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November 04, 2025

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The NNTC is directly funded by the NIMH, NIA, NIDA, and NINDS.

Questions regarding these data should be directed to the Data Coordinating Center  
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Rockville, MD  
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## **Active Cohort Overview: PWH**

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## Tissue Bank Cohort Overview: PWH

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# Consortium Members

## Texas NeuroAIDS Research Center

University of Texas Medical Branch  
Dr. Benjamin Gelman, Principal Investigator

## California NeuroAIDS Tissue Network

University of California, San Diego  
Dr. David Moore, Principal Investigator

## National Neurological AIDS Bank

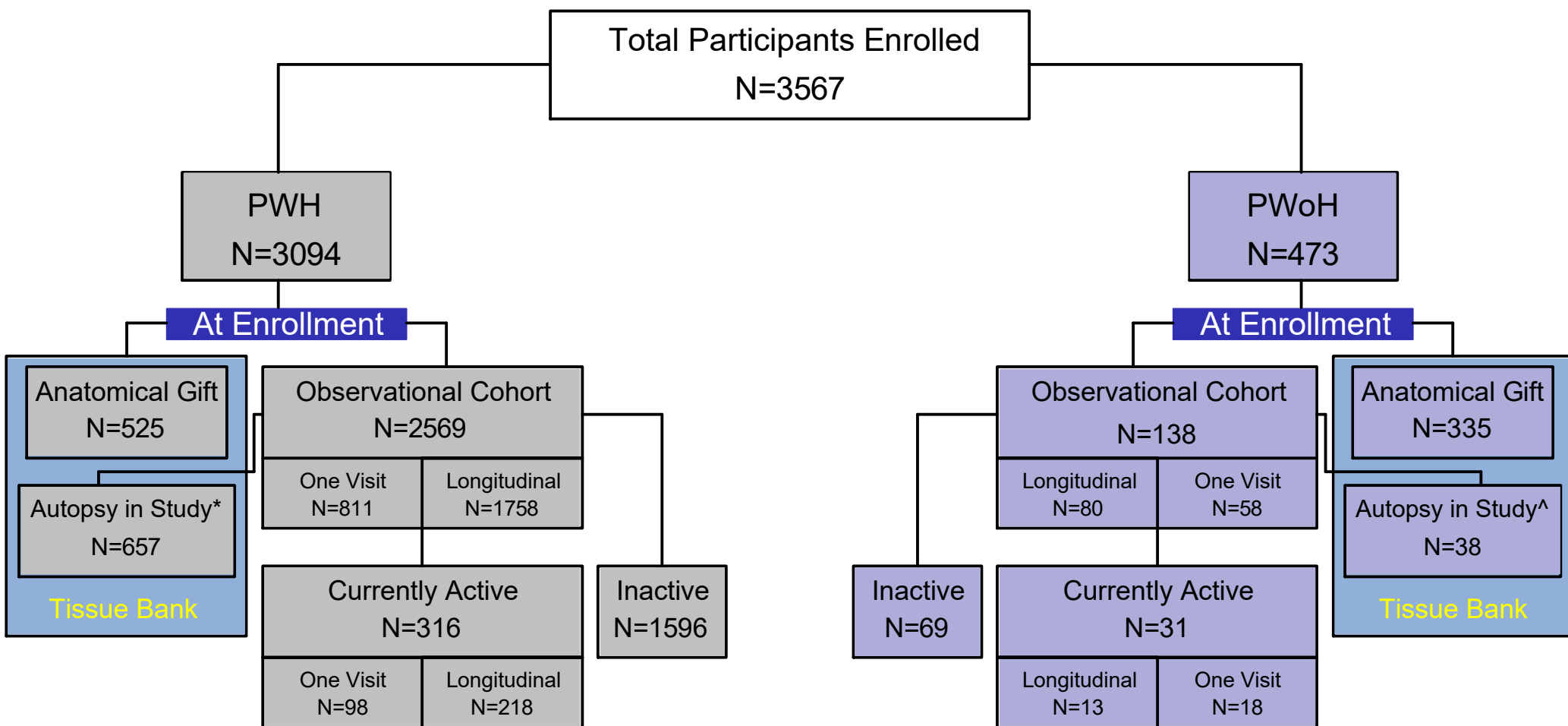
University of California, Los Angeles  
Dr. Elyse Singer, Principal Investigator

## Manhattan HIV Brain Bank

Mount Sinai Medical Center, New York  
Dr. Susan Morgello, Principal Investigator

## Washington University in St. Louis School of Medicine (WUSM)

Washington University in St. Louis  
Dr. Beau Ances, Principal Investigator



PWH: People with HIV.

PWoH: People without HIV.

Longitudinal Cohort: Participants enrolled with 2 or more study visits.

Tissue Bank: Participants deceased with autopsy.

Total does not include 268 cases categorized as unknown HIV status, unknown study status, lost to follow-up, administratively censored, withdrawn, or deceased without autopsy prior to enrollment.

PWH inactive cases are either lost to follow-up/administratively censored/withdrawn (N=1217) or deceased without autopsy (N=379).

PWoH inactive cases are either lost to follow-up/administratively censored/withdrawn (N=49) or deceased without autopsy (N=20).

\* 266 autopsy cases included in Observational Cohort; 391 autopsy cases included in Longitudinal Cohort.

^ 24 autopsy cases included in Observational Cohort; 14 autopsy cases included in Longitudinal Cohort.

## NNTC Participants Co-enrolled or in a Special Cohort

Study Name:	# Participants Enrolled
WIHS	68
CHARTER	131
Last Gift	50
NIDA Opioid	53

WIHS: The Women's Interagency HIV Study (WIHS) was established in 1993 as a multi-center, prospective, observational cohort study of women living in the United States. The study was closed in 2018 after which it was merged with the Multicenter AIDS Cohort Study (MACS) under a unified study comprising a cohort of men and women, known as the MACS/WIHS Combined Cohort Study (<https://statepi.jhsph.edu/mwccs/>).

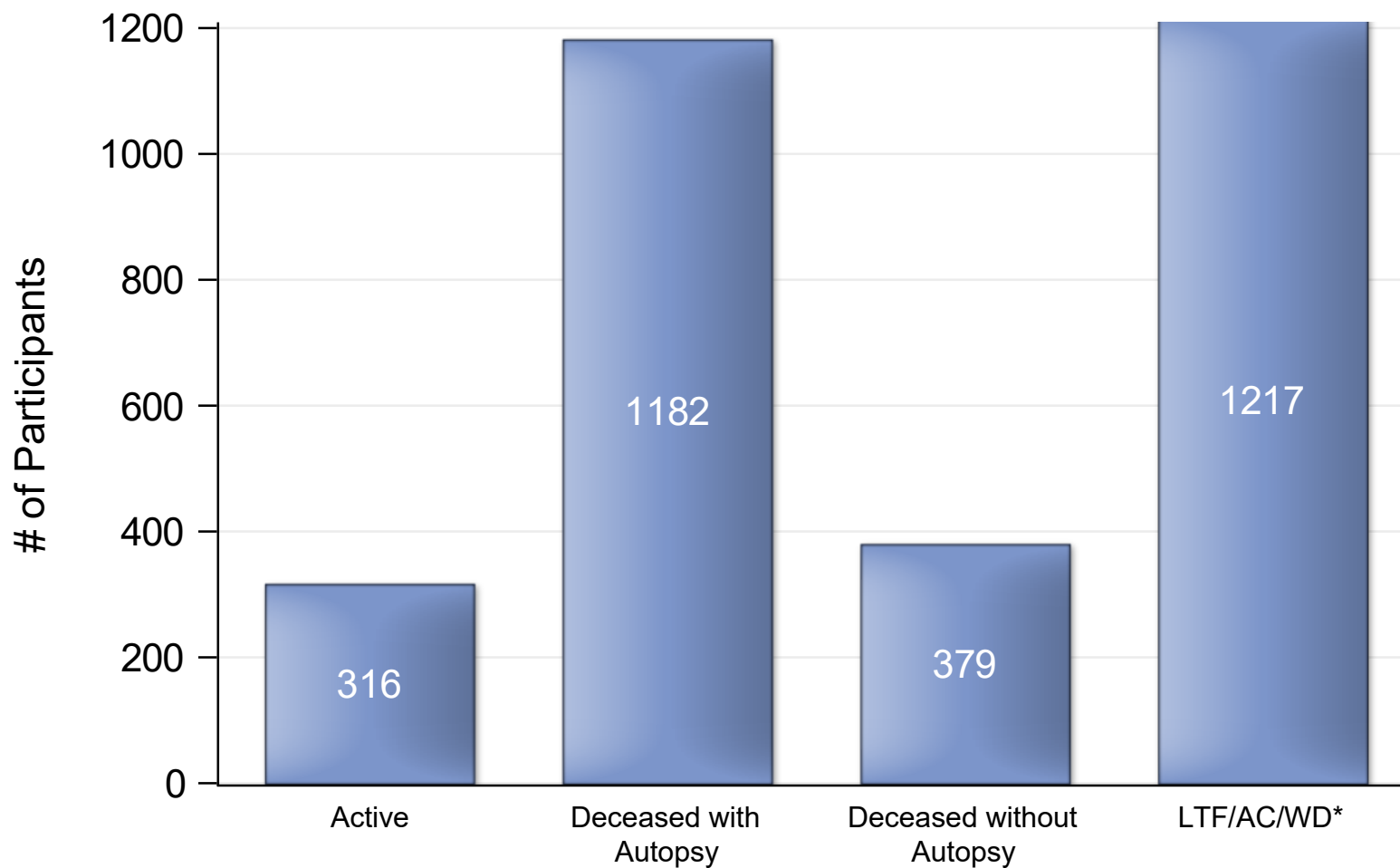
CHARTER: The CNS HIV Antiretroviral Therapy Effects Research (CHARTER) was funded initially in 2002 and continues currently under the project name CHARTER Plus, with the aim of exploring the changing presentation of HIV neurological complications in the context of highly active antiretroviral therapy (HAART). The database and specimens are available for researchers and can be accessed through a NNTC application request.

Last Gift: The Last Gift Study was launched in 2017 with the aim of identifying dynamic reservoirs of HIV by following participants with HIV closely at end of life (EOL) to collect blood and support a body donation upon death and a rapid tissue donation to support further research (<https://lastgift.ucsd.edu>).

NIDA Opioid Study: The NIDA Opioid Study was a supplemental grant that was awarded to the NNTC starting in 2019 to allow for the collection of up to 100 brains from donors without HIV who died of an opiate related overdose. The tissues collected are designed to bolster the supply of HIV negative control samples to support substance use focused research on the impact of opiate use and HIV. Samples may be requested through the NNTC application process.

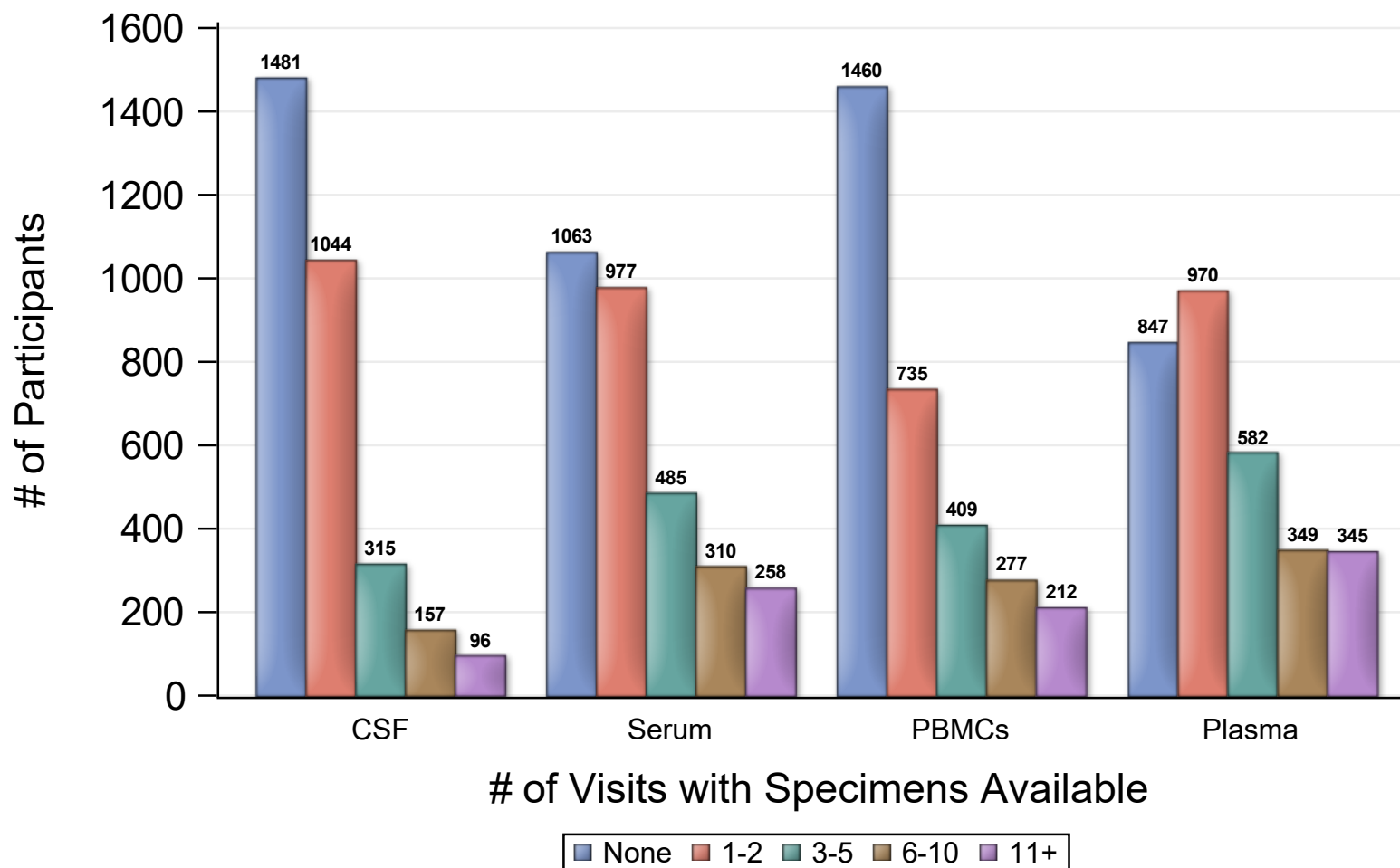


## Cohort Status (N=3094)



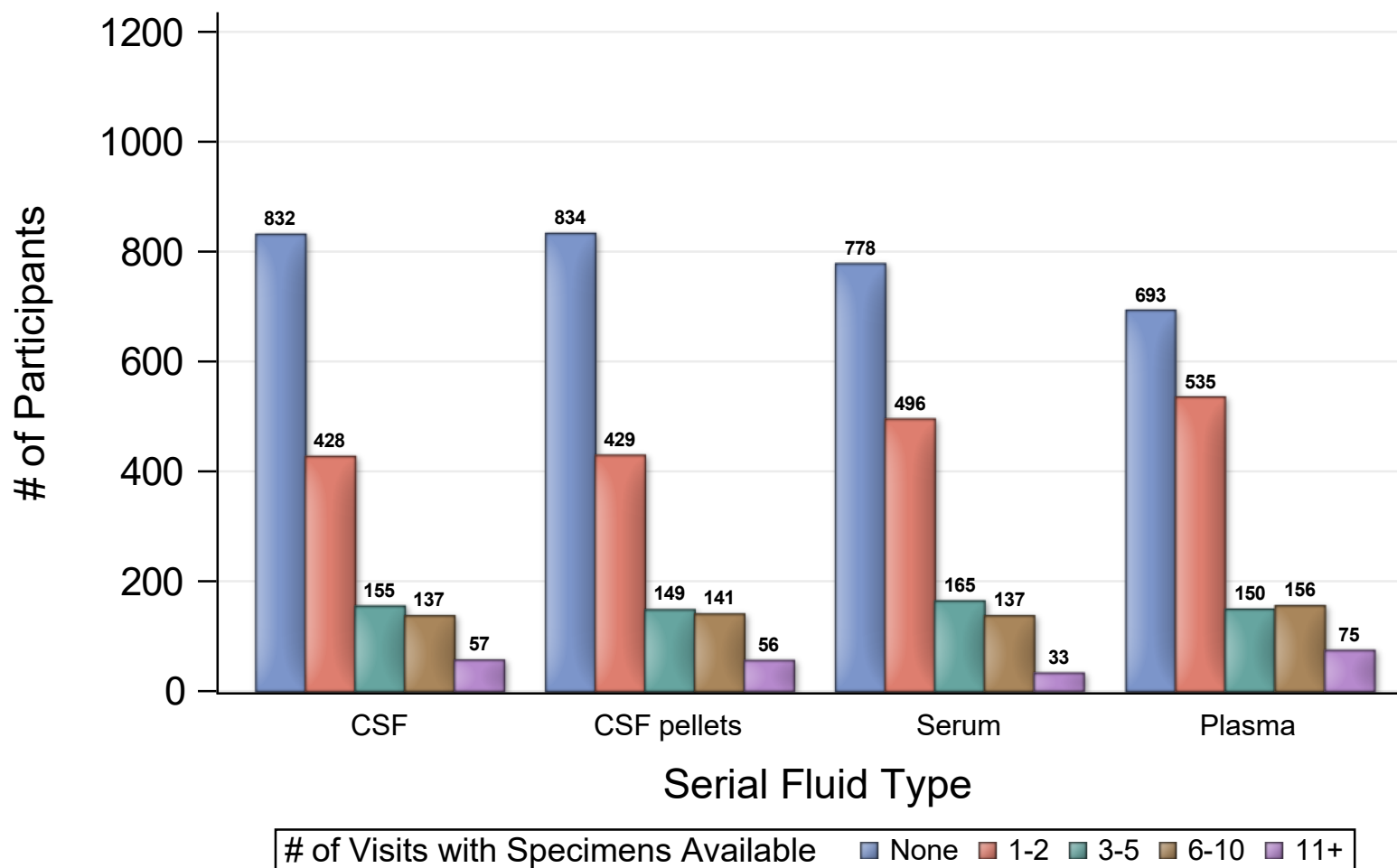
\*Group #'s reflect only those lost to follow-up (LTF), administratively censored (AC), or withdrawn (WD) on study

## Serial Fluid Specimen Inventory



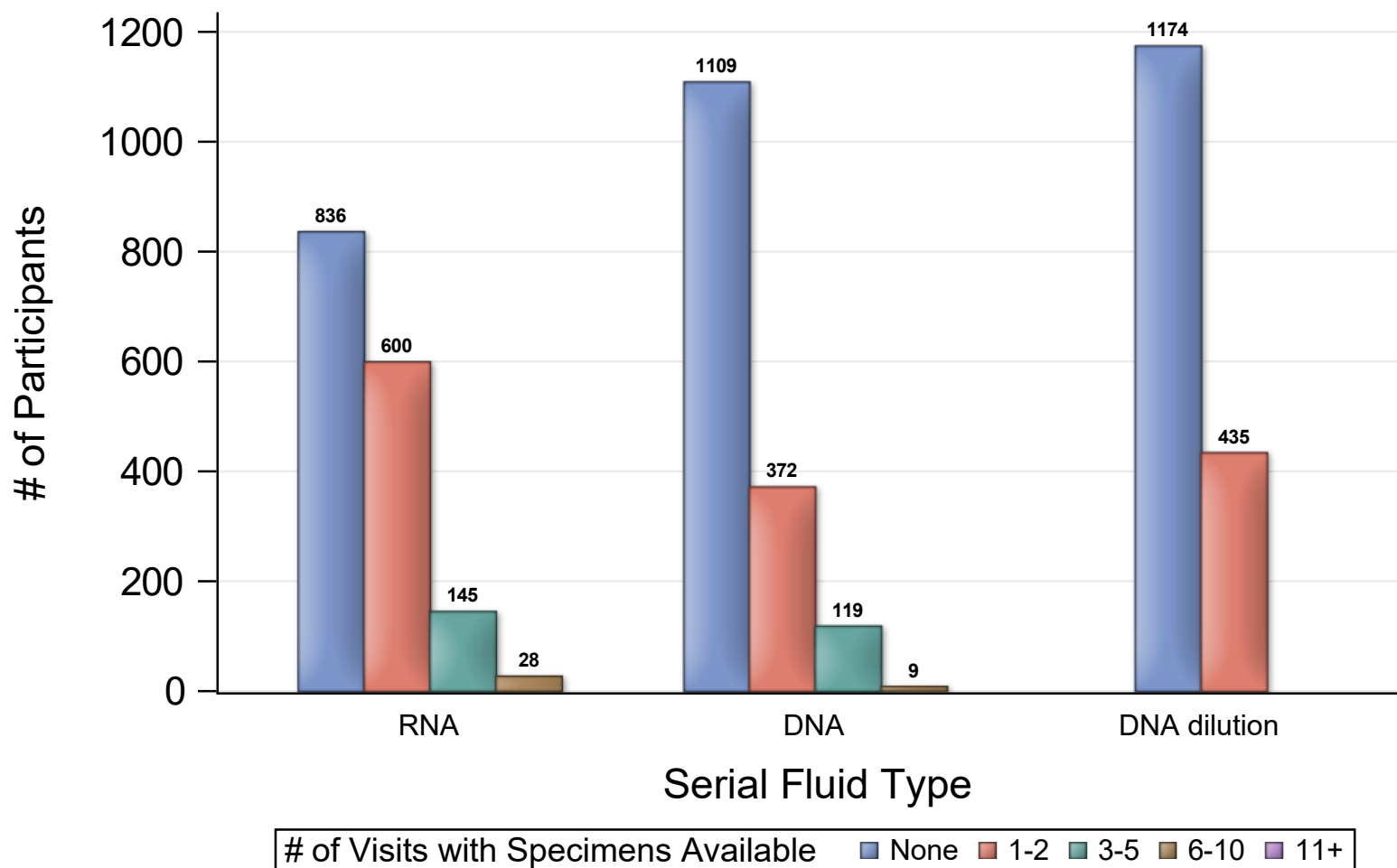
\*Each bar represents # of participants. 'None' represents a visit where the specimen type was either not collected or is depleted; Inventory totals include both ante- and post-mortem collections.

