



**Brazilian Ministry of Health  
Oswaldo Cruz Foundation – FIOCRUZ  
Lab. of AIDS and Molecular Immunology**

**Drug resistance mutations and HIV-1 subtypes  
within the Brazilian Network for HIV-1  
Genotyping in patients failing antiretroviral  
therapy from Rio de Janeiro, Brazil:  
an update, 2002-2006**

# INTRODUCTION

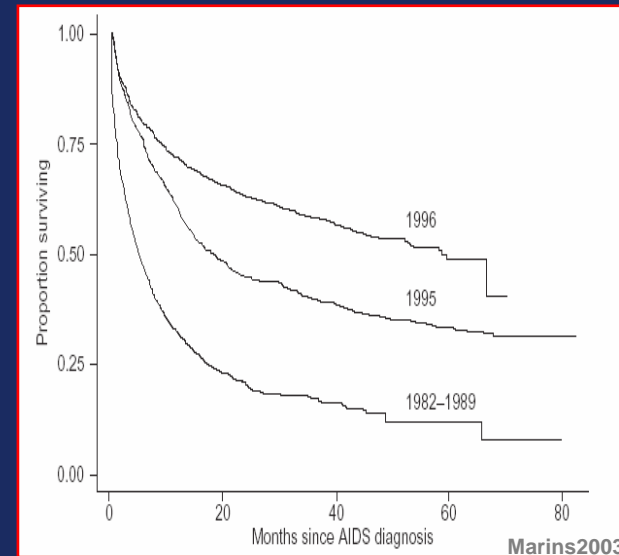
➤ 1991: AZT available in the Public Health System;

➤ 1996: HAART, Public Health System;

➤ 1997: Establishment of the Laboratory Network for CD4+ and HIV-1 viral load determinations;

➤ 2002: Establishment of the Laboratory Network for HIV-1 Genotyping

