



HIV DRUG RESISTANCE SUMMARY SHEET

OCTOBER 2020

The 2018 Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS) was a national household-based survey that assessed the prevalence of human immunodeficiency virus (HIV) and related health indicators, including the prevalence of HIV antiretroviral drug resistance (HIVDR) among samples from participants who tested positive for HIV. Data collection was done from July through December 2018. Data were collected from household members age 0–64 years old. Home-based HIV counseling and testing services were provided to people who participated in the survey. Participants receiving an HIV-positive test result were linked to treatment services. NAIIS data includes national, zonal, and state information on HIV control activities in Nigeria.

NAIIS was led by the Government of Nigeria through the Federal Ministry of Health (FMOH) and the National Agency for the Control of AIDS (NACA), conducted with funding from the United States (U.S.) President’s Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund to Fight AIDS, Tuberculosis and Malaria with technical assistance from the U.S. Centers for Disease Control and Prevention (CDC). The survey was implemented by the NAIIS Consortium, led by the University of Maryland, Baltimore (UMB) under the supervision of the NAIIS Technical Committee.

National HIV prevalence among adults age 15–64 years in 2018 was 1.4%. This summary sheet describes the overall prevalence of drug resistance among all participants who tested positive for HIV age 15–64 years (Table 1), including those who were determined to have been recently infected according to results from HIV-1 LAg-Avidity Assay (Table 2).

TABLE 1: PERCENTAGE DISTRIBUTION OF PERSONS AGED 15–64 YEARS INFECTED WITH HIV WITH RESISTANCE TO ARVS, BY CLASS OF ARV, NAIIS 2018



Indicator	Percent	Number	Denominator	Drug Resistance Mutations Detected ¹
Successfully Amplified ²	97.8	1,351	1,381	
Any	21.6	292	1,351	M41L, K65R, D67N, D67G, T69D, K70R, K70E, L74V, L74I, V75M, F77L, Y115F, F116Y, Q151M, M184V, M184I, L210W, T215Y, T215F, T215I, T215S, T215C, T215E, K219Q, K219E, K219N, K219R, L100I, K101E, K101P, K103N, K103S, V106M, V106A, Y181C, Y181V, Y188L, Y188H, Y188C, G190A, G190S, G190E, P225H, M230L, L24I, M46I, M46L, I50V, I50L, F53L, I54V, I54L, G73S, L76V, V82A, V82F, V82S, V82M, N83D, I84V, L90M
NRTI	13.3	180	1,351	M41L, K65R, D67N, D67G, T69D, K70R, K70E, L74V, L74I, V75M, F77L, Y115F, F116Y, Q151M, M184V, M184I, L210W, T215Y, T215F, T215I, T215S, T215C, T215E, K219Q, K219E, K219N, K219R
NNRTI	20.3	274	1,351	L100I, K101E, K101P, K103N, K103S, V106M, V106A, Y181C, Y181V, Y188L, Y188H, Y188C, G190A, G190S, G190E, P225H, M230L
PI	1.3	18	1,351	L24I, M46I, M46L, I50V, I50L, F53L, I54V, I54L, G73S, L76V, V82A, V82F, V82S, V82M, N83D, I84V, L90M
NRTI and NNRTI	11.9	161	1,351	M41L, K65R, D67N, D67G, T69D, K70R, K70E, L74V, L74I, V75M, F77L, Y115F, M184V, M184I, L210W, T215Y, T215F, T215I, T215S, T215C, K219Q, K219E, K219N, K219R, L100I, K101E, K101P, K103N, K103S, V106M, V106A, Y181C, Y181V, Y188L, Y188H, Y188C, G190A, G190S, P225H, M230L
NRTI, NNRTI, and PI	0.7	9	1,351	M41L, D67N, D67G, T69D, K70R, L74I, Y115F, F116Y, Q151M, M184V, L210W, T215Y, T215F, T215I, K219Q, K219E, K219N, K101E, K103N, K103S, Y181C, Y181V, G190A, G190E, L24I, M46I, I50V, I50L, F53L, I54V, I54L, L76V, V82A, V82S, V82M, N83D, I84V

¹ Based on Stanford Database for HIV Drug Resistance Mutation. <https://hibdvb.stanford.edu/page/who-sdrm-list/>

² Unweighted figures, from a total of 1,381 cases.