## CHARTER Serial Fluid Specimen Inventory



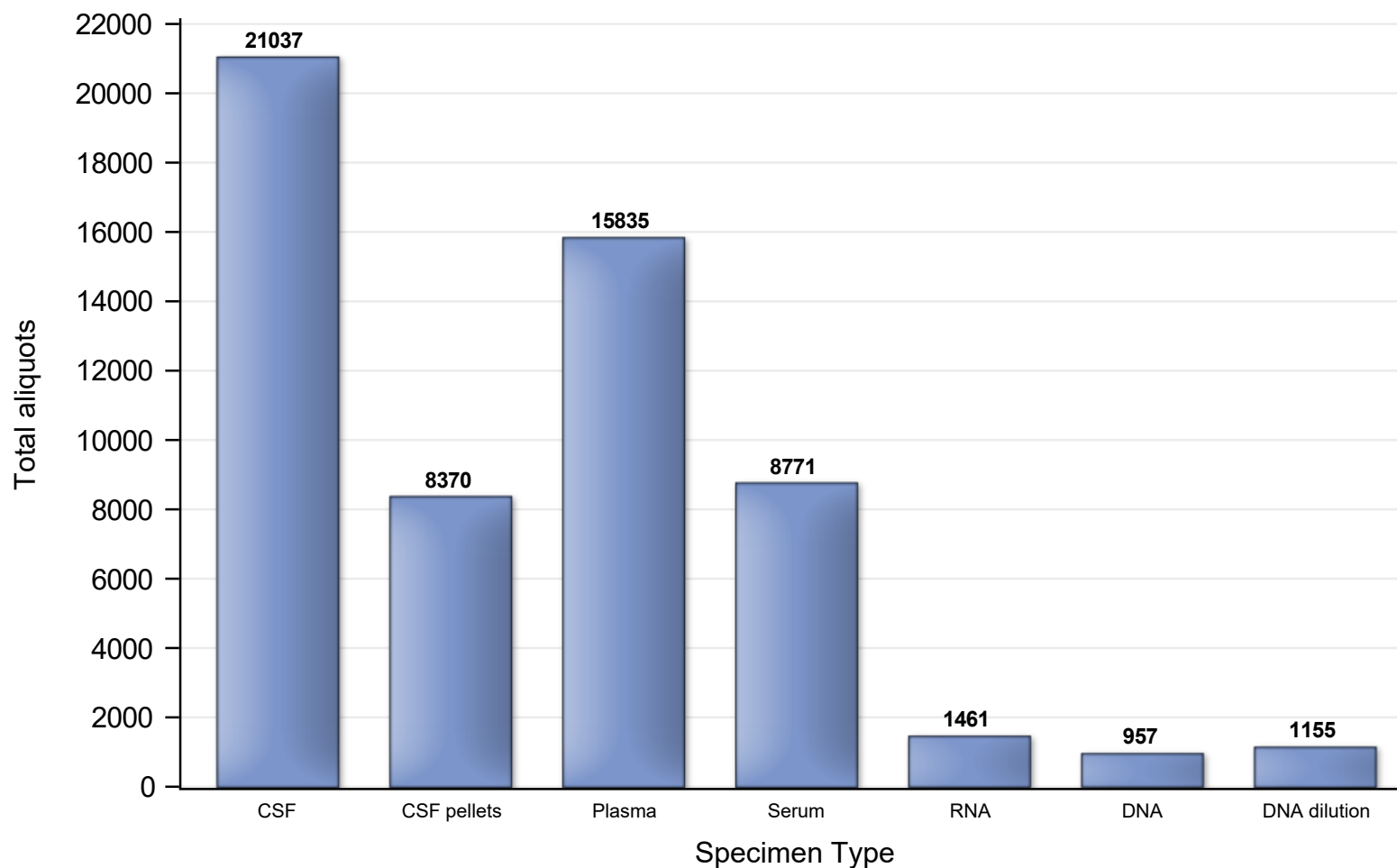
\*Each bar represents # of participants. 'None' represents a visit where the specimen type was either not collected or is depleted. CHARTER data presented on slides 11, 12, 13, 18, 19, 20 and 21 only.

## *CHARTER Serial Fluid Specimen Inventory*

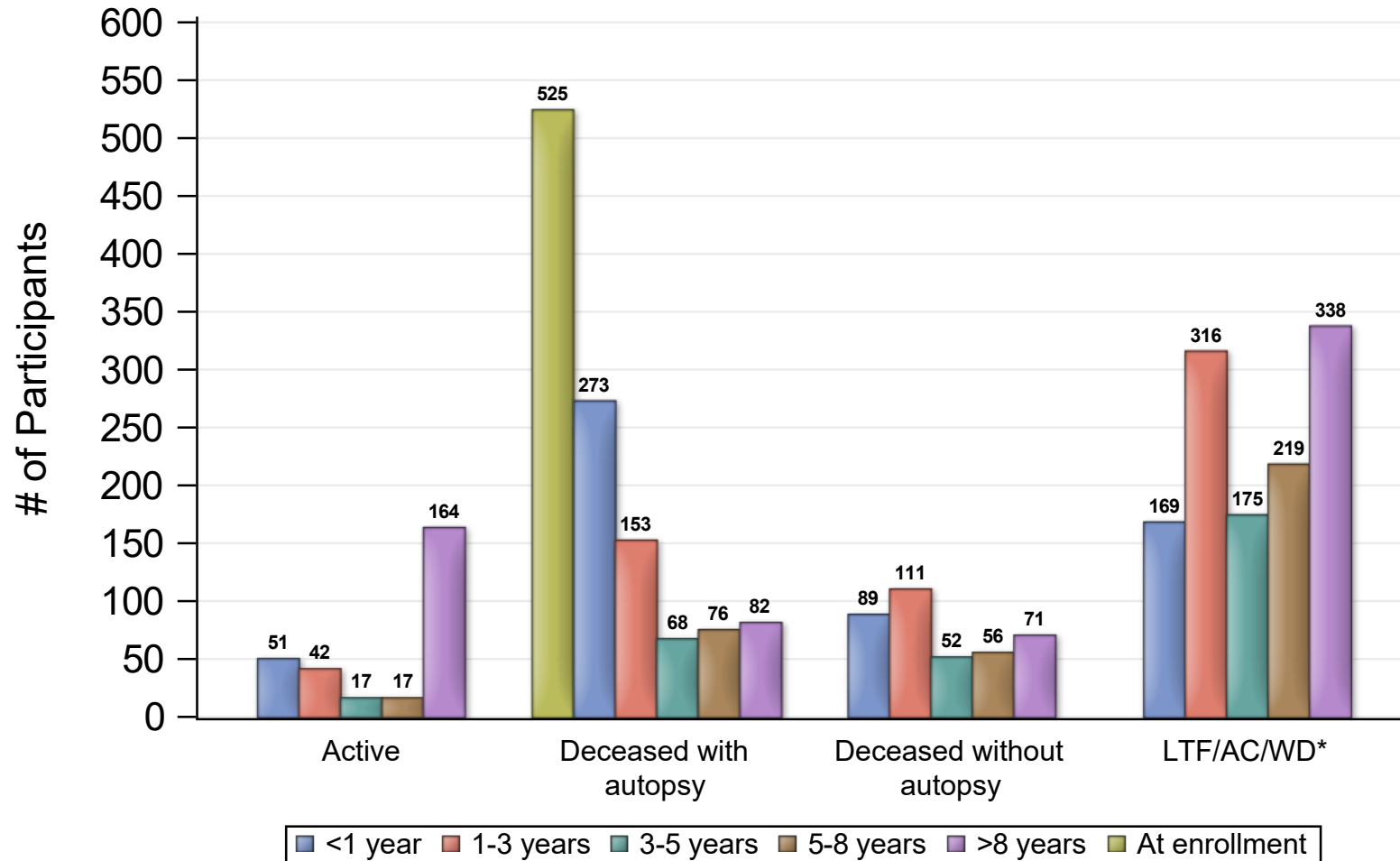


\*Each bar represents # of participants. 'None' represents a visit where the specimen type was either not collected or is depleted.  
CHARTER data presented on slides 11, 12, 13, 18, 19, 20 and 21 only.

## *Total Available CHARTER Aliquots by Specimen Type*

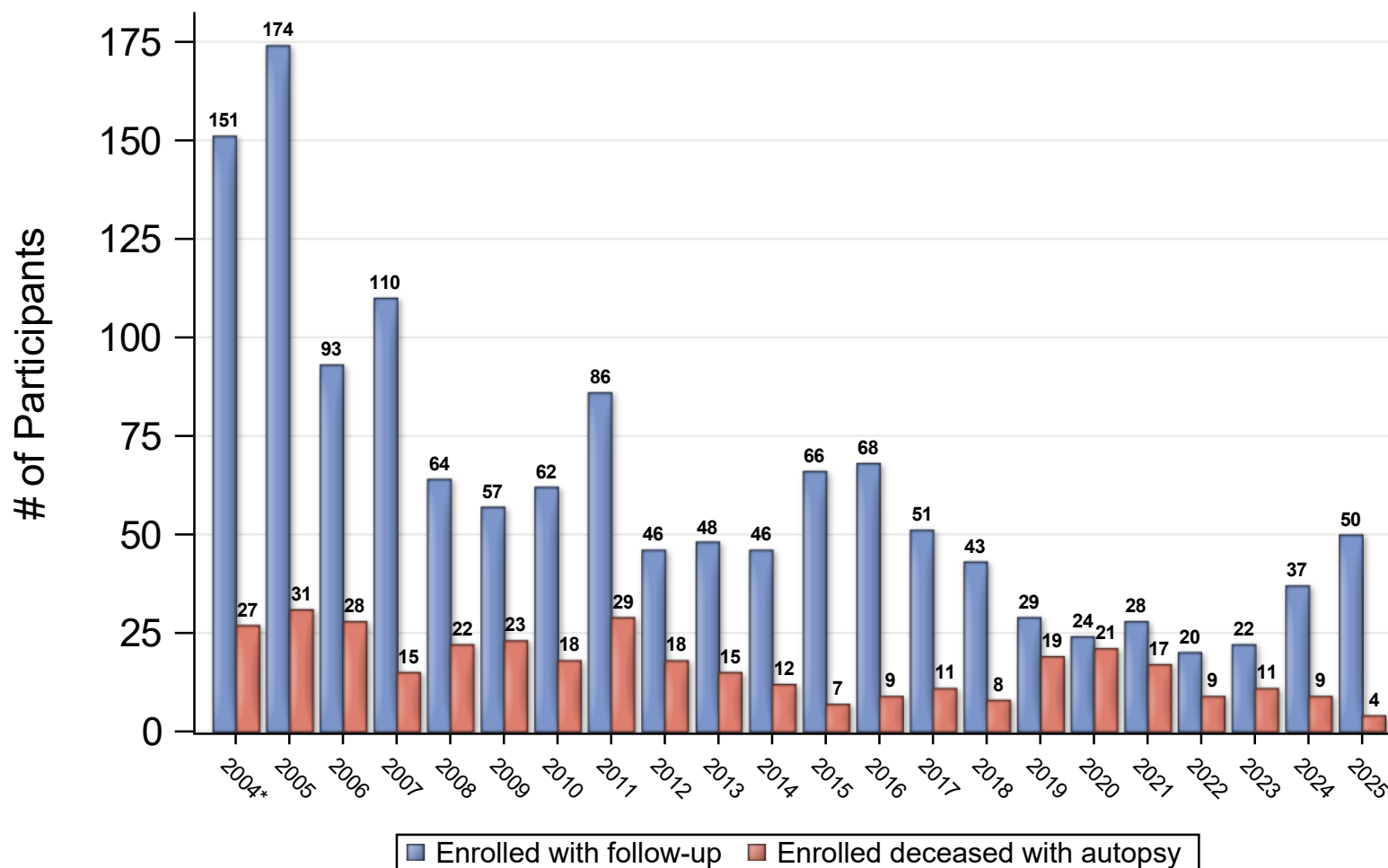


## Length of Study Participation



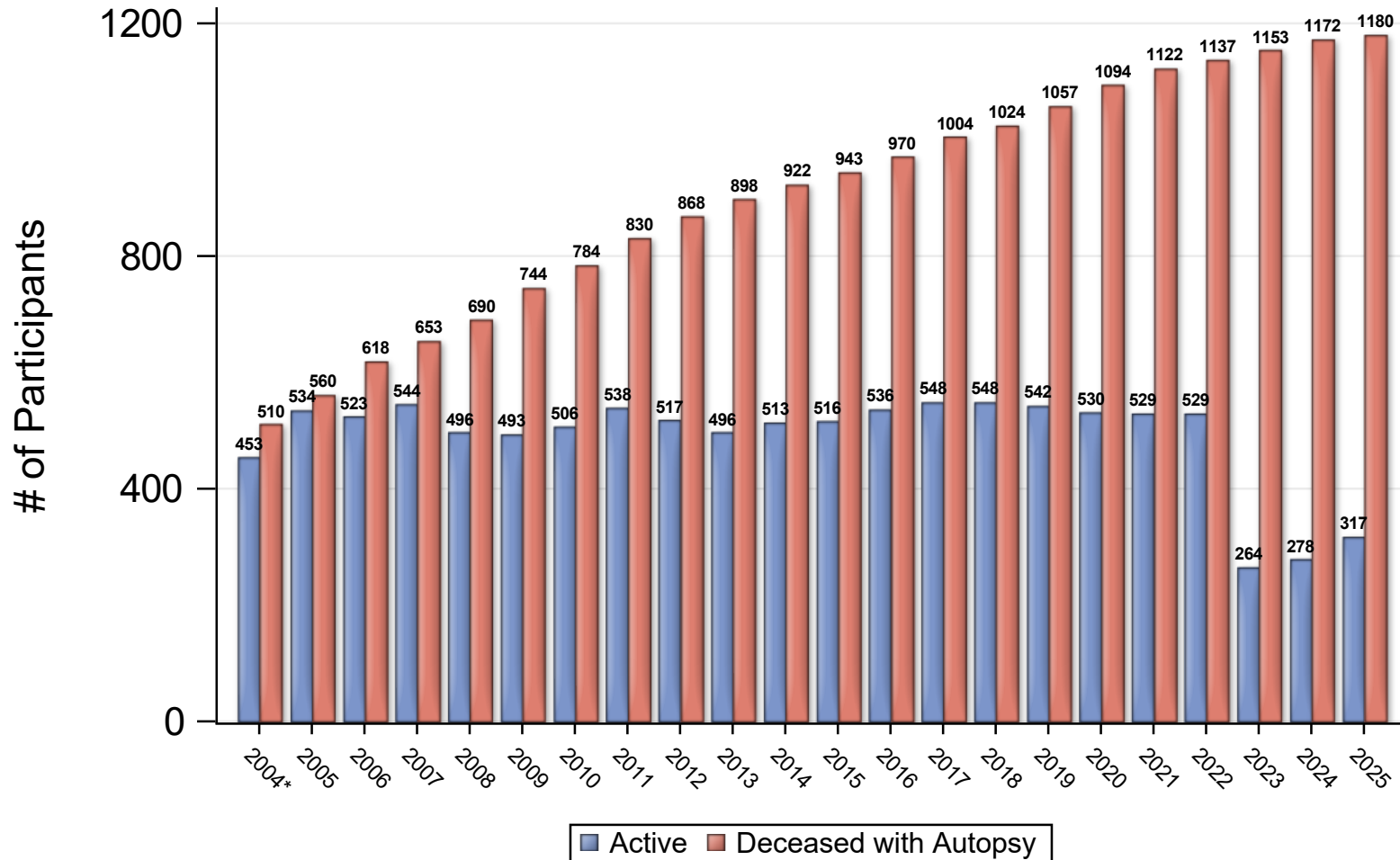
\*LTF = Lost to follow-up (LTF); AC = Administratively censored; WD = Withdrawn

## Participants Enrolled by Year



\*1194 Enrolled with follow-up and 162 Enrolled deceased with autopsy prior to 2004

## Cohort Status Over Time



\*576 Active and 472 Deceased w/ Autopsy prior to 2004



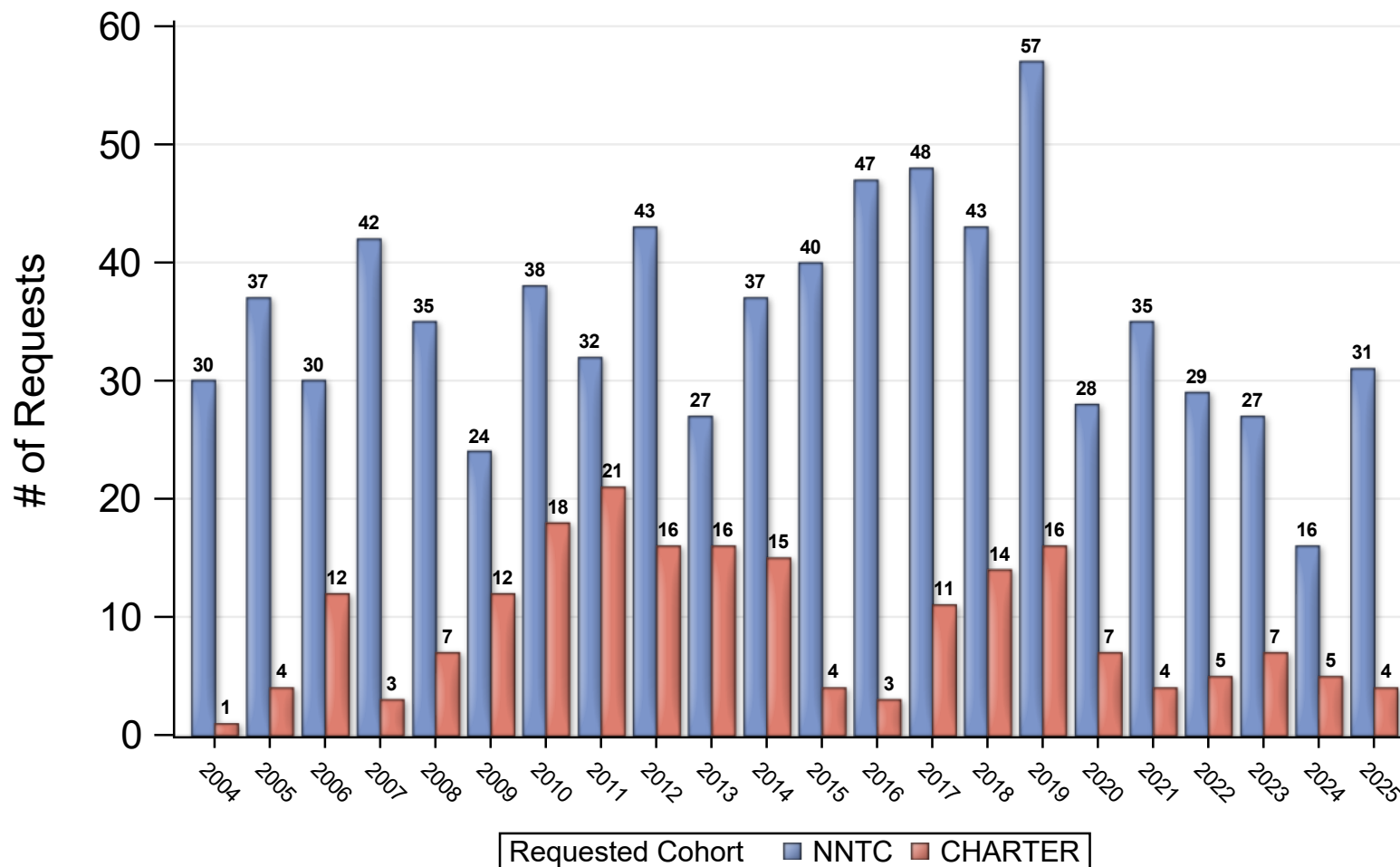
## Diagnostic Normality

Diagnosis at Baseline:	Active Cohort (N=316)	Overall Cohort (N=2569)
Normal Neuromedical Diagnosis	122 (39%)	627 (24%)
No abuse/dependence on PRISM/CIDI*	85 (27%)	526 (20%)
Both normal (Neuromedical & PRISM/CIDI)	39 (12%)	148 (6%)

