

LOW PREVALENCE OF HIV DRUG RESISTANCE WITH MODERN AGENTS

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Conclusions

- ❖ In our cohort, the prevalence of drug resistance has declined in the last decade.
- ❖ Resistance prevalence is very low for patients who initiated antiretroviral therapy in the modern treatment era.
- ❖ Little resistance to INSTI agents has emerged.
- ❖ Prevalence of resistance in viremic patients is consistently higher than overall.
- ❖ Next steps: improve imputation by including relevant variables such as exposure to ART, examine levels of drug-specific resistance in each class (low, intermediate, high)

Introduction

- ❖ **Resistance** limits the impact of potent combination therapy.
- ❖ The **prevalence and pattern of HIV resistance** in the population evolves with the introduction of new medications.
- ❖ We estimated the **annual prevalence** of cumulative HIV drug **resistance by drug class** in a clinical cohort in Southeastern US.

Methods

Study population

- ❖ ART-experienced patients in care at UNC 2000-2015
- ❖ In care defined as at least one HIV RNA VL

Analysis

- ❖ For each year and drug class, we estimated:

Overall prevalence =

$$\frac{\# \text{ with resistance}}{\# \text{ in care}}$$

Prevalence in viremic patients =

$$\frac{\# \text{ with resistance}}{\# \text{ in care with any VL} > 1000}$$

- ❖ Cumulative resistance: **≥ 1 major mutation**, by class
- ❖ Patients with HIV VL < 1000: assume no new mutations
- ❖ Patients with HIV VL > 1000: use new genotype or impute
- ❖ **Multiple imputation** based on age, sex, race, HIV risk factor, proximal CD4 cell count, proximal HIV RNA, and initial ART.
- ❖ Time trends were tested using linear regression
- ❖ Subgroup analysis: patients in care in 2015, ART start after 07

Table 1. Characteristics of patients

Characteristic	Total sample N=3681
Sexual risk factor, N (%)	
MSM	1521 (41%)
Heterosexual male	1085 (29%)
Female	1075 (29%)
Race/ethnicity, N (%)	
African-American, non-Hispanic	2201 (60%)
White, non-Hispanic	1145 (31%)
Hispanic or other	335 (9%)
Year of ART initiation, median (IQR)	2001 (1996, 2007)
Initial ART regimen, N (%)	
NRTI-only	1212 (33%)
PI	1027 (28%)
NNRTI	1021 (28%)
INSTI	248 (7%)
Other	173 (5%)
Age at ART, median years (IQR)	35 (29, 43)
CD4 at ART, median cells/mm³ (IQR)	270 (99, 437)
VL at ART, median log₁₀ copies/mL (IQR)	4.7 (4.1, 5.3)

Results

Resistance time trends (Figure 1):

- NRTI, NNRTI, any drug class, and 2 or more class resistance increased between 2000 and 2005 and subsequently decreased (all $p < 0.05$)
- PI, 3 or more class resistance remained stable between 2000 and 2005 ($p = 0.34$ and 0.13 , respectively) but decreased in the following years (both $p < 0.01$)
- INSTI resistance increased slightly between 2009 and 2015 ($p < 0.01$)

Among **685** patients initiating **ART 2007-2015** and still in care in 2015, we observed the following resistance profile in 2015:

- any class: 21% (95% CI 17%, 24%)
- NNRTI: 17% (14%, 20%)
- NRTI: 6% (4%, 8%)
- PI: 2% (1%, 4%)
- INSTI 1% (0%, 2%)
- 2 or more classes: 5% (3%, 7%)
- 3 or more classes: 1% (0%, 2%)

Figure 1. Prevalence of resistance among patients in care by calendar year.

