	0	0	Assumption
Viral load if on ART at delivery, %				
Non-high-risk cohort				Derived from ^{42,43,49-53,60,64}
HIV RNA ≤50 c/mL	76	76	76	
HIV RNA 50-1,000 c/mL	24	24	24	
HIV RNA >1,000 c/mL	0	0	0	
High-risk and unrecognized exposed cohorts				Assumption
HIV RNA >1,000 c/mL	100	100	100	
Probability of delivering in a healthcare facility, %	70	96	86	⁴²⁻⁴⁴
HIV RNA <1,000 c/mL among postpartum women on ART, by month postpartum	77-92	77-92	77-92	⁶⁵⁻⁷⁴
Retention in HIV care, %				⁷⁵
High-risk and low-risk cohorts				
6 mo. postpartum	87	88	88	
12 mo. postpartum	87	87	87	
24 mo. postpartum	79	79	79	
Unrecognized exposed and unexposed cohorts				
6 mo. postpartum	9	37	19	
12 mo. postpartum	17	57	33	
24 mo. postpartum	27	69	47	
Infant cohort characteristics and transmission risks				
Total number of live births (thousands)	907	1153	425	⁷⁶
Age, mean (SD), mo.	0 (0)	0 (0)	0 (0)	Assumption
Proportion female, %	52	52	52	⁷⁷
Initial CD4% at infection, mean (SD), %	45 (9)	45 (9)	45 (9)	¹
Breastfed infants, %				^{43,53,55,78}
Unexposed or Unrecognized HIV-exposed infants	99	84	99	
Infants with known HIV exposure	99	66	94	
Breastfeeding duration, mean (SD) mo.				^{42-44,68,79}
Unexposed or Unrecognized HIV-exposed infants	19 (7)	12 (6)	18 (7)	
Infants with known HIV exposure	14 (7)	6 (6)	13 (7)	
Intrauterine infections as a share of all perinatal infections, %	67	67	67	⁸⁰
Perinatal transmission, one-time %				
Chronic maternal HIV infection in pregnancy				
On ART, HIV RNA ≤50 c/mL at delivery	0.24	0.24	0.24	⁸¹
On ART, HIV RNA 50-1,000 c/mL at delivery	1.45	1.45	1.45	⁸¹

Parameter	Côte d'Ivoire	South Africa	Zimbabwe	Reference(s)
On ART, HIV RNA >1,000 c/mL at delivery	4-14	4-14	4-14	81
Not on ART at delivery	19-70	19-70	19-70	82
Acute maternal HIV infection in pregnancy				
On ART at delivery	8-79	8-79	8-79	81,82
Not on ART at delivery	18-10	18-10	18-10	82
Postnatal transmission rate, %/mo. ^{†,‡}				
On ART, HIV RNA ≤50 c/mL	0-06	0-06	0-06	81
On ART, HIV RNA 50-1,000 c/mL	0-39	0-39	0-39	81
On ART, HIV RNA >1,000 c/mL	0-78	0-78	0-78	81
Not on ART	0-89	0-89	0-89	82
Early infant diagnosis				
Probability of uptake, % by age				
Birth	0	93	9	83,84
6-8 weeks	69	64	54	53,61,68,85-89
6/9 months (country-specific timepoint)	25	25	26	53,90
18 months	22	22	22	91
Nucleic acid amplification test characteristics				
Sensitivity, 0 months after infection, %	0	0	0	Assumption
Sensitivity, ≥1 month after infection, %	99-4	99-4	99-4	92
Specificity, %	99-6	99-6	99-6	92
Probability of result return, %	84	96	83	61,93,94
Delay between primary test and result return, mean mo. (SD)	2 (1)	2 (1)	2 (1)	61,93
Probability of linkage to care upon detection, %	59-8	80-7	59-8	95,96
Antibody test characteristics				
Sensitivity, 0 months after infection, %	0	0	0	Assumption
Sensitivity, ≥1 month after infection, %	100	100	100	97,98
Specificity, %				
Before seroconversion	0-01	0-01	0-01	Assumption
After seroconversion	99	99	99	98
Probability of result return, %	99-6	99-5	99-7	93,95
Delay between primary test and result return, mean mo. (SD)	0 (0)	0 (0)	0 (0)	93/Assumption
Probability of linkage to care upon detection, %	92-6	92-6	92-6	95
Probability of HIV detection after presenting to care with a severe OI, %	100	100	100	Assumption
Infant HIV prophylaxis				
Probability of receiving scheduled prophylaxis, %				
Standard-of-care oral infant prophylaxis (NVP +/- ZDV) [‡]	86	86	86	99
bNAb prophylaxis (varies by age) [§]	56-83	85-96	71-92	42-44,100
Efficacy of standard-of-care oral infant prophylaxis (NVP +/- ZDV) ^{‡,¶} %				14,15
Against intrapartum transmission	69	69	69	
Against postnatal transmission	71	71	71	
Efficacy of bNAb prophylaxis against intrapartum and postnatal transmission (in addition to efficacy of standard-of-care), %	70	70	70	Assumption based on 20,21
Duration of bNAb effect, mo.	3	3	3	16,17
Probability of infant standard-of-care oral prophylaxis major toxicity, one-time %	0	0	0	Assumption based on 101-103
Probability of infant bNAb prophylaxis minor toxicity, one-time %	50	50	50	Assumption
Probability of infant bNAb prophylaxis major toxicity, one-time %	0	0	0	Assumption
Natural history				
Monthly CD4% or CD4 decline in absence of ART, by age				
<5 years (range by age and time of transmission), %	0-5 – 4-0	0-5 – 4-0	0-5 – 4-0	1
≥5 years, mean (SD) (range by viral load and CD4), cells/mm ³	3-0 (0-3) – 6-4 (0-3)	3-0 (0-3) – 6-4 (0-3)	3-0 (0-3) – 6-4 (0-3)	1,104
Monthly risk of clinical events, by age, %				
0-5 years (range by age and CD4%)				77

Parameter	Côte d'Ivoire	South Africa	Zimbabwe	Reference(s)
WHO stage 3 event (except tuberculosis)	3·3 – 11·6	3·3 – 11·6	3·3 – 11·6	
WHO stage 4 event (except tuberculosis)	1·4 – 6·4	1·4 – 6·4	1·4 – 6·4	
Tuberculosis (any body site)	0·5 – 3·8	0·5 – 3·8	0·5 – 3·8	
≥5 years (range by CD4)				105,106
Mild fungal infection	0·75 – 9·42	1·76 – 3·14	1·8 – 3·1	
Mild bacterial infection	0·93 – 2·01	0	0	
Bacterial gastroenteritis	0·18 – 1·33	0	0	
Malaria	0·85 – 2·97	0	0	
Visceral bacterial infection	0·15 – 1·70	0·04 – 0·71	0·04 – 0·71	
WHO stage 3 or 4 visceral disease	0·03 – 2·92	0·03 – 1·43	0·03 – 1·43	
WHO stage 3 or 4 mucocutaneous disease	0·01 – 2·74	0·03 – 2·26	0·03 – 2·26	
Other WHO stage 3 or 4 disease	0·04 – 2·08	0·02 – 0·73	0·02 – 0·73	
Other severe disease	0·75 – 3·79	0·19 – 1·67	0·19 – 1·67	
Other mild infection	0·72 – 4·16	2·39	2·39	
Tuberculosis (any body site)	0·06 – 0·66	0·03 – 1·74	0·03 – 1·74	
Risk of death within 30 days of clinical event, by age, %				
0-5 years				1,77
WHO stage 3 or 4 event	13·5	13·5	13·5	
Tuberculosis	11·1	11·1	11·1	
≥5 years (range by CD4)				105,106
Mild fungal infection	0	0	0	
Mild bacterial infection	0	
Bacterial gastroenteritis	0	
Malaria	0 – 16·7	
Visceral bacterial infection	0 – 16·7	0	0	
WHO stage 3 or 4 visceral disease	6·7 – 12·3	0·5	0·5	
WHO stage 3 or 4 mucocutaneous disease	0	0	0	
Other WHO stage 3 or 4 disease	6·7 – 12·3	0	0	
Other severe disease	0 – 16·7	0·4	0·4	
Other mild infection	0	2·4	2·4	
Tuberculosis (any body site)	6·5 – 50·0	9·2	9·2	
Monthly risk of HIV-related mortality, by age, % (range by CD4 and OI history)				1,77,105,106
0-5 months	5·3 – 40·8	5·3 – 40·8	5·3 – 40·8	
6-11 months	2·2 – 16·8	2·2 – 16·8	2·2 – 16·8	
12-23 months	0·9 – 7·2	0·9 – 7·2	0·9 – 7·2	
24-35 months	0·5 – 3·6	0·5 – 3·6	0·5 – 3·6	
36-47 months	0·4 – 2·9	0·4 – 2·9	0·4 – 2·9	
48-59 months	0·1 – 1·0	0·1 – 1·0	0·1 – 1·0	
5-13 years	0·1 – 1·0	0·1 – 1·0	0·1 – 1·0	
≥13 years	0·04 – 5·4	0·2 – 9·5	0·2 – 9·5	
Monthly risk of non-HIV related mortality, %				
HIV-exposed, uninfected children, born to mothers not on ART, by age				107,108
0-2 months	1·01	1·01	1·01	
3-5 months	0·41	0·41	0·41	
6-11 months	0·28	0·28	0·28	
12-17 months	0·14	0·14	0·14	
18-23 months	0·07	0·07	0·07	
≥24 months	See below	See below	See below	
All others, by age				109,110
0-11 months (range by age and sex)	0·50 – 0·66	0·24 – 0·31	0·30 – 0·38	
12-23 months (range by sex)	0·05 – 0·06	0·02	0·03	
24-59 months (range by sex)	0·05 – 0·06	0·02	0·03	
5-13 years (range by age and sex)	0·02 – 0·03	0·003 – 0·006	0·01 – 0·02	

Parameter	Côte d'Ivoire	South Africa	Zimbabwe	Reference(s)
13-99 years	0.02 – 2.40	0.004 – 1.930	0.01 – 1.89	
100 years	100	100	100	
Treatment				
Efficacy of adult OI prophylaxis (co-trimoxazole) (range by OI type), %	18 – 88	18 – 50	18 – 88	106,111
Probability of adult OI prophylaxis (co-trimoxazole) minor toxicity, one-time %	17	17	17	106,111
Probability of adult OI prophylaxis (co-trimoxazole) major toxicity, one-time %	6	6	6	106,111
Probability of virologic suppression (<1,000 c/mL for children, <50 c/mL for adults) at 48 weeks while on ART, one-time %				
Pediatric 1 st line ART (LPV/r or EFV-based)	76	76	76	112–118
Pediatric 2 nd and subsequent lines of ART (DTG-based)	87	87	87	119
Adult 1 st line ART (DTG-based)	90	90	90	120,121
Adult 2 nd and subsequent lines of ART (PI-based)	83	83	83	122
Probability of virologic failure after initial suppression, %/mo.				
Pediatric 1 st line ART	0.52	0.52	0.52	113,116
Pediatric 2 nd and subsequent lines of ART	0.37	0.37	0.37	119
Adult 1 st line ART	0.60	0.60	0.60	120,121,123,124
Adult 2 nd and subsequent lines of ART	0.20	0.20	0.20	125
Probability of resuppression when reinitiating ART, one-time %				
Pediatric ART lines	31	31	31	126
Adult ART lines	67	67	67	127,128
Effect of ART on CD4 when suppressed, by age				
0-4 years, absolute CD4% gain/mo., mean (SD)				
0-6 months after ART initiation	2.2 (0.6)	2.2 (0.6)	2.2 (0.6)	129,130
≥6 months after ART initiation	0.7 (0.2)	0.7 (0.2)	0.7 (0.2)	129,130
≥5 years, absolute CD4 gain/mo., mean (SD)				
0-2 months after ART initiation, cells/mm ³	83.2 (38.2)	83.2 (38.2)	83.2 (38.2)	131
≥2 months after ART initiation, cells/mm ³	4.2 (1.9)	4.2 (1.9)	4.2 (1.9)	131
Relative risk reduction of HIV-related mortality for patients on ART, by age, %				
0-5 years	90	90	90	1
5-13 years	90	90	90	1
≥13 years (range by viral load and CD4)	55 – 96	55 – 96	55 – 96	132
Relative risk reduction of clinical events for patients on ART, by age, %				
0-5 years	85	85	85	1
5-13 years (range by OI type)	0 – 85	0 – 85	0 – 85	1
≥13 years (range by OI type)	0 – 32	0 – 32	0 – 32	132
Loss to follow-up probability after ART initiation, by age, %/mo.				
0-13 years	1.6	0.8	0.4	133–142
≥13 years	1.0	2.1	1.1	143–147
Return to care probability after 6 months of loss to follow-up, %/mo.				
With presentation of a severe OI	100	100	100	Assumption
Without presentation of a severe OI	1.3	1.3	1.3	148
Frequency of CD4 monitoring while in care, test interval, mo.				80
First 12 months post-ART initiation	6	6	6	
After 12 months post-ART initiation	12	12	12	
CD4 threshold to stop CD4 monitoring, cells/mm ³	>350	>350	>350	
Frequency of viral load monitoring while in care, mo.				80
First 12 months post-ART initiation	6	6	6	
After 12 months post-ART initiation	12	12	12	
Costs (in 2020 USD)				
Early infant diagnosis program, \$/test				
Nucleic acid amplification test	26.06	26.06	26.06	149
Antibody test	4.06	4.06	4.06	150
Negative result return	2.09	2.09	2.09	151

Parameter	Côte d'Ivoire	South Africa	Zimbabwe	Reference(s)
Positive result return	3.48	3.48	3.48	
Pediatric ART (range by age and weight, per mo.)				
1 st line	5.65 – 11.70	5.65 – 11.70	5.65 – 11.70	152,153
2 nd line	12.43 – 25.99	12.43 – 25.99	12.43 – 25.99	152,153
Adult ART (per mo.)				
1 st line	5.50	5.50	5.50	154
2 nd line	23.00	23.00	23.00	154
Infant oral prophylaxis (NVP +/- ZDV), per mo.	0.91 – 1.74	0.91 – 1.74	0.91 – 1.74	152,153
bNAb prophylaxis, per dose	20.00	20.00	20.00	24–27
Routine HIV care, by age, \$/mo. (range by CD4%/CD4 and ART status)				
0-18 years	4.59 – 181.90	3.73 – 148.88	7.04 – 35.18	105,155–158
≥18 years	4.16 – 28.48	3.73 – 148.88	7.04 – 35.18	105,106,156–158
Routine CD4 monitoring test, \$/test	3.98	3.98	3.98	159,160
Routine HIV viral load test, \$/test	24.05	24.05	24.05	149
Adult OI prophylaxis (co-trimoxazole), \$/mo.	1.04	1.04	1.04	161
Acute OI care (range by OI type), \$/mo.				
0-5 years	128.96 – 456.65	867.99 – 1525.15	0	155,162,163
≥5 years	82.51 – 574.89	230.20 – 780.51	0	105,106,158
Toxicity, \$/event				
Standard-of-care oral infant prophylaxis, minor (outpatient visit)	0	0	0	106,158,164
Infant bNAb prophylaxis, minor/major (outpatient visit)	2.72	22.03	1.93	106,158,164
Adult OI oral prophylaxis (co-trimoxazole), minor (outpatient visit)	2.72	22.03	1.93	106,158,164
Adult OI oral prophylaxis (co-trimoxazole), major (hospitalization)	83.60	1611.45	52.61	106,158,164
Death-related costs, \$/death	90.49	586.16	0	106,111,158,164
Cost of identifying high-risk HIV-exposed infant	31.66	31.66	31.66	26,27,149,151

ART, antiretroviral therapy; mo, month; SD, standard deviation; WHO, World Health Organization; OI, opportunistic infection; NVP, nevirapine; ZDV, zidovudine; bNAb, broadly neutralizing antibody; LPV/r, lopinavir/ritonavir; EFV, efavirenz; DTG, dolutegravir; PI, protease inhibitor.

[†] All women included in this analysis are known to have HIV infection by delivery. Therefore, we did not model acute HIV infection during breastfeeding.

[‡] Postnatal transmission risks among infants whose mothers are on ART while breastfeeding account for the potential impact of antiretrovirals transferred through breastmilk.

[§] Infants with known, high-risk HIV exposure received dual oral infant prophylaxis with nevirapine (NVP) + zidovudine (ZDV) for 12 weeks. Infants with known, low-risk HIV exposure received NVP alone for 6 weeks.

[¶] The probability of receiving broadly neutralizing antibody (bNAb) prophylaxis was based on the probability of receiving World Health Organization (WHO) Expanded Program on Immunization vaccines, by age at recommended immunization.

^{||} A reduction in the risk of intrapartum transmission with use of oral infant prophylaxis was only applied to infants born to mothers who were known to have HIV infection, but who were not on antiretroviral therapy (ART) at delivery. The impact of oral infant prophylaxis on intrapartum transmission among mothers on ART at delivery is already captured in the on ART perinatal transmission estimates.