Diagnosis $\geq$ 5 yrs on study:	Active Cohort (N=181)	Overall Cohort (N=1022)
Normal Neuromedical Diagnosis	63 (35%)	310 (30%)
No abuse/dependence on PRISM/CIDI*	63 (35%)	251 (25%)
Both normal (Neuromedical & PRISM/CIDI)	28 (15%)	85 (8%)

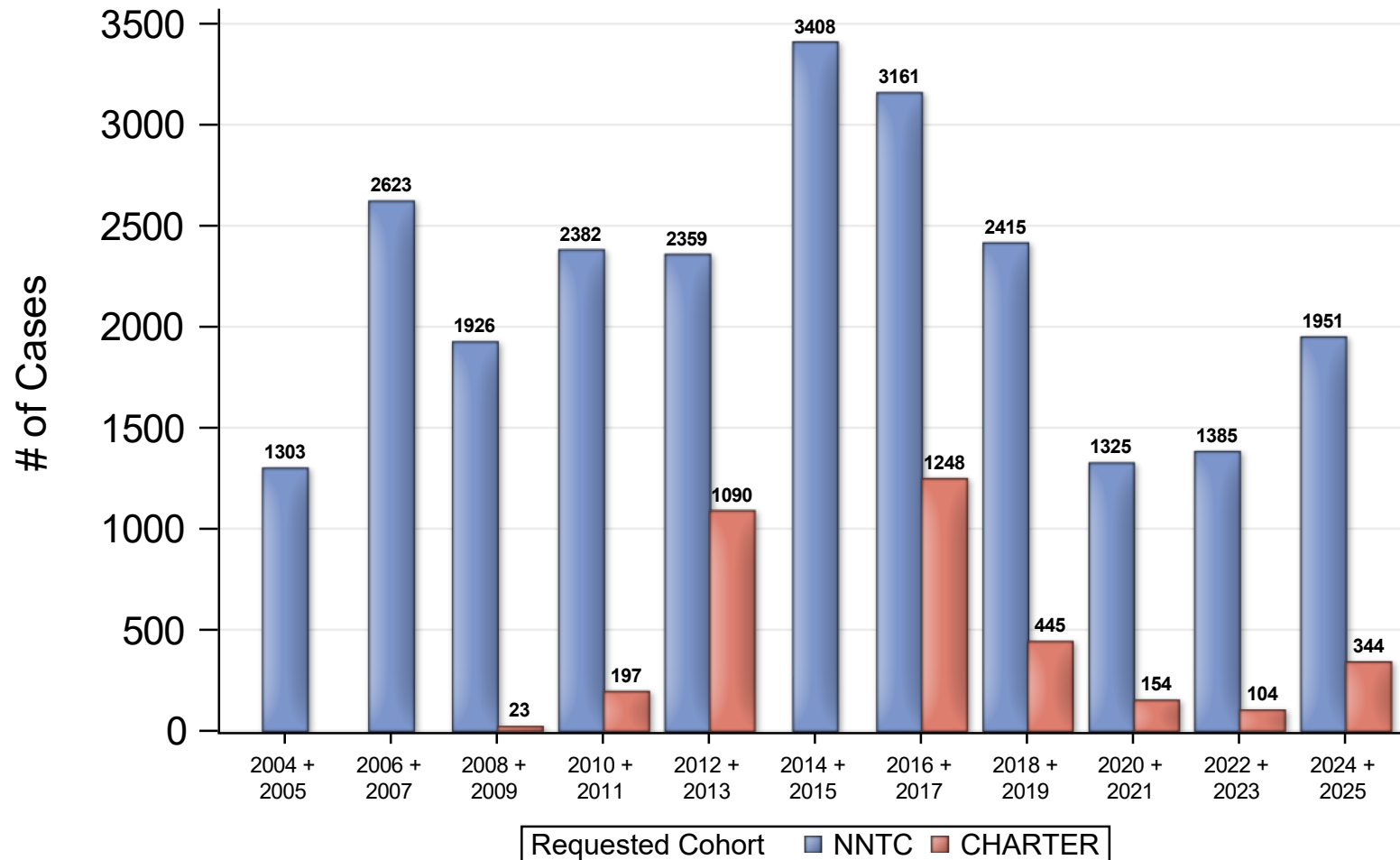
\*No abuse/dependence diagnosis reflects those cases with a submitted PRISM/CIDI where all drug categories are reported as 'normal'.

## Requests Submitted (N=1038)



\*95 requests submitted prior to 2004. Resource requests include consortium-wide requests and local requests for biospecimens, as well as requests for data and Letters of Support for grant submissions.

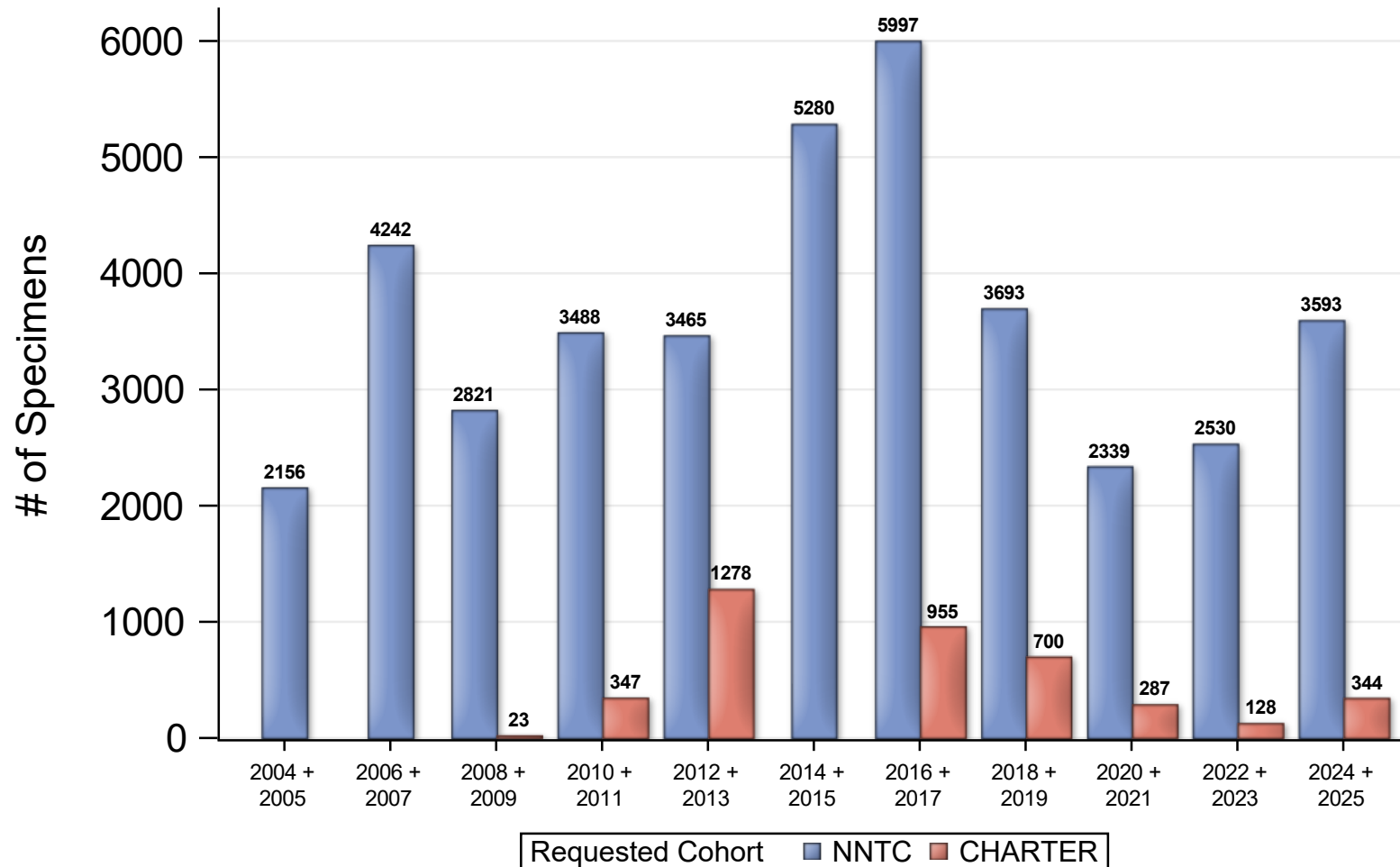
## Cases Shipped (N=29466)



\*1623 cases shipped prior to 2004. More than one specimen may be shipped per case.

Information limited on CHARTER shipments. CHARTER data presented on slides 11, 12, 13, 18, 19, 20 and 21 only.

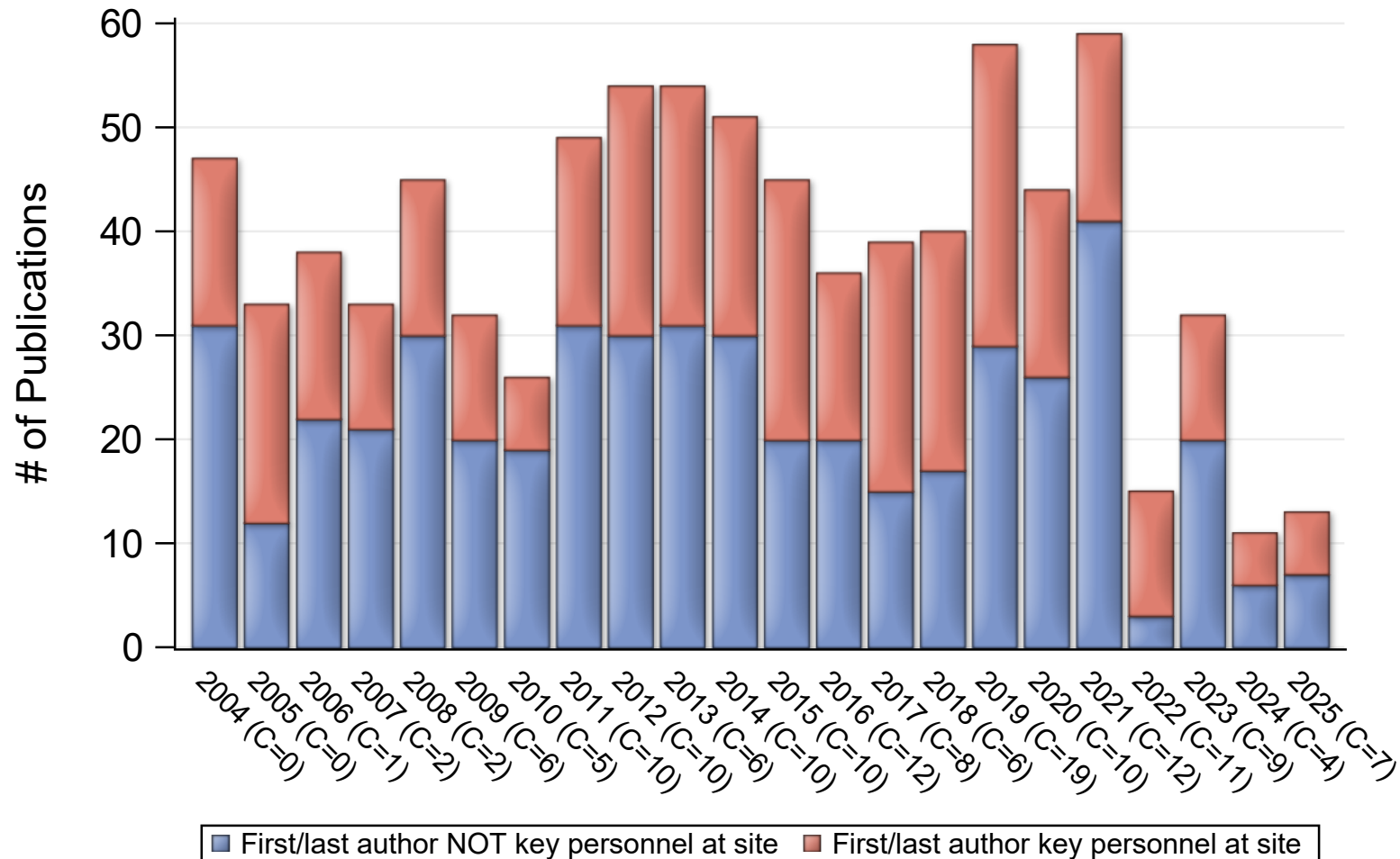
## Specimens Shipped (N=46113)



\*2447 specimens shipped prior to 2004.

Information limited on CHARTER shipments. CHARTER data presented on slides 11, 12, 13, 18, 19, 20 and 21 only.

## Total Publications\* (Total N=928; CHARTER N=160)



\*74 publications prior to 2004.

Total N includes 160 CHARTER (C=) publications. Total does not include 0 In Prep/Submitted/In Press, 281 Meeting Presentations/Abstracts, 12 Dissertations/Theses, 33 Books/Book Chapters, 8 Student Awards, or 24 Miscellaneous/Grants

CHARTER data presented on slides 11, 12, 13, 18, 19, 20 and 21 only.

## Test Results

<u>Result</u>	<u>N</u>	<u>%</u>		<u>N</u>	<u>%</u>
Negative	303	86	CDC PCR Test (FDA Approved)	73	21
Positive	50	14	DiaSorin Molecular PCR Test (FDA Approved)	33	9
Unique participants tested positive	41	29*	COVID-19 IgM/IgG Rapid Test	29	8
Nasopharyngeal swab	112	32	ABBOT SARS-COV-2 IGG/IGM ASSAY	28	8
Nasopharynx	45	13	Roche COBAS 6800 System	25	7
Nasal swab	32	9	Other	21	6
Anterior Nares	31	9	Agena MassARRAY	20	6
Blood	8	2	Cepheid GeneXpert	11	3
Pharyngeal swab	1	0	Lumria Dx	10	3
Unknown	124	35	ID NOW Assay	8	2
			Panther	8	2
			DiaSorin IgG test	4	1
			COV-2 NAAT	4	1
			SARS-COV-2 NAAT	4	1
			ABBOT SARS-COV-2 IGG/IGM ASSAY RAPID ID N	1	0
			IGM/IGG RAPID TEST	1	0
			MOLECULAR COVID-19 PCR TEST (FDA APPROVED)	1	0
			NASAL SWAB	1	0
			RAPID ID NOW COVID-19 ASSAY	1	0
			RAPID TEST	1	0
			SARS COV-2-RAPID ID NOW	1	0
			SARS-COV-2 RAPID ID NOW	1	0
			Unknown	67	19

\*Of unique participants tested.

## Specimen collections

Type:	# cases*
CNS tissue	11
Systemic tissue	11
Pre-mortem fluids	38
Post-mortem fluids	7

\*Indicates collection of at least one specimen type in respective category:

CNS: fixed/frozen brain, spinal cord, trigeminal and dorsal root ganglia.

Systemic: Pituitary gland, peripheral nerve, lymph node, liver, spleen, adipose tissue, bone marrow, muscle, hair, heart, thymus, kidney, lung, eye, bowel, and testes.

Pre-mortem fluids: plasma, serum, PBMC, CSF, and urine.

Post-mortem fluids: plasma, cardiac aspirate, CSF, serum, urine, and ascites fluid.

# Observational Cohort Overview



## Baseline Demographics

<u>N</u>	<u>2537</u>
<u>Age</u>	
Mean	47.2
SD	11.4
25th Percentile	39
Median	45
75th Percentile	54

## Baseline Demographics cont.

	<u>N</u>	<u>%</u>
<u>Sex</u>		
Male	2093	82
Female	471	18
<u>Ethnicity</u>		
Hispanic origin	673	26
<u>Race</u>		
White	1438	56
Black	835	33
Other	291	11

## Baseline Demographics cont.

	<u>N</u>	<u>%</u>
<u>Furthest Education</u>		
8th grade or less	238	10
Some High School	483	20
High School Graduate	515	22
Some College/Associate's Degree	673	28
College Graduate	278	12
Advanced Degree work	193	8

## Baseline HIV Characteristics

	<u>N</u>	<u>%</u>
<u>HIV risk</u>		
IV drug use	592	23
Male to male sex	1201	47
Heterosexual sex	560	22
Other	211	8
ARV med use	2316	90

## Baseline HIV Characteristics cont.

### CD4 Count (N=2376)

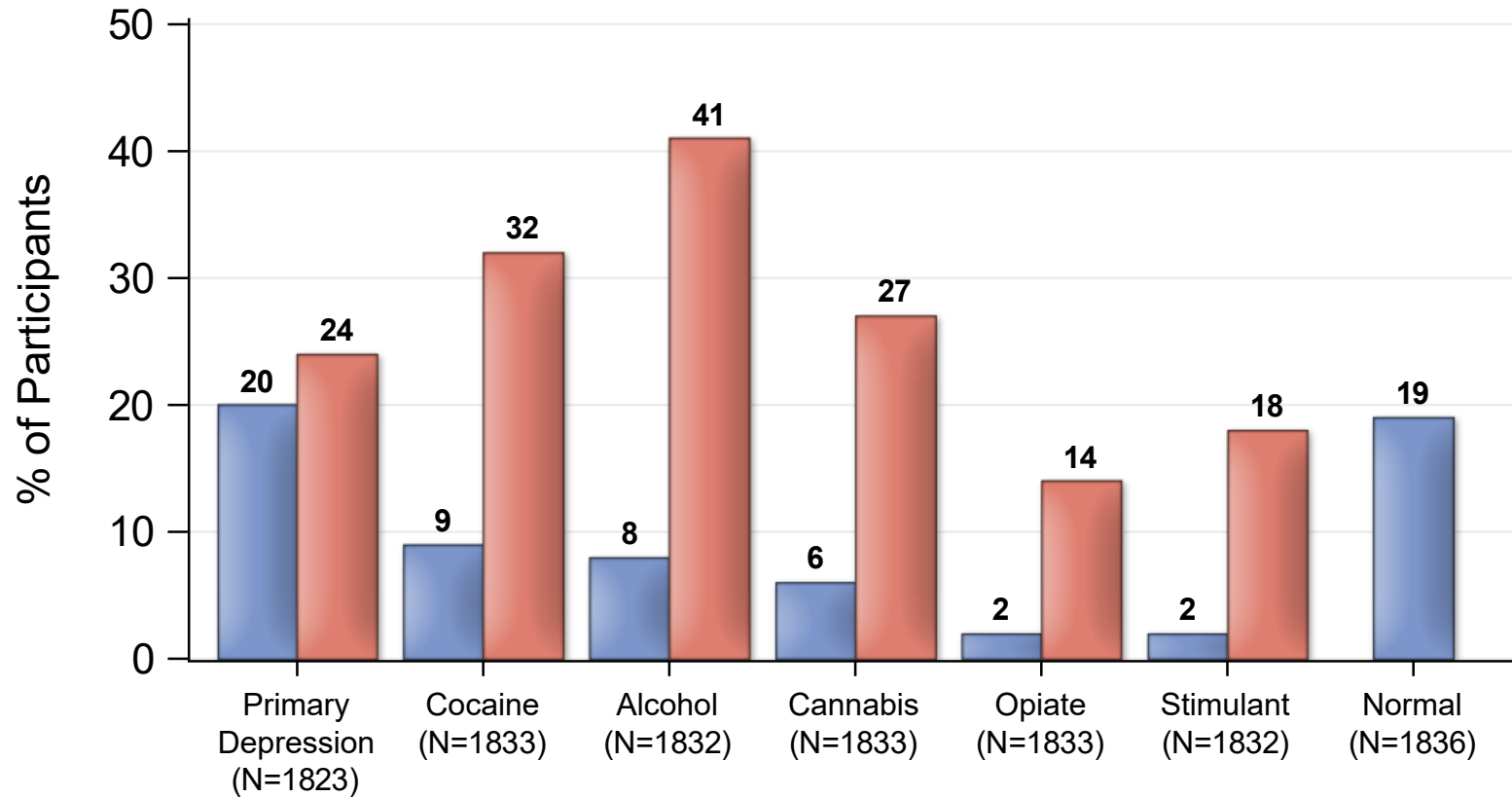
25th Percentile	56
Median	183
75th Percentile	429

### Log Plasma Viral Load\* (N=2102)

25th Percentile	1.70
Median	2.60
75th Percentile	4.47

\*Among those with known ARV medication status. 7 participants had detectable VL values of 0 where a viral log could not otherwise be calculated.

