



2nd International Conference on
HIV/AIDS, STDs, & STIs
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Dispersion of non-B HIV-1 subtypes in Northeast - Brazil

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BRAZIL x HIV-1



- » ~70% of HIV cases in South and Central America.
- » More than 650,000 cases of AIDS.
- » Concentrated epidemic: IDU, MSM, SW.
- » Subtypes B, F1 and C.
- » Multiple CRFs: 28, 29, 39, 40, 72_BF and 31_BC.
- » Other subtypes: A, D.
- » Other recombinants: CRF02_AG, FD, FC...



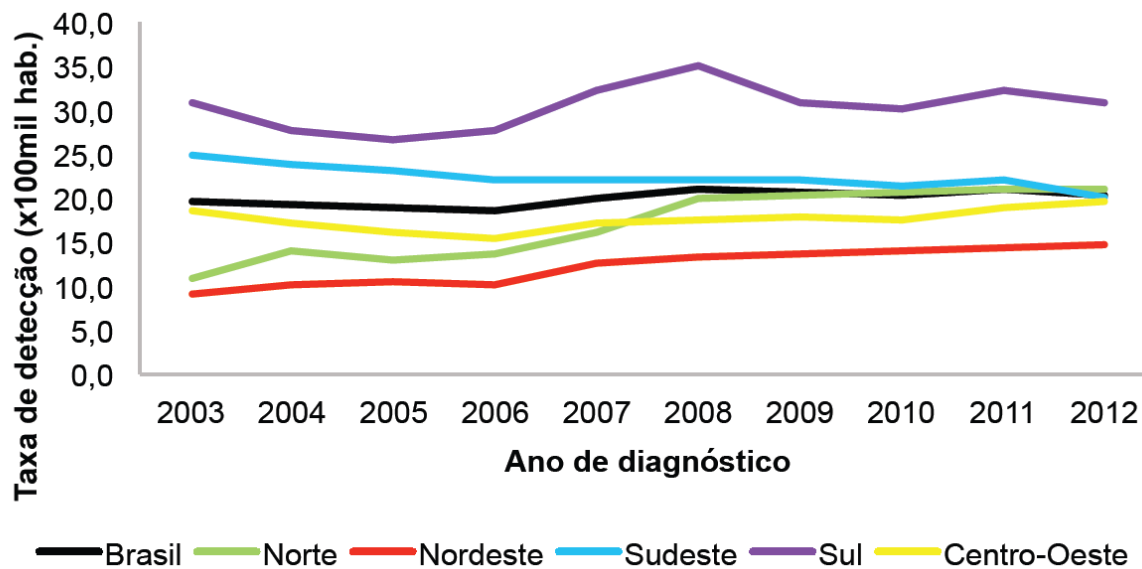
NORTHEAST – BRAZIL:



- » Second most populated region in the country (53 million inhabitants);
- » Worst Human Development Index (HDI) / Brazil (largest increase in 15 years);
- » Economic growth X Emigration (USA, Germany, Spain, France, Italy, Portugal, UK);
- » Largest industrial pole of the northern part of the country;
- » Tourist and cultural center (carnival).



