
Magnitude of Viral Load and HIV Drug Resistance at the Time of Virologic Failure on First-Line Antiretroviral Therapy in Sub-Saharan Africa

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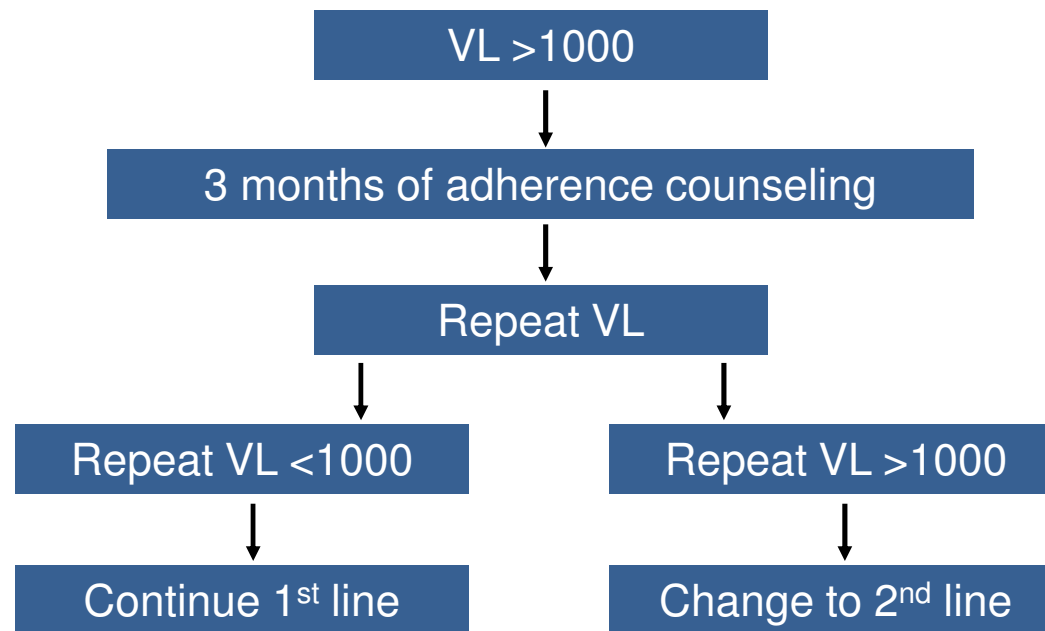
Harvard Medical School

Disclosures

- I have received research grants from:
 - The National Institute of Allergy and Infectious Diseases
 - MGH ECOR Fund for Medical Discovery
 - Harvard University CFAR
 - Gilead Sciences Research Scholars Program in HIV
 - ViiV Healthcare (investigator-sponsored research)