## Baseline Psychiatric Diagnoses

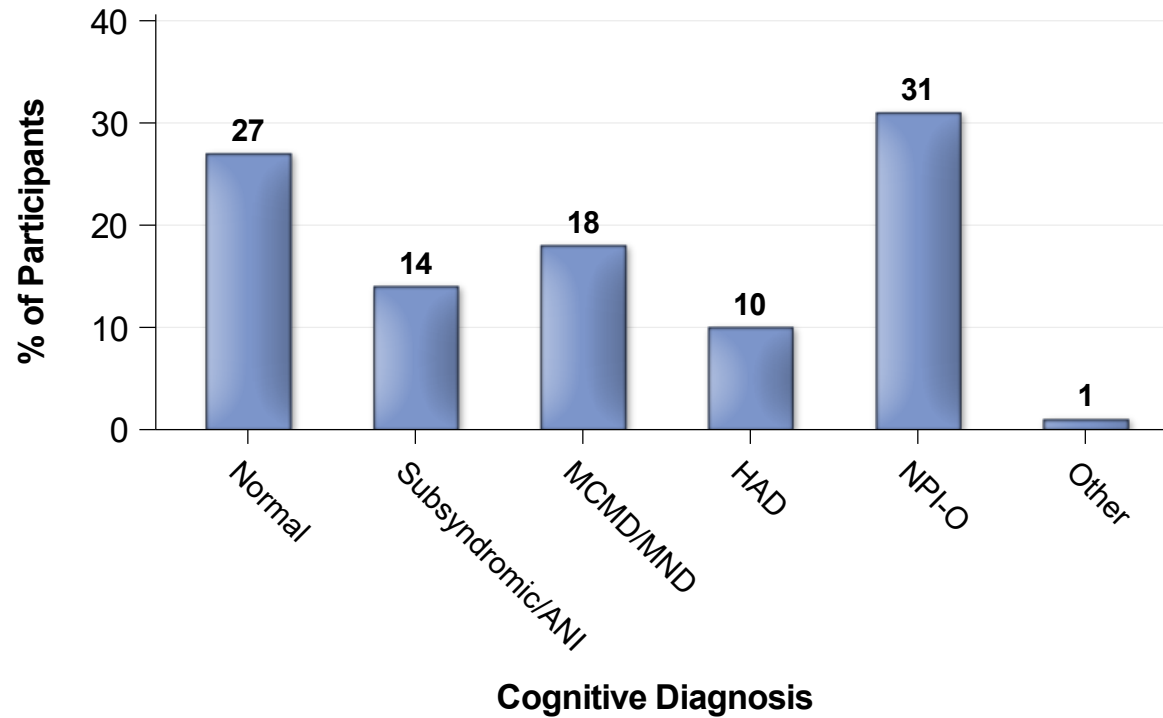


Psychiatric Diagnosis: Dependence or Abuse

■ Current or Current & Past ■ Past only

\*Please note the totals listed above reflect only those cases in the observational cohort who have undergone a PRISM/CIDI evaluation at baseline.

## Baseline Cognitive Diagnosis (N=2340\*)



ANI = Asymptomatic Neurocognitive Impairment

MCMD = Minor Cognitive Motor Disorder

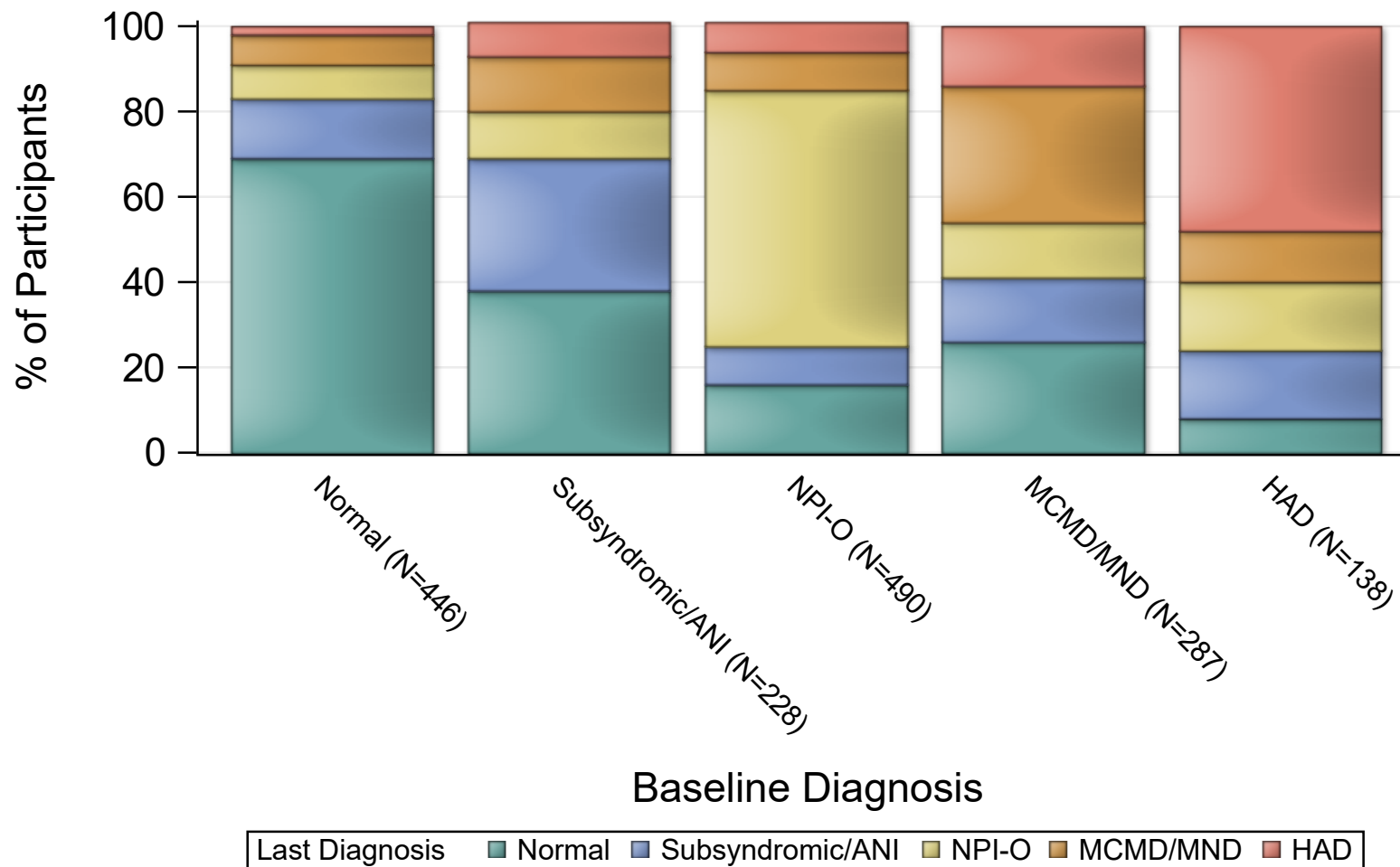
MND = Minor Neurocognitive Disorder

HAD = HIV-Associated Dementia

NPI-O = Neuropsychological Impairment - Other cause, not HIV

\*Please note the totals listed above reflect only those cases in the observational cohort who were assigned a cognitive diagnosis at baseline.

## Change in Cognitive Diagnosis





## Baseline Neurologic Diagnoses

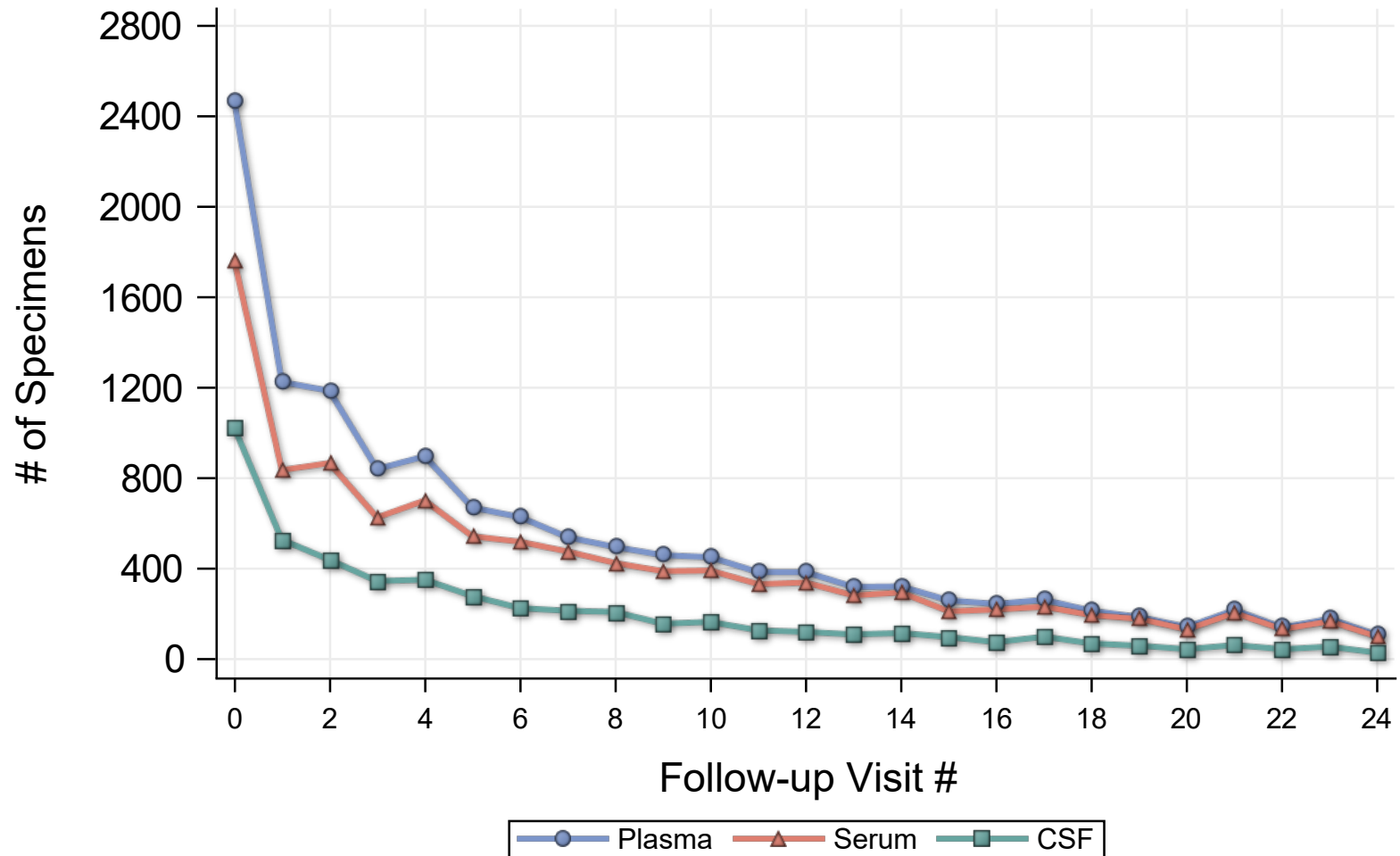
### Clinical Myelopathy (N=2269)

	<u>N</u>	<u>%</u>
HIV associated	166	7
Other	30	1
None	2073	91

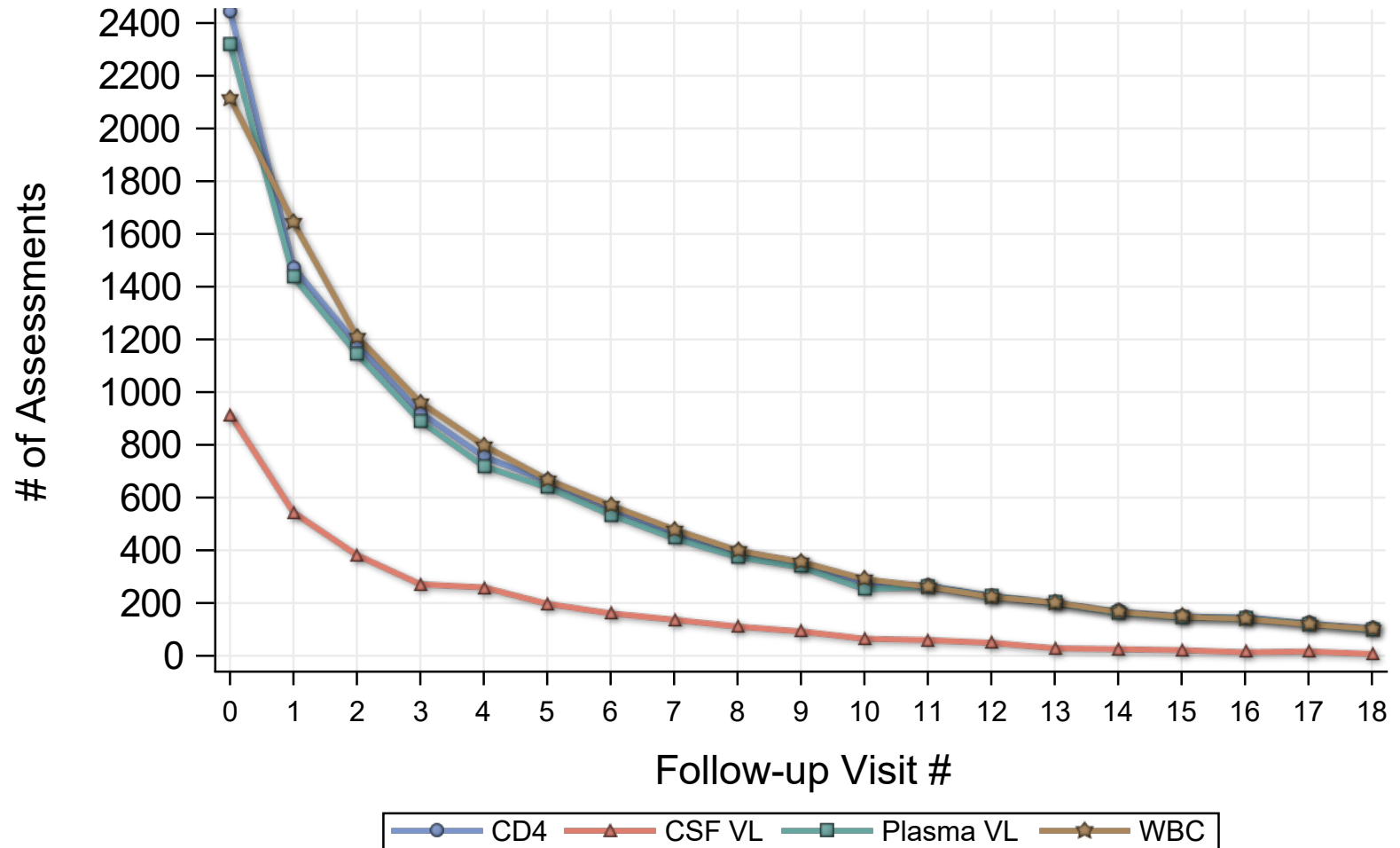
### Neuropathy (N=2135)

HIV associated DSP	718	34
Nucleoside associated	11	1
HIV/nucleoside	210	10
None	1196	56

## *Number of Available Fluid Collections, By Visit*



## *Number of Assessments Completed, By Visit*



## Participants Reporting Concomitant Medications

Medication	# of Pts (N=1891)	%
Central Nervous System Agents	1671	88.4
Anti-infective Agents	1477	78.1
Gastrointestinal Drugs	1125	59.5
Cardiovascular Drugs	1036	54.8
Vitamins	998	52.8
Hormones and Synthetic Substitutes	863	45.6
Autonomic Drugs	685	36.2
Electrolytic, Caloric, and Water Balance	669	35.4
Antihistamine Drugs	563	29.8
Blood Formation, Coagulation, and Thrombosis Agents	486	25.7
Skin and Mucous Membrane Agents	453	24
Miscellaneous Therapeutic Agents	433	22.9
Eye, Ear, Nose, and Throat (EENT) Preparations	305	16.1
Antineoplastic Agents	218	11.5
Respiratory Tract Agents	156	8.2
Local Anesthetics	112	5.9
No medication use reported on at least one occasion	106	5.6
Smooth Muscle Relaxants	85	4.5
Pharmaceutical Aids	44	2.3
Serums, Toxoids, and Vaccines	26	1.4

## Ancillary Lab Measurements

Ancillary Lab	Total # records overall	% cohort with at least 1 measure	Total # cases with baseline measure	% cohort with baseline & one other measure
<b>Miscellaneous Hematology</b>				
Red blood cells	8429	41	943	26
Mean Corpuscular Hemoglobin (MCH)	8399	41	940	25
Mean Corpuscular Volume (MCV)	16777	62	1466	42
Mean Corpuscular Hemoglobin Concentration (MCHC)	8407	40	910	25
Blood Red cell Distribution Width (RDW)	6614	29	488	12
Blood Rapid Plasma Reagin (RPR)	2060	27	387	7
Blood Neutrophil Percent	14420	49	994	28
Blood Lymphocyte Percent	16550	60	1418	41
Blood Monocyte Percent	16267	61	1443	41
Blood Eosinophil Percent	16167	61	1426	40
Blood Basophil Percent	15886	60	1378	38
Blood Mean Platelet Volume (MPV)	4689	19	286	7
Blood CD3 Percent	3060	23	554	16
Blood CD3 Absolute	1317	13	134	4
<b>Miscellaneous Serology &amp; virealogy</b>				
Blood Hepatitis B Surface Antigens	1077	21	428	6
Blood Hepatitis B Surface Antibodies	1039	20	409	6
Blood Hepatitis B Core Antibodies	1023	22	438	5
Blood Hepatitis B Viral Load	120	2	15	0
Blood Hepatitis C Antibodies (HCV)	2745	45	734	11
Blood Hepatitis C Viral Load	604	11	133	1
<b>Miscellaneous Serology &amp; virealogy</b>				
COVID-19 Test Results (qualitative)	321	5	14	0

## Ancillary Lab Measurements cont.

Ancillary Lab	Total # records overall	% cohort with at least 1 measure	Total # cases with baseline measure	% cohort with baseline & one other measure
<b>Miscellaneous Blood Chemistries</b>				
Glucose	15889	66	1552	43
Hemoglobin A1c	3809	31	347	7
Sodium	15456	66	1558	43
Calcium	14991	64	1479	41
Chloride	14690	60	1371	38
Potassium	15067	61	1422	40
Total Protein	13124	60	1368	38
Alkaline Phosphatase	14283	65	1475	41
AST	14133	65	1409	39
ALT	14033	64	1356	37
Total Bilirubin	14617	69	1585	44
Direct Bilirubin	3364	27	520	12
Creatinine	15727	67	1573	43
BUN	15393	65	1548	42
CO2	14391	59	1296	35
PT	4866	25	515	15
INR	4825	24	494	15
Urate	1278	11	240	6
Triglycerides	6705	47	816	20
Cholesterol	6700	47	815	20
LDL	5139	34	460	13
HDL	5715	40	574	14
Phosphorus	3681	24	509	12
LDH	1851	16	329	8
TSH	453	6	73	1
T4	44	1	9	0

## Ancillary Lab Measurements cont.

Ancillary Lab	Total # records overall	% cohort with at least 1 measure	Total # cases with baseline measure	% cohort with baseline & one other measure
<u>Miscellaneous CSF values</u>				
CSF-VDRL Test	758	9	151	3
<u>Miscellaneous Urine values</u>				
Urinalysis: Glucose	4917	25	553	17
Urinalysis: Protein	4965	26	557	17
Urinalysis: pH	4919	26	555	17
Urinalysis: Specific Gravity	4924	26	554	17
Urinalysis: Ketones	4911	25	554	17
Urinalysis: Bilirubin	4906	25	551	17
Urine Toxicology; Methamphetamine	5773	41	955	27
Urinalysis: Red Blood Cells	2238	19	301	8
Urinalysis: White Blood Cells	2243	19	298	8

## Comorbidities

<b>Diagnosis</b>	<b># Pts before Baseline (N=1417)</b>	<b># Pts at Baseline (N=2569)</b>	<b># Pts Current* (N=1468)</b>
Viral Hepatitis	640 (45%)	737 (36%)	459 (31%)
Tobacco Smoking	643 (45%)	724 (35%)	406 (28%)
Hypertension	471 (33%)	685 (33%)	623 (42%)
Hyperlipidemia	391 (28%)	517 (25%)	534 (36%)
Non AIDS Defining Cancer	183 (13%)	363 (18%)	349 (24%)
Diabetes	205 (14%)	293 (14%)	278 (19%)
Cardiac Disease	185 (13%)	279 (14%)	297 (20%)
Cerebrovascular Disease	155 (11%)	217 (11%)	213 (15%)
COPD	157 (11%)	212 (10%)	249 (17%)
Chronic Renal Disease	132 (9%)	210 (10%)	224 (15%)
Lipodystrophy	113 (8%)	191 (9%)	143 (10%)
End Stage Liver Disease	56 (4%)	95 (5%)	66 (4%)

\*Includes participants where last visit is different from baseline visit.