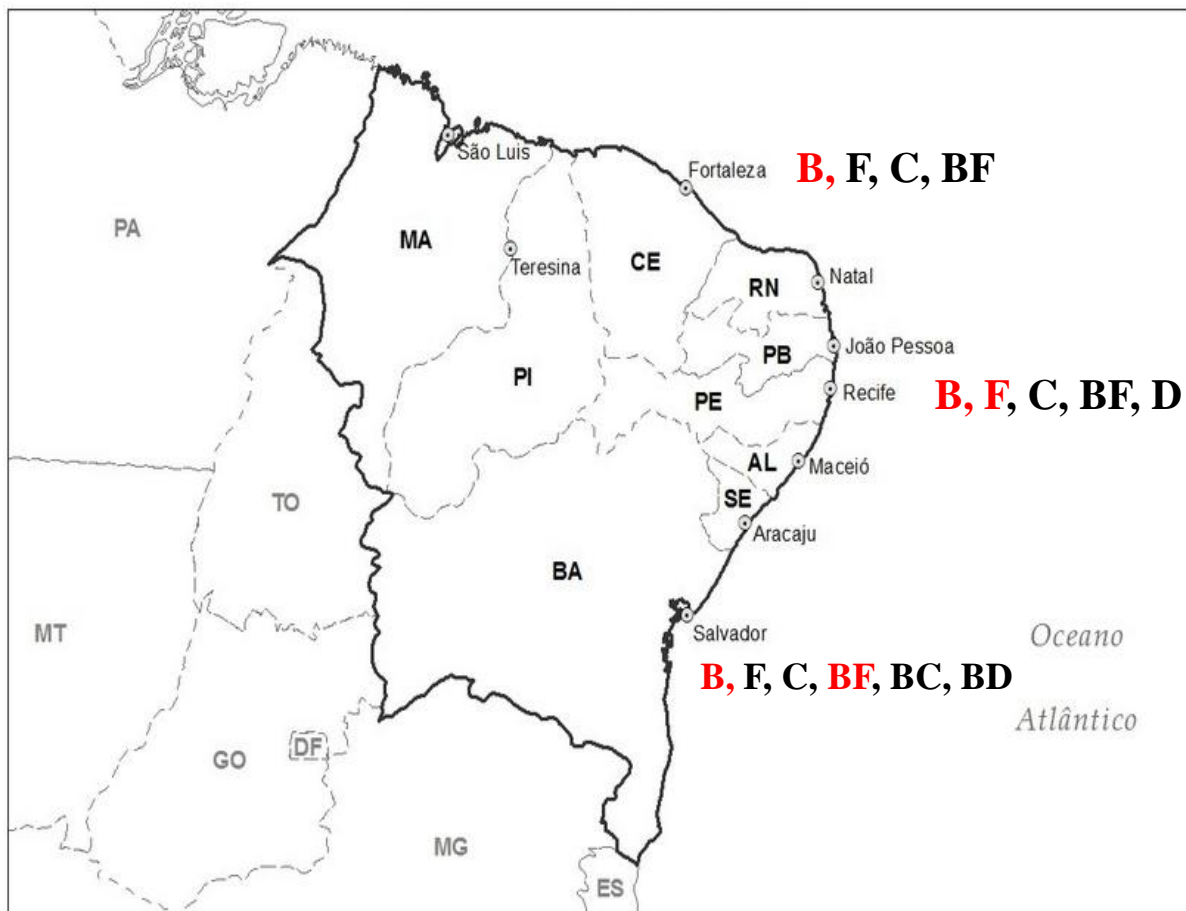
NORTHEAST – BRAZIL



Rates of AIDS cases by region of residence and year of diagnosis, Brazil, 2003 – 2012.



NORTHEAST – BRAZIL



Geographical distribution of HIV-1 subtypes in the Northeast - Brazil. In red are highlighted the most prevalent subtypes for each location.



HIV-1 SUBTYPES IN THE NORTHEAST – BRAZIL:

Authors / Years	City / State	Sampling year	Sample size (N)	Viral gene	ART / Naive	Subtypes (%)
Couto-Fernandez et al. 1999	Salvador / BA	1994 – 1996	126	<i>Env</i>	Naive	B (92.1) F (1.6) BC (0.8) BF (5.5)
Dourado et al. 2007	Salvador / BA	1998 – 2000	19	<i>env, pol, gag</i>	Naive	B (57.9) BF (10.5) ND (31.6)
Gadelha et al. 2003	Fortaleza / CE	2000	149	<i>env, gag</i>	-	B (81.2) F (2.7) BF (2.7) ND (13.4)
Pedroso et al. 2007	Salvador / BA	2000 – 2004	166	<i>pol env</i>	Naive	B (84) F (8) C (2.5) BF (14) BC (0.5)
Monteiro et al. 2009	Salvador / BA	2002	261	<i>env, gag</i>	-	B (81.7) F (0.6) BF (17.1) BD (0.6)
Medeiros et al. 2006	Recife / PE	2002 – 2003	84	<i>pol</i>	Naive	B (72.6) F (22.6) C (1.2) BF (3.6)



HIV-1 SUBTYPES IN THE NORTHEAST – BRAZIL:

Authors / Years	City / State	Sampling year	Sample size (N)	Viral gene	ART / Naive	Subtypes (%)
Cavalcanti et al. 2007	States of PI, CE, RN, PB, PE and AL	2002-2004	502	<i>pol</i>	TARV	B (82.4) F (11.8) C (1.0) BF (4.6) D (0.2)
Araújo et al. 2010	Salvador / BA	2006	61	<i>env, gag</i>	-	B (91.8) F (4.9) BF (3.3)
Santos et al. 2011	Salvador / BA	2006	57	<i>pol</i>	TARV / Naive	B (78.9) F (5.3) BF (15.8)
Inocêncio et al. 2009 ^a	Salvador / BA	2007 / 2008	34	<i>pol</i>	Naive	B (70) F (21) C (3) BF (3)
Santos et al. 2009	Feira de Santana / BA	2008 - 2009	52	<i>pol</i>	TARV / Naive	B (63.5) F (7.6) C (1.9) BF (26.9)
Arruda et al. 2011	Fortaleza / CE	2008 – 2009	64	<i>pol</i>	Naive	B (85.1) F (8.1) C (5.4) BF (1.4)



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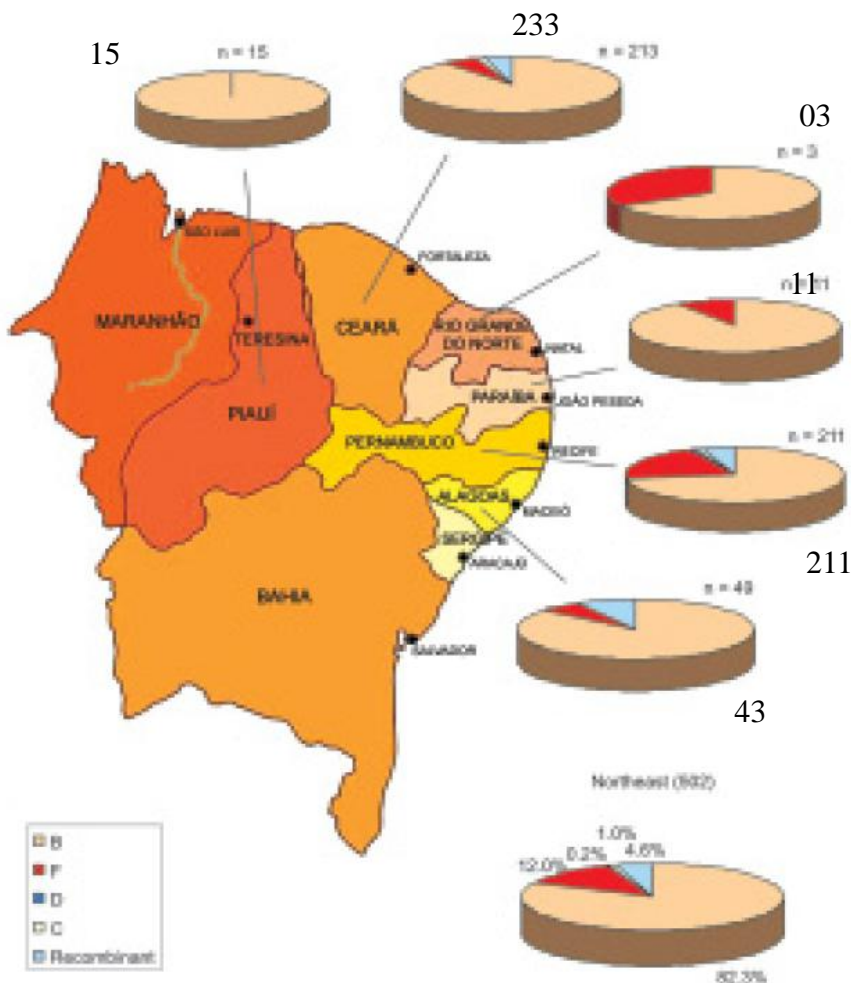


HIV-1 SUBTYPES IN THE NORTHEAST – BRAZIL:

Authors / Years	City / State	Sampling year	Sample size (N)	Viral gene	ART / Naive	Subtypes (%)
Cavalcanti et al. 2012	Recife / PE	2007 – 2009	130	<i>pol</i>	Naive	B (56.9) F (37.7) C (3.1) BF (2.3)
Alencar et al. 2013 ^a	Recife/ PE	2009 – 2011	110	<i>pol</i>	Naive	B (73) F (24) C (2) BF (1)
Soares et al. 2014 ^a	Salvador / BA	2009 – 2010	47	<i>Pol</i>	Naive	B (70.2) F (14.9) C (4.3) BF (10.6)



HIV-1 SUBTYPES IN THE NORTHEAST – BRAZIL:



HIV-1 F1:

PE= 22%

PB=10%

AL=6.7%

CE=6%



HIGH PHYLOGENETIC DIVERSITY IN NORTHEAST – BRAZIL:

Estimate of the relative proportion of HIV-1 B and F in the period 2002-2003 and 2007-2009.