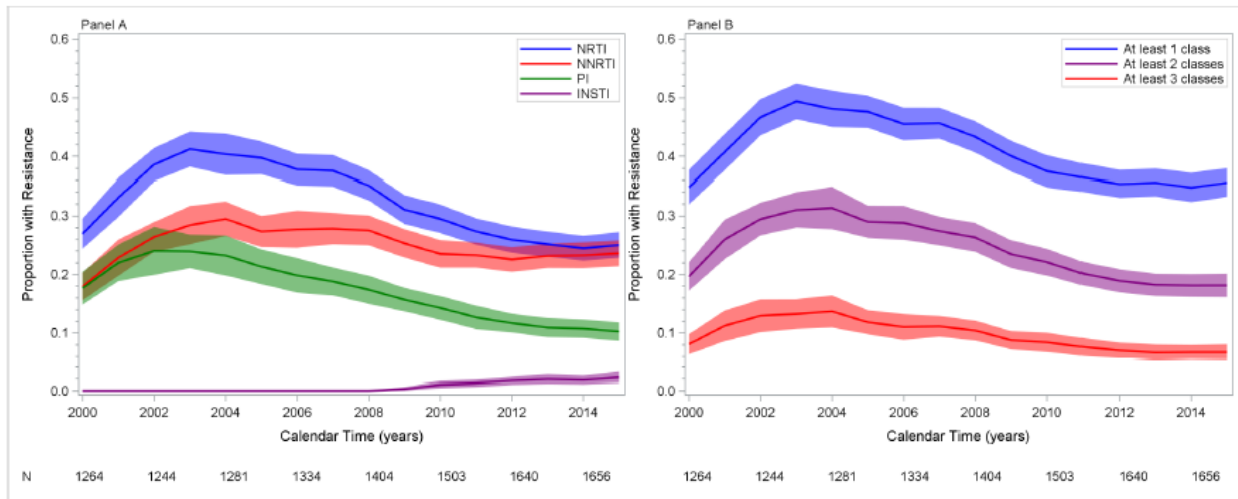


Figure 2. Prevalence of resistance among patients with virologic failure by calendar year.