# Active Cohort Overview

## Current Demographics

<u>N</u>	<u>316</u>
<u>Age</u>	
Mean	65.4
SD	8.2
25th Percentile	60
Median	65
75th Percentile	71
<u>ARV med use</u>	
N	199
%	63

## Baseline Demographics

<u>N</u>	<u>291</u>
<u>Age</u>	
Mean	55.6
SD	11.6
25th Percentile	47
Median	57
75th Percentile	65

## Demographics

	<u>N</u>	<u>%</u>
<u>Sex</u>		
Male	227	72
Female	89	28
<u>Ethnicity</u>		
Hispanic origin	72	23
<u>Race</u>		
White	171	54
Black	106	34
Other	39	12

## Demographics cont.

	<u>N</u>	<u>%</u>
<u>Furthest Education</u>		
8th grade or less	12	4
Some High School	59	19
High School Graduate	46	15
Some College/Associate's Degree	99	31
College Graduate	58	18
Advanced Degree work	41	13

## Baseline HIV Characteristics

	<u>N</u>	<u>%</u>
<u>HIV risk</u>		
IV drug use	44	14
Male to male sex	130	41
Heterosexual sex	74	23
Other	68	22
ARV med use	240	76

## Current HIV Characteristics

### CD4 Count (N=305)

25th Percentile	397
Median	558
75th Percentile	761

### Log Plasma Viral Load\* (N=281)

25th Percentile	1.30
Median	1.48
75th Percentile	1.67

## Baseline HIV Characteristics

### CD4 Count (N=301)

25th Percentile	294
Median	510
75th Percentile	733

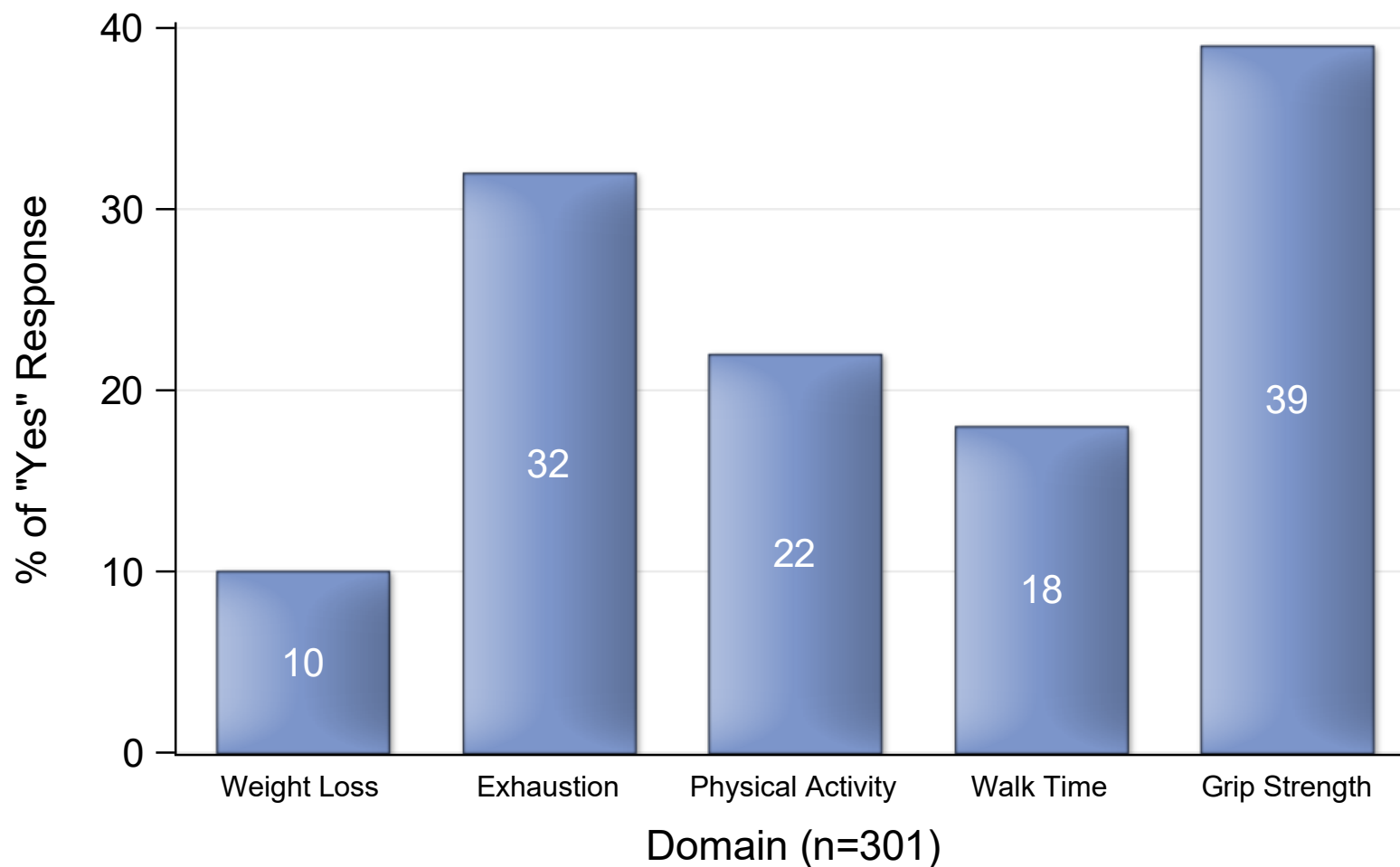
### Log Plasma Viral Load\* (N=264)

25th Percentile	1.48
Median	1.70
75th Percentile	2.04

\*Among those with known ARV medication status. 0 participants had detectable VL values of 0 where a viral log could not otherwise be calculated.



## Frailty Domain Frequency



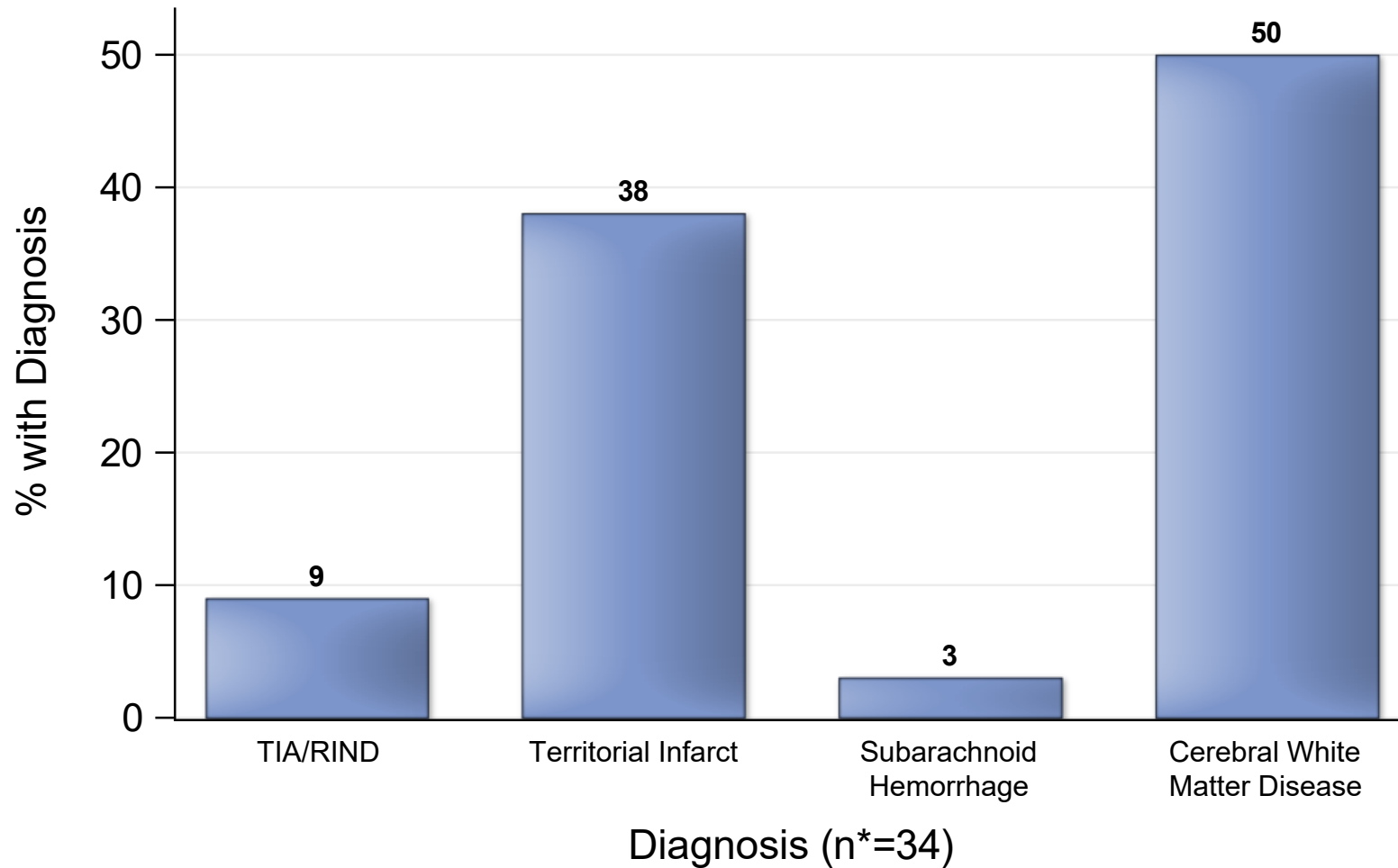
\*From the first available visit. Domains with missing responses are categorized as 'no'.

## Frailty Demographics

<u>Characteristics:</u>	<u>All Frailty Stages</u>	<u>Not Frail</u>	<u>Pre-frail</u>	<u>Frail</u>
N*	301	85	178	38
<u>Age</u>				
Mean	60.3	60.5	60.4	59.5
Std	8.5	8.0	8.7	8.8
<u>Sex</u>				
Male	216 (72%)	63 (29%)	130 (60%)	23 (11%)
Female	85 (28%)	22 (26%)	48 (56%)	15 (18%)

\*Frailty stage from the first available visit. Sex unknown for some recent cases.

## Cerebrovascular Diagnosis Frequency



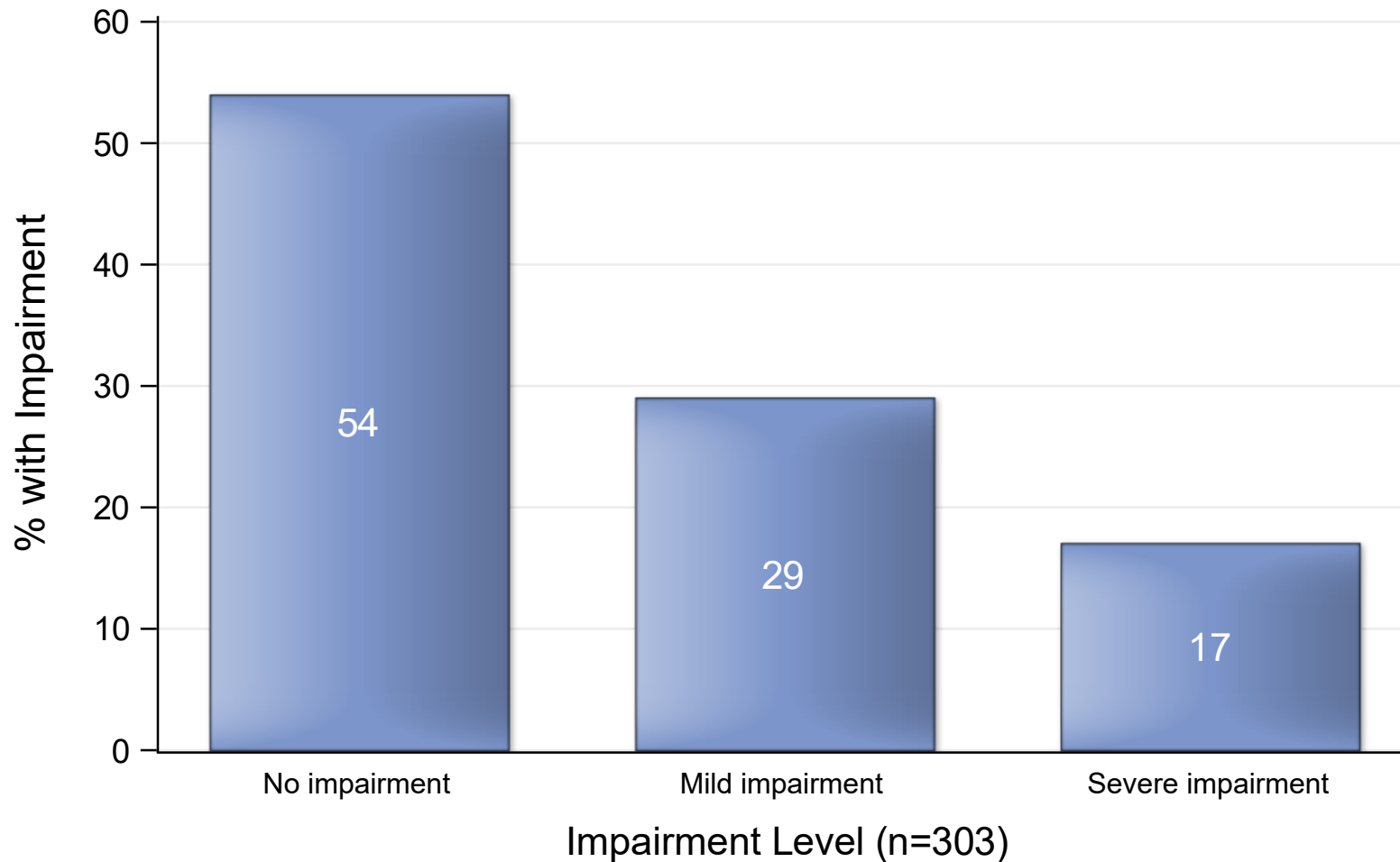
\*From the first available visit. 58 participants have an assigned diagnosis at baseline.

## Cerebrovascular Demographics

<u>Characteristics:</u>	<u>All Records</u>	<u>Condition not present</u>	<u>Condition present</u>	<u>Unable to definitively diagnose</u>
N*	200	159	34	7
<u>Age</u>				
Mean	58.0	57.4	61.4	56.0
Std	8.5	8.7	7.2	8.5
<u>Sex</u>				
Male	127 (64%)	102 (80%)	21 (17%)	4 (3%)
Female	73 (37%)	57 (78%)	13 (18%)	3 (4%)

\*Cerebrovascular disease diagnosis from the first available visit. Sex unknown for some recent cases.

## HIV Motor Scale - Impairment Rating

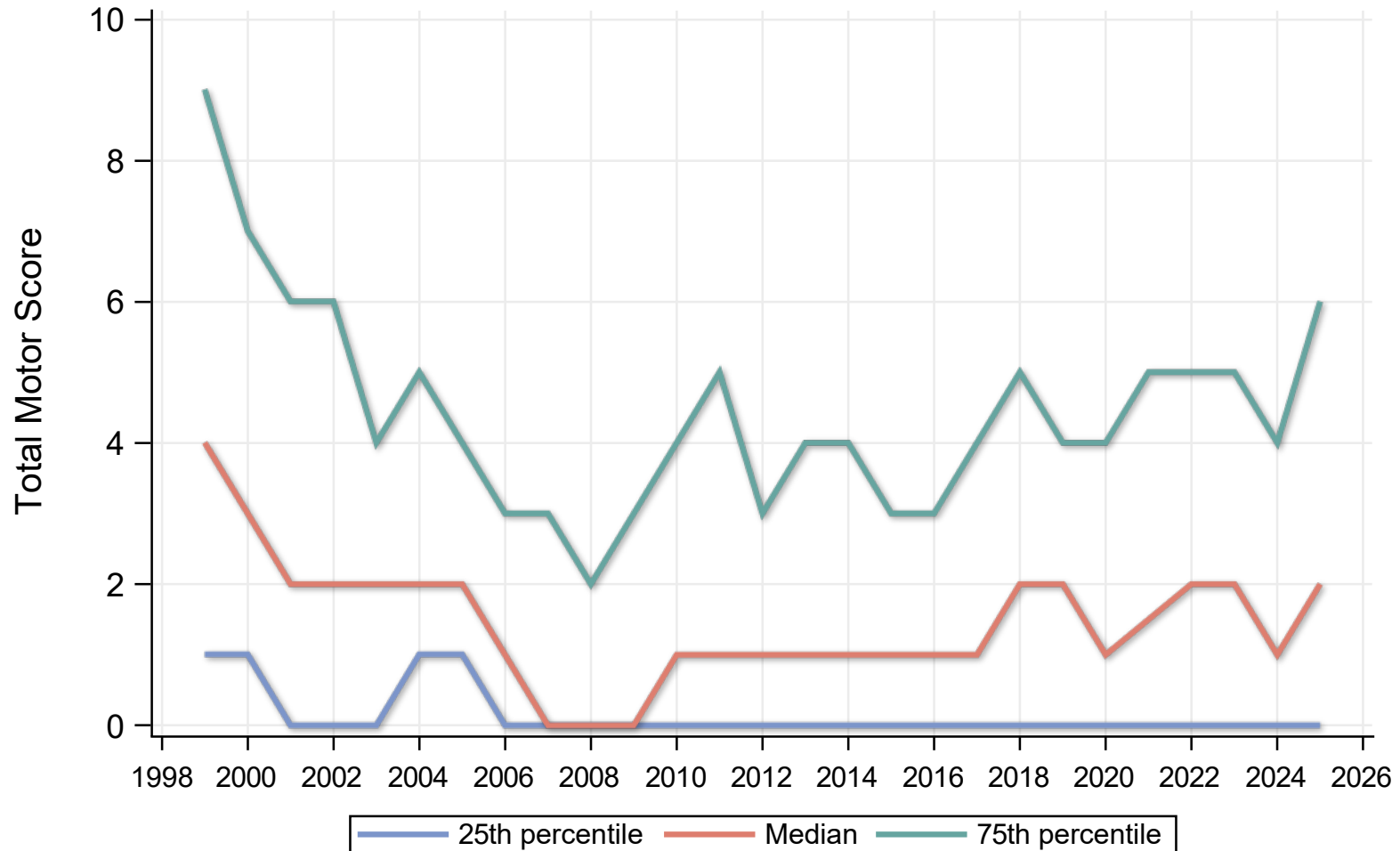


\*From the first available visit.

The HIV Motor Scale measures neurological function in the following domains: strength, deep tendon reflexes, motor tone and strength, and coordination and gait.

The Total Motor Score is a continuous measure on a scale of 0-18, with a score of 0 indicating a normal assessment; 1-4 indicating mild impairment; and 5 or more indicating severe impairment.

## HIV Motor Scale



The HIV Motor Scale measures neurological function in the following domains: strength, deep tendon reflexes, motor tone and strength, and coordination and gait.

