

Supplementary Material

Predicting the Immunological Nonresponse to Antiretroviral Therapy in People Living with HIV: A Machine Learning-Based Multicenter Large-Scale Study

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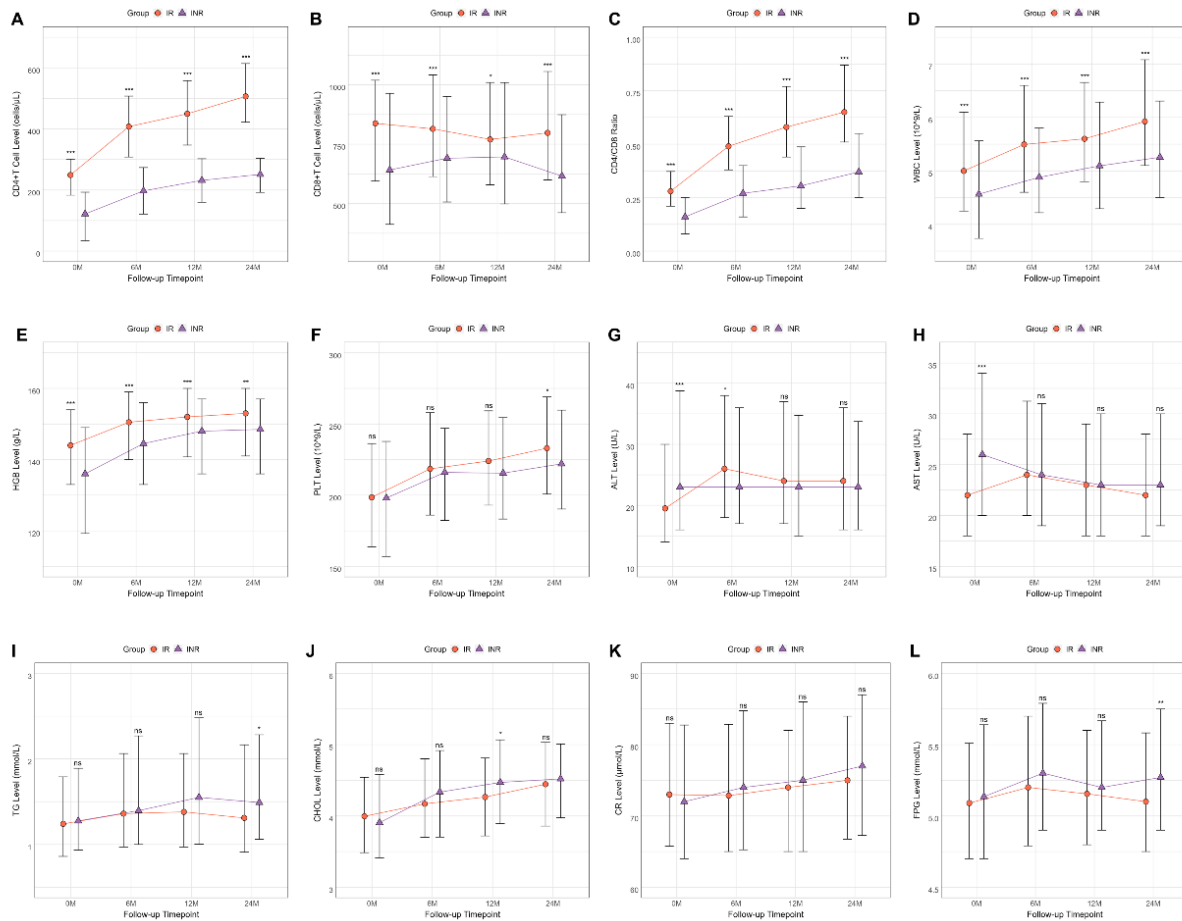
Supplementary Table 1. The clinical characteristics of the training set, internal validation set, and external validation set