Supplementary Table 3. Justification of sensitivity analysis ranges

Model input parameter	Base case value	Sensitivity analysis range	Justification
Antiretroviral therapy (ART) costs (per mo.)	Pediatric ART: <i>1st Line:</i> \$5·65 - \$11·70 <i>2nd Line:</i> \$12·43 - \$25·99 Adult ART: <i>1st Line:</i> \$5·50 <i>2nd Line:</i> \$23·00	0·5x – 2·0x	By halving and doubling all base case ART costs, we aim to capture a plausible range of potential cost changes due to reasons such as new formulations coming to market or price adjustments of existing formulations.
Broadly neutralizing antibody (bNAb) cost (per dose)	\$20	\$5 - \$100	This range was chosen to capture the lower and upper bounds of projected bNAb costs: \$6·26 and \$27·32, respectively (see appendix pp 5-6). Given that our bNAb efficacy estimate assumes a three-bNAb product, we also wanted to capture the price if production cost for each bNAb was separate and equal to the upper bound (i.e., 3 x \$20 for production alone).
BNAb effect duration	3 mo.	1 mo. - 6 mo.	A single, subcutaneous 20 mg/kg dose of VRC01—an older generation, single bNAb product—achieved the mean serum concentration target in infants of >50 ug/mL for 28 days following administration. ¹⁸ VRC01’s pharmacokinetic data informed the lower bound of the sensitivity analysis range, while the upper bound was 2x the suggested efficacy duration of newer generation antibodies, such as VRC07-523LS, from similar pharmacokinetic studies. ¹⁶
BNAb efficacy	70%	10% - 100%	We varied bNAb efficacy widely in increments of 10% from 10% to 100% to capture all potential efficacies of a bNAb product used for infant HIV prophylaxis.
BNAb uptake (varying by age)	Côte d’Ivoire: 56% - 83% South Africa: 85% - 96% Zimbabwe: 71% - 92%	Côte d’Ivoire: 56% at all time points – 83% at all time points South Africa: 85% at all time points – 92% at all time points Zimbabwe: 71% at all time points – 92% at all time points	The lower bound of bNAb uptake was informed by a linear regression model of average uptake of all country-specific recommended vaccinations through 18 months. ¹⁰⁰ The upper bound was informed by the average uptake of recommended vaccines at birth for South Africa or the proportion of infants delivered in a health facility for Côte d’Ivoire and Zimbabwe reported by UNICEF. ^{42,44}
Mean breastfeeding duration	Côte d’Ivoire: <i>Women with HIV:</i> 14 mo. <i>Women w/o HIV:</i> 19 mo. South Africa: <i>Women with HIV:</i> 6 mo. <i>Women w/o HIV:</i> 12 mo. Zimbabwe: <i>Women with HIV:</i> 13 mo. <i>Women w/o HIV:</i> 18 mo.	Côte d’Ivoire: <i>Women with HIV:</i> 8 mo. - 24 mo. <i>Women w/o HIV:</i> 8 mo. - 24 mo. South Africa: <i>Women with HIV:</i> 2 mo. - 18 mo. <i>Women w/o HIV:</i> 2 mo. - 18 mo. Zimbabwe: <i>Women with HIV:</i> 8 mo. - 20 mo. <i>Women w/o HIV:</i> 15 mo. - 20 mo.	In Côte d’Ivoire, we varied the range of mean breastfeeding duration to capture all plausible scenarios in a clinical setting. The same range was used for all women, irrespective of HIV status. We chose a lower bound of 8 months based on clinical assumptions. The upper bound was partially informed by subnational Multiple Indicator Cluster Survey (MICS) estimates: Nord-Est region has the longest duration of breastfeeding (21·5 months). ⁴² In South Africa, the range for women without HIV was informed by published literature and survey estimates. In the Mother-Infant Health Study, women without HIV predominantly breastfed for 2 months, informing the lower bound. ¹⁶⁶ Demographic Health Survey (DHS) data reported that the longest median duration of breastfeeding among any subgroup was 16·5 months among women in the lowest wealth quintile, which was used to inform the upper bound. ⁴³ In Zimbabwe, the range for women without HIV was informed by provincial MICS data: Harare had the shortest breastfeeding duration (15·9 months) and Mashonaland Central had the longest breastfeeding duration (19·4 months). ⁴⁴ The range for women with HIV was informed by the IQR of a nationally representative sample of mother and HIV-exposed infant pairs between 2013 and 2014. ⁷⁹

Model input parameter	Base case value	Sensitivity analysis range	Justification
Cost of ascertaining high-risk status	\$31.66	\$0 - \$31.66	The cost of ascertaining whether an infant has low- or high-risk HIV exposure was assumed to include the cost of a maternal viral load test. The cost components included the cost of a viral load test (\$24.05), result return with counseling (\$3.48), and personnel/overhead (\$4.13), reported in 2020 USD. ^{26,27,149,151} In sensitivity analyses, we wanted to assess whether assuming zero additional cost would make the <i>HR-HIVE</i> strategies cost-effective relative to other bNAb strategies. We chose not to increase the cost of ascertaining risk status because, compared to the base case results, it would only make the <i>HR-HIVE</i> strategies even more costly and less clinically beneficial than other strategies (i.e., dominated).
Maternal ART coverage during pregnancy	Côte d'Ivoire: 95% South Africa: 97% Zimbabwe: 89%	Côte d'Ivoire: 70% - 100% South Africa: 60% - 100% Zimbabwe: 65% - 100%	We chose the ranges for maternal ART coverage during pregnancy based on the 95% confidence intervals from UNAIDS 2021 data (Côte d'Ivoire: 70 - >98%; South Africa: 60 - >98%; Zimbabwe: 68 - >98%). ⁵⁴
Maternal HIV prevalence and incidence	Côte d'Ivoire: <i>Prevalence at delivery:</i> 2.6% <i>Incidence postpartum:</i> 0.003%/mo. South Africa: <i>Prevalence at delivery:</i> 33.0% <i>Incidence postpartum:</i> 0.240%/mo. Zimbabwe: <i>Prevalence at delivery:</i> 12.3% <i>Incidence postpartum:</i> 0.056%/mo.	Côte d'Ivoire: <i>Prevalence at delivery:</i> 1.0% - 5.0% <i>Incidence postpartum:</i> 0.001%/mo. – 0.005%/mo. South Africa: <i>Prevalence at delivery:</i> 15.0% - 45.0% <i>Incidence postpartum:</i> 0.107%/mo. – 0.331%/mo. Zimbabwe: <i>Prevalence at delivery:</i> 5.0% - 25.0% <i>Incidence postpartum:</i> 0.022%/mo. – 0.116%/mo.	We chose the ranges for maternal HIV prevalence and incidence based on subnational estimates among women ages 15-49 years old from Population-Based HIV Impact Assessments (PHIA) data for Côte d'Ivoire and Zimbabwe and National Antenatal Sentinel HIV Survey data for South Africa. In our analysis, maternal HIV prevalence at delivery is inclusive of prevalence and incidence during pregnancy. We applied a multiplier to the base case estimate of HIV prevalence at delivery such that it captured the range of subnational estimates. We assumed the same multiplier applies to incidence postpartum. In Côte d'Ivoire, Woroba had the lowest prevalence (1.5%) and Montagnes had the highest prevalence (5.0%). ⁵⁵ In South Africa, Western Cape province had the lowest prevalence (15.9%) KwaZulu-Natal province had the highest prevalence (41.1%). ⁴⁹ In Zimbabwe, the lower bound of maternal HIV prevalence was informed by the lower 95% confidence interval estimate of maternal HIV prevalence (9.9%). The HIV prevalence for women in Matabeleland South (24.2%) informs the upper bound. ⁵³
Maternal knowledge of acute HIV infection	Côte d'Ivoire: <i>During pregnancy:</i> 56% <i>Postpartum:</i> 2%/mo. South Africa: <i>During pregnancy:</i> 55% <i>Postpartum:</i> 9%/mo. Zimbabwe: <i>During pregnancy:</i> 70% <i>Postpartum:</i> 5%/mo.	All countries: <i>During pregnancy:</i> 25% - 95% <i>Postpartum:</i> 0%/mo. – 15%/mo.	The lower bound of maternal knowledge of acute HIV infection during pregnancy was informed by published literature. In a study from Kenya, 26.7% of women who initially tested HIV-negative in antenatal care and returned to antenatal care to retest prior to delivery. ³⁹ We aimed to capture all plausible scenarios of maternal knowledge of acute HIV infection by setting the upper bound of obtaining knowledge during pregnancy at 95% and during the postpartum period at 15%/mo.
Maternal knowledge of chronic HIV infection	Côte d'Ivoire: 93% South Africa: 99% Zimbabwe: 98%	Côte d'Ivoire: 56-100% South Africa: 75-100% Zimbabwe: 80-100%	The ranges for maternal knowledge of chronic HIV infection were informed by the upper and lower bounds of 95% confidence intervals for knowledge of HIV status as reported in South Africa DHS 2016 and UNAIDS 2020 data. ^{43,60}
Oral infant prophylaxis efficacy	Against intrapartum transmission: 69% Against postnatal transmission: 71%	Against intrapartum transmission: 40% - 90% Against postnatal transmission: 58% - 80%	We chose the range of oral infant prophylaxis efficacy against intrapartum transmission based on ranges reported in the PEPI, HPTN 040, and PHT-5 studies. ^{14,167,168}

Model input parameter	Base case value	Sensitivity analysis range	Justification
Oral infant prophylaxis efficacy (continued)			The range for oral infant prophylaxis efficacy against intrapartum transmission was informed by the 95% confidence interval of relative risk reduction for infants given a short course of nevirapine (NVP) + zidovudine (ZDV) compared to a single dose of NVP. ¹⁴ The range for oral infant prophylaxis efficacy against postnatal transmission was informed by the 95% confidence interval of infant HIV infection for infants given 6 weeks of NVP compared to no oral infant prophylaxis. ¹⁵
Postnatal vertical transmission risk	On ART <i>Acute HIV:</i> 4·0% <i>Chronic HIV, suppressed:</i> 0·06% <i>Chronic HIV, not suppressed:</i> 0·39% – 0·78% Off ART <i>Acute HIV:</i> 4·6% <i>Chronic HIV:</i> 0·89%	0·5x – 2·0x	By halving and doubling all base case postnatal vertical transmission risks, we aim to capture a plausible range of potential transmission risks due to reasons such as adherence to ART regimens or varying HIV viral loads.
Postpartum maternal ART retention	Côte d'Ivoire: <i>Known, high-risk / low-risk:</i> <i>0 mo.:</i> 86% / 100% <i>6 mo.:</i> 87% <i>12 mo.:</i> 87% <i>24 mo.:</i> 79% <i>Unrecognized exposed and unexposed:</i> <i>0 mo.:</i> 0% <i>6 mo.:</i> 9% <i>12 mo.:</i> 17% <i>24 mo.:</i> 27% South Africa: <i>Known, high-risk / low-risk:</i> <i>0 mo.:</i> 87% / 100% <i>6 mo.:</i> 88% <i>12 mo.:</i> 87% <i>24 mo.:</i> 79% <i>Unrecognized exposed and unexposed:</i> <i>0 mo.:</i> 0% <i>6 mo.:</i> 37% <i>12 mo.:</i> 57% <i>24 mo.:</i> 69% Zimbabwe: <i>Known, high-risk / low-risk:</i> <i>0 mo.:</i> 59% / 100% <i>6 mo.:</i> 88% <i>12 mo.:</i> 87% <i>24 mo.:</i> 79% <i>Unrecognized exposed and unexposed:</i> <i>0 mo.:</i> 0% <i>6 mo.:</i> 19% <i>12 mo.:</i> 33% <i>24 mo.:</i> 47%	All countries: <i>Known, high-risk and low-risk</i> <i>6+ mo.:</i> 50% - 100% Côte d'Ivoire: <i>Unrecognized exposed and unexposed:</i> <i>0 mo.:</i> 0% <i>6 mo.:</i> 5% - 10% <i>12 mo.:</i> 10% - 19% <i>24 mo.:</i> 17% - 35% South Africa: <i>Unrecognized exposed and unexposed:</i> <i>0 mo.:</i> 0% <i>6 mo.:</i> 21% - 42% <i>12 mo.:</i> 33% - 66% <i>24 mo.:</i> 44% - 87% Zimbabwe: <i>Unrecognized exposed and unexposed:</i> <i>0 mo.:</i> 0% <i>6 mo.:</i> 11% - 21% <i>12 mo.:</i> 19% - 38% <i>24 mo.:</i> 30% - 59%	We varied postpartum maternal ART retention for the known, high-risk and low-risk cohorts from 50% to 100% after 6 months to capture all plausible scenarios in a clinical setting. For the unrecognized as HIV exposed and unexposed cohorts, we calculated the ranges based on receiving ART during pregnancy if HIV status is known and maternal knowledge of HIV during breastfeeding. ^{43,53-55}

Model input parameter	Base case value	Sensitivity analysis range	Justification
Postpartum maternal HIV incidence	Côte d'Ivoire: 0.003%/mo. South Africa: 0.240%/mo. Zimbabwe: 0.056%/mo.	0.5x – 2.0x	By halving and doubling all base case postpartum maternal HIV incidence, we aim to capture a plausible range of postpartum incidence changes due to reasons such as subnational incidence rates and missing cases in survey data.

mo.: month; w/o: without; IQR: interquartile range.

Supplementary Table 4. Validation of CEPAC-P infant HIV vertical transmission projections

Country	CEPAC-P projected vertical transmission rate in the standard of care (SOC) strategy, %	UNAIDS 2021 estimates, % (95% CI) ⁶²
Côte d'Ivoire	8·4	8 (4-12)
South Africa	4·4	4 (3-8)
Zimbabwe	9·5	9 (6-12)

SOC: standard-of-care; CI: confidence interval.

Model-projected estimates of vertical transmission are often higher than those observed in clinical studies since they capture infants who may have acquired HIV infection, but be undiagnosed due to loss to follow up from EID programs or death prior to diagnosis.

Supplementary Table 5. Clinical and economic outcomes of all modeled bNAb infant prophylaxis programs, by country

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
Standard-of-care	3·6	5·0	8·4	60·129	26·373	15	Reference
HR-HIVE – 1 dose	3·3	4·8	8·0	60·133	26·375	15	dominated
HR-HIVE – 2 doses	3·3	4·7	7·8	60·134	26·375	15	dominated
HIVE – 1 dose	3·3	4·7	7·8	60·134	26·375	14	dominated
HIVE – 1 dose plus HR-HIVE – 2 doses	3·3	4·6	7·6	60·136	26·376	15	dominated
HR-HIVE – Extended	3·3	4·3	7·5	60·136	26·376	14	dominated
HIVE – 2 doses	3·3	4·3	7·4	60·138	26·377	14	dominated
HIVE – 1 dose plus HR-HIVE Extended	3·3	4·2	7·3	60·138	26·377	14	dominated
ALL – 1 dose	3·0	4·6	7·5	60·139	26·377	27	dominated
ALL – 1 dose plus HR-HIVE – 2 doses	3·0	4·5	7·3	60·140	26·378	28	dominated
ALL – 2 doses	3·0	4·2	7·0	60·140	26·378	43	dominated
ALL – 1 dose plus HIVE – 2 doses	3·0	4·3	7·1	60·143	26·379	27	dominated
ALL – 1 dose plus HR-HIVE - Extended	3·0	4·1	7·0	60·143	26·379	28	dominated
HIVE – Extended	3·3	3·2	6·3	60·146	26·379	13	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3·0	3·1	6·0	60·150	26·382	26	6242
ALL - Extended	3·0	2·7	5·5	60·156	26·383	91	57 860
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
Standard-of-care	2·3	2·2	4·4	68·924	28·499	112	Reference
HR-HIVE – 1 dose	2·1	2·1	4·0	68·979	28·518	115	dominated
HR-HIVE – 2 doses	2·1	2·1	4·0	68·986	28·521	115	dominated
HR-HIVE – Extended	2·1	2·0	3·9	68·995	28·523	114	dominated
HIVE – 1 dose	2·0	2·0	3·8	69·011	28·529	105	dominated
HIVE – 1 dose plus HR-HIVE – 2 doses	2·0	1·9	3·8	69·018	28·532	115	dominated
HIVE – 1 dose plus HR-HIVE - Extended	2·0	1·9	3·7	69·027	28·534	114	dominated
HIVE – 2 doses	2·0	1·8	3·6	69·045	28·541	104	dominated
ALL – 1 dose	1·8	1·8	3·5	69·063	28·548	116	dominated
ALL – 1 dose plus HR-HIVE – 2 doses	1·8	1·7	3·4	69·070	28·550	126	dominated
ALL – 1 dose plus HR-HIVE - Extended	1·8	1·7	3·4	69·079	28·553	125	dominated
HIVE – Extended	2·0	1·5	3·3	69·095	28·557	100	cost-saving
ALL – 1 dose plus HIVE – 2 doses	1·8	1·6	3·3	69·097	28·559	115	dominated
ALL – 2 doses	1·8	1·5	3·2	69·122	28·568	122	dominated
ALL – 1 dose plus HIVE - Extended	1·8	1·3	3·0	69·147	28·575	111	606
ALL - Extended	1·8	0·8	2·5	69·228	28·602	135	882*†

Supplemental Table 5. Clinical and economic outcomes of all modeled bNAb infant prophylaxis programs, by country (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.7	5.3	8.6	68.366	28.050	71	dominated
HR-HIVE – 2 doses	3.7	5.2	8.5	68.373	28.053	70	dominated
HIVE – 1 dose	3.7	5.2	8.4	68.380	28.055	67	dominated
HR-HIVE – Extended	3.7	4.9	8.2	68.387	28.057	69	dominated
HIVE – 1 dose plus HR-HIVE – 2 doses	3.7	5.0	8.3	68.387	28.057	70	dominated
HIVE – 1 dose plus HR-HIVE - Extended	3.7	4.7	8.0	68.401	28.062	69	dominated
ALL – 1 dose	3.4	4.9	7.9	68.400	28.062	79	dominated
HIVE – 2 doses	3.7	4.8	8.0	68.402	28.063	66	dominated
ALL – 1 dose plus HR-HIVE – 2 doses	3.4	4.7	7.8	68.408	28.065	83	dominated
ALL – 1 dose plus HR-HIVE - Extended	3.4	4.5	7.5	68.422	28.069	82	dominated
ALL – 1 dose plus HIVE – 2 doses	3.4	4.5	7.5	68.423	28.070	79	dominated
ALL – 2 doses	3.4	4.3	7.4	68.438	28.074	93	dominated
HIVE – Extended	3.7	3.6	6.9	68.458	28.081	61	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.4	3.4	6.5	68.478	28.088	74	1731
ALL - Extended	3.4	2.6	5.7	68.517	28.101	134	4516

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy.

*Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. †Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 6. Scenario analysis: bNAbS do not reduce intrapartum transmission (base case: 70% reduction)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.6	4.9	8.3	60.130	26.374	15	dominated
HR-HIVE – 2 doses	3.6	4.7	8.1	60.131	26.374	15	dominated
HIVE – 1 dose	3.6	4.7	8.1	60.131	26.374	15	dominated
HR-HIVE – Extended	3.6	4.4	7.8	60.134	26.375	15	dominated
HIVE – 2 doses	3.6	4.3	7.8	60.135	26.375	14	dominated
ALL – 1 dose	3.6	4.7	8.1	60.134	26.375	28	dominated
ALL – 2 doses	3.6	4.2	7.6	60.135	26.376	43	dominated
HIVE – Extended	3.6	3.2	6.6	60.142	26.378	13	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.6	3.1	6.6	60.145	26.380	27	10 008
ALL - Extended	3.6	2.7	6.1	60.151	26.381	92	59 542
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.3	2.1	4.3	68.938	28.504	121	dominated
HR-HIVE – 2 doses	2.3	2.1	4.2	68.945	28.506	121	dominated
HR-HIVE – Extended	2.3	2.0	4.2	68.953	28.509	120	dominated
HIVE – 1 dose	2.3	2.0	4.2	68.955	28.510	113	dominated
ALL – 1 dose	2.3	1.8	4.0	68.986	28.521	127	dominated
HIVE – 2 doses	2.3	1.8	4.0	68.989	28.522	112	dominated
HIVE – Extended	2.3	1.5	3.7	69.038	28.538	109	cost-saving
ALL – 2 doses	2.3	1.5	3.7	69.044	28.541	133	dominated
ALL – 1 dose plus HIVE - Extended	2.3	1.3	3.5	69.069	28.549	122	dominated
ALL - Extended	2.3	0.8	3.0	69.150	28.575	146	998*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	4.3	5.4	9.2	68.337	28.040	74	dominated
HR-HIVE – 2 doses	4.3	5.2	9.1	68.344	28.042	74	dominated
HIVE – 1 dose	4.3	5.2	9.0	68.346	28.043	71	dominated
HR-HIVE – Extended	4.3	4.9	8.8	68.358	28.046	73	dominated
ALL – 1 dose	4.3	4.9	8.8	68.357	28.046	85	dominated
HIVE – 2 doses	4.3	4.8	8.6	68.369	28.051	70	dominated
ALL – 2 doses	4.3	4.4	8.2	68.395	28.058	98	dominated
HIVE – Extended	4.3	3.7	7.6	68.424	28.068	65	cost-saving*†
ALL – 1 dose plus HIVE - Extended	4.3	3.4	7.3	68.434	28.072	79	3855
ALL - Extended	4.3	2.6	6.5	68.472	28.085	139	4584

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy.

*Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. †Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 7. Scenario analysis: bNAb replace WHO-recommended standard-of-care oral infant prophylaxis

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.3	5.0	8.1	60.131	26.374	15	dominated
HR-HIVE – 2 doses	3.3	4.9	8.0	60.132	26.374	15	dominated
HIVE – 1 dose	3.3	4.9	8.0	60.132	26.374	14	dominated
HR-HIVE – Extended	3.3	4.5	7.6	60.135	26.375	15	dominated
ALL – 1 dose	3.0	4.9	7.7	60.134	26.375	28	dominated
HIVE – 2 doses	3.3	4.5	7.6	60.136	26.376	14	dominated
ALL – 2 doses	3.0	4.4	7.2	60.144	26.378	43	dominated
HIVE – Extended	3.3	3.4	6.5	60.143	26.379	13	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	3.3	6.2	60.145	26.379	26	15 769
ALL - Extended	3.0	2.9	5.8	60.156	26.383	91	21 344
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.1	2.2	4.1	68.969	28.514	116	dominated
HR-HIVE – 2 doses	2.1	2.1	4.0	68.975	28.517	116	dominated
HR-HIVE – Extended	2.1	2.1	4.0	68.984	28.519	115	dominated
HIVE – 1 dose	2.0	2.1	3.9	69.000	28.525	106	dominated
HIVE – 2 doses	2.0	1.9	3.7	69.032	28.536	105	dominated
ALL – 1 dose	1.8	1.9	3.6	69.058	28.544	118	dominated
HIVE – Extended	2.0	1.6	3.4	69.080	28.552	102	cost-saving
ALL – 2 doses	1.8	1.5	3.2	69.107	28.562	123	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.4	3.1	69.138	28.571	113	587
ALL - Extended	1.8	0.9	2.6	69.211	28.596	136	941*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.7	5.6	8.9	68.349	28.044	72	dominated
HR-HIVE – 2 doses	3.7	5.5	8.8	68.356	28.046	72	dominated
HIVE – 1 dose	3.7	5.5	8.7	68.361	28.048	69	dominated
HR-HIVE – Extended	3.7	5.2	8.5	68.370	28.051	71	dominated
ALL – 1 dose	3.4	5.2	8.3	68.381	28.056	81	dominated
HIVE – 2 doses	3.7	5.1	8.3	68.383	28.056	68	dominated
ALL – 2 doses	3.4	4.7	7.7	68.411	28.066	95	dominated
HIVE – Extended	3.7	4.0	7.2	68.438	28.074	63	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.4	3.7	6.8	68.457	28.081	76	1696
ALL - Extended	3.4	2.9	6.0	68.497	28.093	136	5020

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

In this scenario, infants receive either bNAb or WHO-recommended standard-of-care oral prophylaxis, but not both; sub-populations not eligible to receive bNAb in a strategy continue to be eligible for WHO-recommended standard-of-care oral prophylaxis. For example, in the HR-HIVE strategy, infants who are known, high-risk, HIV-exposed could only receive bNAb but not oral prophylaxis while all other sub-populations would still be eligible to receive WHO-recommended standard-of-care oral prophylaxis. Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. *Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. †Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 8. Scenario analysis: maternal HIV prevalence and incidence

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>Low maternal HIV prevalence/incidence</i>							
Standard-of-care	3·6	5·0	8·4	60·177	26·392	5	Reference
HR-HIVE – 1 dose	3·3	4·9	8·0	60·178	26·393	5	dominated
HR-HIVE – 2 doses	3·3	4·7	7·8	60·179	26·393	5	dominated
HIVE – 1 dose	3·3	4·7	7·8	60·179	26·393	5	dominated
HR-HIVE – Extended	3·3	4·4	7·5	60·180	26·393	5	dominated
HIVE – 2 doses	3·3	4·3	7·4	60·180	26·393	5	dominated
ALL – 2 doses	3·0	4·2	7·0	60·181	26·394	35	dominated
ALL – 1 dose	3·0	4·7	7·5	60·183	26·394	20	dominated
HIVE – Extended	3·3	3·2	6·3	60·183	26·395	4	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3·0	3·1	6·0	60·187	26·396	19	9521
ALL - Extended	3·0	2·7	5·6	60·190	26·396	85	213 006
<i>High maternal HIV prevalence/incidence</i>							
Standard-of-care	3·6	5·0	8·4	60·059	26·345	27	Reference
HR-HIVE – 1 dose	3·3	4·8	7·9	60·065	26·348	27	dominated
HR-HIVE – 2 doses	3·3	4·7	7·8	60·067	26·349	27	dominated
HIVE – 1 dose	3·3	4·7	7·8	60·069	26·349	26	dominated
HR-HIVE – Extended	3·3	4·3	7·5	60·072	26·351	27	dominated
HIVE – 2 doses	3·3	4·3	7·4	60·075	26·352	25	dominated
ALL – 1 dose	3·0	4·6	7·5	60·077	26·353	40	dominated
ALL – 2 doses	3·0	4·1	7·0	60·081	26·355	54	dominated
HIVE – Extended	3·3	3·1	6·3	60·090	26·357	23	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3·0	3·1	6·0	60·098	26·361	37	4158
ALL - Extended	3·0	2·7	5·5	60·106	26·363	99	32 843
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Low maternal HIV prevalence/incidence</i>							
Standard-of-care	2·5	2·5	4·8	69·322	28·639	56	Reference
HR-HIVE – 1 dose	2·2	2·3	4·4	69·349	28·648	57	dominated
HR-HIVE – 2 doses	2·2	2·3	4·4	69·352	28·649	57	dominated
HR-HIVE – Extended	2·2	2·2	4·3	69·356	28·650	56	dominated
HIVE – 1 dose	2·1	2·2	4·2	69·363	28·653	52	dominated
HIVE – 2 doses	2·1	2·0	4·0	69·378	28·658	52	dominated
ALL – 1 dose	2·0	2·0	3·8	69·389	28·661	70	dominated
HIVE – Extended	2·1	1·7	3·7	69·401	28·665	50	cost-saving*
ALL – 2 doses	2·0	1·6	3·4	69·423	28·673	81	dominated
ALL – 1 dose plus HIVE - Extended	2·0	1·5	3·3	69·427	28·674	68	2065
ALL - Extended	2·0	0·9	2·7	69·477	28·690	104	2262†

Supplementary Table 8. Scenario analysis: maternal HIV prevalence and incidence (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>High maternal HIV prevalence/incidence</i>							
Standard-of-care	2.2	2.0	4.1	68.714	28.426	144	Reference
HR-HIVE – 1 dose	1.9	1.9	3.7	68.786	28.450	149	dominated
HR-HIVE – 2 doses	1.9	1.9	3.7	68.795	28.453	149	dominated
HR-HIVE – Extended	1.9	1.8	3.7	68.807	28.457	148	dominated
HIVE – 1 dose	1.8	1.8	3.5	68.830	28.466	135	dominated
HIVE – 2 doses	1.8	1.6	3.3	68.876	28.482	134	dominated
ALL – 1 dose	1.7	1.6	3.2	68.888	28.487	142	dominated
HIVE – Extended	1.8	1.3	3.0	68.945	28.504	129	cost-saving
ALL – 2 doses	1.7	1.3	2.9	68.963	28.512	145	dominated
ALL – 1 dose plus HIVE - Extended	1.7	1.1	2.8	69.003	28.525	135	298
ALL - Extended	1.7	0.7	2.4	69.094	28.555	152	548*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>Low maternal HIV prevalence/incidence</i>							
Standard-of-care	4.4	5.8	9.6	68.675	28.160	29	Reference
HR-HIVE – 1 dose	3.8	5.4	8.8	68.694	28.166	29	dominated
HR-HIVE – 2 doses	3.8	5.3	8.7	68.697	28.167	29	dominated
HIVE – 1 dose	3.7	5.3	8.6	68.699	28.168	27	dominated
HR-HIVE – Extended	3.8	5.0	8.4	68.703	28.169	28	dominated
ALL – 1 dose	3.5	5.0	8.1	68.708	28.170	43	dominated
HIVE – 2 doses	3.7	4.9	8.2	68.708	28.171	27	dominated
ALL – 2 doses	3.5	4.4	7.5	68.728	28.176	59	dominated
HIVE – Extended	3.7	3.8	7.1	68.731	28.179	25	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.5	3.5	6.6	68.739	28.181	41	7410
ALL - Extended	3.5	2.6	5.8	68.756	28.187	109	10 687
<i>High maternal HIV prevalence/incidence</i>							
Standard-of-care	4.2	5.4	9.1	67.742	27.829	139	Reference
HR-HIVE – 1 dose	3.6	5.1	8.3	67.829	27.860	137	dominated
HR-HIVE – 2 doses	3.6	5.0	8.2	67.843	27.865	137	dominated
HIVE – 1 dose	3.5	4.9	8.1	67.857	27.870	130	dominated
HR-HIVE – Extended	3.6	4.7	7.9	67.871	27.874	134	dominated
HIVE – 2 doses	3.5	4.5	7.7	67.903	27.886	128	dominated
ALL – 1 dose	3.3	4.7	7.7	67.903	27.886	138	dominated
ALL – 2 doses	3.3	4.2	7.1	67.973	27.909	148	dominated
HIVE – Extended	3.5	3.4	6.6	68.016	27.922	119	cost-saving*
ALL – 1 dose plus HIVE - Extended	3.3	3.2	6.2	68.062	27.938	126	494†
ALL - Extended	3.3	2.4	5.5	68.134	27.963	173	1894

bNAb: broadly neutralizing antibody; IU/IP: intrauterine/intrapartum; yr: year; ICER: incremental cost-effectiveness ratio; YLS: years of life saved; CET: cost-effectiveness threshold; HR-HIVE: high-risk HIV-exposed infants; HIVE: all HIV-exposed infants; ALL: all live infants at birth.

The setting-specific maternal HIV prevalence and incidence are specified in Supplementary Table 2 (base case) and Supplementary Table 3 (low/high scenarios). Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 9. One-way sensitivity analysis: bNAb efficacy against intrapartum and postnatal transmission (base case: 70% reduction)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>bNAb efficacy: 10%</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference*
HR-HIVE – 1 dose	3.6	5.0	8.3	60.130	26.373	15	dominated
HR-HIVE – 2 doses	3.6	4.9	8.3	60.130	26.373	15	dominated
HIVE – 1 dose	3.6	4.9	8.3	60.130	26.374	15	706†
HR-HIVE – Extended	3.6	4.9	8.2	60.130	26.374	16	dominated
HIVE – 2 doses	3.6	4.9	8.2	60.131	26.374	15	dominated
ALL – 2 doses	3.5	4.9	8.2	60.130	26.374	45	dominated
HIVE – Extended	3.6	4.7	8.1	60.132	26.374	16	1593
ALL – 1 dose	3.5	4.9	8.2	60.133	26.375	28	dominated
ALL – 1 dose plus HIVE - Extended	3.5	4.7	8.0	60.134	26.375	29	11 561
ALL - Extended	3.5	4.7	8.0	60.137	26.375	95	615 409
<i>bNAb efficacy: 100%</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.2	4.8	7.8	60.134	26.375	15	dominated
HR-HIVE – 2 doses	3.2	4.6	7.6	60.136	26.376	14	dominated
HIVE – 1 dose	3.1	4.6	7.5	60.137	26.376	14	dominated
HR-HIVE – Extended	3.2	4.1	7.1	60.139	26.377	14	dominated
HIVE – 2 doses	3.1	4.0	7.0	60.141	26.378	13	dominated
ALL – 1 dose	2.8	4.5	7.1	60.143	26.379	27	dominated
ALL – 2 doses	2.8	3.8	6.4	60.146	26.380	42	dominated
HIVE – Extended	3.1	2.4	5.3	60.153	26.382	11	cost-saving*†
ALL – 1 dose plus HIVE - Extended	2.8	2.3	4.9	60.159	26.385	24	5017
ALL - Extended	2.8	1.6	4.3	60.166	26.387	89	38 627
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>bNAb efficacy: 10%</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.3	2.2	4.3	68.931	28.502	122	dominated
HR-HIVE – 2 doses	2.3	2.2	4.3	68.933	28.502	122	dominated
HR-HIVE – Extended	2.3	2.2	4.3	68.934	28.503	122	dominated
HIVE – 1 dose	2.3	2.2	4.3	68.934	28.503	115	1009
ALL – 1 dose	2.3	2.1	4.2	68.938	28.504	132	dominated
HIVE – 2 doses	2.3	2.1	4.3	68.940	28.505	118	dominated
HIVE – Extended	2.3	2.1	4.2	68.947	28.507	120	1118*†
ALL – 2 doses	2.3	2.1	4.2	68.950	28.508	143	dominated
ALL – 1 dose plus HIVE - Extended	2.3	2.1	4.2	68.951	28.509	136	dominated
ALL - Extended	2.3	2.0	4.1	68.967	28.513	169	7902