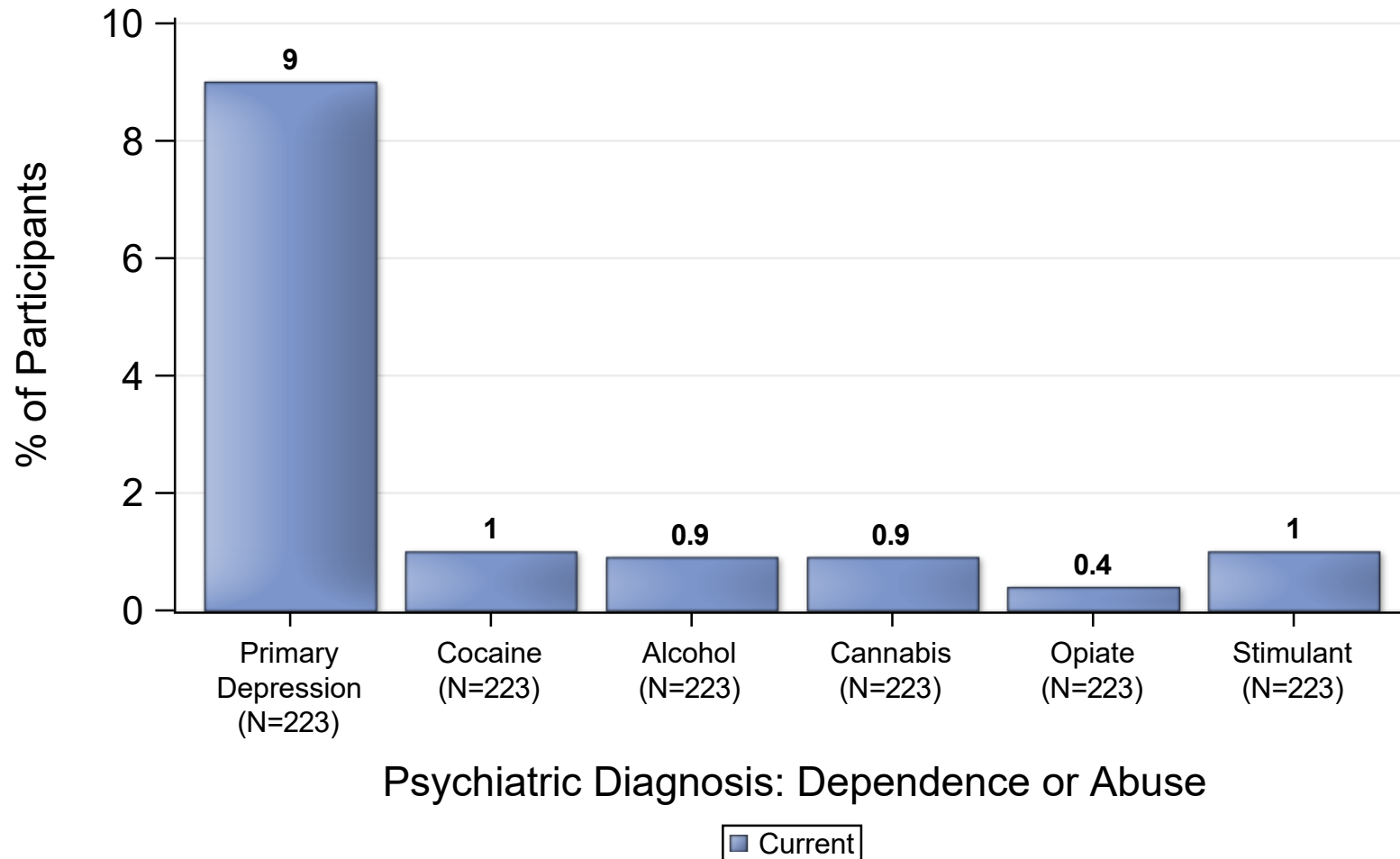
The Total Motor Score is a continuous measure on a scale of 0-18, with a score of 0 indicating a normal assessment; 1-4 indicating mild impairment; and 5 or more indicating severe impairment.

## HIV Motor Scale Demographics

<u>Characteristics:</u>	<u>All Records</u>	<u>No impairment</u>	<u>Mild impairment</u>	<u>Severe impairment</u>
N*	303	164	89	50
<u>Age</u>				
Mean	55.8	55.0	56.9	56.3
Std	11.0	11.1	10.0	12.3
<u>Sex</u>				
Male	214 (71%)	123 (57%)	60 (28%)	31 (14%)
Female	89 (29%)	41 (46%)	29 (33%)	19 (21%)

\*HIV Motor Scale impairment from the first available visit. Sex unknown for some recent cases.

## Current Psychiatric Diagnosis

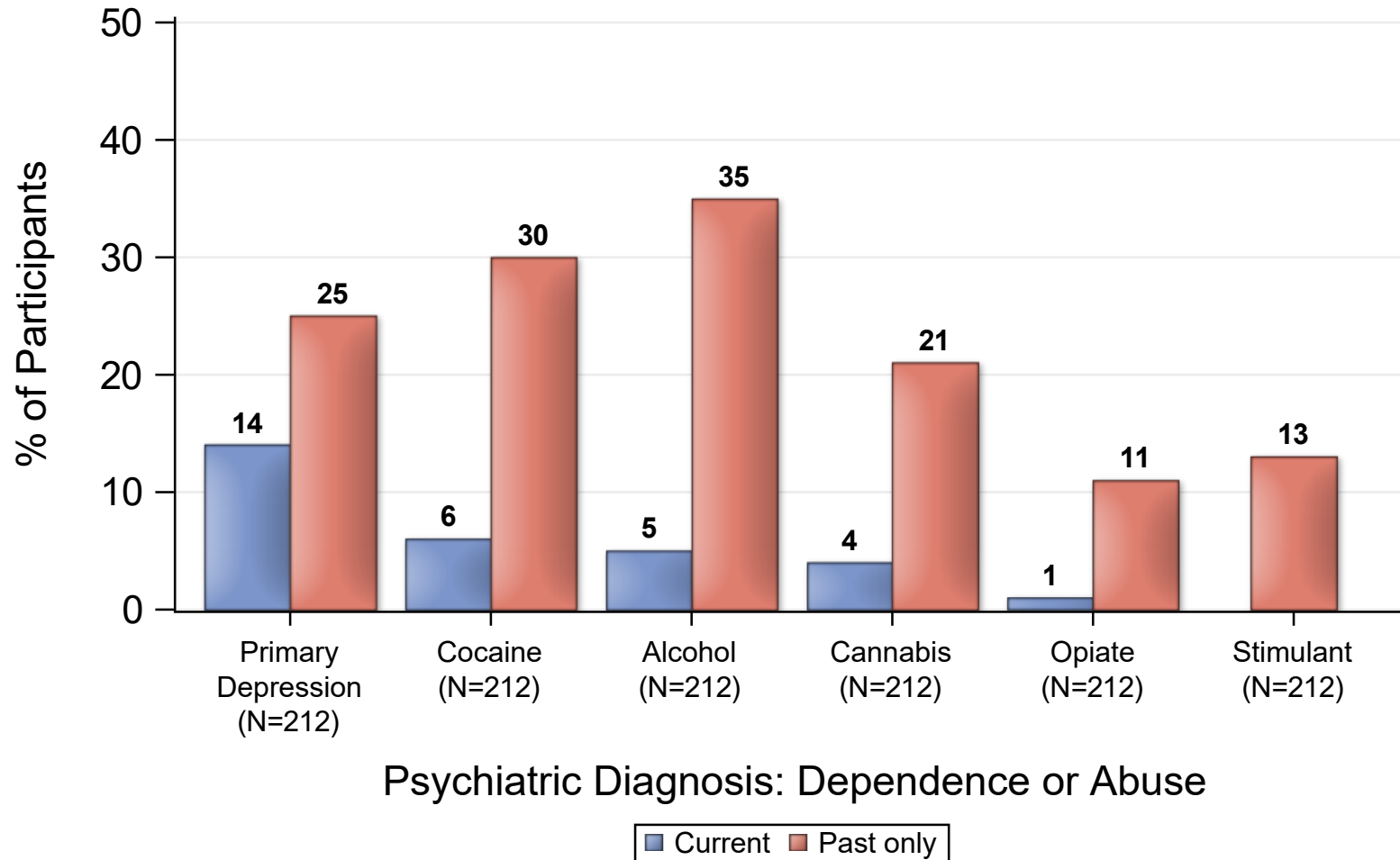


76% are Normal/Test Not Administered

\*Please note the totals listed above reflect only those cases in the active cohort who have undergone a PRISM/CIDI evaluation.



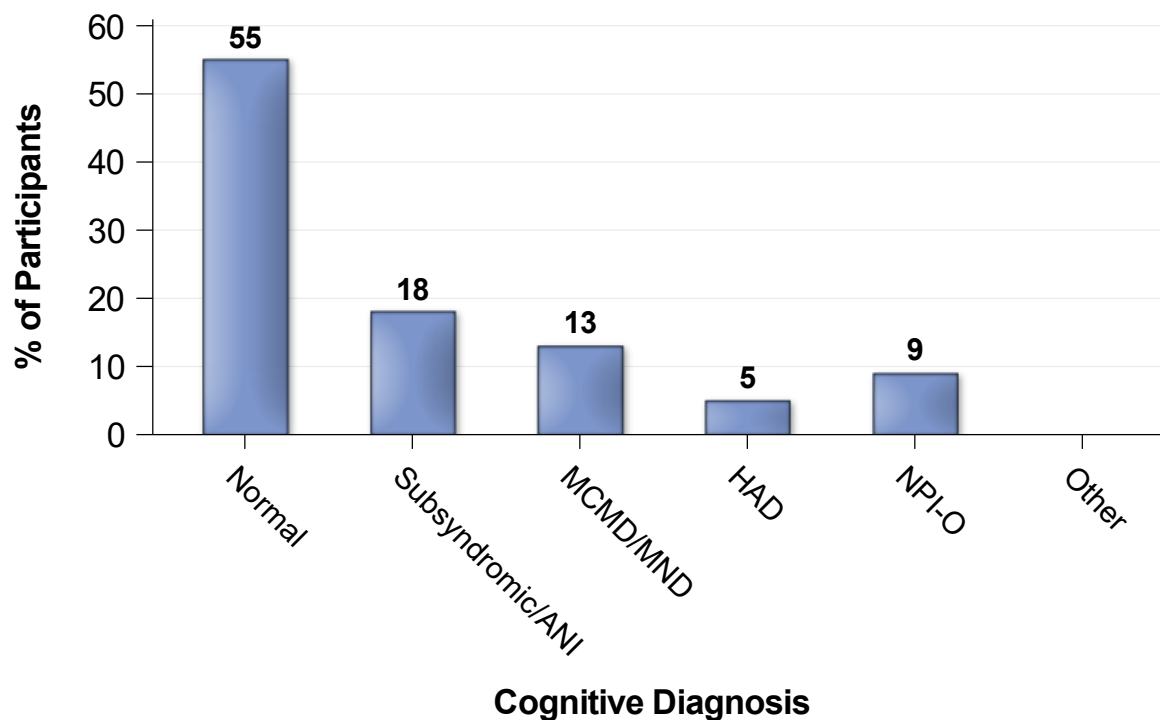
## Baseline Psychiatric Diagnosis



27% are Normal/Test Not Administered

\*Please note the totals listed above reflect only those cases in the active cohort who have undergone a PRISM/CIDI evaluation.

## *Current Cognitive Diagnosis (N=271\*)*



ANI = Asymptomatic Neurocognitive Impairment

MCMD = Minor Cognitive Motor Disorder

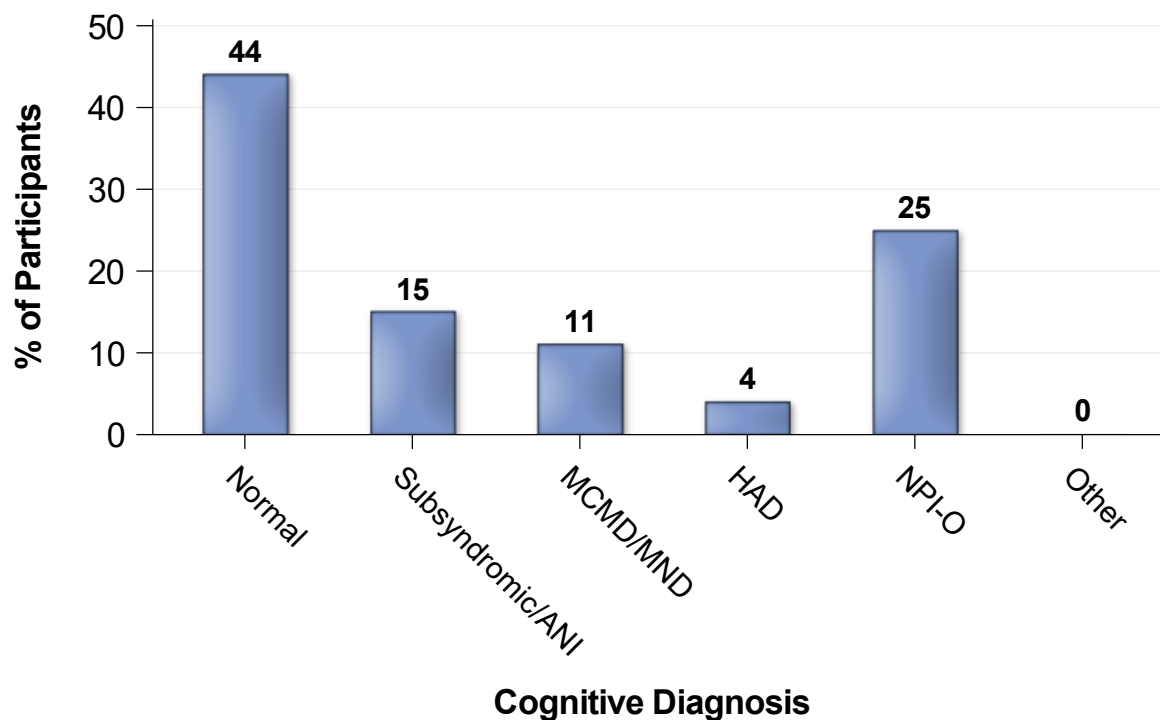
MND = Minor Neurocognitive Disorder

HAD = HIV-Associated Dementia

NPI-O = Neuropsychological Impairment - Other cause, not HIV

\*Please note the totals listed above reflect only those cases in the active cohort who have ever been assigned a cognitive diagnosis.

## Baseline Cognitive Diagnosis (N=276\*)



ANI = Asymptomatic Neurocognitive Impairment

MCMD = Minor Cognitive Motor Disorder

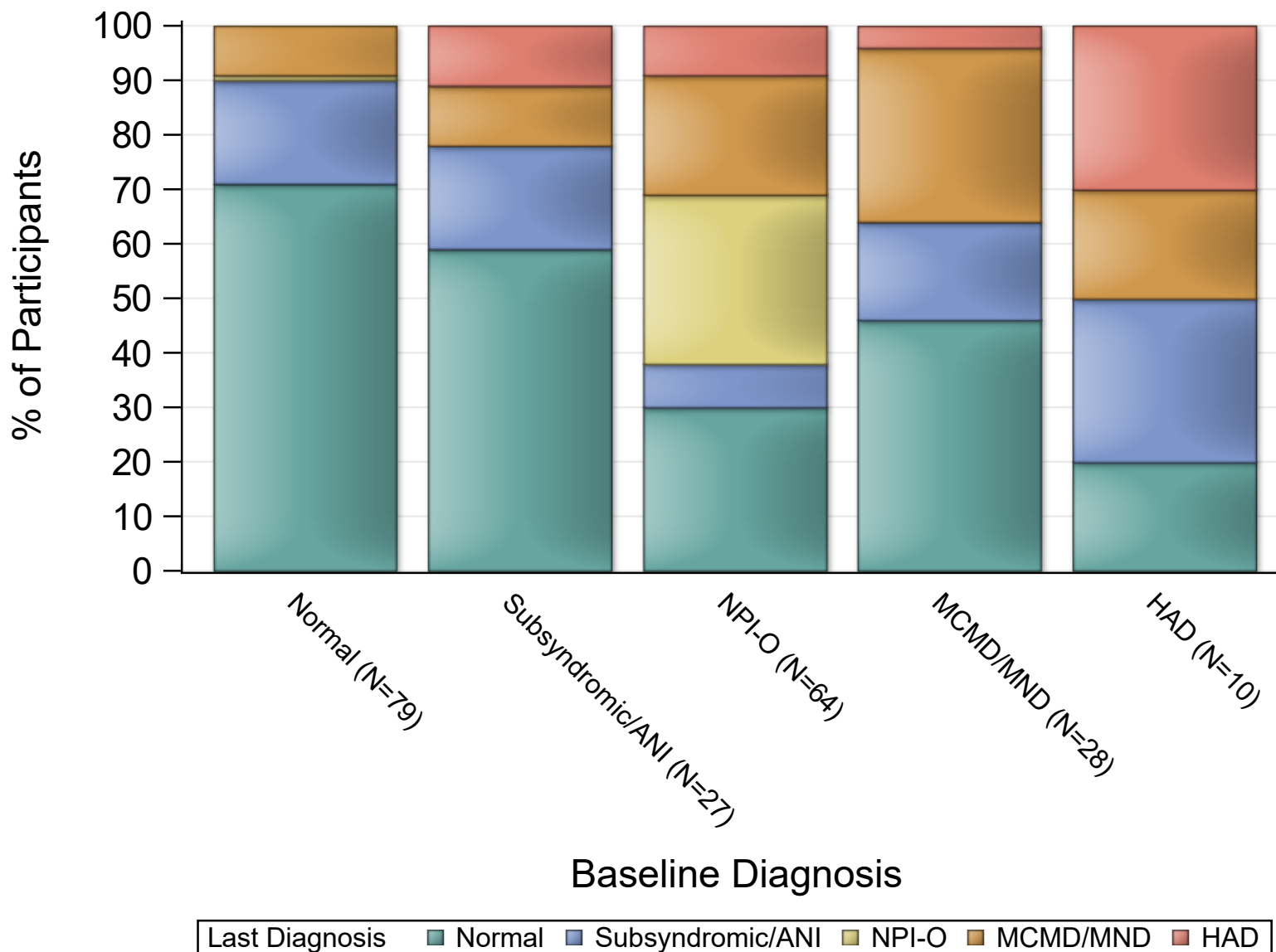
MND = Minor Neurocognitive Disorder

HAD = HIV-Associated Dementia

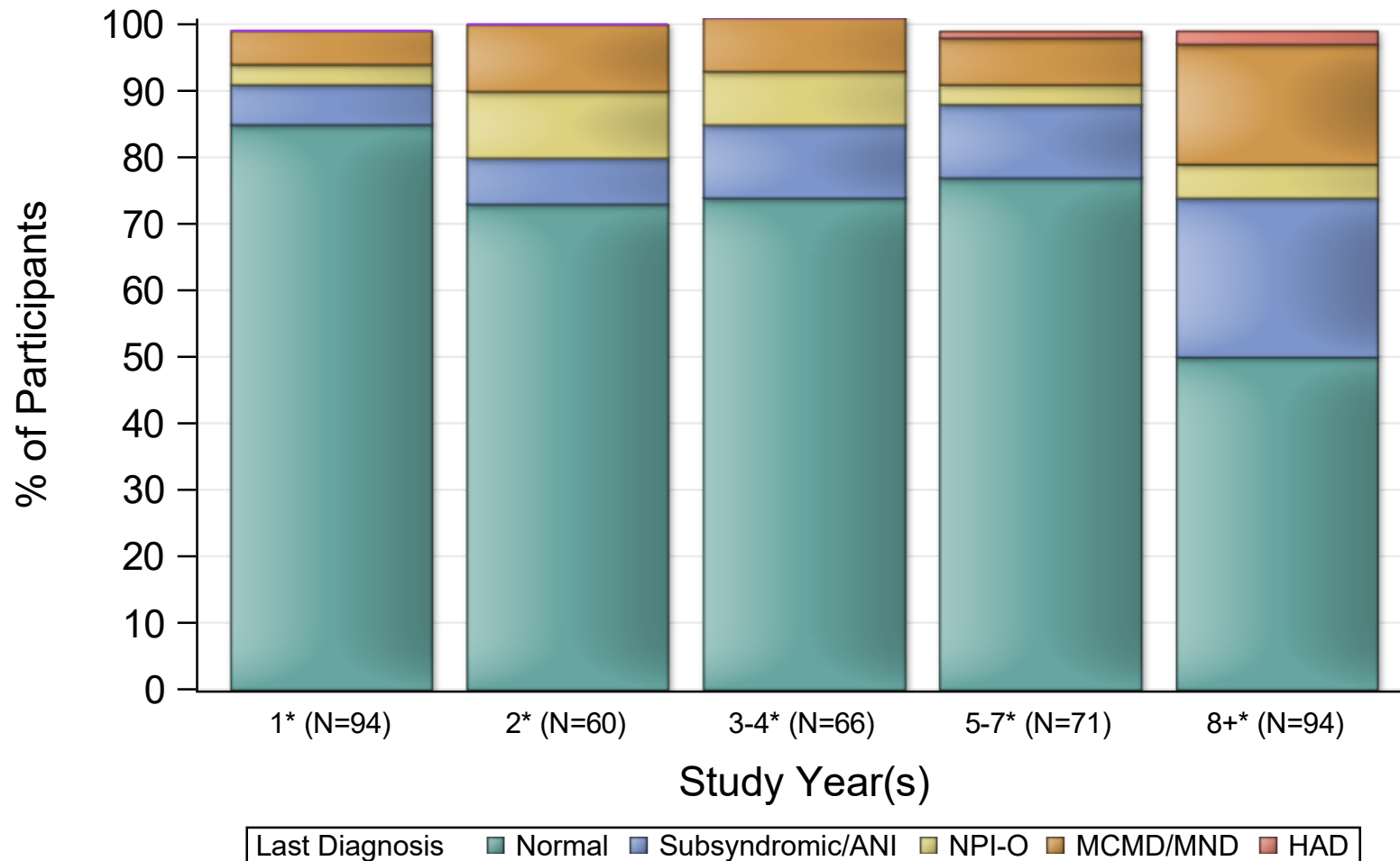
NPI-O = Neuropsychological Impairment - Other cause, not HIV

\*Please note the totals listed above reflect only those cases in the active cohort who were assigned a cognitive diagnosis at baseline.