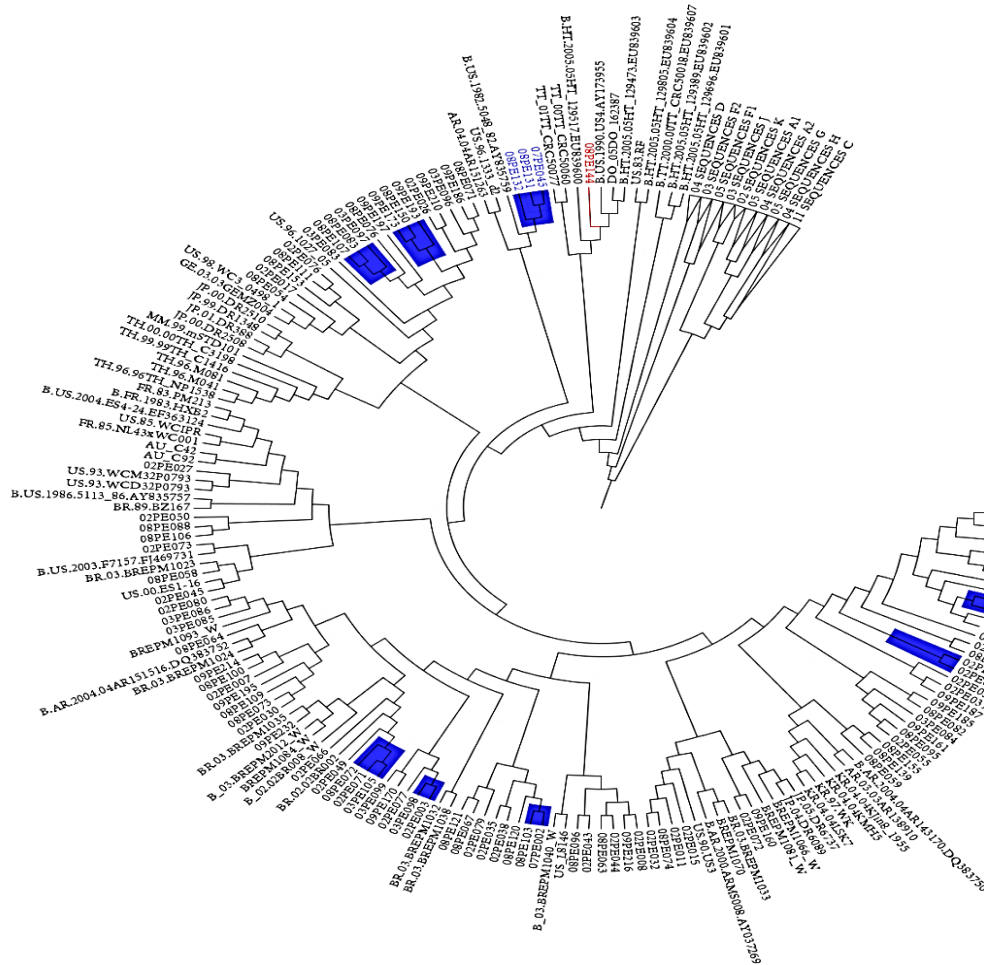
	HIV-1 Subtype		
	B	F	
	N (%)	N (%)	
Time 1: 2002/2003	48 (77.4)	14 (22.6)	p=0.01 ²
Time 2: 2007-2009	55 (58.5)	39 (41.5)	

Years	HTS		MSM	
	B	F	B	F
2002/2003	27 (40,9%)	11 (25,6%)	19 (55,9%)	03 (30,0%)
2007/2009	39 (59,1%)	32 (74,4%)	15 (44,1%)	07 (70,0%)
OR (95%CI)	2,01 (0,80 – 5,11)		2,96 (0,54 – 17,7)	
p-value	0,102		0,155	
OR _{MH} [*]	2,21 (1,00 – 4,94)			
p-value	0,051			

*ODDS MATEL-HAENSZEL.