Supplementary Table 9. One-way sensitivity analysis: bNAb efficacy against intrapartum and postnatal transmission (base case: 70% reduction) (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>bNAb efficacy: 100%</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	1.9	2.1	3.9	69.004	28.527	112	dominated
HR-HIVE – 2 doses	1.9	2.0	3.8	69.013	28.530	111	dominated
HR-HIVE – Extended	1.9	1.9	3.7	69.026	28.534	110	dominated
HIVE – 1 dose	1.8	1.9	3.6	69.050	28.543	100	dominated
HIVE – 2 doses	1.8	1.6	3.3	69.098	28.559	97	dominated
ALL – 1 dose	1.6	1.6	3.1	69.127	28.570	108	dominated
HIVE – Extended	1.8	1.2	2.9	69.169	28.582	90	cost-saving
ALL – 2 doses	1.6	1.1	2.6	69.210	28.599	111	dominated
ALL – 1 dose plus HIVE - Extended	1.6	0.9	2.4	69.246	28.609	98	295
ALL - Extended	1.6	0.2	1.7	69.363	28.648	117	476*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>bNAb efficacy: 10%</i>							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference*
ALL – 1 dose	4.2	5.5	9.2	68.328	28.036	87	dominated
HR-HIVE – 1 dose	4.3	5.6	9.3	68.327	28.036	75	dominated
HR-HIVE – 2 doses	4.3	5.6	9.3	68.328	28.037	75	dominated
HIVE – 1 dose	4.2	5.6	9.3	68.330	28.037	72	dominated
HR-HIVE – Extended	4.3	5.5	9.3	68.330	28.037	76	276†
HIVE – 2 doses	4.2	5.5	9.3	68.333	28.038	74	dominated
ALL – 2 doses	4.2	5.5	9.2	68.339	28.039	104	dominated
ALL – 1 dose plus HIVE - Extended	4.2	5.3	9.0	68.338	28.039	92	1379
HIVE – Extended	4.2	5.4	9.1	68.340	28.040	77	dominated
ALL - Extended	4.2	5.2	8.9	68.342	28.041	157	82 283
<i>bNAb efficacy: 100%</i>							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.5	5.2	8.3	68.386	28.057	68	dominated
HR-HIVE – 2 doses	3.5	5.0	8.1	68.396	28.061	67	dominated
HIVE – 1 dose	3.4	4.9	7.9	68.405	28.064	64	dominated
HR-HIVE – Extended	3.5	4.6	7.7	68.417	28.067	65	dominated
HIVE – 2 doses	3.4	4.4	7.4	68.437	28.075	62	dominated
ALL – 1 dose	3.1	4.5	7.3	68.437	28.076	75	dominated
ALL – 2 doses	3.1	3.7	6.5	68.490	28.093	87	dominated
HIVE – Extended	3.4	2.7	5.8	68.518	28.101	53	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.1	2.4	5.1	68.550	28.113	65	995
ALL - Extended	3.1	1.2	4.0	68.609	28.132	121	2849

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 10. One-way sensitivity analysis: bNAb cost (base case: \$20/dose)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>bNAb cost: \$5/dose</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.3	4.8	8.0	60.133	26.375	15	dominated
HR-HIVE – 2 doses	3.3	4.7	7.8	60.134	26.375	15	dominated
HIVE – 1 dose	3.3	4.7	7.8	60.135	26.375	14	dominated
HR-HIVE – Extended	3.3	4.3	7.5	60.136	26.376	14	dominated
HIVE – 2 doses	3.3	4.3	7.4	60.138	26.377	13	dominated
ALL – 1 dose	3.0	4.6	7.5	60.139	26.377	17	dominated
ALL – 2 doses	3.0	4.2	7.0	60.140	26.378	21	dominated
HIVE – Extended	3.3	3.2	6.3	60.146	26.379	11	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	3.1	6.0	60.151	26.382	15	1673
ALL - Extended	3.0	2.7	5.5	60.156	26.383	31	14 322
<i>bNAb cost: \$100/dose</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.3	4.8	8.0	60.133	26.375	15	dominated
HR-HIVE – 2 doses	3.3	4.7	7.8	60.134	26.375	16	dominated
HIVE – 1 dose	3.3	4.7	7.8	60.135	26.375	15	400*
HR-HIVE – Extended	3.3	4.3	7.5	60.136	26.376	16	dominated
HIVE – 2 doses	3.3	4.3	7.4	60.138	26.377	17	dominated
ALL – 1 dose	3.0	4.6	7.5	60.139	26.377	82	dominated
ALL – 2 doses	3.0	4.2	7.0	60.140	26.378	162	dominated
HIVE – Extended	3.3	3.2	6.3	60.146	26.379	19	874†
ALL – 1 dose plus HIVE - Extended	3.0	3.1	6.0	60.151	26.382	86	31 377
ALL - Extended	3.0	2.7	5.5	60.156	26.383	410	289 474
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>bNAb cost: \$5/dose</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.1	2.1	4.0	68.979	28.518	114	dominated
HR-HIVE – 2 doses	2.1	2.1	4.0	68.986	28.521	114	dominated
HR-HIVE – Extended	2.1	2.0	3.9	68.995	28.523	113	dominated
HIVE – 1 dose	2.0	2.0	3.8	69.011	28.529	103	dominated
HIVE – 2 doses	2.0	1.8	3.6	69.045	28.541	99	dominated
ALL – 1 dose	1.8	1.8	3.5	69.063	28.548	105	dominated
HIVE – Extended	2.0	1.5	3.3	69.095	28.557	93	cost-saving
ALL – 2 doses	1.8	1.5	3.2	69.122	28.568	102	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.3	3.0	69.147	28.575	96	dominated
ALL - Extended	1.8	0.8	2.5	69.228	28.602	94	24*†

Supplementary Table 10. One-way sensitivity analysis: bNAb cost (base case: \$20/dose) (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>bNAb cost: \$100/dose</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.1	2.1	4.0	68.979	28.518	117	dominated
HR-HIVE – 2 doses	2.1	2.1	4.0	68.986	28.521	119	dominated
HR-HIVE – Extended	2.1	2.0	3.9	68.995	28.523	121	dominated
HIVE – 1 dose	2.0	2.0	3.8	69.011	28.529	118	214
HIVE – 2 doses	2.0	1.8	3.6	69.045	28.541	127	dominated
ALL – 1 dose	1.8	1.8	3.5	69.063	28.548	172	dominated
HIVE – Extended	2.0	1.5	3.3	69.095	28.557	138	723*†
ALL – 2 doses	1.8	1.5	3.2	69.122	28.568	228	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.3	3.0	69.147	28.575	192	2918
ALL - Extended	1.8	0.8	2.5	69.228	28.602	350	5977
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>bNAb cost: \$5/dose</i>							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.7	5.3	8.6	68.366	28.050	70	dominated
HR-HIVE – 2 doses	3.7	5.2	8.5	68.373	28.053	69	dominated
HIVE – 1 dose	3.7	5.2	8.4	68.380	28.055	65	dominated
HR-HIVE – Extended	3.7	4.9	8.2	68.387	28.057	67	dominated
ALL – 1 dose	3.4	4.9	7.9	68.400	28.062	67	dominated
HIVE – 2 doses	3.7	4.8	8.0	68.402	28.063	63	dominated
ALL – 2 doses	3.4	4.3	7.4	68.438	28.074	67	dominated
HIVE – Extended	3.7	3.6	6.9	68.458	28.081	55	cost-saving
ALL – 1 dose plus HIVE - Extended	3.4	3.4	6.5	68.478	28.088	56	160*†
ALL - Extended	3.4	2.6	5.7	68.517	28.101	67	791
<i>bNAb cost: \$100/dose</i>							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.7	5.3	8.6	68.366	28.050	72	54*
HR-HIVE – 2 doses	3.7	5.2	8.5	68.373	28.053	74	dominated
HIVE – 1 dose	3.7	5.2	8.4	68.380	28.055	74	295†
HR-HIVE – Extended	3.7	4.9	8.2	68.387	28.057	78	dominated
ALL – 1 dose	3.4	4.9	7.9	68.400	28.062	146	dominated
HIVE – 2 doses	3.7	4.8	8.0	68.402	28.063	80	dominated
ALL – 2 doses	3.4	4.3	7.4	68.438	28.074	228	dominated
HIVE – Extended	3.7	3.6	6.9	68.458	28.081	93	756
ALL – 1 dose plus HIVE - Extended	3.4	3.4	6.5	68.478	28.088	165	9833
ALL - Extended	3.4	2.6	5.7	68.517	28.101	488	24 338

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 11. One-way sensitivity analysis: bNAb effect duration (base case: 3 months)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>bNAb effect duration: 1 month</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.3	4.9	8.0	60.132	26.374	15	dominated
HR-HIVE – 2 doses	3.3	4.9	8.0	60.133	26.375	15	dominated
HIVE – 1 dose	3.3	4.9	7.9	60.133	26.375	14	cost-saving
HIVE – 2 doses	3.3	4.8	7.8	60.134	26.375	15	dominated
HR-HIVE – Extended	3.3	4.4	7.5	60.136	26.376	15	dominated
ALL – 1 dose	3.0	4.9	7.7	60.137	26.377	28	dominated
ALL – 2 doses	3.0	4.7	7.6	60.140	26.378	45	dominated
HIVE – Extended	3.3	3.2	6.3	60.145	26.379	16	267*†
ALL – 1 dose plus HIVE - Extended	3.0	3.2	6.1	60.150	26.381	29	7052
ALL - Extended	3.0	2.7	5.6	60.158	26.384	235	81 484
<i>bNAb effect duration: 6 months</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.3	4.7	7.8	60.134	26.375	15	dominated
HR-HIVE – 2 doses	3.3	4.5	7.6	60.135	26.376	14	dominated
HR-HIVE – Extended	3.3	4.3	7.5	60.136	26.376	14	dominated
HIVE – 1 dose	3.3	4.4	7.4	60.137	26.376	14	dominated
HIVE – 2 doses	3.3	3.7	6.7	60.142	26.378	13	dominated
ALL – 1 dose	3.0	4.2	7.1	60.143	26.379	27	dominated
HIVE – Extended	3.3	3.1	6.2	60.146	26.379	12	cost-saving*†
ALL – 2 doses	3.0	3.3	6.2	60.145	26.381	40	dominated
ALL – 1 dose plus HIVE - Extended	3.0	3.0	5.9	60.151	26.382	25	5467
ALL - Extended	3.0	2.6	5.5	60.158	26.383	55	19 636
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>bNAb effect duration: 1 month</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.1	2.1	4.1	68.970	28.515	116	dominated
HR-HIVE – 2 doses	2.1	2.1	4.0	68.976	28.517	116	dominated
HIVE – 1 dose	2.0	2.1	4.0	68.985	28.520	108	cost-saving
HR-HIVE – Extended	2.1	2.0	3.9	68.995	28.523	117	dominated
HIVE – 2 doses	2.0	2.1	3.9	68.997	28.525	110	dominated
ALL – 1 dose	1.8	2.1	3.8	69.011	28.529	121	dominated
ALL – 2 doses	1.8	1.9	3.6	69.038	28.539	133	dominated
HIVE – Extended	2.0	1.5	3.3	69.093	28.557	116	222*
ALL – 1 dose plus HIVE - Extended	1.8	1.4	3.1	69.119	28.566	130	1462†
ALL - Extended	1.8	0.8	2.5	69.221	28.600	227	2861

Supplementary Table 11. One-way sensitivity analysis: bNAb effect duration (base case: 3 months) (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>bNAb effect duration: 6 months</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.1	2.1	4.0	68.986	28.520	114	dominated
HR-HIVE – 2 doses	2.1	2.0	3.9	68.994	28.523	113	dominated
HR-HIVE – Extended	2.1	2.0	3.9	68.995	28.523	113	dominated
HIVE – 1 dose	2.0	1.8	3.6	69.044	28.541	101	dominated
HIVE – 2 doses	2.0	1.5	3.4	69.086	28.554	97	dominated
HIVE – Extended	2.0	1.5	3.3	69.097	28.558	96	cost-saving
ALL – 1 dose	1.8	1.5	3.2	69.119	28.567	109	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.1	2.8	69.171	28.584	105	dominated
ALL – 2 doses	1.8	1.0	2.7	69.200	28.593	110	dominated
ALL - Extended	1.8	0.8	2.5	69.231	28.603	111	322*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>bNAb effect duration: 1 month</i>							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.7	5.5	8.8	68.356	28.046	72	dominated
HR-HIVE – 2 doses	3.7	5.4	8.7	68.361	28.048	72	dominated
HIVE – 1 dose	3.7	5.5	8.7	68.361	28.048	69	cost-saving
ALL – 1 dose	3.4	5.4	8.4	68.370	28.051	82	dominated
HIVE – 2 doses	3.7	5.3	8.6	68.370	28.051	70	dominated
HR-HIVE – Extended	3.7	4.9	8.2	68.388	28.057	73	dominated
ALL – 2 doses	3.4	5.1	8.2	68.392	28.058	99	dominated
HIVE – Extended	3.7	3.6	6.9	68.457	28.080	76	223*†
ALL – 1 dose plus HIVE - Extended	3.4	3.6	6.7	68.466	28.083	89	4366
ALL - Extended	3.4	2.6	5.7	68.511	28.101	294	11 905
<i>bNAb effect duration: 6 months</i>							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.7	5.2	8.5	68.373	28.052	70	dominated
HR-HIVE – 2 doses	3.7	5.0	8.3	68.382	28.055	69	dominated
HR-HIVE – Extended	3.7	4.9	8.2	68.387	28.057	68	dominated
HIVE – 1 dose	3.7	4.8	8.0	68.401	28.062	64	dominated
ALL – 1 dose	3.4	4.4	7.4	68.430	28.072	76	dominated
HIVE – 2 doses	3.7	4.1	7.4	68.436	28.074	60	dominated
HIVE – Extended	3.7	3.6	6.9	68.459	28.081	58	cost-saving*†
ALL – 2 doses	3.4	3.3	6.4	68.487	28.090	83	dominated
ALL – 1 dose plus HIVE - Extended	3.4	3.2	6.3	68.488	28.091	69	1108
ALL - Extended	3.4	2.5	5.6	68.520	28.102	94	2223

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 12. One-way sensitivity analysis: bNAb uptake

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>56% uptake at all time points</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.4	4.9	8.0	60.132	26.374	15	dominated
HR-HIVE – 2 doses	3.4	4.8	7.9	60.133	26.375	15	dominated
HIVE – 1 dose	3.3	4.8	7.9	60.133	26.375	14	dominated
HR-HIVE – Extended	3.4	4.5	7.7	60.135	26.375	15	dominated
HIVE – 2 doses	3.3	4.5	7.6	60.136	26.376	14	dominated
ALL – 1 dose	3.1	4.7	7.7	60.138	26.376	25	dominated
ALL – 2 doses	3.1	4.4	7.3	60.142	26.378	35	dominated
HIVE – Extended	3.3	3.6	6.7	60.142	26.378	13	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.1	3.5	6.5	60.146	26.380	24	6745
ALL - Extended	3.1	3.2	6.2	60.153	26.381	75	38 825
<i>83% uptake at all time points</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.3	4.8	7.9	60.134	26.375	15	dominated
HR-HIVE – 2 doses	3.3	4.7	7.7	60.135	26.375	15	dominated
HIVE – 1 dose	3.2	4.7	7.7	60.136	26.376	14	dominated
HR-HIVE – Extended	3.3	4.2	7.3	60.137	26.376	14	dominated
HIVE – 2 doses	3.2	4.3	7.3	60.139	26.377	14	dominated
ALL – 1 dose	2.9	4.6	7.3	60.141	26.378	30	dominated
ALL – 2 doses	2.9	4.1	6.8	60.143	26.379	45	dominated
HIVE – Extended	3.2	2.9	5.9	60.148	26.380	12	cost-saving*†
ALL – 1 dose plus HIVE - Extended	2.9	2.8	5.6	60.154	26.383	28	6494
ALL - Extended	2.9	2.3	5.1	60.158	26.384	103	65 508
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>85% uptake at all time points</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.1	2.1	4.1	68.973	28.516	116	dominated
HR-HIVE – 2 doses	2.1	2.1	4.0	68.980	28.518	115	dominated
HR-HIVE – Extended	2.1	2.0	4.0	68.987	28.521	115	dominated
HIVE – 1 dose	2.0	2.0	3.9	69.002	28.526	106	dominated
HIVE – 2 doses	2.0	1.8	3.7	69.032	28.537	105	dominated
ALL – 1 dose	1.9	1.8	3.6	69.050	28.543	115	dominated
HIVE – Extended	2.0	1.5	3.4	69.078	28.552	102	cost-saving
ALL – 2 doses	1.9	1.5	3.3	69.098	28.560	122	dominated
ALL – 1 dose plus HIVE - Extended	1.9	1.4	3.1	69.126	28.568	111	589
ALL - Extended	1.9	0.9	2.7	69.201	28.592	134	930*†