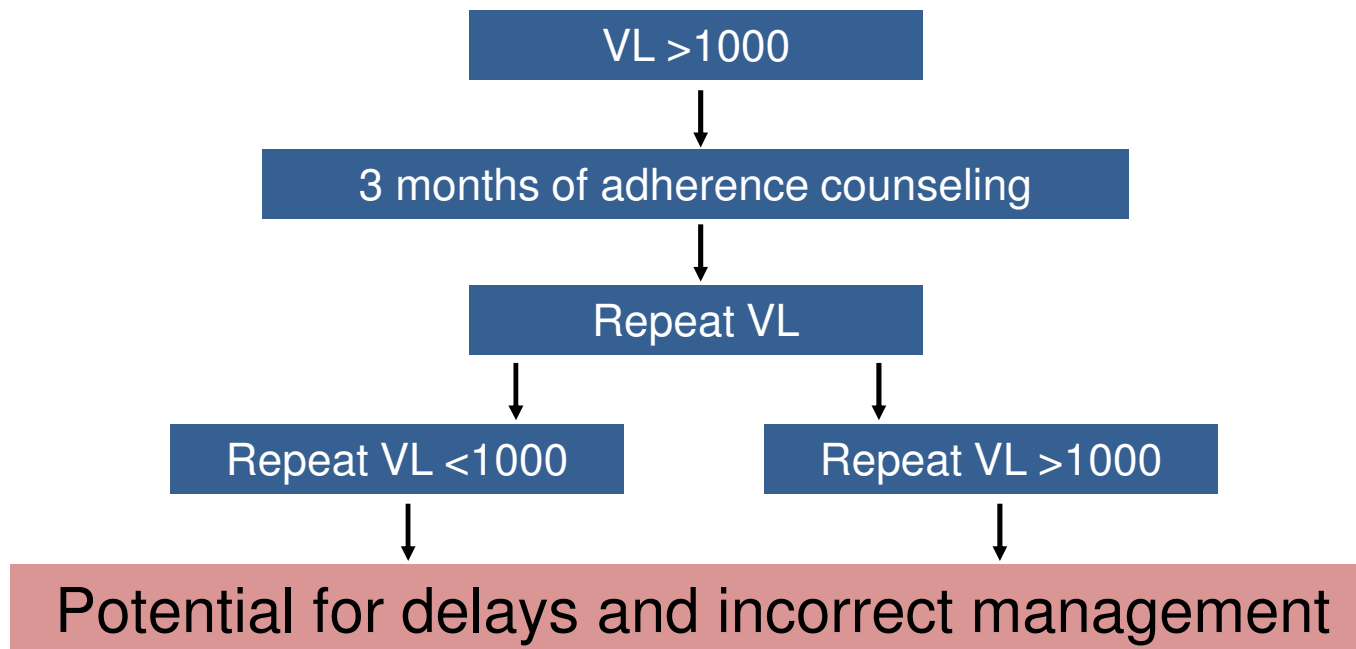
- I have no conflicts of interest

Background



Resistance testing is not routinely available in resource-limited settings

Background



Background

VL >1000



Are there factors that can distinguish whether HIV drug resistance is present at the time of virologic failure?

Study Objective

To evaluate the predictive value of viral load magnitude in determining presence or absence of HIV drug resistance