The Brazilian policy of access to antiretroviral therapy has resulted in a shift of the morbidity and mortality profile of HIV infection.



# SUMMARY OF THE HIV/AIDS EPIDEMIC IN BRAZIL 1980-2006

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<b>Number of HIV/Aids cases</b>	<b>Total</b>	<b>433.067</b>
	Male	290.917
	Female	142.138
	Children < 13 years	16.071

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<b>Estimated HIV-1 Infection (15-49y)</b>	<b>Total</b>	<b>593.787</b>
	Male	384.889
	Female	208.898

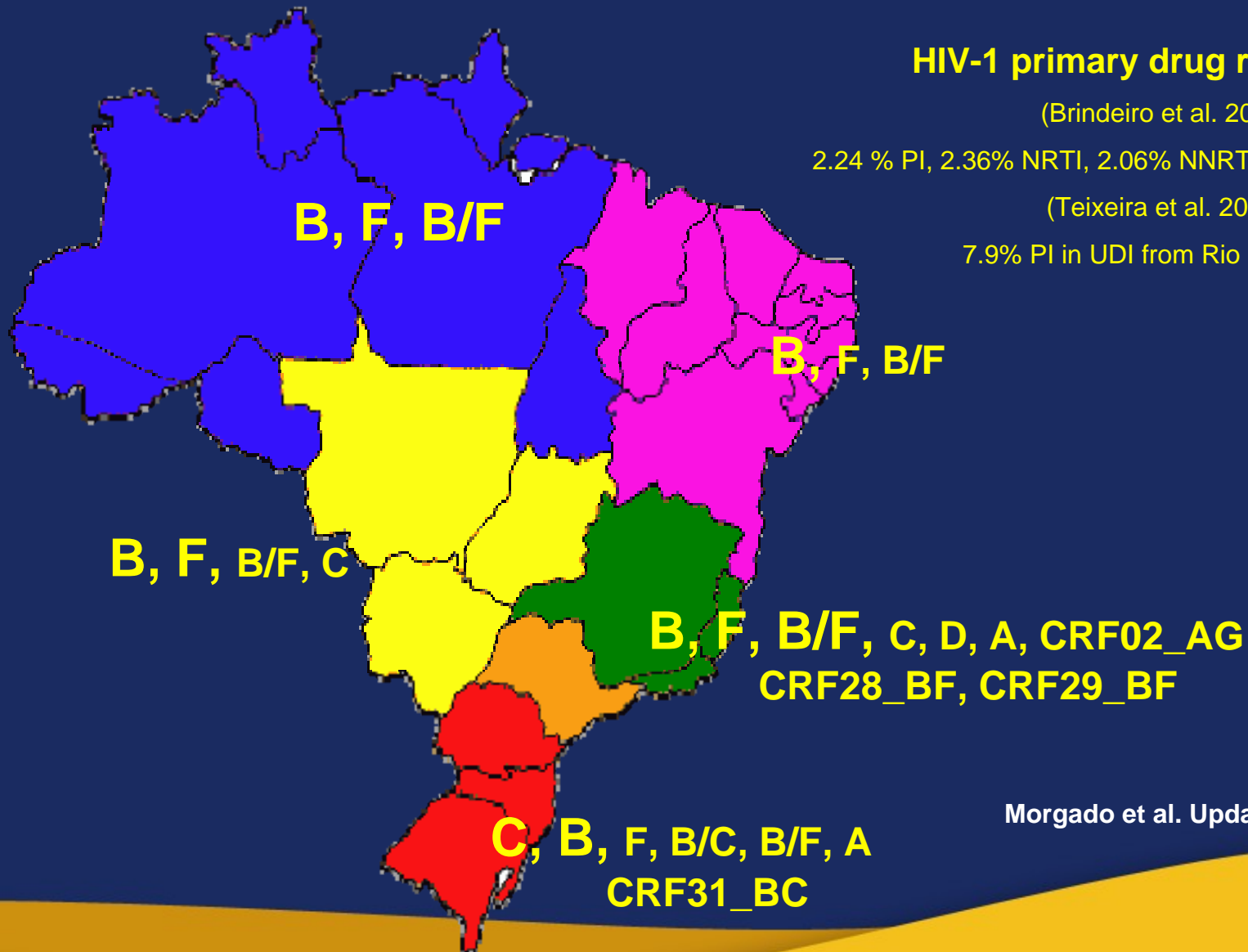
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<b>Death from Aids</b>	<b>1980-2005</b>	<b>Total</b>	<b>183.074</b>
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Prevalence: 0,61%