Supplementary Table 12. One-way sensitivity analysis: bNAb uptake (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>96% uptake at all time points</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.1	2.1	4.0	68.979	28.518	115	dominated
HR-HIVE – 2 doses	2.1	2.1	4.0	68.986	28.521	115	dominated
HR-HIVE – Extended	2.1	2.0	3.9	68.996	28.524	114	dominated
HIVE – 1 dose	2.0	2.0	3.8	69.011	28.529	105	dominated
HIVE – 2 doses	2.0	1.8	3.6	69.045	28.541	104	dominated
ALL – 1 dose	1.8	1.8	3.5	69.063	28.548	116	dominated
HIVE – Extended	2.0	1.5	3.3	69.098	28.558	100	cost-saving
ALL – 2 doses	1.8	1.4	3.1	69.122	28.568	122	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.3	3.0	69.150	28.576	111	606
ALL - Extended	1.8	0.8	2.5	69.235	28.604	136	891*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>71% uptake at all time points</i>							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.8	5.4	8.8	68.358	28.047	71	dominated
HR-HIVE – 2 doses	3.8	5.3	8.7	68.363	28.049	71	dominated
HIVE – 1 dose	3.8	5.2	8.6	68.370	28.051	68	dominated
HR-HIVE – Extended	3.8	5.0	8.4	68.375	28.053	70	dominated
ALL – 1 dose	3.6	5.0	8.2	68.381	28.056	78	dominated
HIVE – 2 doses	3.8	4.9	8.3	68.387	28.057	67	dominated
ALL – 2 doses	3.6	4.6	7.8	68.419	28.067	89	dominated
HIVE – Extended	3.8	4.0	7.3	68.433	28.072	63	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.6	3.7	7.0	68.445	28.077	73	2444
ALL - Extended	3.6	3.1	6.3	68.488	28.090	124	3706
<i>92% uptake at all time points</i>							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.7	5.3	8.6	68.369	28.051	70	dominated
HR-HIVE – 2 doses	3.7	5.2	8.4	68.377	28.054	70	dominated
HIVE – 1 dose	3.6	5.1	8.3	68.384	28.056	66	dominated
HR-HIVE – Extended	3.7	4.8	8.1	68.392	28.059	68	dominated
HIVE – 2 doses	3.6	4.7	7.9	68.406	28.064	65	dominated
ALL – 1 dose	3.4	4.8	7.8	68.409	28.065	80	dominated
ALL – 2 doses	3.4	4.3	7.3	68.441	28.076	93	dominated
HIVE – Extended	3.6	3.4	6.7	68.469	28.084	60	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.4	3.2	6.2	68.494	28.093	74	1545
ALL - Extended	3.4	2.3	5.3	68.535	28.107	140	4822

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

The setting-specific base case uptake is specified in Supplementary Table 2. Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 13. One-way sensitivity analysis: proportion of mothers on antiretroviral therapy during pregnancy

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>Proportion of mothers on ART during pregnancy: 70%</i>							
Standard-of-care	7.3	5.4	12.2	60.081	26.353	42	Reference
HR-HIVE – 1 dose	6.4	5.2	11.1	60.090	26.357	39	dominated
HIVE – 1 dose	6.3	5.1	11.0	60.091	26.357	38	dominated
HR-HIVE – 2 doses	6.4	4.9	10.8	60.092	26.357	39	dominated
HIVE – 2 doses	6.3	4.6	10.5	60.094	26.359	37	dominated
HR-HIVE – Extended	6.4	4.3	10.3	60.095	26.359	37	dominated
ALL – 1 dose	6.1	5.0	10.6	60.096	26.359	52	dominated
ALL – 2 doses	6.1	4.4	10.1	60.097	26.360	66	dominated
HIVE – Extended	6.3	3.4	9.4	60.102	26.361	33	cost-saving*†
ALL – 1 dose plus HIVE - Extended	6.1	3.3	9.1	60.107	26.363	47	6244
ALL - Extended	6.1	2.9	8.6	60.113	26.365	112	57 665
<i>Proportion of mothers on ART during pregnancy: 100%</i>							
Standard-of-care	3.0	4.9	7.7	60.138	26.377	14	Reference
HR-HIVE – 1 dose	2.8	4.8	7.4	60.141	26.378	14	dominated
HR-HIVE – 2 doses	2.8	4.7	7.3	60.142	26.378	14	dominated
HIVE – 1 dose	2.7	4.7	7.2	60.143	26.379	13	dominated
HR-HIVE – Extended	2.8	4.3	7.0	60.144	26.379	14	dominated
HIVE – 2 doses	2.7	4.3	6.8	60.146	26.380	13	dominated
ALL – 1 dose	2.5	4.6	6.9	60.148	26.381	27	dominated
ALL – 2 doses	2.5	4.1	6.5	60.148	26.381	42	dominated
HIVE – Extended	2.7	3.1	5.7	60.154	26.383	12	cost-saving*†
ALL – 1 dose plus HIVE - Extended	2.5	3.1	5.4	60.159	26.385	25	6242
ALL - Extended	2.5	2.6	5.0	60.164	26.386	90	57 888
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Proportion of mothers on ART during pregnancy: 70%</i>							
Standard-of-care	8.1	2.6	10.1	67.590	28.013	232	Reference
HR-HIVE – 1 dose	6.4	2.3	8.3	67.824	28.091	209	dominated
HIVE – 1 dose	6.3	2.3	8.1	67.844	28.098	199	dominated
HR-HIVE – 2 doses	6.4	2.2	8.1	67.848	28.099	207	dominated
HR-HIVE – Extended	6.4	2.0	8.0	67.869	28.106	206	dominated
HIVE – 2 doses	6.3	2.0	7.9	67.884	28.112	196	dominated
ALL – 1 dose	6.2	2.0	7.8	67.895	28.116	209	dominated
HIVE – Extended	6.3	1.7	7.6	67.931	28.127	193	cost-saving
ALL – 2 doses	6.2	1.6	7.4	67.961	28.139	214	dominated
ALL – 1 dose plus HIVE - Extended	6.2	1.5	7.2	67.982	28.145	204	575
ALL - Extended	6.2	0.9	6.7	68.066	28.172	227	850*†

Supplementary Table 13. One-way sensitivity analysis: proportion of mothers on antiretroviral therapy during pregnancy (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Proportion of mothers on ART during pregnancy: 100%</i>							
Standard-of-care	2.0	2.2	4.0	69.018	28.534	104	Reference
HR-HIVE – 1 dose	1.8	2.1	3.7	69.061	28.548	109	dominated
HR-HIVE – 2 doses	1.8	2.0	3.7	69.067	28.550	108	dominated
HR-HIVE – Extended	1.8	2.0	3.7	69.075	28.553	108	dominated
HIVE – 1 dose	1.7	2.0	3.5	69.094	28.560	99	dominated
HIVE – 2 doses	1.7	1.8	3.3	69.127	28.571	98	dominated
ALL – 1 dose	1.5	1.8	3.2	69.145	28.578	110	dominated
HIVE – Extended	1.7	1.5	3.0	69.177	28.588	94	cost-saving
ALL – 2 doses	1.5	1.4	2.9	69.204	28.598	116	dominated
ALL – 1 dose plus HIVE - Extended	1.5	1.3	2.7	69.229	28.606	105	606
ALL - Extended	1.5	0.8	2.2	69.310	28.632	129	884*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>Proportion of mothers on ART during pregnancy: 70%</i>							
Standard-of-care	7.8	6.1	12.9	68.038	27.928	93	Reference
HR-HIVE – 1 dose	6.5	5.6	11.3	68.119	27.957	88	dominated
HIVE – 1 dose	6.4	5.5	11.1	68.130	27.960	84	dominated
HR-HIVE – 2 doses	6.5	5.3	11.0	68.133	27.961	87	dominated
ALL – 1 dose	6.2	5.2	10.6	68.150	27.967	97	dominated
HR-HIVE – Extended	6.5	4.8	10.6	68.156	27.969	85	dominated
HIVE – 2 doses	6.4	5.0	10.7	68.154	27.969	83	dominated
ALL – 2 doses	6.2	4.6	10.0	68.191	27.980	110	dominated
HIVE – Extended	6.4	3.9	9.6	68.208	27.986	78	cost-saving*†
ALL – 1 dose plus HIVE - Extended	6.2	3.6	9.1	68.228	27.993	91	1739
ALL - Extended	6.2	2.7	8.3	68.267	28.007	151	4466
<i>Proportion of mothers on ART during pregnancy: 100%</i>							
Standard-of-care	2.7	5.4	7.8	68.461	28.087	61	Reference
HR-HIVE – 1 dose	2.5	5.2	7.4	68.488	28.096	62	dominated
HR-HIVE – 2 doses	2.5	5.1	7.3	68.492	28.098	62	dominated
HR-HIVE – Extended	2.5	4.9	7.1	68.502	28.101	61	dominated
HIVE – 1 dose	2.4	5.0	7.1	68.504	28.102	58	dominated
HIVE – 2 doses	2.4	4.6	6.8	68.525	28.109	58	dominated
ALL – 1 dose	2.2	4.7	6.7	68.524	28.109	71	dominated
ALL – 2 doses	2.2	4.2	6.2	68.561	28.121	85	dominated
HIVE – Extended	2.4	3.5	5.7	68.581	28.127	53	cost-saving*†
ALL – 1 dose plus HIVE - Extended	2.2	3.3	5.2	68.602	28.135	66	1729
ALL - Extended	2.2	2.5	4.5	68.640	28.148	126	4533

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 14. One-way sensitivity analysis: breastfeeding duration

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>Mean breastfeeding duration: 8 months for all women</i>							
Standard-of-care	3.6	2.7	6.2	60.155	26.381	10	Reference
HR-HIVE – 1 dose	3.3	2.6	5.8	60.158	26.383	10	dominated
HR-HIVE – 2 doses	3.3	2.5	5.7	60.159	26.383	10	dominated
HIVE – 1 dose	3.3	2.5	5.7	60.160	26.383	9	dominated
HR-HIVE – Extended	3.3	2.3	5.5	60.160	26.384	10	dominated
HIVE – 2 doses	3.3	2.2	5.4	60.162	26.384	9	dominated
ALL – 1 dose	3.0	2.4	5.4	60.161	26.385	22	dominated
HIVE – Extended	3.3	1.6	4.8	60.166	26.386	9	cost-saving*†
ALL – 2 doses	3.0	2.1	5.0	60.167	26.386	33	dominated
ALL – 1 dose plus HIVE - Extended	3.0	1.5	4.5	60.168	26.387	21	10 463
ALL - Extended	3.0	1.3	4.3	60.168	26.388	52	51 570
<i>Mean breastfeeding duration: 24 months for all women</i>							
Standard-of-care	3.6	7.9	11.2	60.121	26.369	20	Reference
ALL – 1 dose	3.0	7.6	10.3	60.120	26.370	34	dominated
HR-HIVE – 1 dose	3.3	7.8	10.8	60.125	26.371	20	dominated
HR-HIVE – 2 doses	3.3	7.7	10.7	60.126	26.371	20	dominated
HIVE – 1 dose	3.3	7.7	10.6	60.127	26.372	19	dominated
ALL – 2 doses	3.0	7.1	9.8	60.127	26.372	49	dominated
HR-HIVE – Extended	3.3	7.1	10.1	60.130	26.373	20	dominated
HIVE – 2 doses	3.3	7.2	10.2	60.130	26.373	19	dominated
ALL – 1 dose plus HIVE - Extended	3.0	5.3	8.1	60.136	26.376	31	dominated
HIVE – Extended	3.3	5.4	8.4	60.142	26.378	17	cost-saving*†
ALL - Extended	3.0	4.8	7.6	60.146	26.380	103	40 559
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Mean breastfeeding duration: 2 months for all women</i>							
Standard-of-care	2.3	0.9	3.2	69.125	28.566	84	Reference
HR-HIVE – 1 dose	2.1	0.9	2.9	69.178	28.583	87	dominated
HR-HIVE – 2 doses	2.1	0.8	2.9	69.181	28.585	87	dominated
HR-HIVE – Extended	2.1	0.8	2.8	69.185	28.586	87	dominated
HIVE – 1 dose	2.0	0.8	2.7	69.205	28.593	77	dominated
HIVE – 2 doses	2.0	0.7	2.6	69.225	28.600	76	dominated
HIVE – Extended	2.0	0.6	2.5	69.244	28.606	75	cost-saving
ALL – 1 dose	1.8	0.7	2.4	69.252	28.610	83	dominated
ALL – 2 doses	1.8	0.5	2.3	69.280	28.619	85	dominated
ALL – 1 dose plus HIVE - Extended	1.8	0.4	2.2	69.291	28.622	81	364*
ALL - Extended	1.8	0.3	2.1	69.306	28.628	87	1145†

Supplementary Table 14. One-way sensitivity analysis: breastfeeding duration (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Mean breastfeeding duration: 18 months for all women</i>							
Standard-of-care	2.3	4.9	6.9	68.494	28.361	175	Reference
HR-HIVE – 1 dose	2.1	4.7	6.6	68.553	28.381	178	dominated
HR-HIVE – 2 doses	2.1	4.7	6.5	68.563	28.385	178	dominated
HIVE – 1 dose	2.0	4.6	6.3	68.591	28.394	168	dominated
HR-HIVE – Extended	2.1	4.4	6.3	68.602	28.397	174	dominated
HIVE – 2 doses	2.0	4.3	6.0	68.645	28.413	166	dominated
ALL – 1 dose	1.8	4.4	6.0	68.645	28.413	180	dominated
ALL – 2 doses	1.8	3.9	5.6	68.717	28.439	186	dominated
HIVE – Extended	2.0	2.9	4.7	68.860	28.482	148	cost-saving
ALL – 1 dose plus HIVE - Extended	1.8	2.7	4.4	68.914	28.501	159	607
ALL - Extended	1.8	2.0	3.7	69.031	28.539	192	847*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>Mean breastfeeding duration: 8 months for women with HIV and 15 months for women without HIV</i>							
Standard-of-care	4.3	4.1	8.0	68.397	28.058	59	Reference
HR-HIVE – 1 dose	3.7	3.8	7.2	68.440	28.074	58	dominated
HR-HIVE – 2 doses	3.7	3.7	7.1	68.446	28.076	57	dominated
HIVE – 1 dose	3.7	3.7	7.0	68.453	28.078	54	dominated
HR-HIVE – Extended	3.7	3.5	7.0	68.454	28.078	57	dominated
HIVE – 2 doses	3.7	3.3	6.7	68.470	28.084	53	dominated
ALL – 1 dose	3.4	3.4	6.5	68.480	28.087	67	dominated
HIVE – Extended	3.7	2.7	6.1	68.500	28.094	51	cost-saving*†
ALL – 2 doses	3.4	2.9	6.1	68.502	28.096	80	dominated
ALL – 1 dose plus HIVE - Extended	3.4	2.5	5.6	68.527	28.103	64	1348
ALL - Extended	3.4	1.8	5.0	68.554	28.113	116	5362
<i>Mean breastfeeding duration: 20 months for all women</i>							
Standard-of-care	4.3	7.6	11.3	68.226	28.004	87	Reference
HR-HIVE – 1 dose	3.7	7.3	10.5	68.271	28.020	86	dominated
HR-HIVE – 2 doses	3.7	7.1	10.4	68.279	28.023	86	dominated
HIVE – 1 dose	3.7	7.1	10.3	68.285	28.025	82	dominated
HR-HIVE – Extended	3.7	6.7	9.9	68.301	28.030	84	dominated
ALL – 1 dose	3.4	6.8	9.8	68.298	28.031	95	dominated
HIVE – 2 doses	3.7	6.7	9.8	68.311	28.034	81	dominated
ALL – 2 doses	3.4	6.3	9.2	68.340	28.044	109	dominated
HIVE – Extended	3.7	4.9	8.1	68.398	28.062	74	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.4	4.6	7.7	68.411	28.068	86	2140
ALL - Extended	3.4	3.8	6.8	68.467	28.086	151	3624

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 15. One-way sensitivity analysis: maternal postpartum HIV incidence

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>Postpartum incidence: 0.5x base case</i>							
Standard-of-care	3.6	4.9	8.3	60.130	26.374	14	Reference
HR-HIVE – 1 dose	3.3	4.7	7.9	60.134	26.375	14	dominated
HR-HIVE – 2 doses	3.3	4.6	7.7	60.135	26.375	14	dominated
HIVE – 1 dose	3.3	4.6	7.7	60.135	26.376	13	dominated
HR-HIVE – Extended	3.3	4.2	7.4	60.137	26.376	13	dominated
HIVE – 2 doses	3.3	4.2	7.3	60.138	26.377	13	dominated
ALL – 1 dose	3.0	4.5	7.4	60.141	26.378	27	dominated
ALL – 2 doses	3.0	4.0	6.9	60.141	26.378	43	dominated
HIVE – Extended	3.3	3.0	6.2	60.146	26.380	12	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	3.0	5.9	60.152	26.382	26	6337
ALL - Extended	3.0	2.6	5.5	60.156	26.383	91	75 319
<i>Postpartum incidence: 2.0x base case</i>							
Standard-of-care	3.6	5.2	8.5	60.126	26.372	15	Reference
HR-HIVE – 1 dose	3.3	5.1	8.1	60.130	26.374	15	dominated
HR-HIVE – 2 doses	3.3	5.0	8.0	60.131	26.374	15	dominated
HIVE – 1 dose	3.3	5.0	8.0	60.131	26.374	14	dominated
HR-HIVE –Extended	3.3	4.6	7.7	60.133	26.375	14	dominated
HIVE – 2 doses	3.3	4.6	7.6	60.135	26.376	14	dominated
ALL – 1 dose	3.0	4.9	7.6	60.137	26.377	28	dominated
ALL – 2 doses	3.0	4.4	7.2	60.138	26.377	44	dominated
HIVE – Extended	3.3	3.4	6.5	60.143	26.378	13	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	3.3	6.2	60.149	26.381	27	5993
ALL - Extended	3.0	2.8	5.6	60.154	26.382	91	58 257
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Postpartum incidence: 0.5x base case</i>							
Standard-of-care	2.3	1.9	4.1	68.984	28.519	104	Reference
HR-HIVE – 1 dose	2.1	1.8	3.7	69.039	28.538	108	dominated
HR-HIVE – 2 doses	2.1	1.7	3.7	69.046	28.541	107	dominated
HR-HIVE – Extended	2.1	1.7	3.6	69.055	28.543	107	dominated
HIVE – 1 dose	2.0	1.7	3.5	69.071	28.549	98	dominated
HIVE – 2 doses	2.0	1.5	3.3	69.105	28.561	96	dominated
ALL – 1 dose	1.8	1.5	3.2	69.116	28.565	109	dominated
HIVE – Extended	2.0	1.1	3.0	69.155	28.577	93	cost-saving
ALL – 2 doses	1.8	1.2	2.9	69.169	28.583	116	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.0	2.7	69.200	28.593	104	700*
ALL - Extended	1.8	0.7	2.4	69.251	28.609	131	1,675†