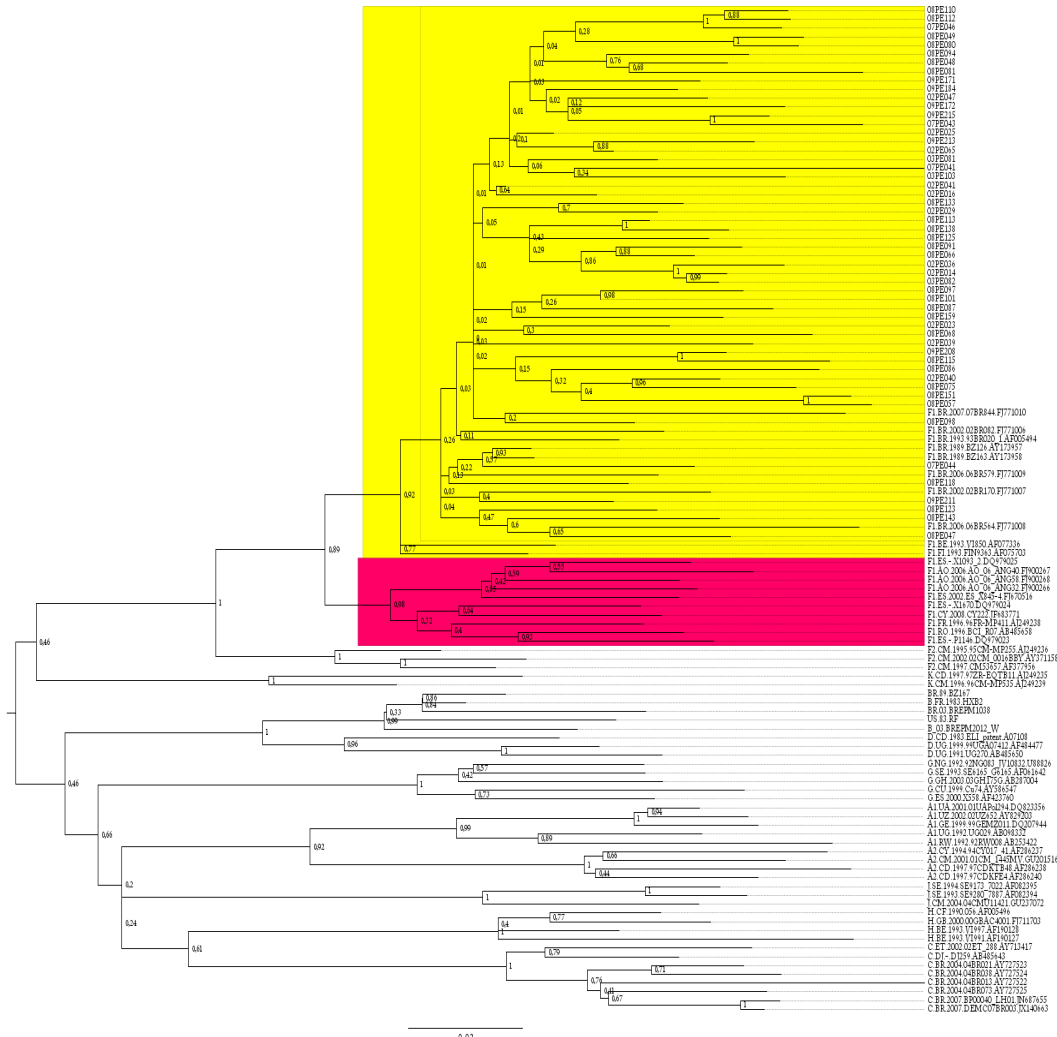
HIGH PHYLOGENETIC DIVERSITY IN NORTHEAST – BRAZIL: Subtype B



- » N = 103 (60.9%)
- » Position basal of HT strains / 08PE144
- » Weak geographical correlation
- » Isolated GWGR and GPGR distributed in tree
- » 23 patients (08 clusters): 13 men / 05 MSM



