

## Background

- The Department of Health and Human Services' (DHHS) HIV guidelines outline recommendations on when to obtain genotypic HIV resistance testing in antiretroviral therapy (ART) experienced individuals<sup>1</sup>.
  - The "A" rating or "strong" recommendations are as follows<sup>1</sup>:
    - Virologic failure and a HIV RNA level >1000.
      - Genotypic testing in the setting of virologic failure should be performed while the patient is taking prescribed ART or within 4 week of discontinuation.
    - Managing suboptimal viral load reduction.
- Previously selected mutations can be missed (archived) if more than 4 weeks have elapsed since ART was discontinued<sup>1</sup>.

## Objectives

- To examine utilization/ordering patterns of HIV genotypes, detection of acquired resistance, and impact of genotypic ordering on change in an ART regimen.
- To determine whether the results obtained from genotype testing per DHHS guidelines influenced treatment decisions more than those obtained off-guidelines.

## Methods

- All HIV genotypes ordered between 05/2011 – 05/2012 and 03/2015 – 03/2016 in a large urban health system caring for 2000 HIV-infected individuals were assessed.
- Baseline pre-treatment genotypes were excluded from analyses.
- Chart review was performed for testing rationale, provider perceived medication adherence (as reported in the chart), resistance mutations detected, and ART changes.

## Results

### Reason Genotype (GT) Ordered and Downstream Impact

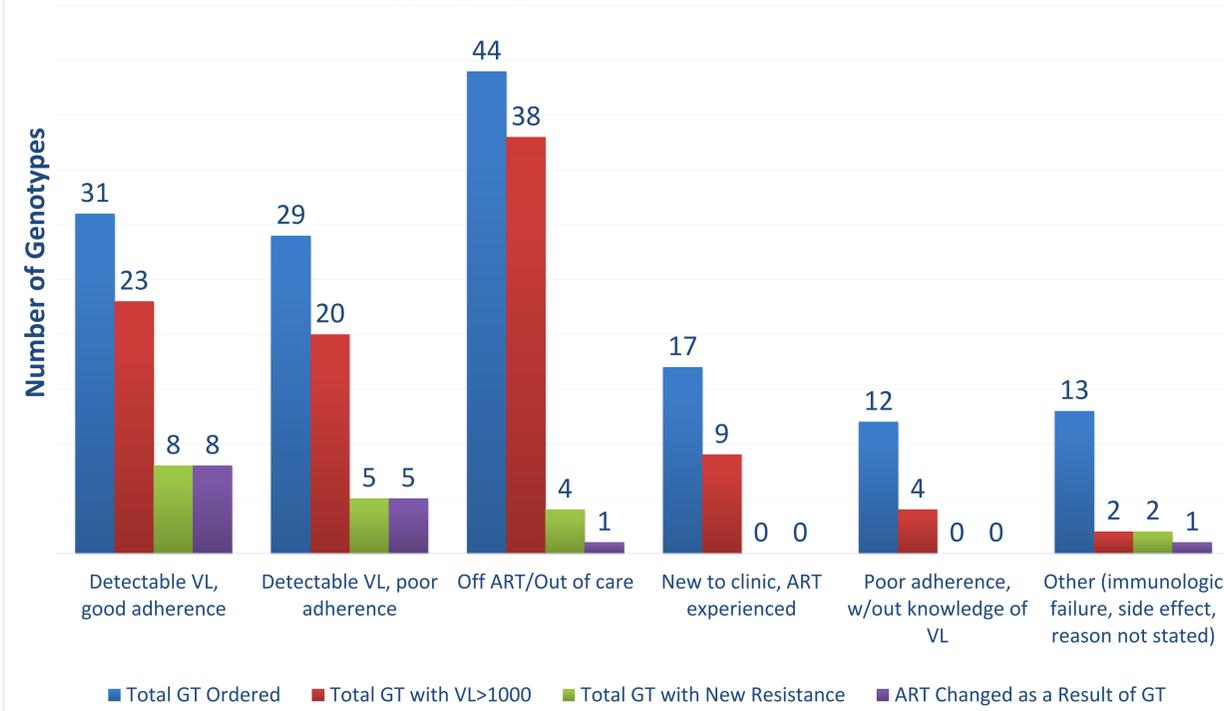


Figure 1: Number of Genotypes Ordered by Reason for Ordering and Impact on ART Regimen