Supplementary Table 15. One-way sensitivity analysis: maternal postpartum HIV incidence (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Postpartum incidence: 2·0x base case</i>							
Standard-of-care	2·3	2·8	4·8	68·813	28·462	127	Reference
HR-HIVE – 1 dose	2·1	2·7	4·5	68·868	28·481	130	dominated
HR-HIVE – 2 doses	2·1	2·6	4·5	68·875	28·483	130	dominated
HR-HIVE – Extended	2·1	2·6	4·4	68·884	28·486	129	dominated
HIVE – 1 dose	2·0	2·6	4·3	68·900	28·492	121	dominated
HIVE – 2 doses	2·0	2·4	4·1	68·934	28·504	119	dominated
ALL – 1 dose	1·8	2·3	3·9	68·960	28·513	130	dominated
HIVE – Extended	2·0	2·1	3·8	68·984	28·520	116	cost-saving
ALL – 2 doses	1·8	1·9	3·5	69·034	28·540	135	dominated
ALL – 1 dose plus HIVE - Extended	1·8	1·8	3·5	69·043	28·541	125	dominated
ALL - Extended	1·8	1·0	2·6	69·183	28·588	140	359*·†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>Postpartum incidence: 0·5x base case</i>							
Standard-of-care	4·3	5·2	9·2	68·351	28·044	66	Reference
HR-HIVE – 1 dose	3·7	4·9	8·3	68·396	28·060	65	dominated
HR-HIVE – 2 doses	3·7	4·7	8·2	68·403	28·062	65	dominated
HIVE – 1 dose	3·7	4·7	8·1	68·410	28·065	61	dominated
HR-HIVE – Extended	3·7	4·4	7·9	68·417	28·067	64	dominated
ALL – 1 dose	3·4	4·4	7·6	68·430	28·072	75	dominated
HIVE – 2 doses	3·7	4·3	7·7	68·432	28·073	61	dominated
ALL – 2 doses	3·4	3·9	7·1	68·466	28·083	89	dominated
HIVE – Extended	3·7	3·1	6·6	68·488	28·090	56	cost-saving*·†
ALL – 1 dose plus HIVE - Extended	3·4	2·9	6·1	68·508	28·097	70	1976
ALL - Extended	3·4	2·3	5·6	68·534	28·107	131	6572
<i>Postpartum incidence: 2·0x base case</i>							
Standard-of-care	4·3	6·4	10·0	68·258	28·014	68	Reference
HR-HIVE – 1 dose	3·7	6·1	9·2	68·303	28·030	68	dominated
HR-HIVE – 2 doses	3·7	6·0	9·1	68·310	28·032	68	dominated
HIVE – 1 dose	3·7	6·0	9·0	68·317	28·035	68	dominated
HR-HIVE – Extended	3·7	5·7	8·8	68·325	28·037	68	dominated
HIVE – 2 doses	3·7	5·6	8·6	68·339	28·042	68	dominated
ALL – 1 dose	3·4	5·7	8·5	68·342	28·043	68	dominated
ALL – 2 doses	3·4	5·0	7·9	68·387	28·058	68	dominated
HIVE – Extended	3·7	4·5	7·6	68·395	28·060	68	cost-saving*·†
ALL – 1 dose plus HIVE - Extended	3·4	4·2	7·1	68·420	28·069	68	1503
ALL - Extended	3·4	3·0	5·9	68·486	28·092	68	2414

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 16. One-way sensitivity analysis: antiretroviral therapy treatment cost

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>ART treatment cost: 0.5x base case</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	12	Reference
HR-HIVE – 1 dose	3.3	4.8	8.0	60.133	26.375	12	dominated
HR-HIVE – 2 doses	3.3	4.7	7.8	60.134	26.375	12	dominated
HIVE – 1 dose	3.3	4.7	7.8	60.134	26.375	11	dominated
HR-HIVE – Extended	3.3	4.3	7.5	60.136	26.376	12	dominated
HIVE – 2 doses	3.3	4.3	7.4	60.138	26.377	11	dominated
ALL – 1 dose	3.0	4.6	7.5	60.139	26.377	26	dominated
ALL – 2 doses	3.0	4.2	7.0	60.140	26.378	41	dominated
HIVE – Extended	3.3	3.2	6.3	60.146	26.379	10	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	3.1	6.0	60.150	26.382	25	6722
ALL - Extended	3.0	2.7	5.5	60.156	26.383	89	57 928
<i>ART treatment cost: 2.0x base case</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	18	Reference
HR-HIVE – 1 dose	3.3	4.8	8.0	60.133	26.375	19	dominated
HR-HIVE – 2 doses	3.3	4.7	7.8	60.134	26.375	18	dominated
HIVE – 1 dose	3.3	4.7	7.8	60.134	26.375	18	dominated
HR-HIVE – Extended	3.3	4.3	7.5	60.136	26.376	18	dominated
HIVE – 2 doses	3.3	4.3	7.4	60.138	26.377	17	dominated
ALL – 1 dose	3.0	4.6	7.5	60.139	26.377	31	dominated
ALL – 2 doses	3.0	4.2	7.0	60.140	26.378	47	dominated
HIVE – Extended	3.3	3.2	6.3	60.146	26.379	15	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	3.1	6.0	60.150	26.382	29	6197
ALL - Extended	3.0	2.7	5.5	60.156	26.383	93	57 720
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>ART treatment cost: 0.5x base case</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	103	Reference
HR-HIVE – 1 dose	2.1	2.1	4.0	68.979	28.518	108	dominated
HR-HIVE – 2 doses	2.1	2.1	4.0	68.986	28.521	107	dominated
HR-HIVE – Extended	2.1	2.0	3.9	68.995	28.523	107	dominated
HIVE – 1 dose	2.0	2.0	3.8	69.011	28.529	98	dominated
HIVE – 2 doses	2.0	1.8	3.6	69.045	28.541	97	dominated
ALL – 1 dose	1.8	1.8	3.5	69.063	28.548	109	dominated
HIVE – Extended	2.0	1.5	3.3	69.095	28.557	94	cost-saving
ALL – 2 doses	1.8	1.5	3.2	69.122	28.568	116	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.3	3.0	69.147	28.575	105	596
ALL - Extended	1.8	0.8	2.5	69.228	28.602	129	913*†

Supplementary Table 16. One-way sensitivity analysis: antiretroviral therapy treatment cost (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>ART treatment cost: 2·0x base case</i>							
Standard-of-care	2·3	2·2	4·4	68·924	28·499	130	Reference
HR-HIVE – 1 dose	2·1	2·1	4·0	68·979	28·518	131	dominated
HR-HIVE – 2 doses	2·1	2·1	4·0	68·986	28·521	131	dominated
HR-HIVE – Extended	2·1	2·0	3·9	68·995	28·523	130	dominated
HIVE – 1 dose	2·0	2·0	3·8	69·011	28·529	120	dominated
HIVE – 2 doses	2·0	1·8	3·6	69·045	28·541	119	dominated
ALL – 1 dose	1·8	1·8	3·5	69·063	28·548	130	dominated
HIVE – Extended	2·0	1·5	3·3	69·095	28·557	114	cost-saving
ALL – 2 doses	1·8	1·5	3·2	69·122	28·568	135	dominated
ALL – 1 dose plus HIVE - Extended	1·8	1·3	3·0	69·147	28·575	124	518
ALL - Extended	1·8	0·8	2·5	69·228	28·602	145	819*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>ART treatment cost: 0·5x base case</i>							
Standard-of-care	4·3	5·6	9·5	68·321	28·034	62	Reference
HR-HIVE – 1 dose	3·7	5·3	8·6	68·366	28·050	61	dominated
HR-HIVE – 2 doses	3·7	5·2	8·5	68·373	28·053	61	dominated
HIVE – 1 dose	3·7	5·2	8·4	68·380	28·055	58	dominated
HR-HIVE – Extended	3·7	4·9	8·2	68·387	28·057	60	dominated
ALL – 1 dose	3·4	4·9	7·9	68·400	28·062	71	dominated
HIVE – 2 doses	3·7	4·8	8·0	68·402	28·063	57	dominated
ALL – 2 doses	3·4	4·3	7·4	68·438	28·074	85	dominated
HIVE – Extended	3·7	3·6	6·9	68·458	28·081	54	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3·4	3·4	6·5	68·478	28·088	67	1777
ALL - Extended	3·4	2·6	5·7	68·517	28·101	128	4601
<i>ART treatment cost: 2·0x base case</i>							
Standard-of-care	4·3	5·6	9·5	68·321	28·034	91	Reference
HR-HIVE – 1 dose	3·7	5·3	8·6	68·366	28·050	88	dominated
HR-HIVE – 2 doses	3·7	5·2	8·5	68·373	28·053	87	dominated
HIVE – 1 dose	3·7	5·2	8·4	68·380	28·055	84	dominated
HR-HIVE – Extended	3·7	4·9	8·2	68·387	28·057	86	dominated
ALL – 1 dose	3·4	4·9	7·9	68·400	28·062	95	dominated
HIVE – 2 doses	3·7	4·8	8·0	68·402	28·063	82	dominated
ALL – 2 doses	3·4	4·3	7·4	68·438	28·074	108	dominated
HIVE – Extended	3·7	3·6	6·9	68·458	28·081	75	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3·4	3·4	6·5	68·478	28·088	86	1522
ALL - Extended	3·4	2·6	5·7	68·517	28·101	145	4411

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 17. One-way sensitivity analysis: postpartum vertical transmission risk

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>Postpartum vertical transmission risk: 0.5x base case</i>							
Standard-of-care	3.6	2.5	6.0	60.147	26.380	10	Reference
HR-HIVE – 1 dose	3.3	2.5	5.7	60.150	26.381	10	dominated
HR-HIVE – 2 doses	3.3	2.4	5.6	60.150	26.381	10	dominated
HIVE – 1 dose	3.3	2.4	5.5	60.151	26.382	9	dominated
HR-HIVE – Extended	3.3	2.2	5.4	60.152	26.382	10	dominated
HIVE – 2 doses	3.3	2.2	5.3	60.153	26.382	9	dominated
ALL – 2 doses	3.0	2.1	5.0	60.155	26.383	39	dominated
ALL – 1 dose	3.0	2.4	5.3	60.156	26.384	24	dominated
HIVE – Extended	3.3	1.6	4.8	60.157	26.384	9	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	1.6	4.5	60.161	26.386	24	7038
ALL - Extended	3.0	1.3	4.3	60.166	26.386	89	112 676
<i>Postpartum vertical transmission risk: 2.0x base case</i>							
Standard-of-care	3.6	9.6	12.8	60.096	26.361	22	Reference
HR-HIVE – 1 dose	3.3	9.3	12.3	60.101	26.362	22	dominated
HR-HIVE – 2 doses	3.3	9.1	12.0	60.103	26.363	22	dominated
HIVE – 1 dose	3.3	9.1	12.0	60.103	26.364	21	dominated
HR-HIVE – Extended	3.3	8.4	11.3	60.107	26.365	21	dominated
ALL – 1 dose	3.0	8.9	11.6	60.109	26.366	35	dominated
HIVE – 2 doses	3.3	8.3	11.2	60.110	26.366	20	dominated
ALL – 2 doses	3.0	8.0	10.7	60.113	26.368	50	dominated
HIVE – Extended	3.3	6.1	9.1	60.125	26.372	17	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	5.9	8.7	60.130	26.374	31	6027
ALL - Extended	3.0	5.2	8.0	60.138	26.376	95	32 149
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Postpartum vertical transmission risk: 0.5x base case</i>							
Standard-of-care	2.3	1.1	3.3	69.097	28.558	90	Reference
HR-HIVE – 1 dose	2.1	1.1	3.0	69.146	28.574	94	dominated
HR-HIVE – 2 doses	2.1	1.1	3.0	69.149	28.576	94	dominated
HR-HIVE – Extended	2.1	1.0	3.0	69.154	28.577	94	dominated
HIVE – 1 dose	2.0	1.0	2.9	69.169	28.582	85	cost-saving
HIVE – 2 doses	2.0	0.9	2.8	69.187	28.589	85	103
ALL – 1 dose	1.8	0.9	2.6	69.205	28.595	97	dominated
HIVE – Extended	2.0	0.8	2.6	69.212	28.597	85	dominated
ALL – 2 doses	1.8	0.7	2.5	69.237	28.606	107	dominated
ALL – 1 dose plus HIVE - Extended	1.8	0.7	2.4	69.248	28.609	98	590*
ALL - Extended	1.8	0.4	2.1	69.291	28.623	126	2023†

Supplementary Table 17. One-way sensitivity analysis: postpartum vertical transmission risk (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Postpartum vertical transmission risk: 2·0x base case</i>							
Standard-of-care	2·3	4·2	6·3	68·599	28·390	154	Reference
HR-HIVE – 1 dose	2·1	4·0	5·9	68·668	28·413	156	dominated
HR-HIVE – 2 doses	2·1	3·9	5·8	68·681	28·418	155	dominated
HR-HIVE – Extended	2·1	3·8	5·7	68·698	28·423	153	dominated
HIVE – 1 dose	2·0	3·8	5·6	68·719	28·431	143	dominated
HIVE – 2 doses	2·0	3·4	5·2	68·784	28·453	139	dominated
ALL – 1 dose	1·8	3·4	5·1	68·797	28·459	151	dominated
HIVE – Extended	2·0	2·8	4·6	68·880	28·484	129	cost-saving
ALL – 2 doses	1·8	2·8	4·5	68·904	28·496	151	dominated
ALL – 1 dose plus HIVE - Extended	1·8	2·4	4·1	68·958	28·512	136	260
ALL - Extended	1·8	1·6	3·3	69·103	28·560	151	315*·†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>Postpartum vertical transmission risk: 0·5x base case</i>							
Standard-of-care	4·3	2·9	6·8	68·461	28·081	52	Reference
HR-HIVE – 1 dose	3·7	2·7	6·1	68·499	28·094	52	dominated
HR-HIVE – 2 doses	3·7	2·7	6·1	68·502	28·095	52	dominated
HIVE – 1 dose	3·7	2·6	6·0	68·508	28·097	48	cost-saving
HR-HIVE – Extended	3·7	2·5	5·9	68·510	28·098	52	dominated
HIVE – 2 doses	3·7	2·4	5·8	68·519	28·101	49	dominated
ALL – 1 dose	3·4	2·5	5·6	68·522	28·102	61	dominated
ALL – 2 doses	3·4	2·2	5·3	68·546	28·109	77	dominated
HIVE – Extended	3·7	1·9	5·2	68·548	28·110	49	18*·†
ALL – 1 dose plus HIVE - Extended	3·4	1·7	4·9	68·562	28·115	62	2656
ALL - Extended	3·4	1·3	4·5	68·582	28·123	124	8712
<i>Postpartum vertical transmission risk: 2·0x base case</i>							
Standard-of-care	4·3	10·7	14·3	68·060	27·946	107	Reference
HR-HIVE – 1 dose	3·7	10·1	13·2	68·118	27·967	105	dominated
HR-HIVE – 2 doses	3·7	9·9	13·0	68·132	27·972	104	dominated
HIVE – 1 dose	3·7	9·8	12·9	68·141	27·976	100	dominated
HR-HIVE – Extended	3·7	9·3	12·5	68·159	27·981	100	dominated
ALL – 1 dose	3·4	9·3	12·2	68·173	27·987	112	dominated
HIVE – 2 doses	3·7	9·0	12·1	68·185	27·991	97	dominated
ALL – 2 doses	3·4	8·3	11·2	68·239	28·009	122	dominated
HIVE – Extended	3·7	6·8	10·0	68·292	28·025	84	cost-saving*·†
ALL – 1 dose plus HIVE - Extended	3·4	6·4	9·4	68·323	28·036	96	1061
ALL - Extended	3·4	5·0	8·0	68·393	28·060	152	2370