## Change in Cognitive Diagnosis



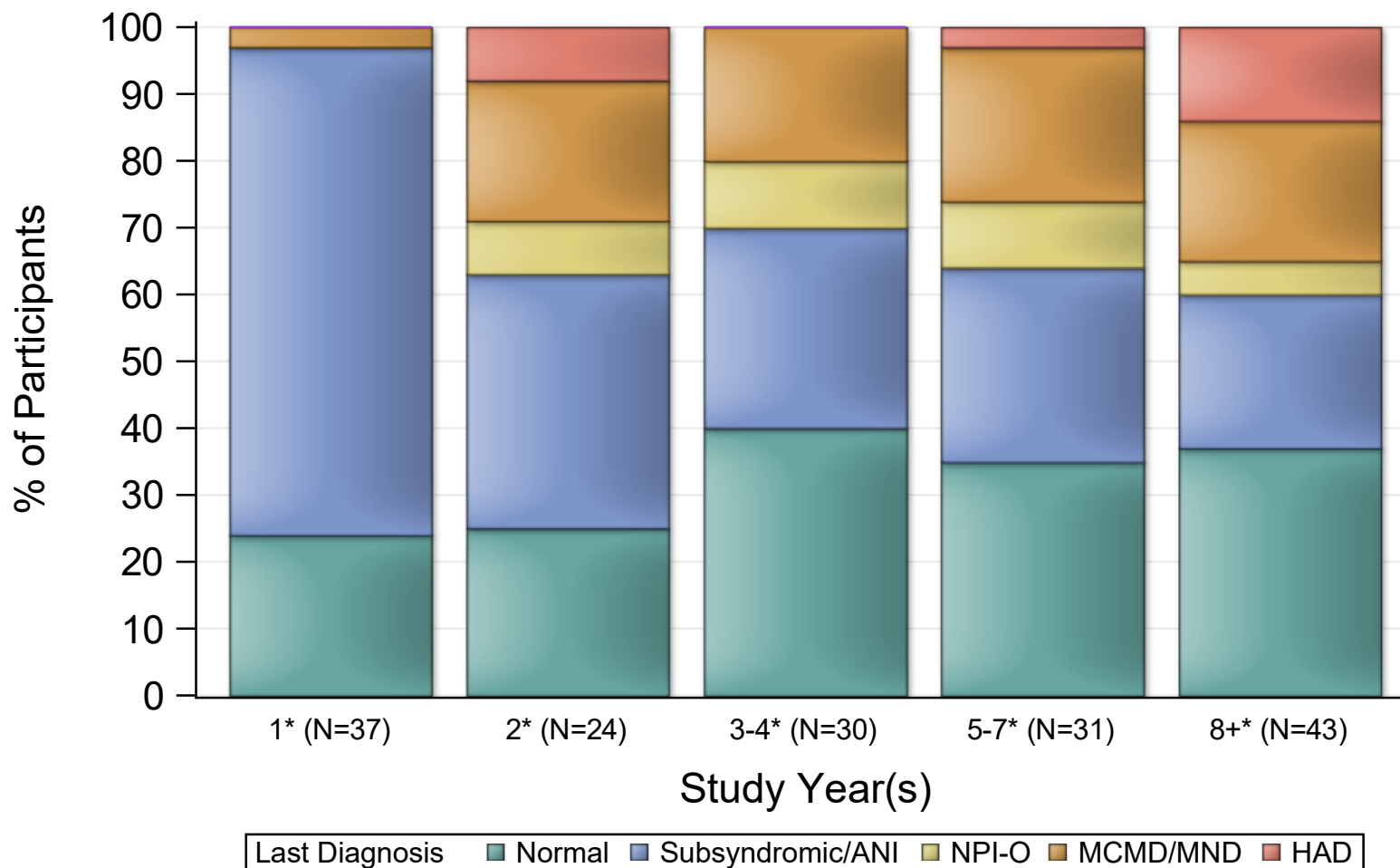
## Change in Cognitive Diagnosis Normal at Baseline



\*Worst diagnosis in study year period shown.

Participants followed for two or more years contribute to all preceding groups.

## Change in Cognitive Diagnosis Subsyndromic/ANI at Baseline

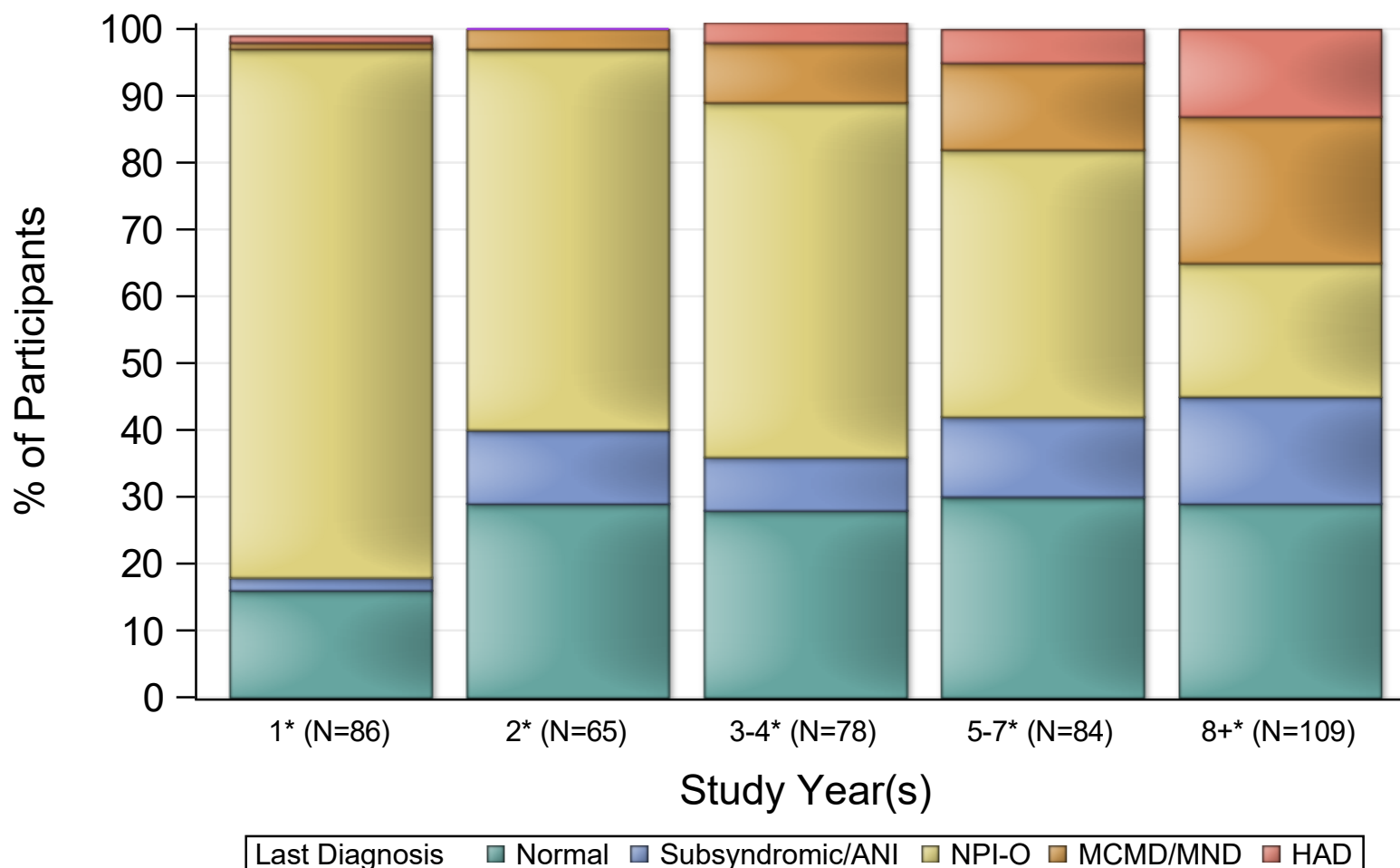


\*Worst diagnosis in study year period shown.

Participants followed for two or more years contribute to all preceding groups.

## Change in Cognitive Diagnosis

### NPI-O at Baseline

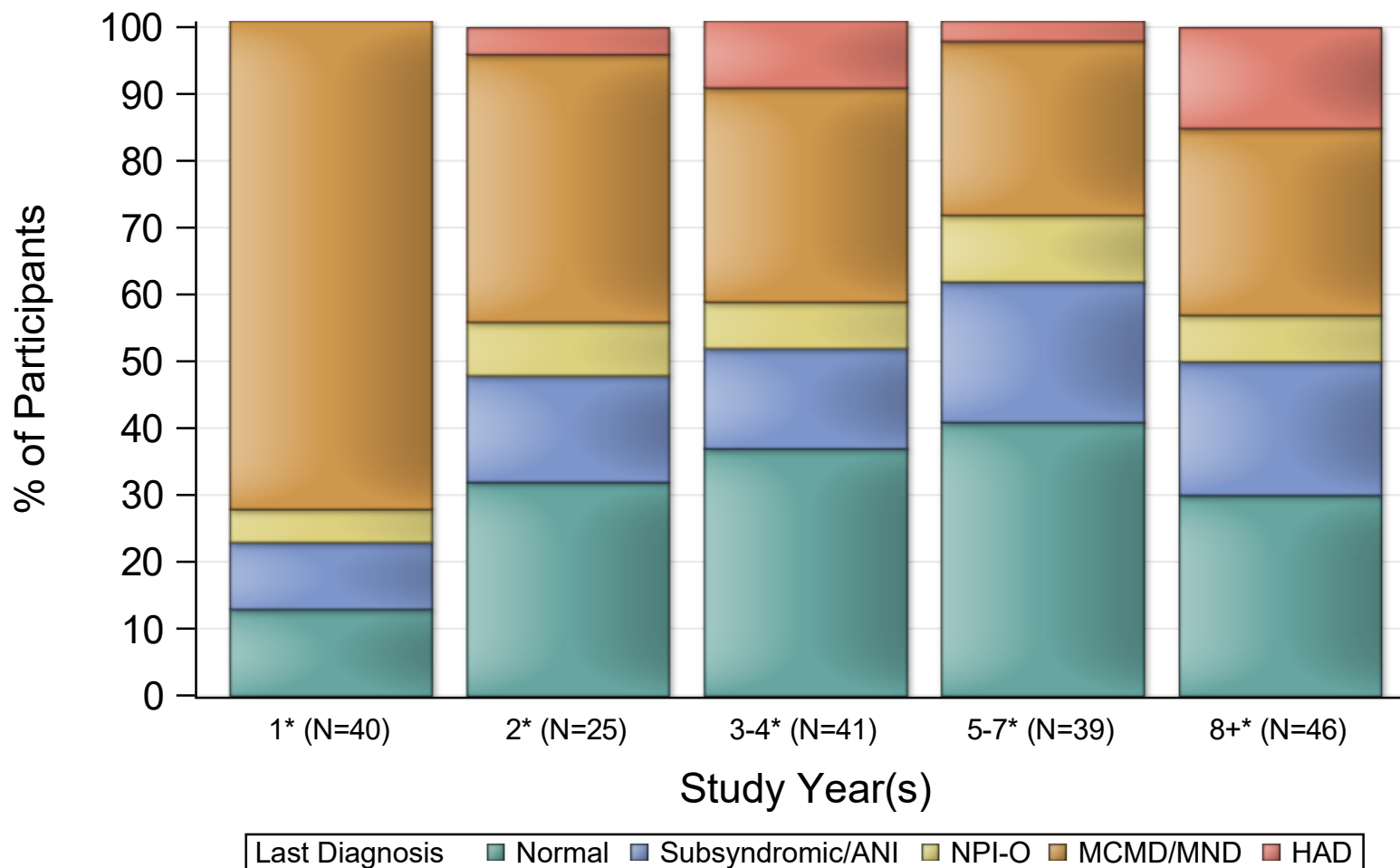


\*Worst diagnosis in study year period shown.

Participants followed for two or more years contribute to all preceding groups.

## Change in Cognitive Diagnosis

### MCMD/MND at Baseline



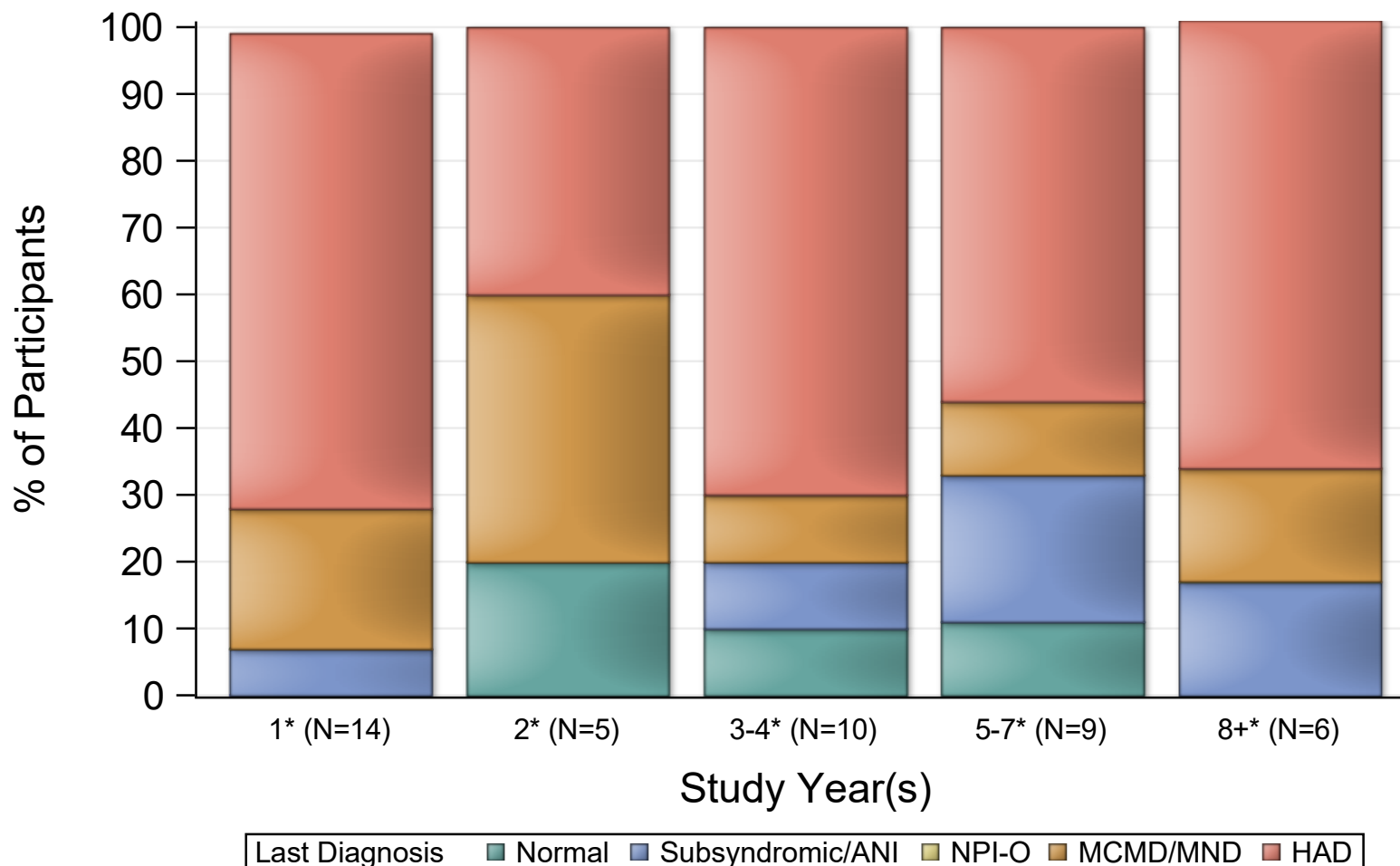
\*Worst diagnosis in study year period shown.

Participants followed for two or more years contribute to all preceding groups.



## Change in Cognitive Diagnosis

### HAD at Baseline



\*Worst diagnosis in study year period shown.

Participants followed for two or more years contribute to all preceding groups.