Characteristics	Training, N = 631	Internal Validation, N = 272	External Validation, N = 674
Age, years	32.00 [26.00, 43.00]	32.00 [25.00, 43.00]	32.00 [26.00, 43.00]
Gender			
Female	60 (9.51%)	23 (8.46%)	105 (15.58%)
Male	571 (90.49%)	249 (91.54%)	569 (84.42%)
Group			
IR	364 (57.69%)	168 (61.76%)	408 (60.53%)
INR	267 (42.31%)	104 (38.24%)	266 (39.47%)
HAART Regimen			
INSTI based	131 (20.76%)	125 (45.96%)	62 (9.20%)
NNRTI based	483 (76.55%)	142 (52.21%)	558 (82.79%)
PI based	17 (2.69%)	5 (1.84%)	54 (8.01%)
Baseline HBsAg			
Negative	554 (87.80%)	236 (86.76%)	602 (89.32%)
Positive	77 (12.20%)	36 (13.24%)	72 (10.68%)
Baseline AntiHCV			
Negative	627 (99.37%)	267 (98.16%)	655 (97.18%)
Positive	4 (0.63%)	5 (1.84%)	19 (2.82%)
Baseline CD4+T cell, cells/ μ l	210.00 [130.00, 278.50]	211.00 [106.75, 280.00]	200.00 [102.50, 271.50]
Baseline CD8+T cell, cells/ μ l	835.00 [571.50, 1,172.00]	848.50 [561.75, 1165.75]	761.50 [520.00, 964.75]
Baseline CD4/CD8 ratio	0.22 [0.14, 0.33]	0.21 [0.13, 0.32]	0.24 [0.15, 0.34]
Baseline HIV load, log ₁₀ (copies/ml)	4.37 [3.81, 4.82]	4.41 [3.70, 4.93]	4.65 [4.19, 5.07]
Baseline WBC, 10 ⁹ /L	5.09 [4.26, 6.11]	5.01 [3.99, 5.90]	4.84 [4.06, 5.94]
Baseline HGB, g/L	144.00 [129.00, 153.00]	145.00 [129.00, 155.00]	142.00 [127.25, 153.00]
Baseline PLT, 10 ⁹ /L	208.00 [169.50, 250.00]	200.50 [167.00, 246.50]	198.00 [161.00, 237.00]

Baseline ALT, U/L	19.00 [14.00, 29.00]	19.00 [13.00, 30.25]	21.00 [15.00, 33.00]
Baseline AST, U/L	20.00 [17.00, 26.00]	21.00 [16.00, 28.00]	23.00 [19.00, 30.00]
Baseline TBIL, μ mol/L	9.50 [7.00, 12.55]	9.80 [7.00, 13.00]	8.90 [6.40, 12.30]
Baseline CR, μ mol/L	75.00 [66.00, 83.00]	77.50 [69.00, 87.00]	73.00 [65.00, 83.00]
Baseline TG, mmol/L	1.18 [0.88, 1.64]	1.12 [0.84, 1.56]	1.25 [0.87, 1.83]
Baseline CHOL, mmol/L	3.93 [3.50, 4.47]	3.99 [3.43, 4.53]	3.95 [3.46, 4.55]
Baseline FPG, mmol/L	5.07 [4.71, 5.43]	5.12 [4.77, 5.50]	5.10 [4.70, 5.60]

Abbreviations: IR, immune reconstitution; INR, immune non-responder; HAART, highly active antiretroviral therapy; INSTI, integrase strand transfer inhibitor; NNRTI, non-nucleoside reverse transcriptase inhibitor; PI, protease inhibitor; HBsAg, hepatitis B surface antigen; AntiHCV, anti-hepatitis C virus; WBC, white blood cells; HGB, hemoglobin; PLT, platelets; AST, aspartate aminotransferase; ALT, alanine aminotransferase; TBIL, total bilirubin; CR, creatinine; TG, triglycerides; CHOL, cholesterol; FPG, fasting plasma glucose.

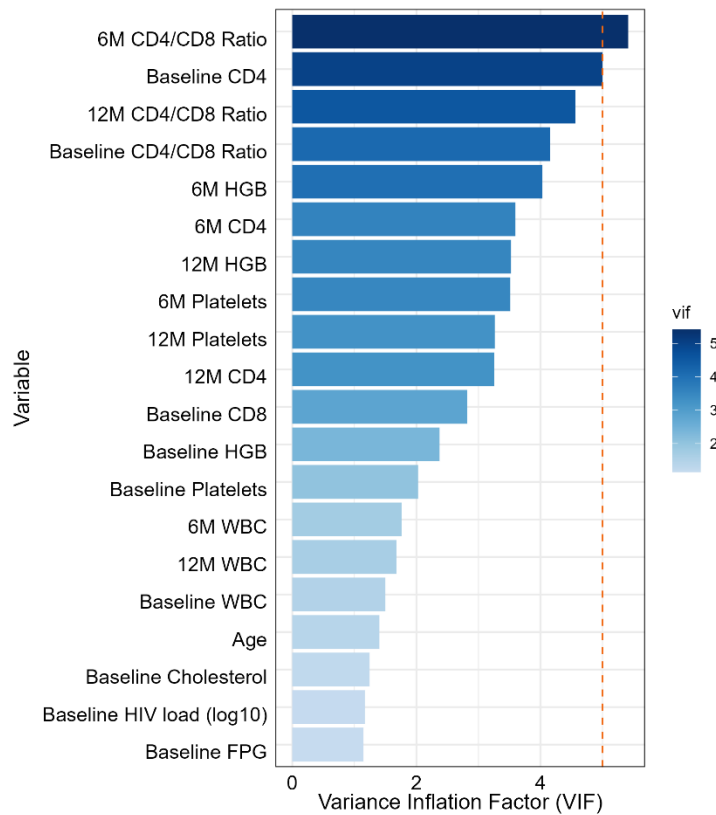
Supplementary Figure 1. The changes in the clinical characteristics of PLWH within the external dataset across four follow-up points.