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 18. One-way sensitivity analysis: infant oral prophylaxis efficacy (base case: 69% intrapartum efficacy and 71% postpartum efficacy)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>Low infant oral prophylaxis efficacy (intrapartum efficacy: 40%; postpartum efficacy: 58%)</i>							
Standard-of-care	3.7	5.1	8.5	60.128	26.373	15	Reference
HR-HIVE – 1 dose	3.4	4.9	8.1	60.132	26.374	15	dominated
HR-HIVE – 2 doses	3.4	4.8	7.9	60.133	26.375	15	dominated
HIVE – 1 dose	3.3	4.8	7.9	60.134	26.375	14	dominated
HR-HIVE – Extended	3.4	4.4	7.6	60.135	26.376	15	dominated
HIVE – 2 doses	3.3	4.4	7.5	60.137	26.376	14	dominated
ALL – 1 dose	3.1	4.7	7.6	60.139	26.377	28	dominated
ALL – 2 doses	3.1	4.2	7.1	60.139	26.378	43	dominated
HIVE – Extended	3.3	3.2	6.4	60.145	26.379	13	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.1	3.1	6.1	60.150	26.381	26	6240
ALL - Extended	3.1	2.7	5.6	60.155	26.382	91	57 858
<i>High infant oral prophylaxis efficacy (intrapartum efficacy: 90%; postpartum efficacy: 80%)</i>							
Standard-of-care	3.6	4.9	8.3	60.130	26.374	14	Reference
HR-HIVE – 1 dose	3.3	4.8	7.9	60.133	26.375	15	dominated
HR-HIVE – 2 doses	3.3	4.7	7.7	60.135	26.375	15	dominated
HIVE – 1 dose	3.2	4.7	7.7	60.135	26.376	14	dominated
HR-HIVE – Extended	3.3	4.3	7.4	60.137	26.376	14	dominated
HIVE – 2 doses	3.2	4.3	7.3	60.138	26.377	14	dominated
ALL – 1 dose	3.0	4.6	7.4	60.140	26.378	27	dominated
ALL – 2 doses	3.0	4.1	6.9	60.141	26.378	43	dominated
HIVE – Extended	3.2	3.1	6.2	60.146	26.380	13	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	3.1	5.9	60.151	26.382	26	6246
ALL - Extended	3.0	2.6	5.5	60.157	26.383	91	57 856
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Low infant oral prophylaxis efficacy (intrapartum efficacy: 40%; postpartum efficacy: 58%)</i>							
Standard-of-care	2.4	2.2	4.5	68.909	28.494	114	Reference
HR-HIVE – 1 dose	2.1	2.1	4.1	68.970	28.515	116	dominated
HR-HIVE – 2 doses	2.1	2.1	4.0	68.977	28.517	116	dominated
HR-HIVE – Extended	2.1	2.0	4.0	68.985	28.520	115	dominated
HIVE – 1 dose	2.0	2.0	3.9	69.003	28.526	106	dominated
HIVE – 2 doses	2.0	1.8	3.7	69.037	28.538	105	dominated
ALL – 1 dose	1.8	1.8	3.5	69.055	28.545	117	dominated
HIVE – Extended	2.0	1.5	3.4	69.086	28.554	101	cost-saving
ALL – 2 doses	1.8	1.5	3.2	69.114	28.565	123	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.3	3.0	69.139	28.573	112	596
ALL - Extended	1.8	0.8	2.6	69.220	28.599	136	882*†

Supplementary Table 18. One-way sensitivity analysis: infant oral prophylaxis efficacy (base case: 69% intrapartum efficacy and 71% postpartum efficacy) (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>High infant oral prophylaxis efficacy (intrapartum efficacy: 90%; postpartum efficacy: 80%)</i>							
Standard-of-care	2.3	2.2	4.3	68.934	28.503	110	Reference
HR-HIVE – 1 dose	2.0	2.1	4.0	68.986	28.521	114	dominated
HR-HIVE – 2 doses	2.0	2.0	3.9	68.993	28.523	114	dominated
HR-HIVE – Extended	2.0	2.0	3.9	69.002	28.526	113	dominated
HIVE – 1 dose	1.9	2.0	3.8	69.017	28.531	104	dominated
HIVE – 2 doses	1.9	1.8	3.6	69.051	28.543	103	dominated
ALL – 1 dose	1.8	1.8	3.4	69.069	28.550	115	dominated
HIVE – Extended	1.9	1.5	3.3	69.101	28.559	100	cost-saving
ALL – 2 doses	1.8	1.4	3.1	69.127	28.570	122	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.3	2.9	69.152	28.577	111	613
ALL - Extended	1.8	0.8	2.5	69.233	28.604	134	882*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>Low infant oral prophylaxis efficacy (intrapartum efficacy: 40%; postpartum efficacy: 58%)</i>							
Standard-of-care	4.5	5.8	9.8	68.303	28.027	74	Reference
HR-HIVE – 1 dose	3.9	5.4	8.8	68.354	28.046	72	dominated
HR-HIVE – 2 doses	3.9	5.3	8.7	68.361	28.048	71	dominated
HIVE – 1 dose	3.8	5.2	8.6	68.369	28.051	68	dominated
HR-HIVE – Extended	3.9	5.0	8.4	68.375	28.053	70	dominated
ALL – 1 dose	3.6	4.9	8.1	68.389	28.058	81	dominated
HIVE – 2 doses	3.8	4.8	8.2	68.391	28.059	67	dominated
ALL – 2 doses	3.6	4.4	7.6	68.427	28.070	94	dominated
HIVE – Extended	3.8	3.7	7.1	68.446	28.076	63	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.6	3.4	6.7	68.467	28.084	75	1715
ALL - Extended	3.6	2.6	5.9	68.506	28.097	135	4520
<i>High infant oral prophylaxis efficacy (intrapartum efficacy: 90%; postpartum efficacy: 80%)</i>							
Standard-of-care	4.2	5.5	9.2	68.334	28.038	70	Reference
HR-HIVE – 1 dose	3.6	5.3	8.5	68.374	28.053	70	dominated
HR-HIVE – 2 doses	3.6	5.1	8.3	68.382	28.056	69	dominated
HIVE – 1 dose	3.6	5.1	8.3	68.388	28.058	66	dominated
HR-HIVE – Extended	3.6	4.8	8.1	68.396	28.060	68	dominated
ALL – 1 dose	3.3	4.8	7.8	68.408	28.065	78	dominated
HIVE – 2 doses	3.6	4.7	7.9	68.410	28.066	65	dominated
ALL – 2 doses	3.3	4.3	7.3	68.446	28.077	92	dominated
HIVE – Extended	3.6	3.6	6.8	68.466	28.083	60	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.3	3.3	6.3	68.486	28.091	73	1738
ALL - Extended	3.3	2.5	5.5	68.525	28.104	133	4516

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 19. One-way sensitivity analysis: additional cost of identifying high-risk infants

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>Cost of identifying high-risk infants: \$0</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.3	4.8	8.0	60.133	26.375	14	dominated
HR-HIVE – 2 doses	3.3	4.7	7.8	60.134	26.375	14	dominated
HIVE – 1 dose	3.3	4.7	7.8	60.134	26.375	14	dominated
HR-HIVE – Extended	3.3	4.3	7.5	60.136	26.376	14	dominated
HIVE – 2 doses	3.3	4.3	7.4	60.138	26.377	14	dominated
ALL – 1 dose	3.0	4.6	7.5	60.139	26.377	27	dominated
ALL – 2 doses	3.0	4.2	7.0	60.140	26.378	43	dominated
HIVE – Extended	3.3	3.2	6.3	60.146	26.379	13	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	3.1	6.0	60.150	26.382	26	6242
ALL - Extended	3.0	2.7	5.5	60.156	26.383	91	57 860
<i>Cost of identifying high-risk infants: \$32</i>							
Standard-of-care	3.6	5.0	8.4	60.129	26.373	15	Reference
HR-HIVE – 1 dose	3.3	4.8	8.0	60.133	26.375	15	dominated
HR-HIVE – 2 doses	3.3	4.7	7.8	60.134	26.375	15	dominated
HIVE – 1 dose	3.3	4.7	7.8	60.134	26.375	14	dominated
HR-HIVE – Extended	3.3	4.3	7.5	60.136	26.376	14	dominated
HIVE – 2 doses	3.3	4.3	7.4	60.138	26.377	14	dominated
ALL – 1 dose	3.0	4.6	7.5	60.139	26.377	27	dominated
ALL – 2 doses	3.0	4.2	7.0	60.140	26.378	43	dominated
HIVE – Extended	3.3	3.2	6.3	60.146	26.379	13	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	3.1	6.0	60.150	26.382	26	6242
ALL - Extended	3.0	2.7	5.5	60.156	26.383	91	57 860
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Cost of identifying high-risk infants: \$0</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.1	2.1	4.0	68.979	28.518	105	dominated
HR-HIVE – 2 doses	2.1	2.1	4.0	68.986	28.521	105	dominated
HR-HIVE – Extended	2.1	2.0	3.9	68.995	28.523	104	dominated
HIVE – 1 dose	2.0	2.0	3.8	69.011	28.529	105	dominated
HIVE – 2 doses	2.0	1.8	3.6	69.045	28.541	104	dominated
ALL – 1 dose	1.8	1.8	3.5	69.063	28.548	116	dominated
HIVE – Extended	2.0	1.5	3.3	69.095	28.557	100	cost-saving
ALL – 2 doses	1.8	1.5	3.2	69.122	28.568	122	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.3	3.0	69.147	28.575	111	606
ALL - Extended	1.8	0.8	2.5	69.228	28.602	135	882*†

Supplementary Table 19. One-way sensitivity analysis: additional cost of identifying high-risk infants (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Cost of identifying high-risk infants: \$32</i>							
Standard-of-care	2.3	2.2	4.4	68.924	28.499	112	Reference
HR-HIVE – 1 dose	2.1	2.1	4.0	68.979	28.518	115	dominated
HR-HIVE – 2 doses	2.1	2.1	4.0	68.986	28.521	115	dominated
HR-HIVE – Extended	2.1	2.0	3.9	68.995	28.523	114	dominated
HIVE – 1 dose	2.0	2.0	3.8	69.011	28.529	105	dominated
HIVE – 2 doses	2.0	1.8	3.6	69.045	28.541	104	dominated
ALL – 1 dose	1.8	1.8	3.5	69.063	28.548	116	dominated
HIVE – Extended	2.0	1.5	3.3	69.095	28.557	100	cost-saving
ALL – 2 doses	1.8	1.5	3.2	69.122	28.568	122	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.3	3.0	69.147	28.575	111	606
ALL - Extended	1.8	0.8	2.5	69.228	28.602	135	882*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>Cost of identifying high-risk infants: \$0</i>							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.7	5.3	8.6	68.366	28.050	67	dominated
HR-HIVE – 2 doses	3.7	5.2	8.5	68.373	28.053	66	dominated
HIVE – 1 dose	3.7	5.2	8.4	68.380	28.055	67	dominated
HR-HIVE – Extended	3.7	4.9	8.2	68.387	28.057	65	dominated
ALL – 1 dose	3.4	4.9	7.9	68.400	28.062	79	dominated
HIVE – 2 doses	3.7	4.8	8.0	68.402	28.063	66	dominated
ALL – 2 doses	3.4	4.3	7.4	68.438	28.074	93	dominated
HIVE – Extended	3.7	3.6	6.9	68.458	28.081	61	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.4	3.4	6.5	68.478	28.088	74	1731
ALL - Extended	3.4	2.6	5.7	68.517	28.101	134	4516
<i>Cost of identifying high-risk infants: \$32</i>							
Standard-of-care	4.3	5.6	9.5	68.321	28.034	72	Reference
HR-HIVE – 1 dose	3.7	5.3	8.6	68.366	28.050	71	dominated
HR-HIVE – 2 doses	3.7	5.2	8.5	68.373	28.053	70	dominated
HIVE – 1 dose	3.7	5.2	8.4	68.380	28.055	67	dominated
HR-HIVE – Extended	3.7	4.9	8.2	68.387	28.057	69	dominated
ALL – 1 dose	3.4	4.9	7.9	68.400	28.062	79	dominated
HIVE – 2 doses	3.7	4.8	8.0	68.402	28.063	66	dominated
ALL – 2 doses	3.4	4.3	7.4	68.438	28.074	93	dominated
HIVE – Extended	3.7	3.6	6.9	68.458	28.081	61	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.4	3.4	6.5	68.478	28.088	74	1731
ALL - Extended	3.4	2.6	5.7	68.517	28.101	134	4516

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

The cost of ascertaining an infant’s HIV exposure risk status includes a maternal viral load test (\$24.05), result return (\$3.48), and personnel/overhead costs (\$4.13).^{26,27,149,151} Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 20. One-way sensitivity analysis: maternal knowledge of acute HIV infection

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>Low maternal knowledge of acute HIV infection (in pregnancy: 25%; retesting postpartum: 0%/month)</i>							
Standard-of-care	3.7	5.0	8.4	60.128	26.373	15	Reference
HR-HIVE – 1 dose	3.4	4.9	8.1	60.132	26.374	15	dominated
HR-HIVE – 2 doses	3.4	4.8	7.9	60.133	26.375	15	dominated
HIVE – 1 dose	3.3	4.8	7.9	60.133	26.375	14	dominated
HR-HIVE – Extended	3.4	4.4	7.6	60.135	26.375	14	dominated
HIVE – 2 doses	3.3	4.4	7.5	60.136	26.376	14	dominated
ALL – 1 dose	3.0	4.7	7.6	60.138	26.377	27	dominated
ALL – 2 doses	3.0	4.2	7.1	60.139	26.378	44	dominated
HIVE – Extended	3.3	3.2	6.4	60.144	26.379	13	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	3.2	6.1	60.149	26.381	26	6012
ALL - Extended	3.0	2.7	5.6	60.155	26.382	91	55 092
<i>High maternal knowledge of acute HIV infection (in pregnancy: 95%; retesting postpartum: 15%/month)</i>							
Standard-of-care	3.6	4.6	8.0	60.133	26.375	14	Reference
HR-HIVE – 1 dose	3.3	4.5	7.6	60.136	26.376	14	dominated
HR-HIVE – 2 doses	3.3	4.4	7.5	60.137	26.377	14	dominated
HIVE – 1 dose	3.2	4.4	7.4	60.138	26.377	14	dominated
HR-HIVE – Extended	3.3	4.0	7.1	60.140	26.377	14	dominated
HIVE – 2 doses	3.2	4.0	7.0	60.141	26.378	13	dominated
ALL – 1 dose	3.0	4.3	7.1	60.143	26.379	27	dominated
ALL – 2 doses	3.0	3.8	6.7	60.143	26.379	42	dominated
HIVE – Extended	3.2	2.8	5.9	60.149	26.381	12	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	2.8	5.6	60.154	26.383	26	6779
ALL - Extended	3.0	2.4	5.3	60.159	26.384	91	79 100
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Low maternal knowledge of acute HIV infection (in pregnancy: 25%; retesting postpartum: 0%/month)</i>							
Standard-of-care	2.7	2.2	4.7	68.851	28.472	118	Reference
HR-HIVE – 1 dose	2.4	2.1	4.3	68.905	28.491	121	dominated
HR-HIVE – 2 doses	2.4	2.1	4.3	68.911	28.493	121	dominated
HR-HIVE – Extended	2.4	2.0	4.3	68.919	28.495	120	dominated
HIVE – 1 dose	2.3	2.0	4.1	68.937	28.502	111	dominated
HIVE – 2 doses	2.3	1.8	4.0	68.970	28.513	110	dominated
ALL – 1 dose	2.1	1.8	3.7	69.000	28.524	120	dominated
HIVE – Extended	2.3	1.5	3.7	69.019	28.529	107	cost-saving
ALL – 2 doses	2.1	1.5	3.4	69.060	28.545	127	dominated
ALL – 1 dose plus HIVE - Extended	2.1	1.3	3.2	69.082	28.551	116	405
ALL - Extended	2.1	0.8	2.8	69.164	28.578	139	875*†