ARV: Antiretroviral; HIV: Human Immunodeficiency Virus; NRTI: Nucleoside Reverse Transcriptase Inhibitors; NNRTI: Non-Nucleoside Reverse Transcriptase Inhibitors; PI: Protease Inhibitor

Commonly used ARVs by class include NNRTIs: nevirapine (NVP) and efavirenz (EFV); NRTIs tenofovir (TDF), lamivudine (3TC), zidovudine (AZT), emtricitabine (FTC) and PIs: lopinavir/ritonavir (LPV/r) and atazanavir (ATV).

A total of 1,351 samples from all participants who tested positive for HIV age 15–64 years were successfully amplified and underwent testing for evidence of HIVDR. Of these 1,351 samples, 292 (21.6%) exhibited mutations associated with resistance to nucleoside reverse transcriptase inhibitors (NRTIs), non-nucleoside reverse transcriptase inhibitors (NNRTIs) or protease inhibitors (PIs). NNRTI-resistance was most common (20.3%), followed by NRTI-resistance (13.3%) and PI-resistance (1.3%). Table 1 also details prevalence of co-occurrent resistance to NRTIs and NNRTIs (11.9% of samples) and resistance to all three inhibitor types (0.7% of samples).

TABLE 2: PERCENTAGE DISTRIBUTION OF PERSONS AGED 15–64 YEARS RECENTLY INFECTED¹ WITH HIV WITH RESISTANCE TO ARVS, BY CLASS OF ARV,



Indicator	Percent	Number	Denominator	Drug Resistance Mutations Detected ²
Successfully Amplified ³	92.7	38	41	
Any	21.1	8	38	M41L, M184V, M184I, L210W, T215Y, K219N, K103N, Y181C, Y188L, G190A, M230L
NRTI	10.5	4	38	M41L, M184V, M184I, L210W, T215Y, K219N
NNRTI	21.1	8	38	K103N, Y181C, Y188L, G190A, M230L
PI	0.0	0	38	
NRTI and NNRTI	10.5	4	38	M41L, M184V, M184I, L210W, T215Y, K219N, K103N, Y181C, G190A, M230L
NRTI, NNRTI, and PI	0.0	0	38	

¹ Working Group and Consortium for Evaluation and Performance of Incidence Assays, and with assay performance characteristics of a mean duration of recent infection (MDRI) = 130 days (95% confidence interval [CI]: 118, 142), a time cutoff (T) = 1.0 year, and proportion false recent (PFR) = 0.00.

² Based on Stanford Database for HIV Drug Resistance Mutation. <https://hivdb.stanford.edu/page/who-sdrm-list/>

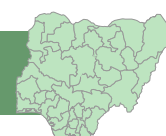
³ Unweighted figures, from a total of 41 cases.

ARV: Antiretroviral; HIV: Human Immunodeficiency Virus; NRTI: Nucleoside Reverse Transcriptase Inhibitors; NNRTI: Non-Nucleoside Reverse Transcriptase Inhibitors; PI: Protease Inhibitor

Commonly used ARVs by class include NNRTIs: nevirapine (NVP) and efavirenz (EFV); NRTIs tenofovir (TDF), lamivudine (3TC), zidovudine (AZT), emtricitabine (FTC) and PIs: lopinavir/ritonavir (LPV/r) and atazanavir (ATV).

Thirty-eight samples obtained from NAIIS participants were determined as recent HIV infections and were successfully amplified. Results from eight (21.1%) samples indicated some resistance. NNRTI-resistance was found in all eight of these samples, four of which also contained evidence of NRTI-resistance (10.5%). No samples collected from participants who were recently infected with HIV exhibited mutations associated with PI-resistance.

DISCUSSION



Findings from the analyses of the drug resistant mutations indicate that approximately 20% of people living with HIV and on antiretroviral therapy (ART) identified through NAIIS were resistant to NNRTIs. This is consistent with what would be expected in a mature HIV treatment program. Among participants who were recently infected with HIV, 21% were infected with a virus strain already resistant to NNRTIs. This underscores the importance of starting individuals identified as newly infected on regimens using an integrase inhibitor as the backbone. No PI mutations were observed among those identified as recently infected and slightly more than 1% of prevalent cases had resistance to PIs indicating PIs are still a viable second line option in Nigeria or for patients where an integrase inhibitor might be contraindicated.

The Government of Nigeria is grateful to all citizens who agreed to be part of NAIIS. Their dedication and willingness will help improve the lives of all Nigerians.



NAIIS is supported by PEPFAR through CDC under the terms of cooperative agreement GH18-1813, GH002108 and by the Global Fund to Fight AIDS, Tuberculosis and Malaria under contract NGA-H-NACA. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the funding agencies.