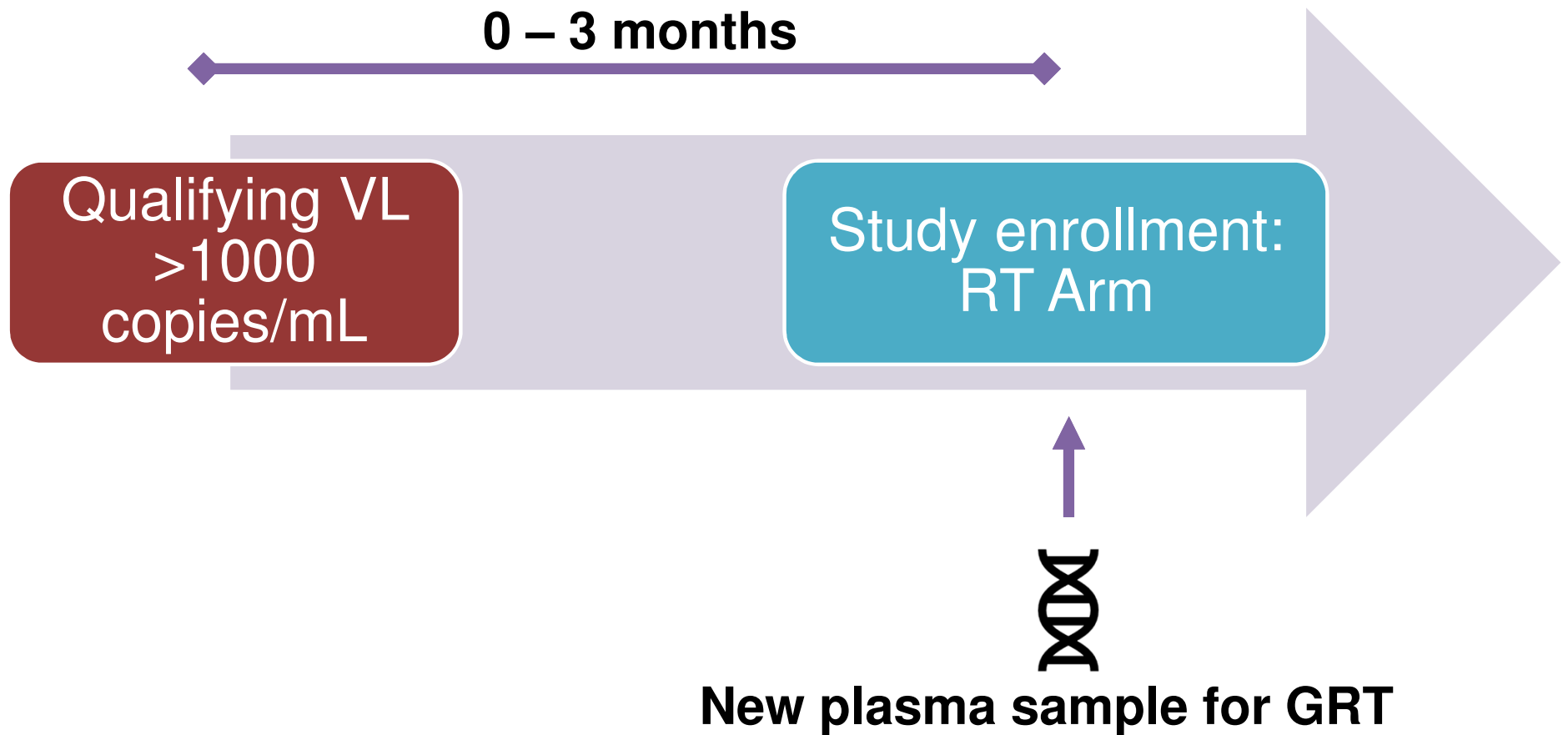
Data Source: The REVAMP Study

- Randomized trial
 - Experimental arm: Genotypic resistance test (GRT) by Sanger sequencing to guide treatment
 - Control arm: Standard management per WHO guidelines
- Timeline: 2016 - present
- Enrollment criteria
 - Adults with a viral load $>1,000$ copies/mL
 - At least 5 months on first-line ART