Supplementary Table 20. One-way sensitivity analysis: HIV knowledge of acute infection (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>High maternal knowledge of acute HIV infection (in pregnancy: 95%; retesting postpartum: 15%/month)</i>							
Standard-of-care	1.9	2.0	3.8	69.051	28.546	101	Reference
HR-HIVE – 1 dose	1.6	1.9	3.4	69.109	28.566	104	dominated
HR-HIVE – 2 doses	1.6	1.8	3.4	69.117	28.568	104	dominated
HR-HIVE – Extended	1.6	1.8	3.3	69.127	28.571	104	dominated
HIVE – 1 dose	1.5	1.8	3.2	69.140	28.577	94	dominated
ALL – 1 dose	1.5	1.7	3.1	69.161	28.584	109	dominated
HIVE – 2 doses	1.5	1.6	3.0	69.175	28.589	93	dominated
ALL – 2 doses	1.5	1.4	2.8	69.217	28.603	115	dominated
HIVE – Extended	1.5	1.3	2.7	69.226	28.605	90	cost-saving*
ALL – 1 dose plus HIVE - Extended	1.5	1.1	2.6	69.247	28.612	104	dominated
ALL - Extended	1.5	0.7	2.1	69.320	28.636	128	1221†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>Low maternal knowledge of acute HIV infection (in pregnancy: 25%; retesting postpartum: 0%/month)</i>							
Standard-of-care	4.9	6.6	10.9	68.213	27.994	79	Reference
HR-HIVE – 1 dose	4.5	6.4	10.3	68.244	28.005	79	dominated
HR-HIVE – 2 doses	4.5	6.3	10.2	68.249	28.007	79	dominated
HIVE – 1 dose	4.4	6.3	10.1	68.258	28.010	76	dominated
HR-HIVE – Extended	4.5	6.1	10.0	68.260	28.010	78	dominated
HIVE – 2 doses	4.4	5.9	9.7	68.278	28.017	75	dominated
ALL – 1 dose	3.9	5.6	9.1	68.310	28.029	85	dominated
HIVE – Extended	4.4	4.8	8.7	68.330	28.034	70	cost-saving*
ALL – 2 doses	3.9	5.0	8.5	68.351	28.042	99	dominated
ALL – 1 dose plus HIVE - Extended	3.9	4.2	7.7	68.383	28.053	80	520†
ALL - Extended	3.9	3.1	6.6	68.438	28.072	138	3081
<i>High maternal knowledge of acute HIV infection (in pregnancy: 95%; retesting postpartum: 15%/month)</i>							
Standard-of-care	4.0	5.0	8.6	68.383	28.056	67	Reference
HR-HIVE – 1 dose	3.4	4.6	7.6	68.436	28.075	65	dominated
HR-HIVE – 2 doses	3.4	4.5	7.5	68.444	28.078	64	dominated
HIVE – 1 dose	3.3	4.5	7.4	68.449	28.080	61	dominated
ALL – 1 dose	3.2	4.4	7.2	68.454	28.082	75	dominated
HR-HIVE – Extended	3.4	4.2	7.2	68.460	28.083	63	dominated
HIVE – 2 doses	3.3	4.1	7.0	68.473	28.088	60	dominated
ALL – 2 doses	3.2	3.9	6.7	68.490	28.093	89	dominated
HIVE – Extended	3.3	2.9	5.9	68.530	28.107	55	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.2	2.8	5.7	68.534	28.108	70	dominated
ALL - Extended	3.2	2.3	5.2	68.561	28.117	130	7013

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. * Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. † Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 21. One-way sensitivity analysis: maternal knowledge of chronic HIV infection

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>Low maternal knowledge of chronic HIV infection: 56%</i>							
Standard-of-care	11·0	8·1	18·9	60·020	26·329	27	Reference
HR-HIVE – 1 dose	10·8	8·1	18·6	60·022	26·329	27	dominated
HR-HIVE – 2 doses	10·8	8·0	18·5	60·023	26·330	27	dominated
HIVE – 1 dose	10·7	8·0	18·5	60·023	26·330	27	dominated
HR-HIVE – Extended	10·8	7·7	18·3	60·025	26·330	27	dominated
HIVE – 2 doses	10·7	7·7	18·3	60·025	26·331	27	dominated
HIVE – Extended	10·7	7·0	17·5	60·030	26·332	26	cost-saving*†
ALL – 1 dose	9·0	7·6	16·5	60·041	26·337	39	dominated
ALL – 2 doses	9·0	6·9	15·7	60·044	26·339	54	dominated
ALL – 1 dose plus HIVE - Extended	9·0	6·7	15·5	60·048	26·340	38	1587
ALL - Extended	9·0	4·5	13·4	60·065	26·345	100	11 429
<i>High maternal knowledge of chronic HIV infection: 100%</i>							
Standard-of-care	2·4	4·2	6·6	60·149	26·381	12	Reference
HR-HIVE – 1 dose	2·1	4·1	6·2	60·153	26·383	13	dominated
HR-HIVE – 2 doses	2·1	4·0	6·0	60·154	26·383	13	dominated
HIVE – 1 dose	2·0	4·0	6·0	60·155	26·384	12	dominated
HR-HIVE – Extended	2·1	3·6	5·7	60·157	26·384	12	dominated
ALL – 1 dose	2·0	4·0	5·9	60·157	26·385	25	dominated
HIVE – 2 doses	2·0	3·6	5·6	60·158	26·385	12	dominated
ALL – 2 doses	2·0	3·6	5·5	60·158	26·385	41	dominated
HIVE – Extended	2·0	2·4	4·4	60·166	26·388	10	cost-saving*†
ALL – 1 dose plus HIVE - Extended	2·0	2·4	4·3	60·169	26·389	24	11 617
ALL - Extended	2·0	2·2	4·2	60·173	26·390	89	197 506
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Low maternal knowledge of chronic HIV infection: 75%</i>							
Standard-of-care	6·9	3·3	9·8	67·760	28·071	207	Reference
HR-HIVE – 1 dose	6·7	3·2	9·5	67·807	28·087	209	dominated
HR-HIVE – 2 doses	6·7	3·1	9·5	67·812	28·089	209	dominated
HR-HIVE – Extended	6·7	3·1	9·4	67·819	28·091	208	dominated
HIVE – 1 dose	6·6	3·1	9·3	67·831	28·095	201	dominated
HIVE – 2 doses	6·6	2·9	9·2	67·857	28·104	200	dominated
HIVE – Extended	6·6	2·7	8·9	67·895	28·117	198	dominated
ALL – 1 dose	5·3	2·7	7·7	68·064	28·178	193	dominated
ALL – 1 dose plus HIVE - Extended	5·3	2·3	7·3	68·128	28·199	189	cost-saving
ALL – 2 doses	5·3	2·2	7·2	68·149	28·207	196	dominated
ALL - Extended	5·3	1·2	6·2	68·302	28·257	203	239*†

Supplementary Table 21. One-way sensitivity analysis: maternal knowledge of chronic HIV infection (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>High maternal knowledge of chronic HIV infection: 100%</i>							
Standard-of-care	2.3	2.1	4.3	68.946	28.507	110	Reference
HR-HIVE – 1 dose	2.0	2.0	3.9	69.000	28.526	114	dominated
HR-HIVE – 2 doses	2.0	2.0	3.9	69.007	28.528	113	dominated
HR-HIVE – Extended	2.0	1.9	3.8	69.016	28.531	113	dominated
HIVE – 1 dose	1.9	1.9	3.7	69.034	28.538	103	dominated
HIVE – 2 doses	1.9	1.7	3.5	69.068	28.549	102	dominated
ALL – 1 dose	1.7	1.7	3.4	69.082	28.555	115	dominated
HIVE – Extended	1.9	1.4	3.2	69.118	28.566	99	cost-saving
ALL – 2 doses	1.7	1.4	3.1	69.140	28.575	121	dominated
ALL – 1 dose plus HIVE - Extended	1.7	1.2	2.9	69.166	28.583	110	674
ALL - Extended	1.7	0.8	2.4	69.245	28.608	134	909*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>Low maternal knowledge of chronic HIV infection: 80%</i>							
Standard-of-care	7.3	6.6	13.4	68.047	27.933	94	Reference
HR-HIVE – 1 dose	6.8	6.3	12.6	68.088	27.947	93	dominated
HR-HIVE – 2 doses	6.8	6.2	12.5	68.094	27.950	93	dominated
HIVE – 1 dose	6.7	6.2	12.5	68.099	27.951	90	dominated
HR-HIVE – Extended	6.8	6.0	12.3	68.106	27.954	92	dominated
HIVE – 2 doses	6.7	5.9	12.1	68.117	27.958	89	dominated
HIVE – Extended	6.7	4.9	11.2	68.164	27.973	85	cost-saving*
ALL – 1 dose	5.8	5.8	11.2	68.159	27.973	99	dominated
ALL – 2 doses	5.8	5.1	10.5	68.203	27.987	112	dominated
ALL – 1 dose plus HIVE - Extended	5.8	4.6	9.9	68.224	27.994	94	410†
ALL - Extended	5.8	3.1	8.5	68.298	28.019	150	2238
<i>High maternal knowledge of chronic HIV infection: 100%</i>							
Standard-of-care	4.0	5.3	9.1	68.348	28.044	69	Reference
HR-HIVE – 1 dose	3.4	5.0	8.2	68.397	28.062	68	dominated
HR-HIVE – 2 doses	3.4	4.9	8.1	68.404	28.064	68	dominated
HIVE – 1 dose	3.4	4.9	8.0	68.408	28.065	64	dominated
HR-HIVE – Extended	3.4	4.6	7.8	68.418	28.069	67	dominated
ALL – 1 dose	3.2	4.6	7.6	68.424	28.071	77	dominated
HIVE – 2 doses	3.4	4.5	7.6	68.430	28.073	64	dominated
ALL – 2 doses	3.2	4.1	7.1	68.462	28.083	91	dominated
HIVE – Extended	3.4	3.4	6.5	68.487	28.091	59	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.2	3.1	6.1	68.503	28.097	72	2215
ALL - Extended	3.2	2.4	5.4	68.539	28.109	132	4077

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. *Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. †Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

Supplementary Table 22. One-way sensitivity analysis: postpartum maternal retention in care

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
Côte d'Ivoire [CET: ICER ≤ \$465/YLS (20% GDP per capita), ICER ≤ \$1163/YLS (50% GDP per capita)]							
<i>Low postpartum maternal retention in care (50% of mothers with known HIV status in care at 6+ months)</i>							
Standard-of-care	3.6	7.1	10.4	60.114	26.368	18	Reference
HR-HIVE – 1 dose	3.3	7.0	10.0	60.118	26.369	19	dominated
HR-HIVE – 2 doses	3.3	6.8	9.8	60.119	26.370	18	dominated
HIVE – 1 dose	3.3	6.8	9.8	60.120	26.370	18	dominated
HR-HIVE – Extended	3.3	6.2	9.2	60.123	26.371	18	dominated
HIVE – 2 doses	3.3	6.2	9.2	60.125	26.372	17	dominated
ALL – 1 dose	3.0	6.8	9.5	60.125	26.372	31	dominated
ALL – 2 doses	3.0	6.0	8.8	60.127	26.373	47	dominated
HIVE – Extended	3.3	4.3	7.4	60.138	26.377	15	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	4.2	7.1	60.143	26.379	28	6245
ALL - Extended	3.0	3.8	6.7	60.148	26.380	93	57 575
<i>High postpartum maternal retention in care (100% of mothers with known HIV status in care at 6+ months)</i>							
Standard-of-care	3.6	4.1	7.5	60.135	26.375	13	Reference
HR-HIVE – 1 dose	3.3	4.0	7.1	60.139	26.377	13	dominated
HR-HIVE – 2 doses	3.3	3.9	7.0	60.140	26.377	13	dominated
HIVE – 1 dose	3.3	3.9	6.9	60.140	26.378	13	dominated
HR-HIVE – Extended	3.3	3.6	6.7	60.142	26.378	13	dominated
HIVE – 2 doses	3.3	3.5	6.6	60.143	26.379	12	dominated
ALL – 1 dose	3.0	3.8	6.6	60.145	26.380	26	dominated
ALL – 2 doses	3.0	3.4	6.3	60.145	26.380	41	dominated
HIVE – Extended	3.3	2.7	5.8	60.149	26.381	12	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.0	2.6	5.5	60.154	26.383	25	6264
ALL - Extended	3.0	2.2	5.1	60.160	26.384	90	57 976
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>Low postpartum maternal retention in care (50% of mothers with known HIV status in care at 6+ months)</i>							
Standard-of-care	2.3	2.8	5.0	68.827	28.467	125	Reference
HR-HIVE – 1 dose	2.1	2.7	4.6	68.883	28.486	128	dominated
HR-HIVE – 2 doses	2.1	2.6	4.5	68.893	28.490	127	dominated
HR-HIVE – Extended	2.1	2.5	4.4	68.908	28.494	126	dominated
HIVE – 1 dose	2.0	2.6	4.4	68.919	28.499	117	dominated
ALL – 1 dose	1.8	2.3	4.0	68.970	28.517	128	dominated
HIVE – 2 doses	2.0	2.2	4.1	68.973	28.517	114	dominated
HIVE – Extended	1.8	1.9	3.6	69.050	28.544	132	dominated
ALL – 2 doses	2.0	1.7	3.5	69.057	28.545	106	cost-saving
ALL – 1 dose plus HIVE - Extended	1.8	1.5	3.2	69.109	28.563	116	575
ALL - Extended	1.8	1.0	2.7	69.192	28.590	139	847*†

Supplementary Table 22. One-way sensitivity analysis: postpartum maternal retention in care (cont.)

Country/strategy	Clinical outcomes			Lifetime efficacy and costs			
	IU/IP cumulative HIV incidence (%)	Postnatal cumulative HIV incidence (%)	Total cumulative HIV incidence (%)	Undiscounted life expectancy (yrs)	Discounted life expectancy (yrs)	Discounted costs (\$)	ICER (\$/YLS)
South Africa [CET: ICER ≤ \$1131/YLS (20% GDP per capita), ICER ≤ \$2828/YLS (50% GDP per capita)]							
<i>High postpartum maternal retention in care (100% of mothers with known HIV status in care at 6+ months)</i>							
Standard-of-care	2.3	2.0	4.2	68.956	28.510	108	Reference
HR-HIVE – 1 dose	2.1	1.9	3.8	69.011	28.529	111	dominated
HR-HIVE – 2 doses	2.1	1.9	3.8	69.017	28.531	111	dominated
HR-HIVE – Extended	2.1	1.8	3.7	69.024	28.533	110	dominated
HIVE – 1 dose	2.0	1.8	3.6	69.043	28.540	101	dominated
ALL – 1 dose	2.0	1.6	3.5	69.070	28.549	100	dominated
HIVE – 2 doses	1.8	1.6	3.3	69.094	28.558	111	dominated
ALL – 2 doses	2.0	1.4	3.2	69.108	28.561	99	cost-saving
HIVE – Extended	1.8	1.3	3.0	69.147	28.576	118	dominated
ALL – 1 dose plus HIVE - Extended	1.8	1.2	2.9	69.160	28.580	109	569
ALL - Extended	1.8	0.7	2.4	69.240	28.606	133	921*†
Zimbabwe [CET: ICER ≤ \$243/YLS (20% GDP per capita), ICER ≤ \$607/YLS (50% GDP per capita)]							
<i>Low postpartum maternal retention in care (50% of mothers with known HIV status in care at 6+ months)</i>							
Standard-of-care	4.3	7.5	11.3	68.227	28.003	86	Reference
HR-HIVE – 1 dose	3.7	7.2	10.4	68.271	28.019	85	dominated
HR-HIVE – 2 doses	3.7	7.0	10.2	68.282	28.022	84	dominated
HIVE – 1 dose	3.7	7.0	10.2	68.288	28.025	81	dominated
HR-HIVE – Extended	3.7	6.5	9.8	68.305	28.030	81	dominated
ALL – 1 dose	3.4	6.7	9.7	68.308	28.032	93	dominated
HIVE – 2 doses	3.7	6.4	9.6	68.322	28.037	78	dominated
ALL – 2 doses	3.4	5.9	9.0	68.358	28.048	106	dominated
HIVE – Extended	3.7	4.5	7.8	68.415	28.066	68	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.4	4.2	7.3	68.435	28.074	81	1738
ALL - Extended	3.4	3.4	6.5	68.474	28.087	140	4438
<i>High postpartum maternal retention in care (100% of mothers with known HIV status in care at 6+ months)</i>							
Standard-of-care	4.3	4.9	8.8	68.356	28.045	66	Reference
HR-HIVE – 1 dose	3.7	4.6	7.9	68.401	28.062	65	dominated
HR-HIVE – 2 doses	3.7	4.5	7.8	68.407	28.064	65	dominated
HIVE – 1 dose	3.7	4.5	7.7	68.415	28.066	61	dominated
HR-HIVE – Extended	3.7	4.3	7.6	68.418	28.067	64	dominated
HIVE – 2 doses	3.7	4.1	7.4	68.433	28.073	61	dominated
ALL – 1 dose	3.4	4.2	7.3	68.435	28.074	74	dominated
ALL – 2 doses	3.4	3.7	6.8	68.469	28.084	88	dominated
HIVE – Extended	3.7	3.3	6.6	68.475	28.086	59	cost-saving*†
ALL – 1 dose plus HIVE - Extended	3.4	3.0	6.1	68.495	28.093	71	1724
ALL - Extended	3.4	2.2	5.4	68.534	28.107	131	4539

bNAb: broadly neutralizing antibody; *IU/IP*: intrauterine/intrapartum; *yr*: year; *ICER*: incremental cost-effectiveness ratio; *YLS*: years of life saved; *CET*: cost-effectiveness threshold; *HR-HIVE*: high-risk HIV-exposed infants; *HIVE*: all HIV-exposed infants; *ALL*: all live infants at birth.

Pediatric HIV incidence is rounded to the nearest tenth of a percent. IU/IP HIV incidence is calculated based on the number of infants exposed to HIV at birth. Postnatal and total HIV incidence is calculated based on the number of infants ever exposed to HIV through 36 months of life. Undiscounted and discounted life expectancies are rounded to the nearest ten thousandth. Costs are rounded to the nearest dollar and are presented in 2020 USD. Discounted values are discounted at 3% per year. ICERs are rounded to the nearest dollar and are calculated using unrounded discounted life expectancy and discounted costs. The cost-effective bNAb strategy was the strategy that offered the greatest increase in overall population life expectancy while still having an ICER less than the cost-effectiveness threshold when compared to the next best performing, non-dominated strategy. *Indicates the cost-effective strategy using a cost-effectiveness threshold of 20% GDP per capita. †Indicates the cost-effective strategy using a cost-effectiveness threshold of 50% GDP per capita.

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