Introduction

- The prevalence of transmitted and acquired HIV-1 drug resistance impacts the effectiveness of antiretroviral therapy in both treatment-naive and treatment-experienced people living with HIV.
- Given the relatively recent availability of integrase inhibitors (INSTIs) for treatment of HIV, there have been few studies of trends in prevalence of 4-class resistance (INSTIs, protease inhibitors (PIs), nucleoside reverse transcriptase inhibitors (NRTIs), and nonnucleoside reverse transcriptase inhibitors (NNRTIs)).
- This analysis utilized data from a large, representative commercial patient testing database to assess trends in HIV-1 resistance prevalence in the modern treatment era.

Methods

- De-identified HIV-1 samples submitted for routine HIV resistance testing with Monogram Biosciences’ GenoSure PRIMe® assay were analyzed.
- GenoSure PRIme tests for genotypic resistance to four classes of HIV drugs: NRTIs, NNRTIs, PIs, and INSTIs.
- GenoSure PRIme is used to assess both transmitted and acquired HIV resistance.
- Samples collected from individuals in the United States or US Territories between July 1 2012 (first availability of test) and June 30, 2018 (database cut-off) were included in the analysis.
- Per individual subject, a single test per year could be reported, allowing for individuals to contribute data from multiple tests between years, but not within the same year.
- To minimize bias by sample submission trends as a result of changes in resistance testing behaviors over time, the analysis was restricted to samples demonstrating substantial genotypic resistance to at least one ARV in any class (PI, NRTI, NNRTI, or INSTI). Substantial decreased susceptibility was predicted by Monogram’s proprietary HIV-1 genotypic algorithm which is based on >10,000 matched HIV-1 genotype-phenotype results.
- Class resistance was defined as reduced susceptibility to at least one drug within the class.

Results

- A total of 84,811 eligible samples were evaluated during the study period.
- Of these, 27,911 (33.0%) demonstrated reduced susceptibility to at least one ARV.
- Between 2012-2018, reduced susceptibility to at least one NNRTI was most common and consistent (>75%) in samples with any resistance. Resistance to NRTIs and PIs steadily declined over the study period; INSTI resistance decreased (2012-2014), and then stabilized (2014-2017) (Figure 1).

Discussion

- Multiclass (≥2 classes) resistance increased with older age. Samples from US territories were more likely to have multiclass resistance compared to samples from US geographic regions (Figure 3).
- Increases in samples with single-class resistance were primarily associated with an increasing proportion of single-class NNRTI resistance (Figure 4).
- Resistance to INSTIs was uncommon and decreasing over time, particularly in combination with resistance to other core agent classes (PIs and NNRTIs).
- Even with documented class resistance, most samples remained susceptible to at least one ARV drug within the resistant class (Figure 5).

Conclusions

- Decreasing prevalence of multiclass ARV resistance was observed in testing data, in addition to declines in NNRTI, PI, and INSTI resistance.
- These trends correspond with the availability of newer treatment options with favourable cross-resistance profiles, improved effectiveness, and more convenient formulations leading to better adherence.

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References


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