\* PN DST & Aids Epidemiological Bulletin, year III, June 2006, Brazil.

# Molecular epidemiology of HIV-1 in Brazil



## HIV-1 primary drug resistance:

(Brindeiro et al. 2003)

2.24 % PI, 2.36% NRTI, 2.06% NNRTI in drug-naïve subjects

(Teixeira et al. 2006)

7.9% PI in UDI from Rio de Janeiro

Morgado et al. Updated 2006

# Brazilian Network for Genotyping of HIV-1 Drug Resistance (RENAGENO)

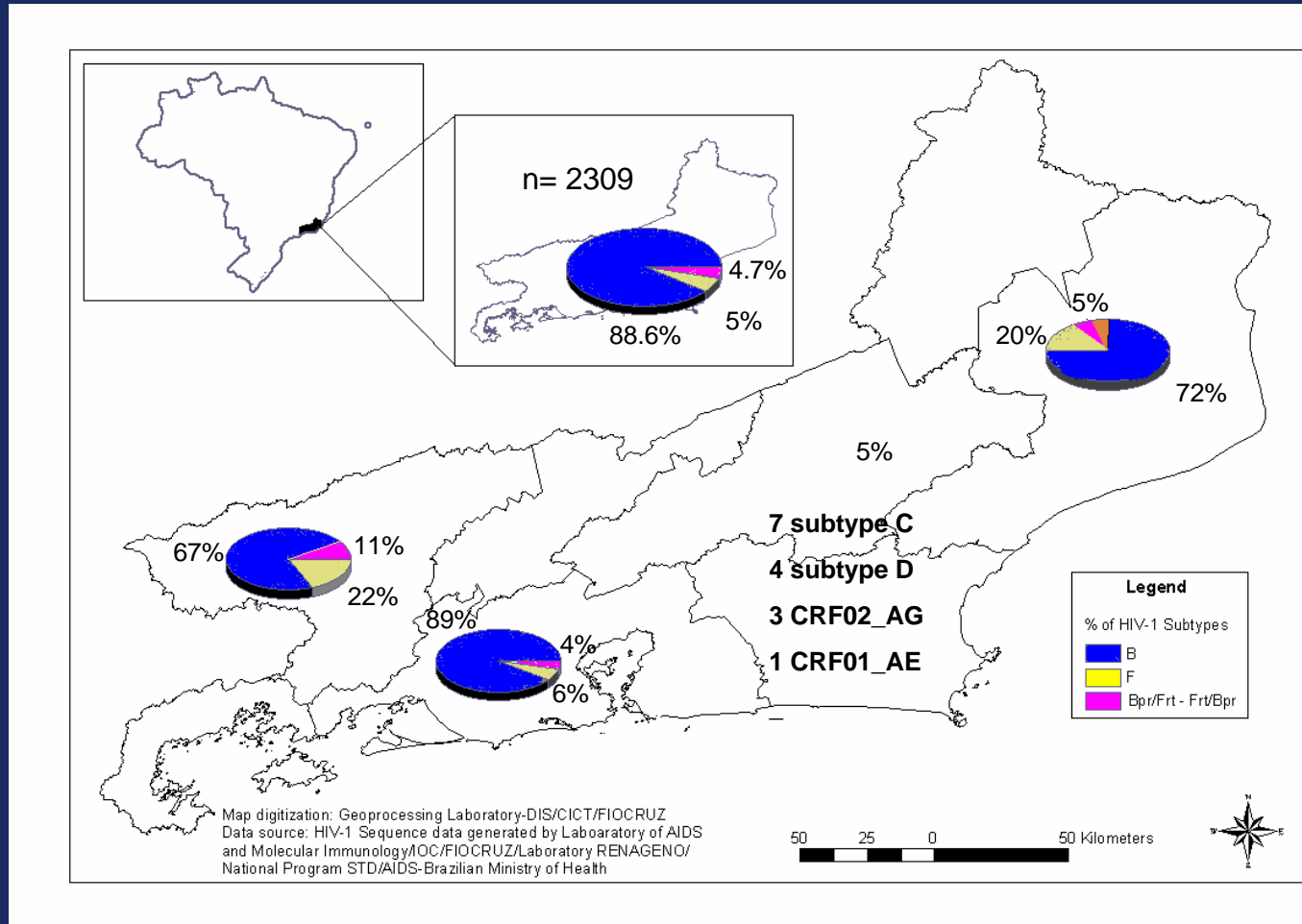
- ✓ Establish a National Laboratory Network able to perform HIV-1 genotyping in patients from the public health system;
- ✓ Evaluate new antiretroviral strategies for patients failing to respond to previous therapeutic regimens, under supervision of the genotyping referral doctors (MRGs), enable to analyze resistance data;
- ✓ Analyze the impact of the genotyping tests in the clinical, immunological and virological evolution in these patients;
- ✓ Determine the drug resistance profile and the prevalence of the different resistance associated mutations;
- ✓ Determine the prevalence of HIV-1 subtypes, analyzing pol gene derived sequences.

# RENAGENO LABORATORY NETWORK

Composed by 23 laboratories in five different Brazilian regions and at least 300 doctors trained to analyze HIV-1 genotyping tests (MRGs).