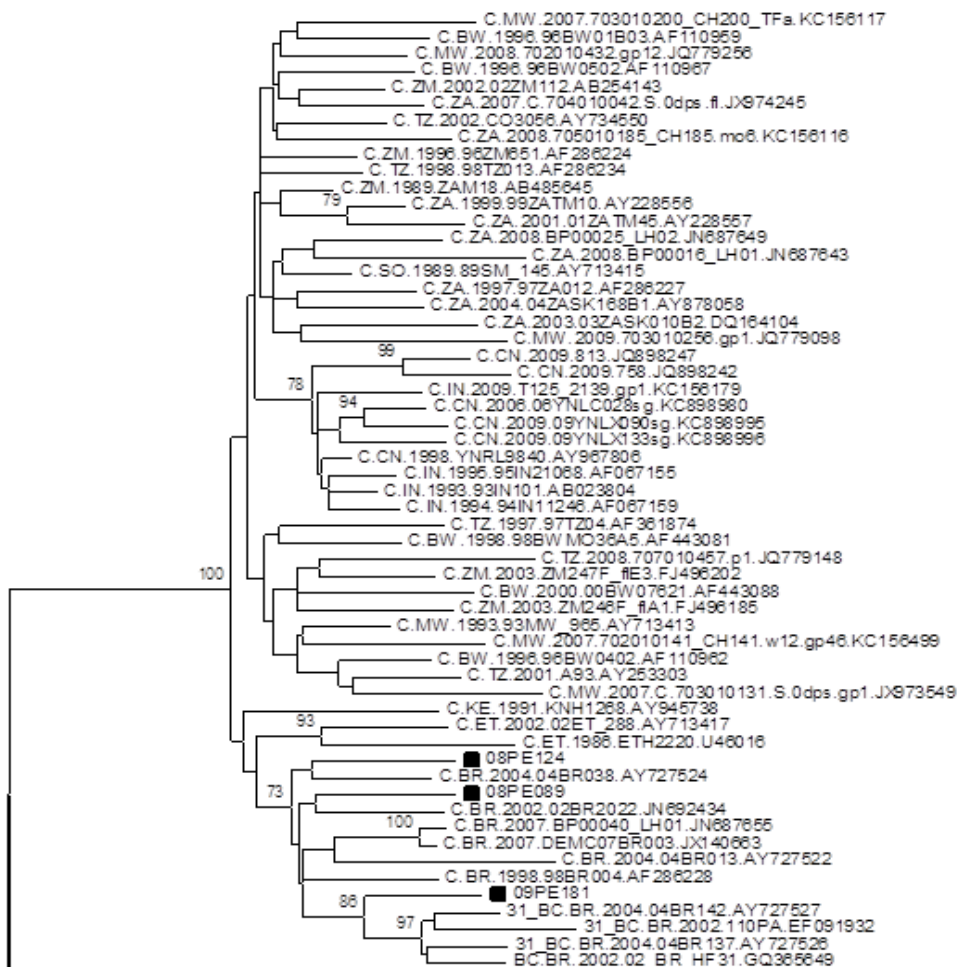
HIGH PHYLOGENETIC DIVERSITY IN NORTHEAST – BRAZIL: Subtype F



- » N = 53 (31.4%)
- » Clusters with Brazilian sequences
- » Most of the sequences were from heterosexual men (26/53, 49%) and women (15/53, 32%)
- » HIV-1 F: Co-infection syphilis (19.4%) and HBV (22.2%)