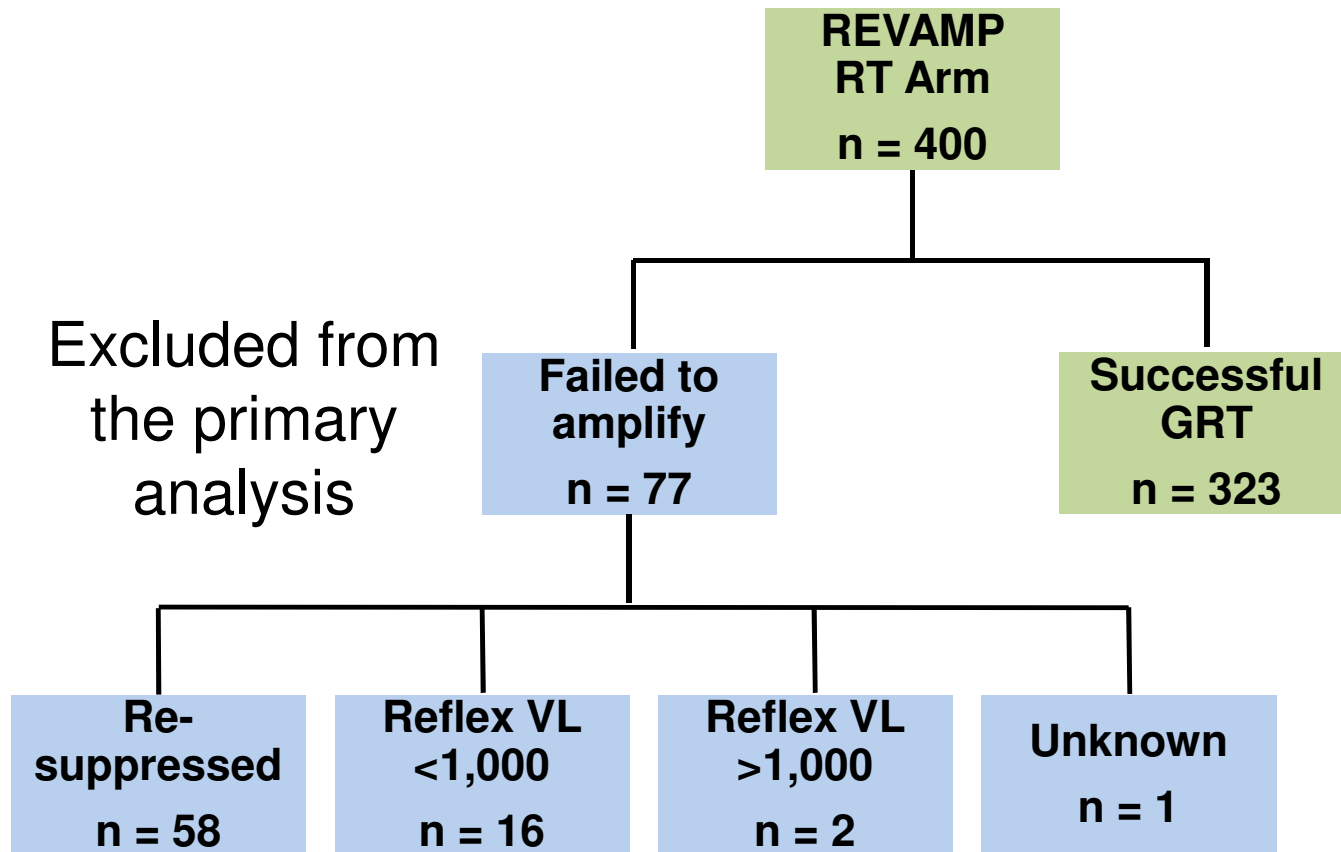


Herein, we present baseline data from the enrollment visit only.

Timing of VL and Resistance Tests



Study Population for Analysis



Statistical Analysis

- Predictor: HIV VL magnitude
 - Continuous
 - Categorical
- Outcome: HIV drug resistance
- Main analysis
 - Unadjusted logistic regression model
 - Adjusted logistic regression model
 - Age
 - Sex
 - Duration of ART
 - Self-reported adherence level
 - Regimen
- Sensitivity analysis

Population Characteristics

	Uganda n = 137	South Africa n = 186
Female	79 (58%)	78 (42%)
Age	35 (29 – 43)	37 (31 – 44)
Log ₁₀ HIV RNA viral load (copies/mL)	4.29 (3.58 – 4.85)	4.17 (3.64 – 4.87)
Duration of ART (years)	4.98 (2.50 – 7.60)	2.62 (1.57 – 4.94)
ART regimen at failure		
3(F)TC/TDF/EFV	70 (51%)	166 (89%)
3(F)TC/TDF/NVP	3 (2%)	8 (4%)
3TC/AZT/NVP	43 (31%)	1 (1%)
Other	21 (15%)	11 (6%)

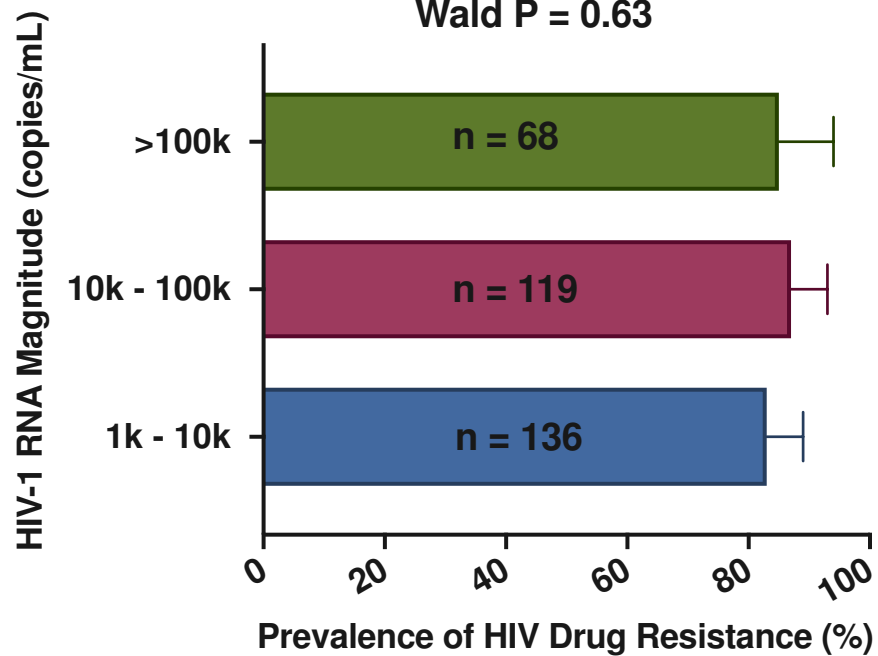
Categorical data expressed as count (%)
 Continuous data expressed as median (IQR)

Results

	Unadjusted OR	95% CI	P value
<i>Continuous</i>			
Log ₁₀ HIV-1 RNA	1.14	0.77 – 1.69	0.51
<i>Categorical</i>			
1k – 10k cp/mL	<i>ref</i>	<i>ref</i>	<i>ref</i>
10k – 100k cp/mL	1.41	0.70 – 2.85	0.34
>100k cp/mL	1.18	0.53 – 2.65	0.69

- In adjusted models, results remained unchanged.
- No other covariates were significant correlates.