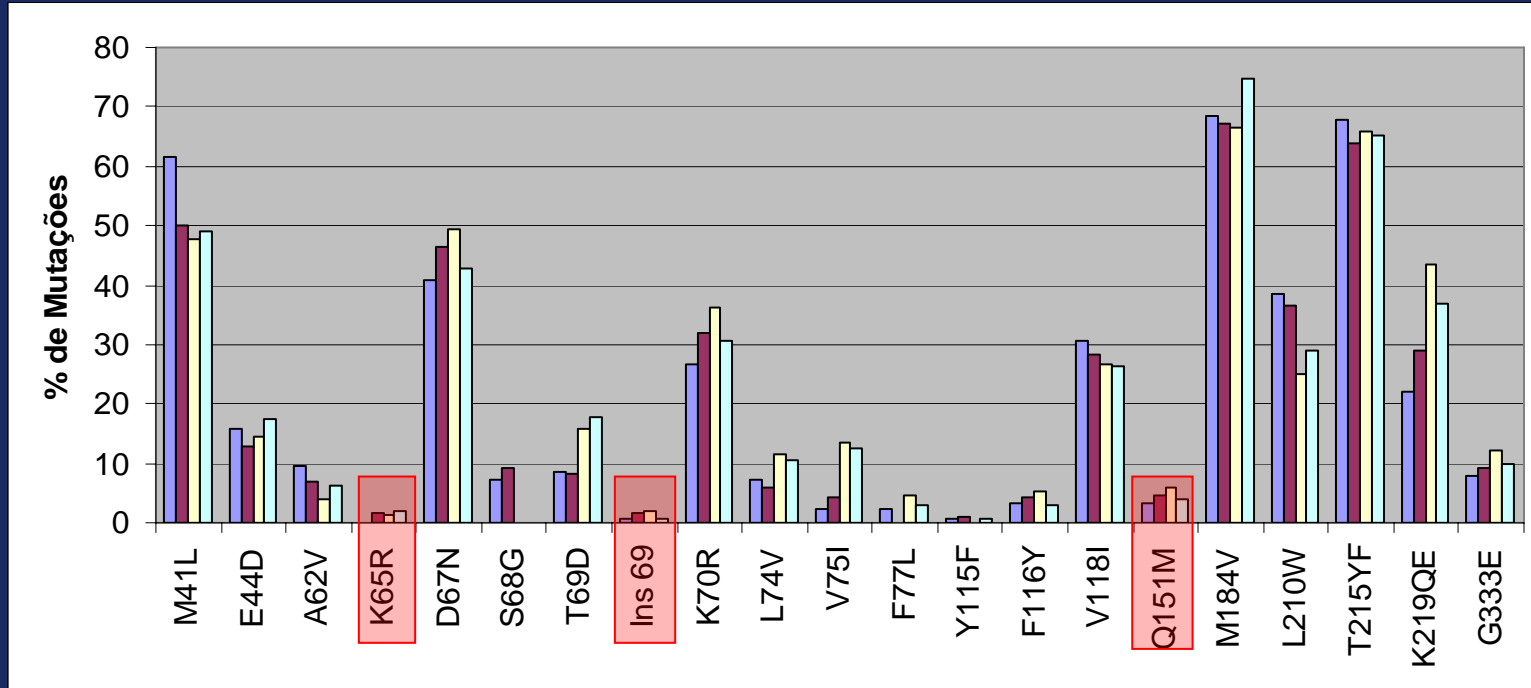


# Geographical distribution of the HIV-1 genetic subtypes in the state of Rio de Janeiro, Brazil



Couto-Fernandez et al., 2007

# Prevalence of NRTI mutations

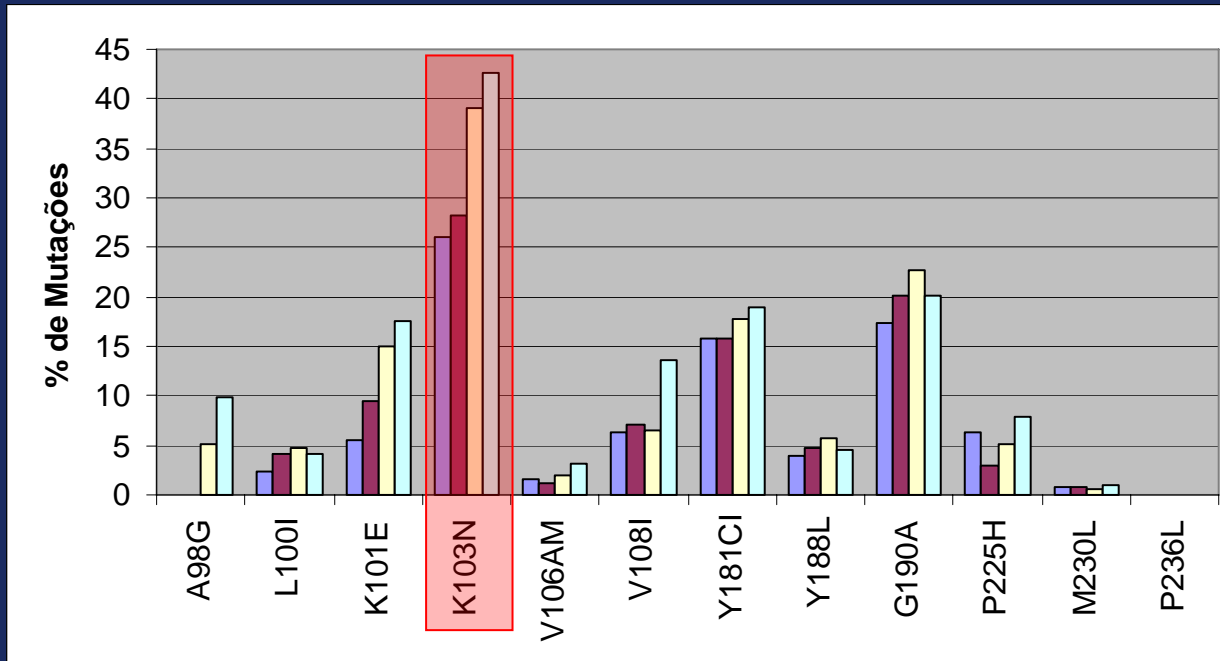


Year

- 2002/2003
- 2004
- 2005
- 2006

Couto-Fernandez et al., 2007

# Prevalence of NNRTI mutations

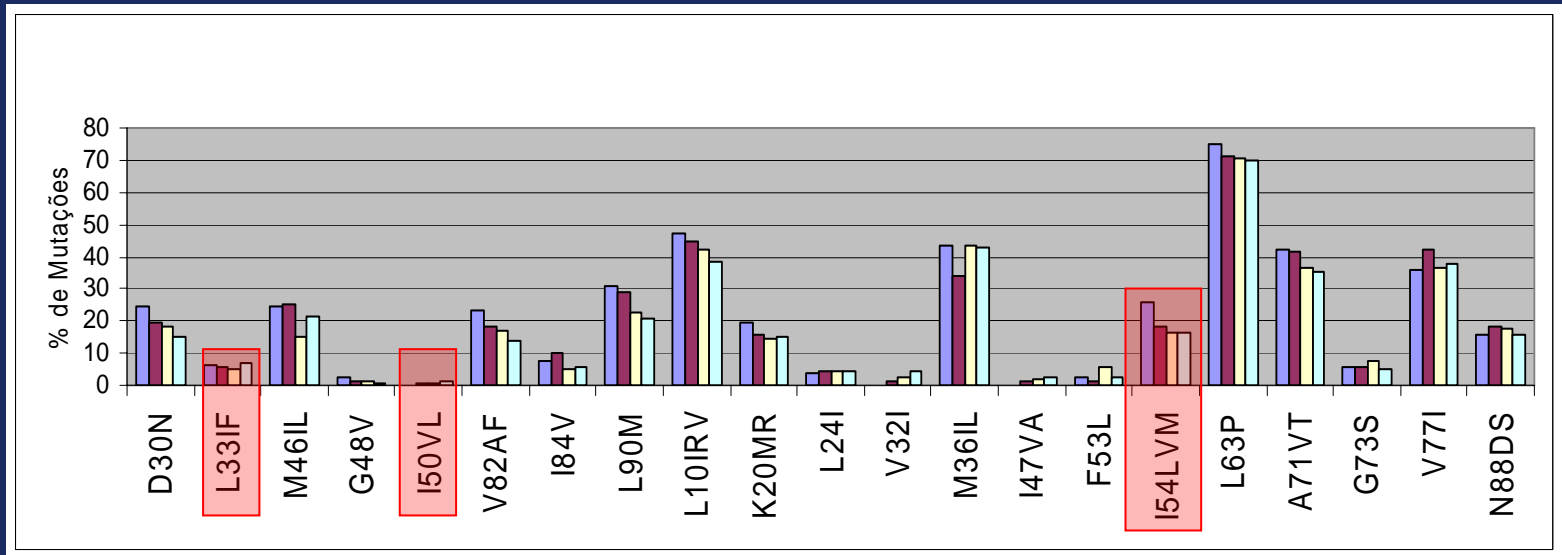


Year

- 2002/2003
- 2004
- 2005
- 2006

Couto-Fernandez et al., 2007


# Prevalence of Protease Inhibitors Resistance Mutations





Year

- 2002/2003
- 2004
- 2005
- 2006

# CONCLUSIONS

 The distribution of HIV-1 resistance mutations in this analysis was related to the ART regimens used by the patients followed in the public health system, according to the Brazilian guidelines for treating HIV infected patients.

 We observed the circulation of the HIV-1 subtype C and D, and the first description in Brazil of the presence of the CRF02\_AG and CRF01\_AE viruses in the Rio de Janeiro state.

 The maintenance and implementation of the HIV-1 resistance genotyping program in Brazil is important for the management of patients failing ARTs, and to monitor the epidemiology of HIV-1 subtypes and the prevalence of drug resistance mutations.

 Our results demonstrate that an integrated public health policy, can substantially contribute for the improvement in the survival and quality of life of HIV-1 patients failing ART.

# COLLABORATORS

- ✓ Brazilian Ministry of Health - National Program on STD and AIDS ([www.aids.gov.br/renageno](http://www.aids.gov.br/renageno))
- ✓ Rio de Janeiro State Health Secretariat
- ✓ Rio de Janeiro Municipality Health Secretariat
- ✓ Evandro Chagas Clinical Research Institute (IPEC/FIOCRUZ)
- ✓ Referral Doctors for Genotyping Analyzes (MRG Group)