HIGH PHYLOGENETIC DIVERSITY IN NORTHEAST – BRAZIL: Subtype C



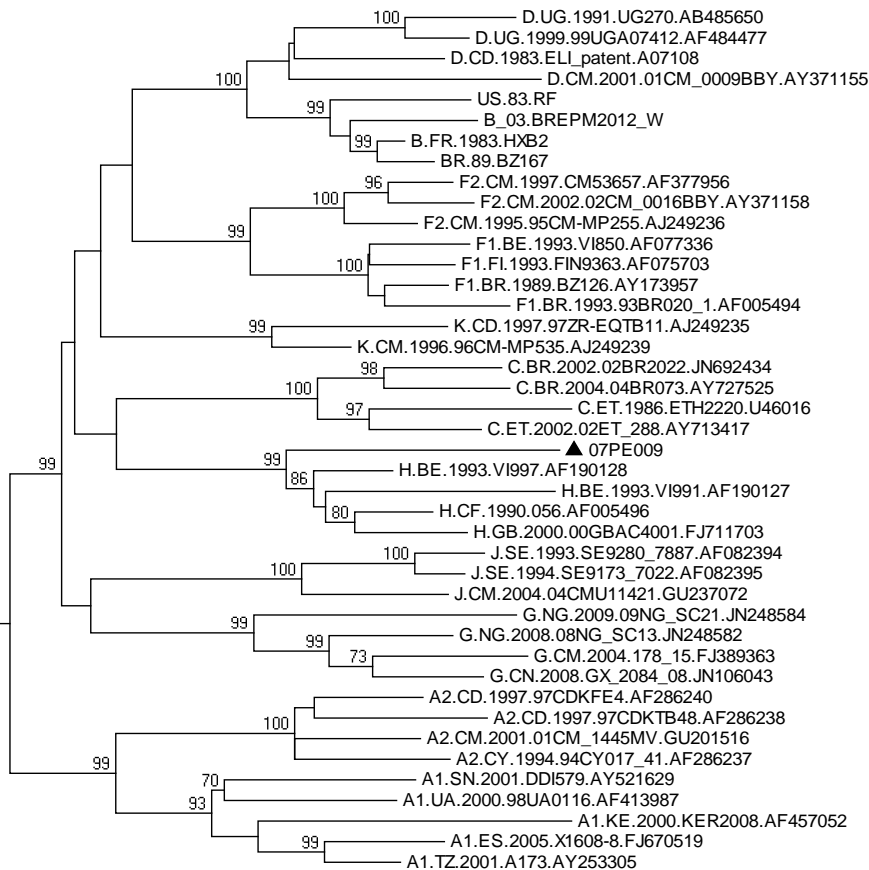
» N = 02 (1.2%)

» 01 CB Recombinant (like-31BC)