The changes in various parameters over different time-points during follow-up including CD4+T cells (A), CD8+T cells (B), CD4/CD8 ratio (C), WBC (D), HGB (E), PLT (F), ALT (G), AST (H), TG (I), CHOL (J), CR (K), and FPG (L).

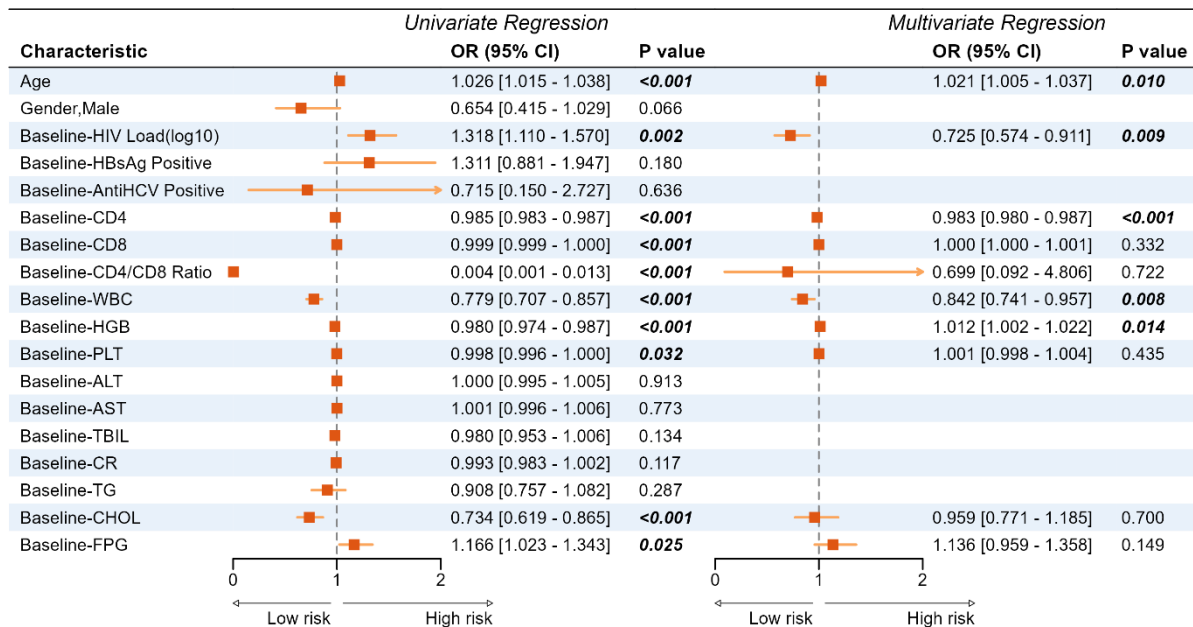
Abbreviations: WBC, white blood cells; HGB, hemoglobin; PLT, platelets; ALT, alanine aminotransferase; AST, aspartate aminotransferase; TG, triglycerides; CHOL, cholesterol; CR, creatinine; FPG, fasting plasma glucose.

Supplementary Figure 2. Calculating variance inflation factors to assess multicollinearity among model variables.



Abbreviations: WBC, white blood cells; HGB, hemoglobin; CHOL, cholesterol; FPG, fasting plasma glucose; PLT, platelets.

Supplementary Figure 3. Univariate and multivariate analysis of baseline parameters on INR



Abbreviations: WBC, white blood cells; HGB, hemoglobin; PLT, platelets; ALT, alanine aminotransferase; AST, aspartate aminotransferase; TBIL, total bilirubin; CR, creatinine; TG, triglycerides; CHOL, cholesterol; FPG, fasting plasma glucose.