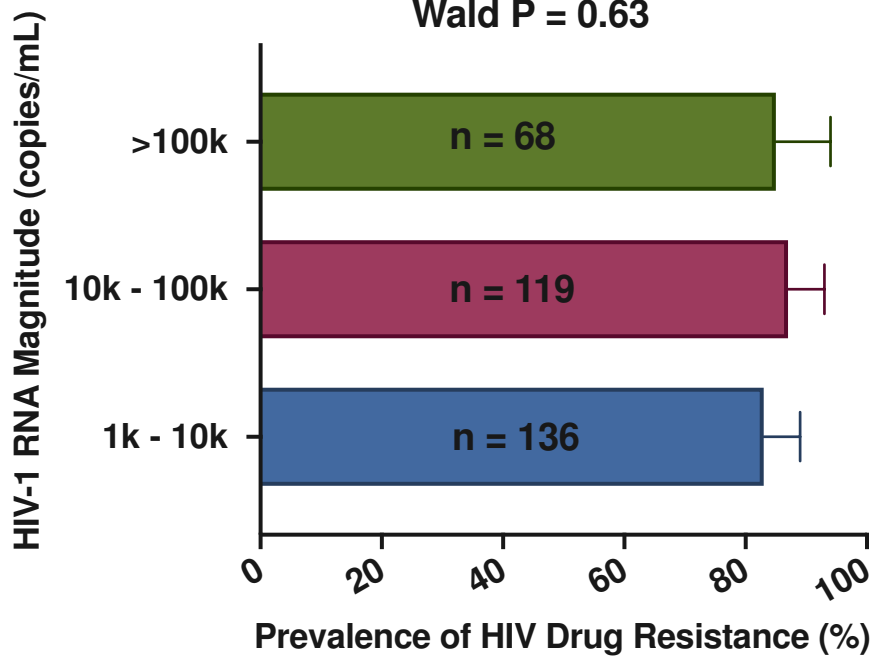
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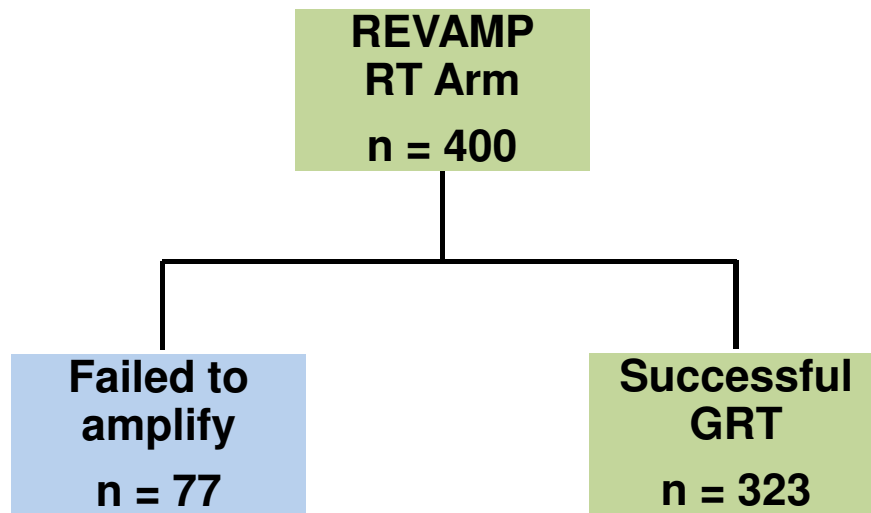


