Impact of Regional Population Displacement on HIV Epidemiology and Care Outcomes in Georgia

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Akaki Abutidze[1,2], Revaz Metchurtchlishvili[1], Eric R. Schuler[3,4], Otar Chokoshvili[1], Natia Dvali[1], Pati Gabunia[1], Marine Karchava[1], Anna Nanava[5], Lali Sharvadze[1,2], Roger Ying[3,4], Glenna Schluck[3,4], Thomas Musich[5], Julie Ake[3], Brennan Cebula[3]
for the Republic of Georgia HIV Threat Assessment (RoGHITA) Study Group

[1]T. Tsertsvadze Infectious Diseases, AIDS and Clinical Immunology Research Center, Tbilisi, Georgia [2]Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia [3]U.S. Military HIV Research Program, Center for Infectious Diseases Research, Walter Reed Army Institute of Research, Silver Spring, Maryland, United States of America [4]Henry M. Jackson Foundation for the Advancement of Military Medicine, Bethesda, Maryland, United States of America [5]Walter Reed Army Institute of Research Europe-Middle East, Tbilisi, Georgia

BACKGROUND

- Fastest growing HIV epidemics in Europe are in Russia & Ukraine[1]
- War in Ukraine has resulted in significant population displacement in Eastern Europe, impacting regional HIV epidemiology[2,3]
  - Poland recently experienced:
    - 15% increase in people living with HIV (PLH)
    - Increased prevalence of HIV-1 subtype A6 in a predominantly subtype B region
  - Impact of this population displacement on the epidemiology of HIV in Georgia remains unclear

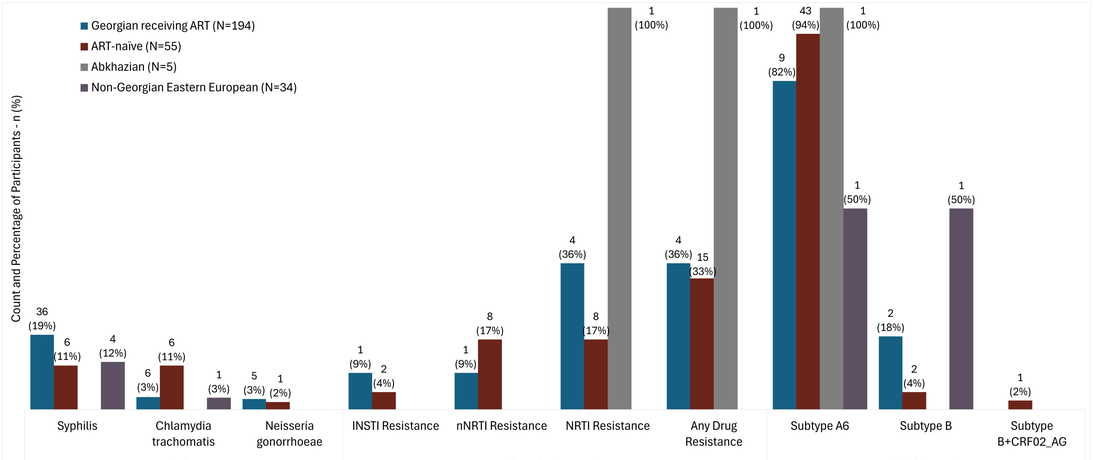
METHODS

- This cross-sectional study aims to characterize HIV risks, molecular epidemiology, & associated infections amongst PLH receiving care at the T. Tsertsvadze Infectious Diseases, AIDS, & Clinical Immunology Research Center in Tbilisi, Georgia.
- Enrolling up to 650 PLH aged ≥ 18 years into four groups:
  - Up to 400 from Georgia taking antiretroviral therapy (ART)
  - Up to 100 ART-naïve
  - Up to 50 from the occupied territory of Abkhazia
  - Up to 100 from non-Georgian Eastern European countries
- Data collection includes demographics, health & sociobehavioral factors, HIV viral load (VL) with sequencing for those with VL ≥1000 copies/mL, CD4 count, & associated infection testing
- Risk Ratios (RR) and 95% confidence intervals (CI) for comparisons between enrollment groups for sexually transmitted infections were calculated from contingency tables using the unconditional maximum likelihood estimation method.
- Robust Poisson regression used to calculate adjusted RR (aRR) & 95% CI for health & sociodemographic factors associated with unsuppressed (>1000 copies/mL) versus suppressed (≤ 1000 copies/mL) HIV VL[4].



The Georgian national HIV treatment program provides universal, free access to antiretroviral therapy & has achieved high treatment coverage rates. Preliminary results of this unique cross-sectional study suggest effective HIV care in Georgia, reflect regional molecular HIV epidemic influence, and potentially indicate evolving HIV drug resistance trends, underscoring the need for continued surveillance of HIV & associated infections to guide regional public health strategies.