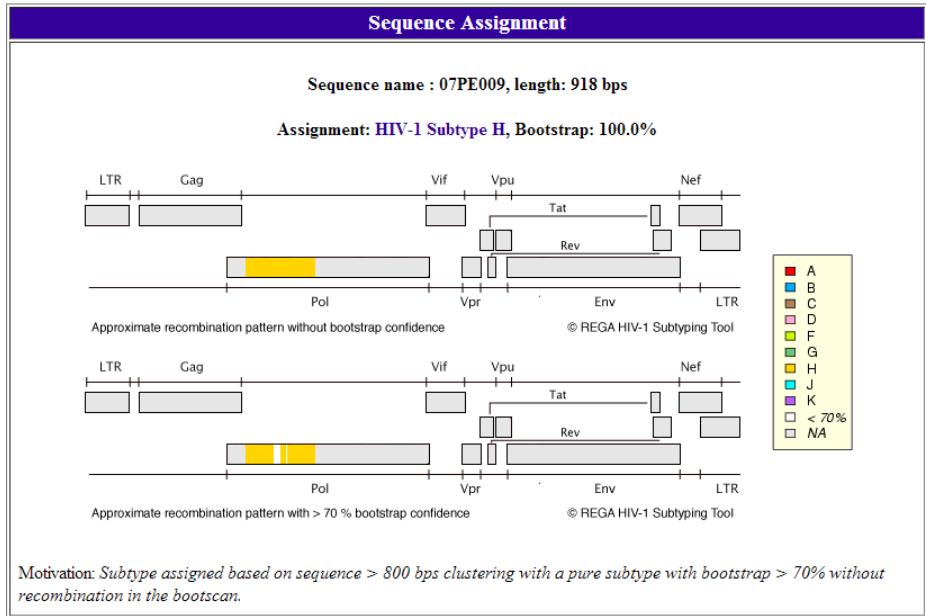
» 09PE181 = Recent Infection



HIGH PHYLOGENETIC DIVERSITY IN NORTHEAST – BRAZIL: Subtype H



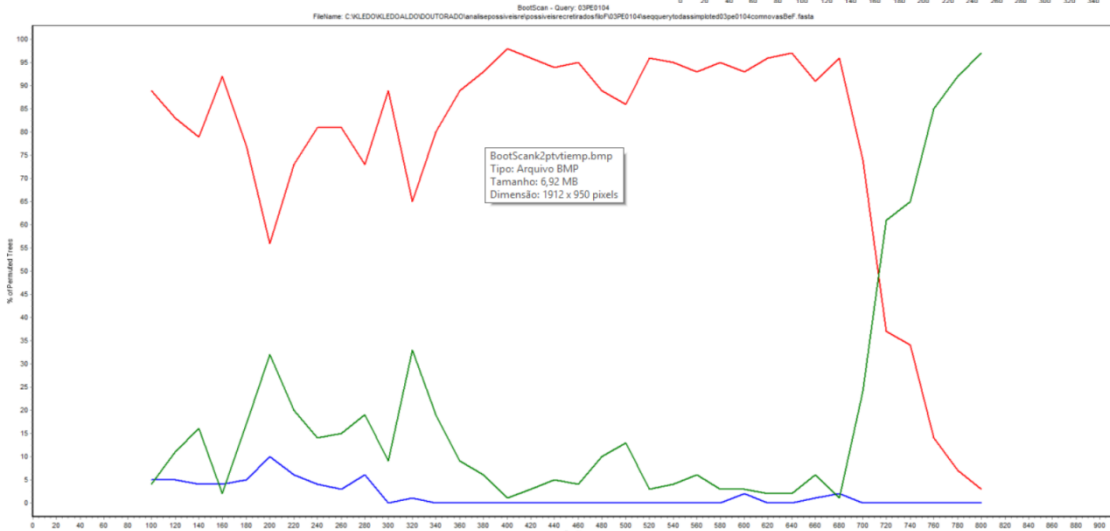
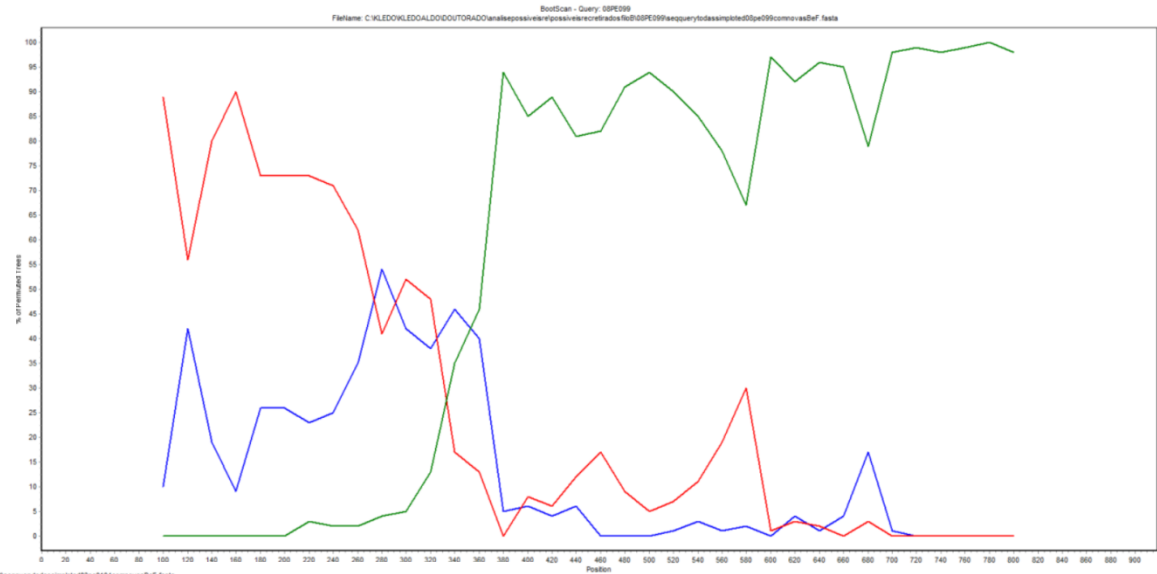
0.02



Developed in cooperation with the [Evolutionary group](#) at University of Oxford, UK., the [HIV-1 Pathogenesis and Immunotherapeutics Program](#) at University of Pretoria, South Africa, and the [REGA Institute](#) at the Katholieke Universiteit Leuven, Belgium. Funded by the Flanders Bilateral Cooperation Program and the Wellcome Trust (grant #061238). Suggestions or problems on the program please contact: [Dr Tulio de Oliveira](#)



HIGH PHYLOGENETIC DIVERSITY IN NORTHEAST – BRAZIL: BF recombinants





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HIGH PHYLOGENETIC DIVERSITY IN NORTHEAST – BRAZIL: Caracteristics:

- » No statistical differences in antiretroviral resistance;
- » Mutations more prevalent in subtype F: 211 (NRTI), 110 (NNRTI), 20 PI;
- » Association between subtype F and infection in women ($p < 0.001$);
- » HIV-1 F and BF more associated with HTLV and vaginitis.



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OBRIGADO!

THANK YOU!