

## SUPPLEMENTARY MATERIAL

SUPPLEMENTARY TABLE S1. Database Composition: Distribution of HIV-1 genetic variants across 2004–2009, 2010–2014, 2015–2019, and 2020–2023.

Region/Years	HIV-1 CRFs					URF	Total CRFs	Total recombinants	HIV-1 Subtypes		Total Subtypes	N
	01_AE	07_BC	08_BC	55_01B	Other				B	Other		
China												
2004–2009	29.6%	22.3%	5.2%	1.3%	3.5%	0.9%	61.9%	62.8%	35.4%	1.8%	37.2%	9,488
2010–2014	44.7%	30.7%	4.5%	4.5%	4.4%	0.9%	88.8%	89.7%	9.2%	1.1%	10.3%	22,921
2015–2019	41.4%	34.1%	6.7%	5.5%	4.7%	0.9%	92.4%	93.2%	6.3%	0.5%	6.8%	43,480
2020–2023	29.2%	39.8%	11.4%	2.9%	9.2%	2.0%	92.5%	94.5%	4.8%	0.7%	5.5%	18,587
Central												
2004–2009	9.8%	1.5%	0.2%	0.0%	0.4%	0.1%	12.0%	12.0%	87.8%	0.2%	88.0%	2,225
2010–2014	51.9%	21.7%	2.4%	4.6%	2.8%	0.3%	83.4%	83.7%	16.2%	0.1%	16.3%	711
2015–2019	36.0%	29.0%	3.8%	5.6%	3.1%	1.0%	77.5%	78.4%	21.1%	0.4%	21.6%	2,662
2020–2023	29.0%	37.2%	3.9%	3.9%	7.1%	1.6%	81.0%	82.6%	16.6%	0.7%	17.4%	2,269
East												
2004–2009	35.3%	12.3%	5.0%	0.0%	3.0%	0.6%	55.6%	56.2%	41.3%	2.5%	43.8%	1,509
2010–2014	58.7%	25.6%	0.9%	1.6%	4.4%	0.2%	91.2%	91.4%	7.3%	1.3%	8.6%	2,475
2015–2019	41.5%	29.7%	4.1%	3.8%	6.8%	1.2%	85.8%	87.1%	12.4%	0.5%	12.9%	8,510
2020–2023	31.2%	40.0%	6.5%	3.4%	10.5%	2.6%	91.7%	94.3%	4.7%	1.0%	5.7%	5,298
North												
2004–2009	37.5%	15.7%	3.2%	1.2%	1.7%	0.2%	59.4%	59.6%	39.6%	0.8%	40.4%	997
2010–2014	50.7%	24.3%	1.1%	1.1%	4.0%	0.3%	81.2%	81.5%	17.9%	0.6%	18.5%	6,637
2015–2019	50.1%	30.3%	0.9%	2.5%	6.4%	0.8%	90.2%	90.9%	8.8%	0.3%	9.1%	5,536
2020–2023	37.7%	38.0%	1.3%	2.5%	13.8%	2.1%	93.3%	95.4%	4.5%	0.1%	4.6%	1,734
Northeast												
2004–2009	66.9%	4.3%	1.8%	0.6%	8.0%	0.0%	81.6%	81.6%	17.2%	1.2%	18.4%	163
2010–2014	77.7%	6.7%	0.0%	0.3%	6.1%	1.1%	90.8%	91.9%	7.0%	1.1%	8.1%	358
2015–2019	72.2%	16.6%	0.4%	0.8%	4.0%	0.2%	94.0%	94.2%	5.5%	0.3%	5.8%	1,264
2020–2023	51.3%	29.6%	0.6%	1.6%	8.8%	1.9%	92.0%	93.9%	5.3%	0.8%	6.1%	622
Northwest												
2004–2009	4.0%	85.1%	0.3%	0.0%	0.0%	0.0%	89.4%	89.4%	10.4%	0.2%	10.6%	597
2010–2014	21.4%	71.3%	0.2%	0.3%	1.1%	0.3%	94.2%	94.5%	5.5%	0.0%	5.5%	637
2015–2019	18.4%	69.1%	0.8%	2.4%	4.1%	0.8%	94.8%	95.6%	4.1%	0.3%	4.4%	1,109
2020–2023	10.5%	70.9%	1.5%	1.6%	9.9%	3.0%	94.5%	97.5%	2.0%	0.5%	2.5%	910
South												
2004–2009	53.5%	21.9%	5.6%	4.7%	3.7%	0.4%	89.5%	89.8%	8.1%	2.1%	10.2%	2,220
2010–2014	43.5%	34.2%	3.8%	9.5%	2.9%	0.4%	93.9%	94.3%	5.1%	0.6%	5.7%	8,893
2015–2019	49.5%	28.3%	6.9%	9.3%	3.1%	0.4%	97.1%	97.5%	2.3%	0.2%	2.5%	17,808
2020–2023	39.3%	33.3%	8.8%	6.0%	7.8%	2.0%	95.1%	97.1%	2.6%	0.3%	2.9%	2,490
Southwest												
2004–2009	20.1%	41.6%	14.3%	0.1%	9.4%	3.9%	85.5%	89.4%	6.5%	4.1%	10.6%	1,777
2010–2014	24.0%	34.9%	18.3%	1.0%	10.6%	4.0%	88.8%	92.7%	3.6%	3.6%	7.3%	3,210
2015–2019	12.7%	58.2%	17.7%	1.0%	5.7%	1.6%	95.3%	96.9%	1.3%	1.8%	3.1%	6,591
2020–2023	20.1%	40.3%	27.2%	0.9%	8.0%	1.2%	96.6%	97.8%	1.3%	0.9%	2.2%	5,264