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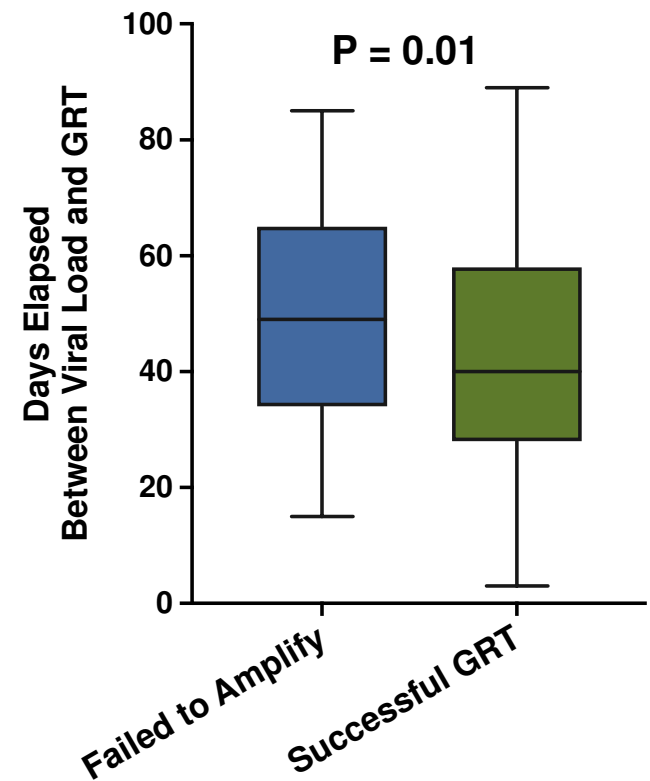
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VL magnitude is not associated with HIV drug resistance

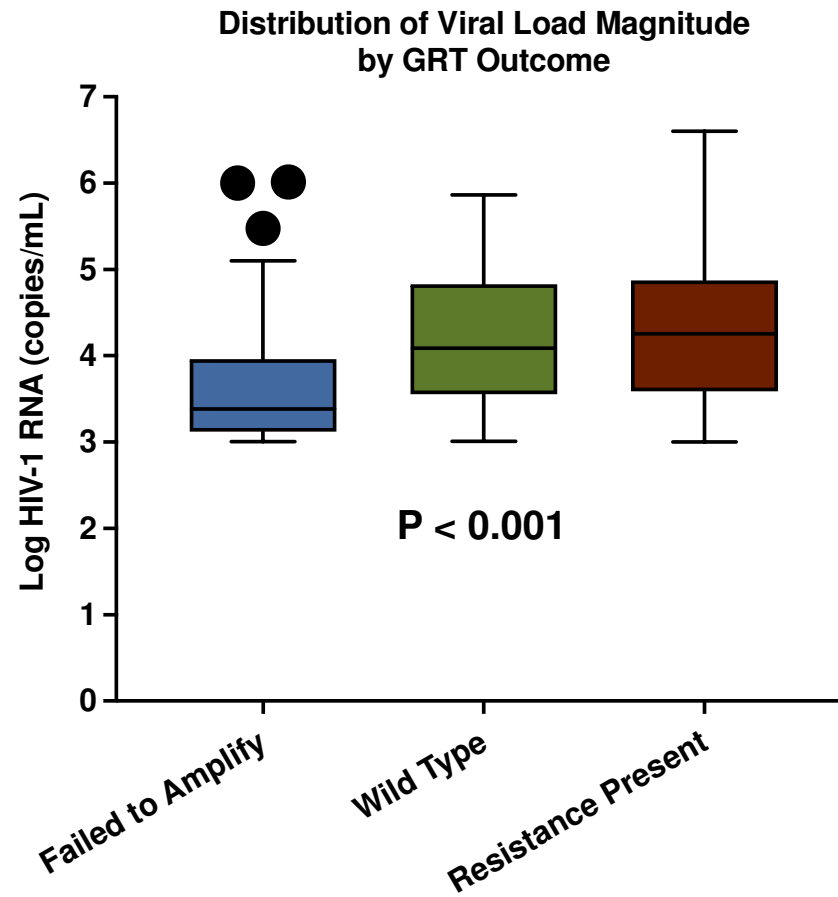
Sensitivity Analyses



Time between Viral Load and GRT Tests



Sensitivity Analyses

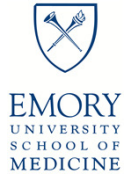


Conclusions

- Magnitude of VL does not correlate with presence of HIV drug resistance at time of failure
- Efforts are needed to reduce costs and increase feasibility of GRT and/or objective adherence assessments in resource-limited settings



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