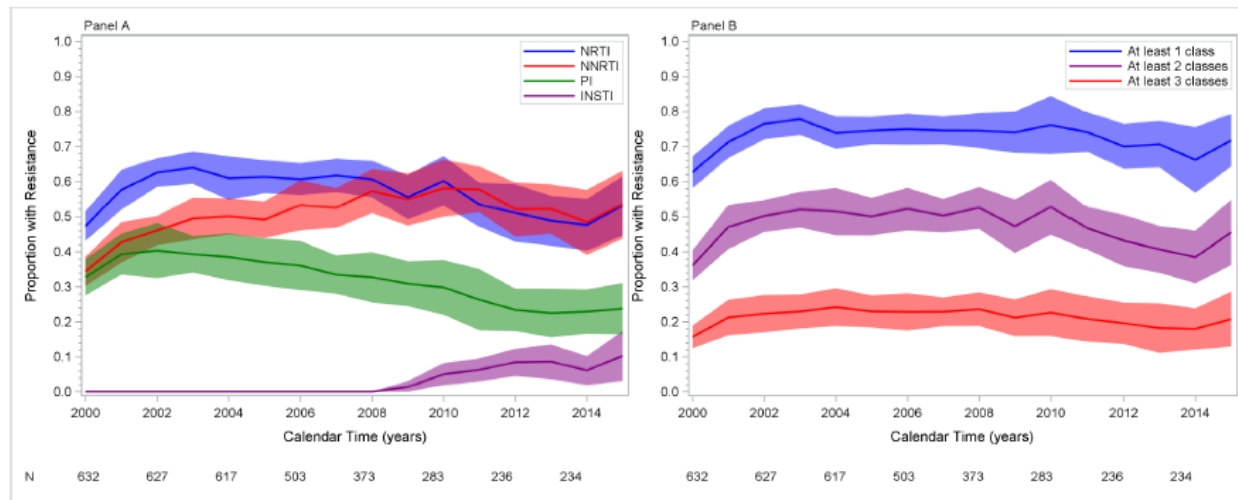
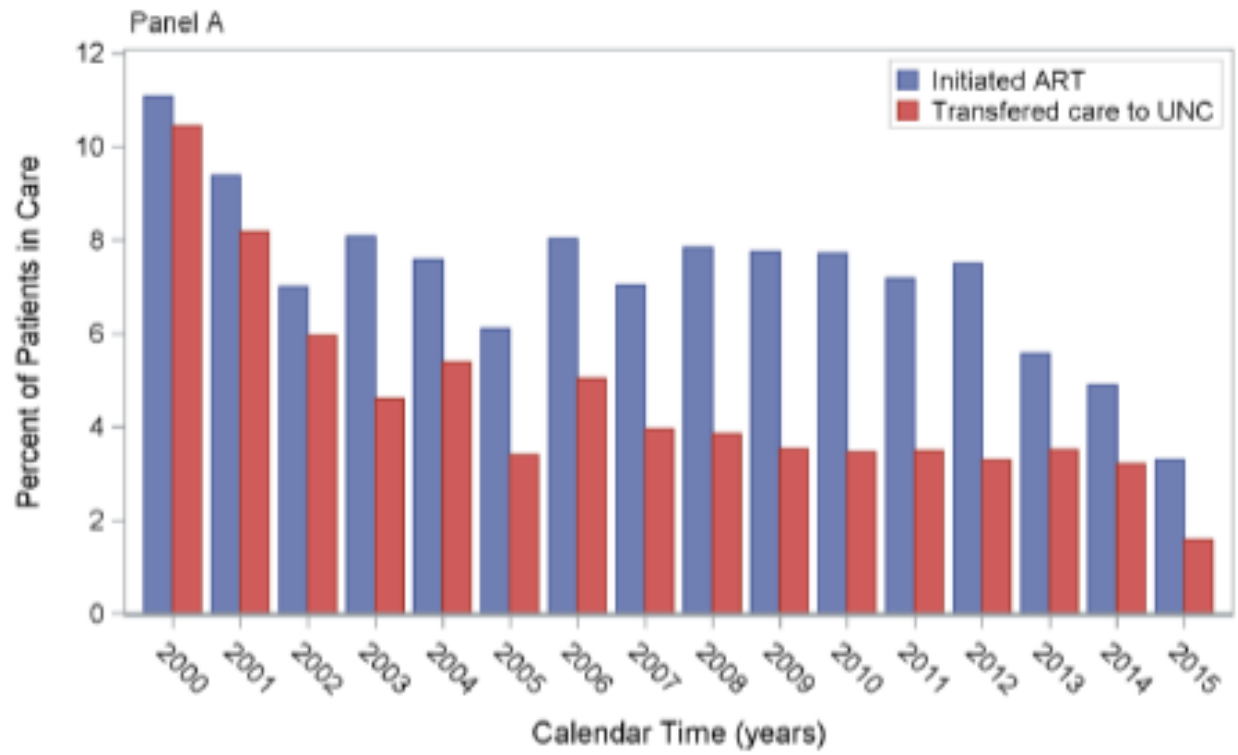
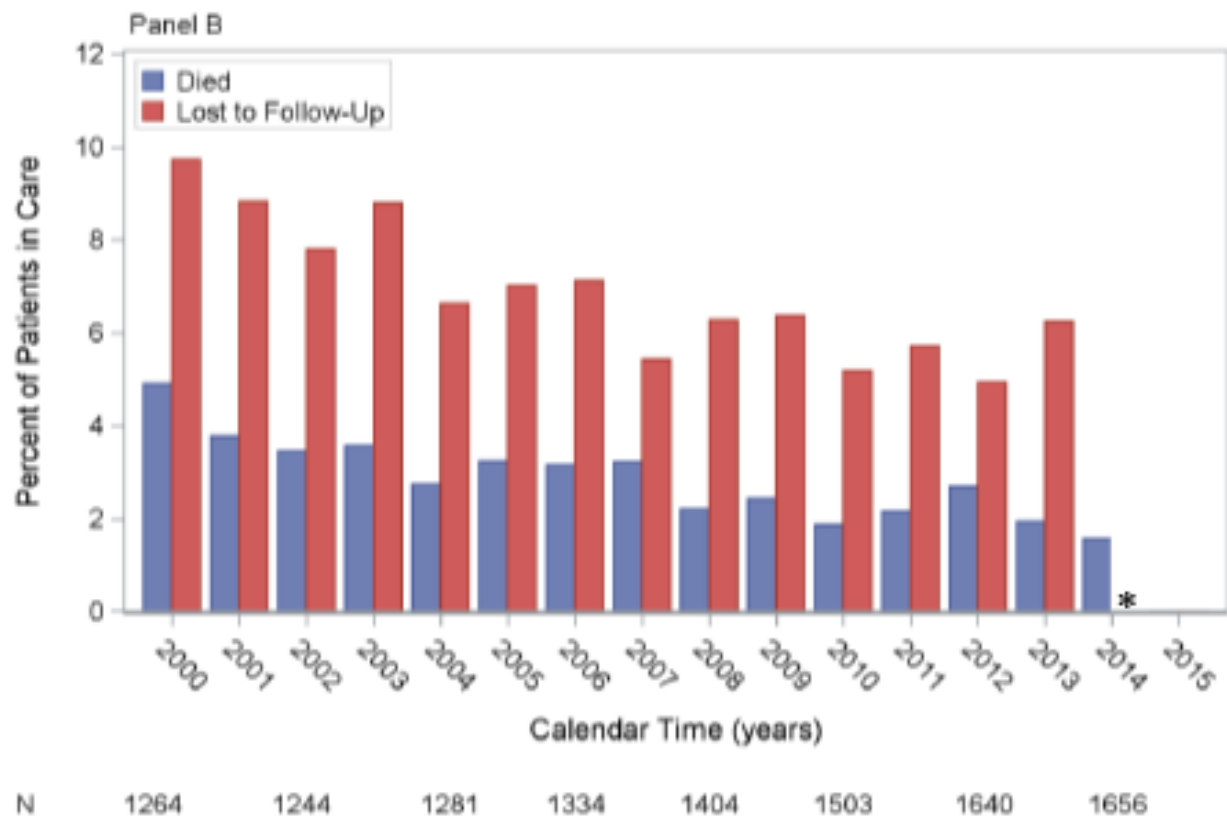


Figure 3. Ingress (A) and Egress (B) of patients in analysis by year.



N 1264 1244 1281 1334 1404 1503 1640 1656



Death: patients who die within a year before returning to care.

LTFU: patients not in care in any subsequent year.

*2014 LTFU not shown, unstable estimate because of shorter time