### Impact of Genotypes (GTs) Ordered per DHHS Guidelines vs. Off-Guideline

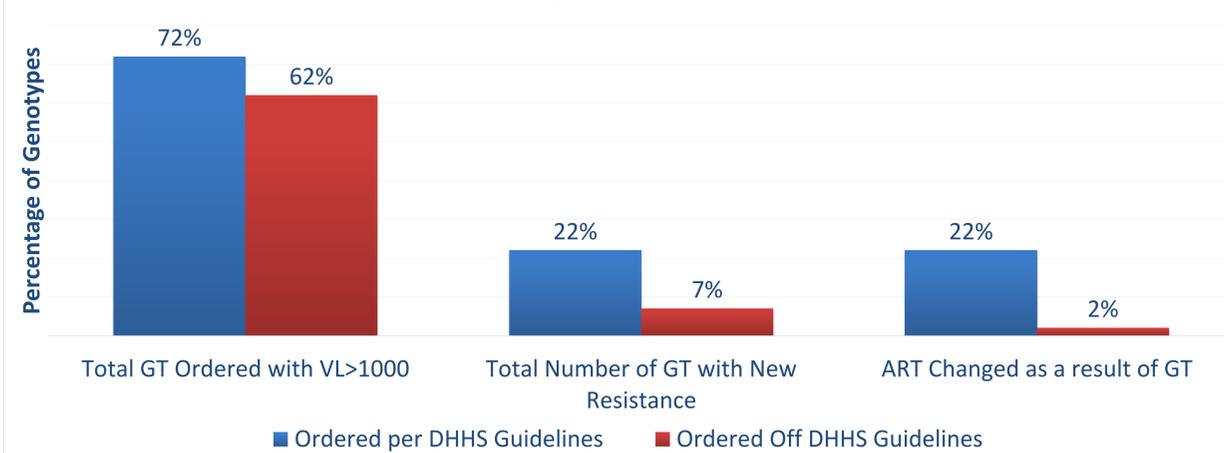


Figure 2: Impact of Genotypes (GTs) Ordered per DHHS Guidelines vs. Off-Guidelines

## Results (cont'd)

- 146 genotypes were assessed.
- The most common off-guidelines reason for which a genotype was ordered was due to a patient being off ART more than 4 weeks: 44 (30%) of all genotypes ordered (see figure 1).
- Sixty genotypes were ordered per DHHS guidelines (virologic failure while on ART).
  - These samples were significantly more likely to have new resistance mutations detected (22% vs. 7%,  $p=0.009$ ) and lead to a change in ART (22% vs 2%,  $p<0.001$ )(see figure 2).
- ART was not frequently modified as a result of new mutations detected in genotypes ordered off-guidelines because the new mutation(s) did not affect the current/last ART regimen.

## Conclusions

- Despite DHHS recommendations on appropriate timing for HIV genotypic resistance testing, our quality improvement investigation found many areas where ordering practices can be optimized.
- Our findings suggest that there is little utility in sending genotypic analysis for a reason other than a detectable VL in individuals with either good or poor adherence
- These findings are consistent with DHHS level A recommendations and provide additional objective measures to support these guidelines.

## References

- Panel Recommendation Regarding Drug-Resistance Testing. AIDSinfo website <https://aidsinfo.nih.gov/guidelines/html/1/adult-and-adolescent-arv-guidelines/6/drug-resistance-testing>. Updated May 1, 2014. Accessed February 21, 2016.