Figure 1. Proportions of sexually transmitted infection, HIV drug resistance, and HIV-1 subtypes by enrollment group

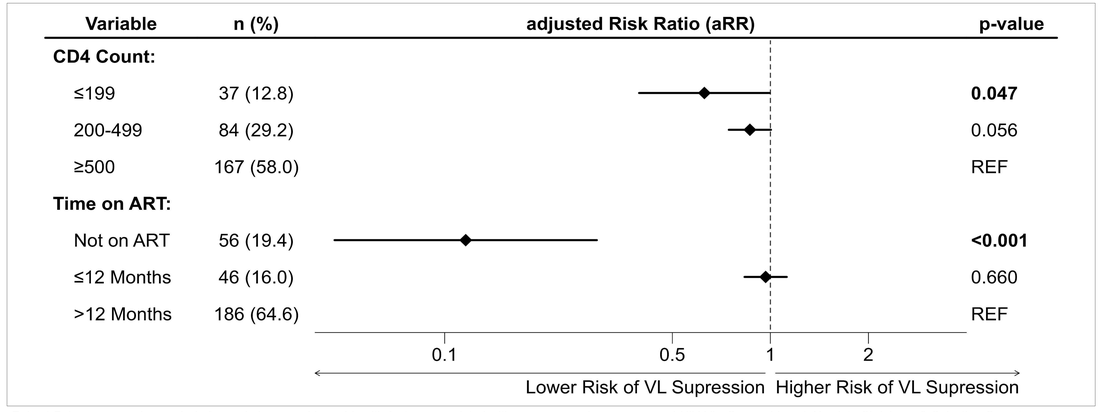


Proportions of participants living with a sexually transmitted infections (STI) by enrollment group for the analysis population (*N*=288) & HIV drug resistance & subtypes by enrollment group for participants with sequenced HIV (*N*=60). ART = antiretroviral therapy; INSTI= Integrase Strand Transfer Inhibitors; NRTI= Nucleoside/Nucleotide Analogue Transcriptase Inhibitors; nNRT= Nonnucleoside Analogue Reverse Transcriptase Inhibitors. No protease inhibitor drug resistance mutations were detected.

Percentages are calculated as n/N.

†Drug resistance and subtype data are based on 60 sequenced samples: Georgian receiving antiretroviral therapy (ART) (*N*=11), ART-naïve (*N*=46), Abkhazian (*N*=1), and non-Georgian Eastern European (*N*=2).

Figure 2. Participant HIV health variables associated with unsuppressed VL



Robust Poisson regression analysis for sociodemographic and health factors associated with unsuppressed vs. suppressed HIV VL. Grouped Least Absolute Shrinkage & Selection Operator regression used for variable selection. Variables included in model: CD4 Count (cells/mm^3) at study visit, CD4 at nadir (cells/mm^3), household income, education level, employment status (employed vs. unemployed), marital status (married vs. not married), participant was or was not living with a sexually transmitted infection, country of origin (Georgia vs. all other countries), & time on antiretroviral therapy (ART). Only CD4 count at study visit & time on ART were statistically significant, all other variables were not listed in the figure as their 95% confidence intervals crossed 1.00 & had p-values greater than 0.190. REF = referent group; x-axis is log scaled to properly space the adjusted prevalence ratios. Bolded p-values represent aRR that were statistically significant (p<0.050).

RESULTS

- As of September 2025, data from 288 participants available for analysis (**Figure 1**)
  - Median age 37.5 years; 23.3% female
- Viral suppression rates high amongst participants from:
  - Georgia taking ART (94.9%)
  - Abkhazia (80%)
  - Non-Georgian Eastern European countries (97.1%)
- Among 60 participants with sequenced HIV (**Figure 1**):
  - Predominantly subtype A6 (90%)
  - Lower prevalence of subtype B (8.3%) & B+CRF02_AG (1.7%)
  - Drug resistance mutations present in 33.3%
    - Primarily nucleoside reverse transcriptase inhibitor (NRTI)-related (21.6%)
    - Small proportion with integrase strand transfer inhibitor (INSTI) resistance mutations (3.0%)
- Higher chlamydia prevalence among ART-naïve participants (referent: participants from Georgia taking ART; RR=3.53, 95% CI 1.18-10.5) (**Figure 1**)
- Associations with unsuppressed VL (**Figure 2**):
  - Low CD4 count (aRR=0.63, 95% CI 0.40-0.99)
  - Not taking ART (aRR=0.12, 95% CI 0.05-0.29)

CONCLUSIONS

- High viral suppression rates suggest effective HIV care in Georgia
- Subtype A6 predominance with lower prevalence of subtype B & B+CRF02_AG reflects regional epidemic influence
- Low prevalence of INSTI resistance mutations may indicate evolving HIV drug resistance trends in Georgia amidst widespread uptake of INSTI-based ART
- Higher chlamydia prevalence amongst ART-naïve participants suggests distinct sociobehavioral patterns within this group
- Association of low CD4 count and not taking ART with unsuppressed VL not unexpected
- Continued data collection and analysis from this unique study will further clarify the impact of population displacement on HIV and related infection epidemiology and care outcomes in Georgia to inform regional public health strategies.

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For more information contact: Akaki Abutidze. akakiabutidze@yahoo.com