## Current Neurologic Diagnoses

	<u>N</u>	<u>%</u>
<u>Clinical Myelopathy (N=146)</u>		

HIV associated	5	3
Other	4	3
None	137	94

## Neuropathy (N=146)

HIV associated DSP	113	77
None	33	23

## Baseline Neurologic Diagnoses

### Clinical Myelopathy (N=207)

	<u>N</u>	<u>%</u>
HIV associated	7	3
Other	4	2
None	196	95

HIV associated	7	3
Other	4	2
None	196	95

### Neuropathy (N=206)

HIV associated DSP	103	50
HIV/nucleoside	6	3
None	97	47

## Participants Reporting Concomitant Medications

Medication	# of Pts (N=176)	%
Central Nervous System Agents	173	98.3
Cardiovascular Drugs	144	81.8
Vitamins	144	81.8
Anti-infective Agents	134	76.1
Gastrointestinal Drugs	130	73.9
Hormones and Synthetic Substitutes	106	60.2
Autonomic Drugs	105	59.7
Electrolytic, Caloric, and Water Balance	88	50
Antihistamine Drugs	84	47.7
Skin and Mucous Membrane Agents	84	47.7
Eye, Ear, Nose, and Throat (EENT) Preparations	74	42
Miscellaneous Therapeutic Agents	68	38.6
Blood Formation, Coagulation, and Thrombosis Agents	52	29.5
No medication use reported on at least one occasion	34	19.3
Respiratory Tract Agents	27	15.3
Local Anesthetics	23	13.1
Smooth Muscle Relaxants	23	13.1
Antineoplastic Agents	22	12.5
Pharmaceutical Aids	6	3.4
Enzymes	5	2.8

## Ancillary Lab Measurements

Ancillary Lab	Total # records overall	% cohort with at least 1 measure	Total # cases with baseline measure	% cohort with baseline & one other measure
<u>Miscellaneous Hematology</u>				
Red blood cells	879	51	158	25
Mean Corpuscular Hemoglobin (MCH)	877	51	158	25
Mean Corpuscular Volume (MCV)	4203	96	298	67
Mean Corpuscular Hemoglobin Concentration (MCHC)	850	41	129	25
Blood Red cell Distribution Width (RDW)	771	51	142	20
Blood Rapid Plasma Reagin (RPR)	650	60	133	18
Blood Neutrophil Percent	4038	97	283	62
Blood Lymphocyte Percent	4131	87	272	68
Blood Monocyte Percent	4156	97	301	68
Blood Eosinophil Percent	4139	97	300	67
Blood Basophil Percent	4086	97	297	66
Blood Mean Platelet Volume (MPV)	203	20	45	4
Blood CD3 Percent	338	12	37	10
Blood CD3 Absolute	224	11	21	5
<u>Miscellaneous Serology &amp; virology</u>				
Blood Hepatitis B Surface Antigens	300	46	129	13
Blood Hepatitis B Surface Antibodies	301	45	126	15
Blood Hepatitis B Core Antibodies	324	54	156	12
Blood Hepatitis B Viral Load	39	6	5	1
Blood Hepatitis C Antibodies (HCV)	875	78	206	31
Blood Hepatitis C Viral Load	208	17	27	3
<u>Miscellaneous Serology &amp; virology</u>				
COVID-19 Test Results (qualitative)	58	9	2	0

## Ancillary Lab Measurements cont.

Ancillary Lab	Total # records overall	% cohort with at least 1 measure	Total # cases with baseline measure	% cohort with baseline & one other measure
<b>Miscellaneous Blood Chemistries</b>				
Glucose	3919	97	296	66
Hemoglobin A1c	1912	95	187	32
Sodium	3840	97	298	66
Calcium	3845	97	298	66
Chloride	3767	96	285	63
Potassium	3839	97	297	66
Total Protein	3740	97	298	66
Alkaline Phosphatase	3797	97	297	66
AST	3794	97	297	66
ALT	3789	97	296	66
Total Bilirubin	3792	97	298	66
Direct Bilirubin	697	41	117	20
Creatinine	3878	97	298	66
BUN	3873	97	297	66
CO2	3800	97	295	65
PT	1946	45	137	41
INR	1948	45	138	41
Urate	125	5	16	4
Triglycerides	2510	97	252	52
Cholesterol	2505	97	251	52
LDL	2129	76	171	41
HDL	2403	97	239	48
Phosphorus	717	42	115	20
LDH	224	9	24	7

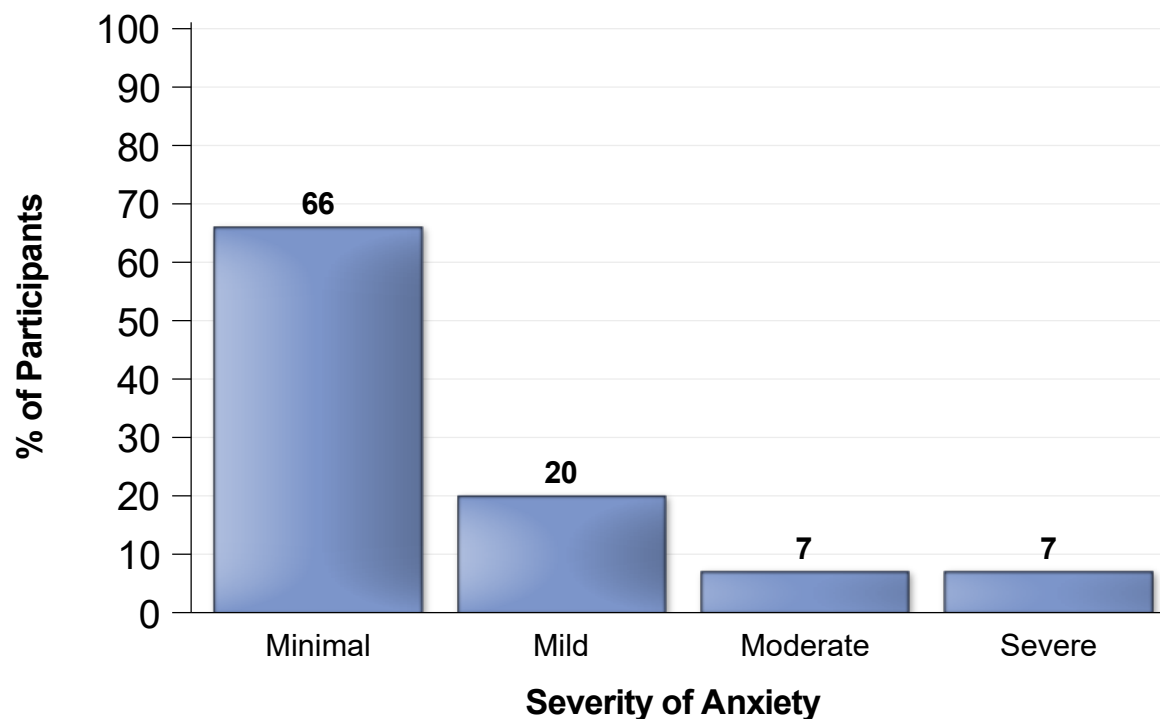
## Ancillary Lab Measurements cont.

Ancillary Lab	Total # records overall	% cohort with at least 1 measure	Total # cases with baseline measure	% cohort with baseline & one other measure
<u>Miscellaneous CSF values</u>				
CSF-VDRL Test	11	2	4	1
<u>Miscellaneous Urine values</u>				
Urinalysis: Glucose	2051	46	143	43
Urinalysis: Protein	2051	46	143	43
Urinalysis: pH	2050	46	143	43
Urinalysis: Specific Gravity	2053	46	142	42
Urinalysis: Ketones	2046	46	142	42
Urinalysis: Bilirubin	2042	46	141	42
Urine Toxicology; Methamphetamine	841	41	123	23
Urinalysis: Red Blood Cells	525	30	52	13
Urinalysis: White Blood Cells	526	29	51	13

- As of the end of July 2025, a total of 106 participants from across multiple NNTC sites have completed a baseline neuroimaging scan session with future follow-up scan sessions planned.
- All MRI data were acquired on Siemens Prisma 3T Scanners using standardized sequences for rigor, reproducibility, and generalizability.
- These sequences include:
  - T1w and T2w sequences based on HCP
  - FLAIR sequence based on ADNI
  - Resting state fMRI based on the ABCD Study with multiband factor=6
  - Single-voxel frontal white matter and frontal gray matter MRS based on an existing CHARTER protocol
  - 3D GRASE PCASL
- Data files from each session are available upon request in NIFTI format. The total number of scans collected to date is:
  - 106 - T1w
  - 105 - T2w
  - 105 - FLAIR
  - 104 - Fieldmap
  - 104 - Resting state fMRI
  - 87 - ASL
  - 92 - MRS



## Current Psychiatric Assessments: General Anxiety Screening (GAD-7) (N=197)

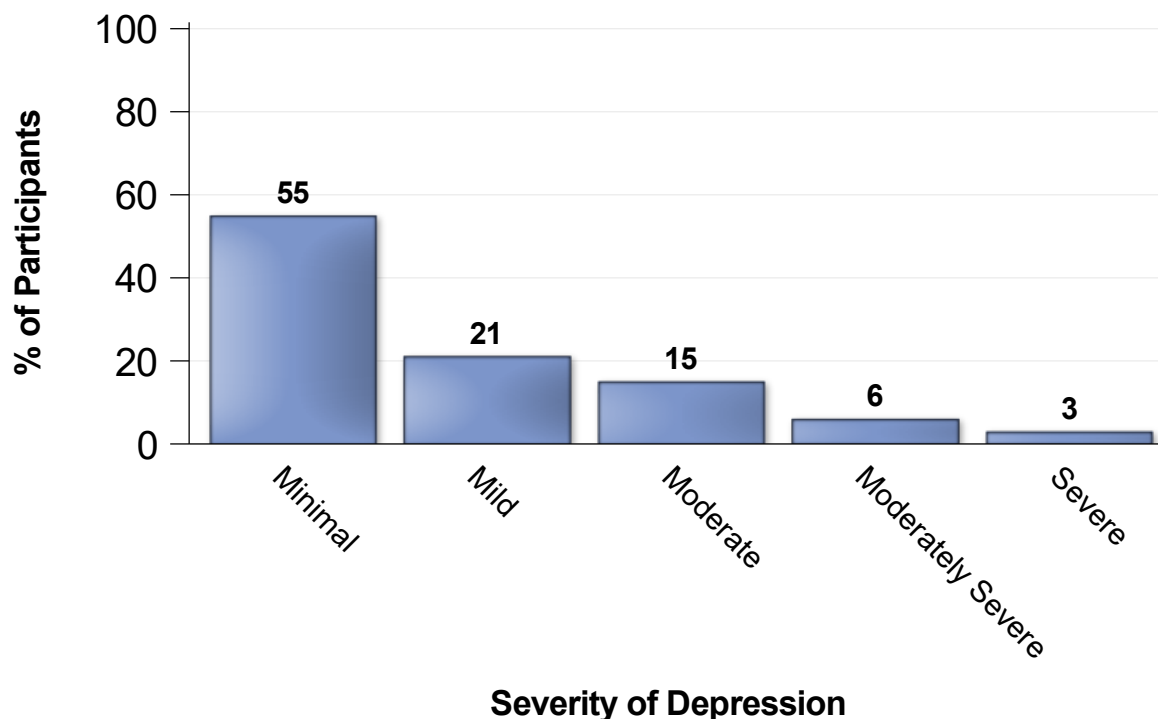


The range of total scores observed in the current active cohort was 0 to 21 with a mean score of 4.1.

\* GAD-7 was approved as part of the revised Psychiatric domain that was approved on October 11, 2024 and is completed by participants once at baseline if newly enrolled or the first visit following protocol approval.

\*\* A GAD-7 total score of 0-4 is considered minimal anxiety, 5-9 is considered mild, 10-14 is considered moderate, and 15-21 is considered severe.

## Current Psychiatric Assessments: Depression Screening (PHQ-9) (N=224)



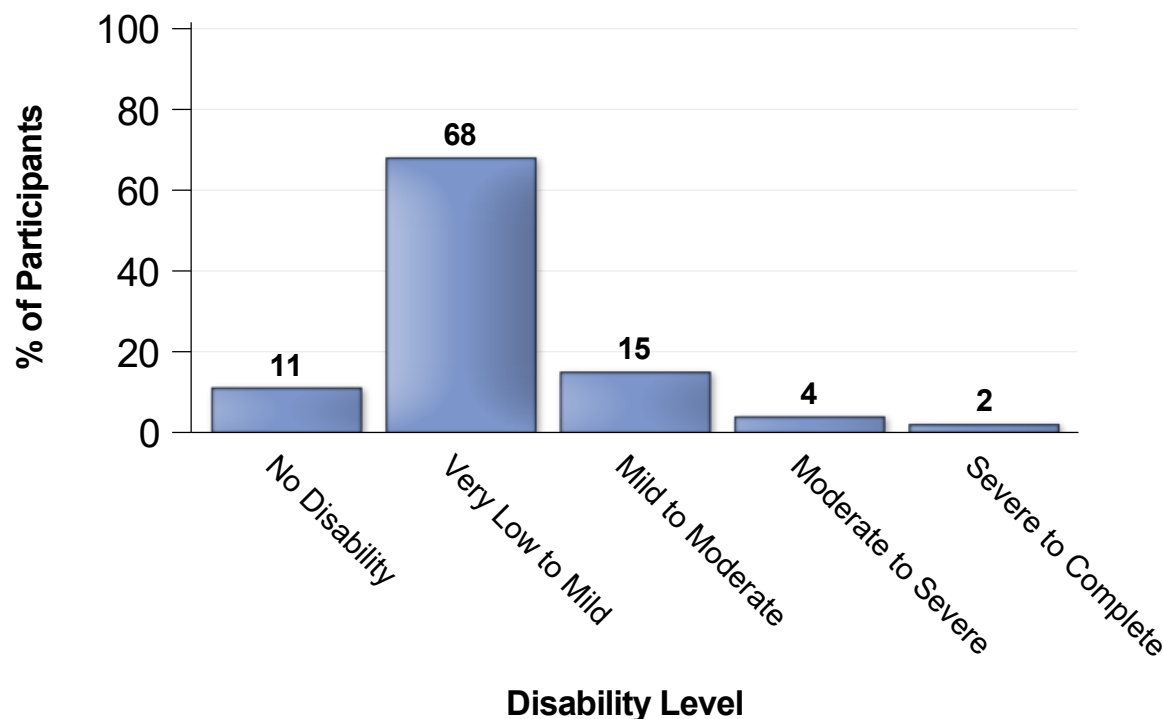
5.4% of participants endorsed suicidal ideation at the most recent visit.

The range of total scores observed in the current active cohort was 0 to 27 with a mean score of 5.6.

\* PHQ-9 was approved as part of the revised Psychiatric domain protocol on October 11, 2024 and is completed by participants once at baseline if newly enrolled or the first visit following protocol approval.

\*\* A PHQ-9 total score of 0-4 is considered minimal depression, 5-9 is considered mild, 10-14 is considered moderate, 15-19 is considered moderately severe, and 20-27 is considered severe depression.

## Current Psychiatric Assessments: Assessment of Disability (WHODAS 2.0 12-item) (N=105)

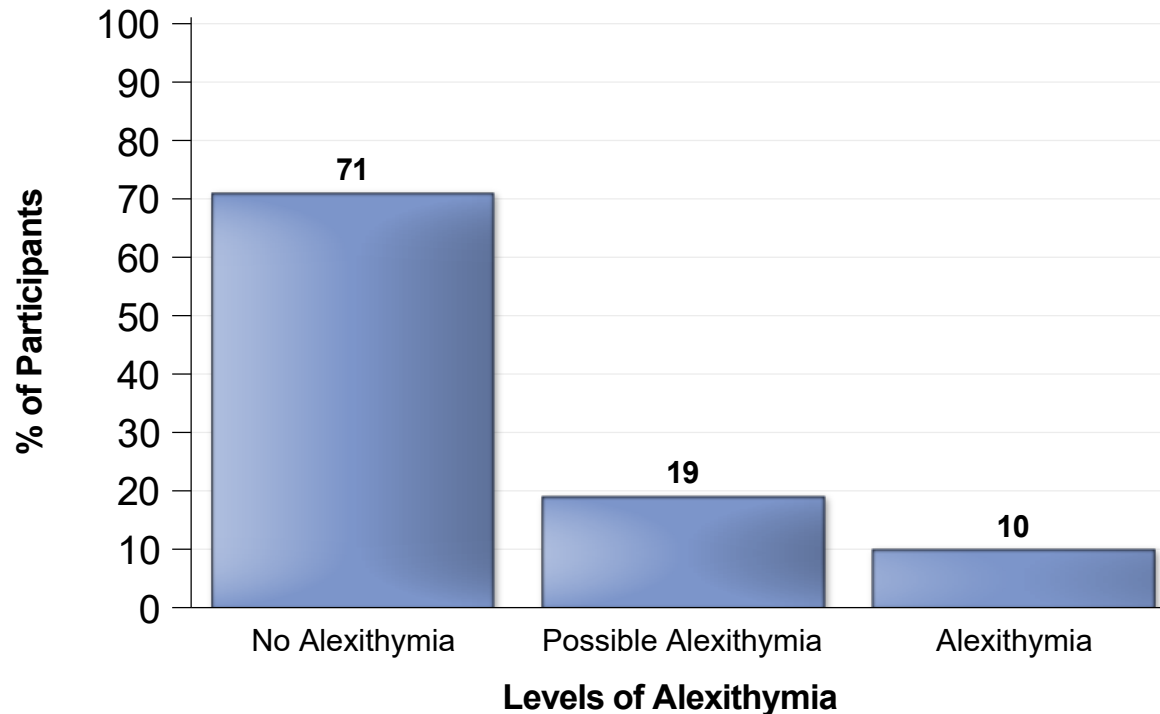


The range of total scores observed in the current active cohort was 0 to 49 with a mean score of 9.1.

\* WHODAS 2.0 (12 item version) was approved as part of the revised Psychiatric domain protocol on October 11, 2024 and is completed by participants once at baseline if newly enrolled or the first visit following protocol approval.

\*\* A simple scoring approach was used to determine disability where all individual item scores (0-4) are summed together. A WHODAS total score of 0 is considered no disability, 1-12 is considered very low to mild, 13-24 is considered mild to moderate, 25-36 is considered moderate to severe, and 37-48 is considered severe to complete disability. If 1 score was missing from a record, then we used the mean of all the other items to assign the missing score.

## Current Neurobehavioral Assessments: Alexithymia (Toronto Alexithymia Scale) (N=204)

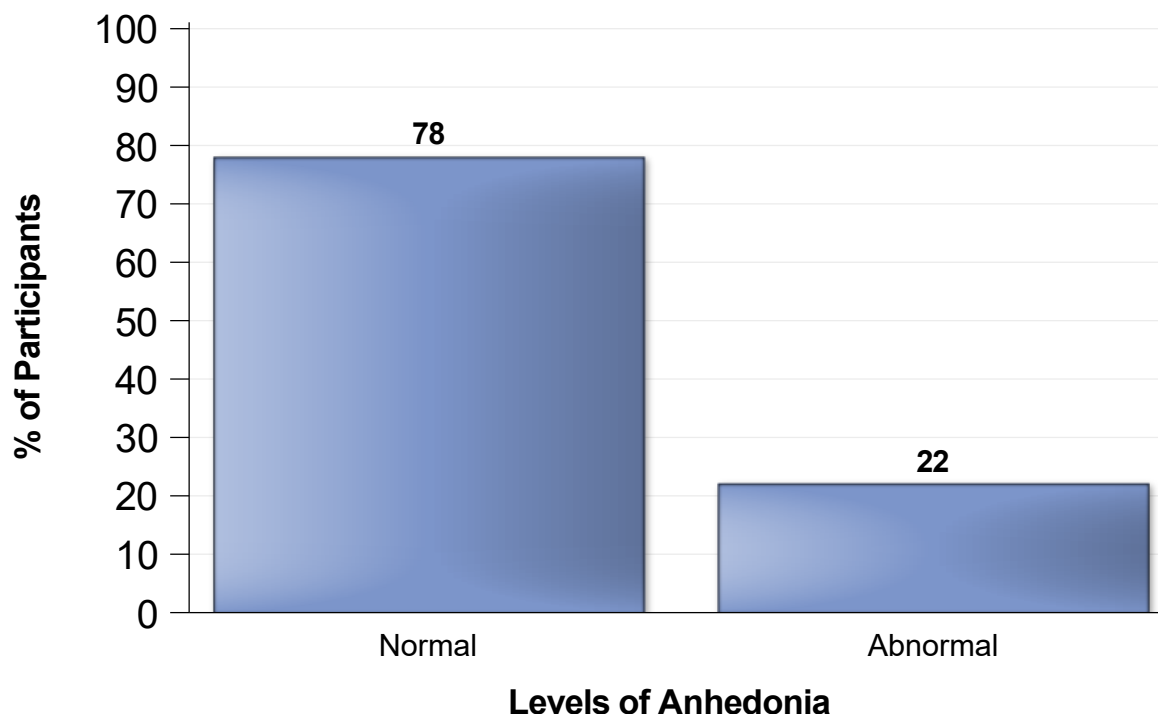


The range of total scores observed in the current active cohort was 20 to 79 with a mean score of 42.5.

\* Toronto Alexithymia Scale (TAS-20) was approved as part of the new Neurobehavioral domain protocol on October 11, 2024. The assessment is expected to be completed at each comprehensive participant visit.

\*\* Each item is scored on a 5-point Likert scale and the total is calculated by summing up all 20 items. A total score of 0-51 indicates No Alexithymia, 52-60 indicates Possible Alexithymia, and 61-100 indicates Alexithymia.

## Current Neurobehavioral Assessments: Anhedonia (Snaith-Hamilton Pleasure Scale (SHAPS) (N=199)



The range of total scores observed in the current active cohort was 0 to 9 with a mean score of 1.6.

\* The Snaith-Hamilton Pleasure Scale (SHAPS) was approved as part of the new Neurobehavioral domain protocol on October 11, 2024. The assessment is expected to be completed at each comprehensive participant visit.

\*\* Each item is scored as either a '1' for a disagree and '0' for each agree and the total is calculated by summing up all 14 items. A total score of 2 or less is considered normal while a score of >3 indicates grater anhedonia (inability to experience pleasure).

# Tissue Bank Cohort Overview

## CNS Specimens Available

Type:	PWH	PWoH
Frozen Brain	1044	362
Spinal Cord	1009	276
Fixed Brain	927	347
Dorsal Root Ganglia	820	228
Cerebellum	634	153
Brain Stem	612	153
Trigeminal Ganglia	538	75
Frontal Lobe	404	137
Occipital Lobe	401	137
Parietal Lobe	399	137
Temporal Lobe	397	137
Basal Ganglia	371	123
Thalamus	328	131
Hippocampus	320	107
Occipital Pole	18	20

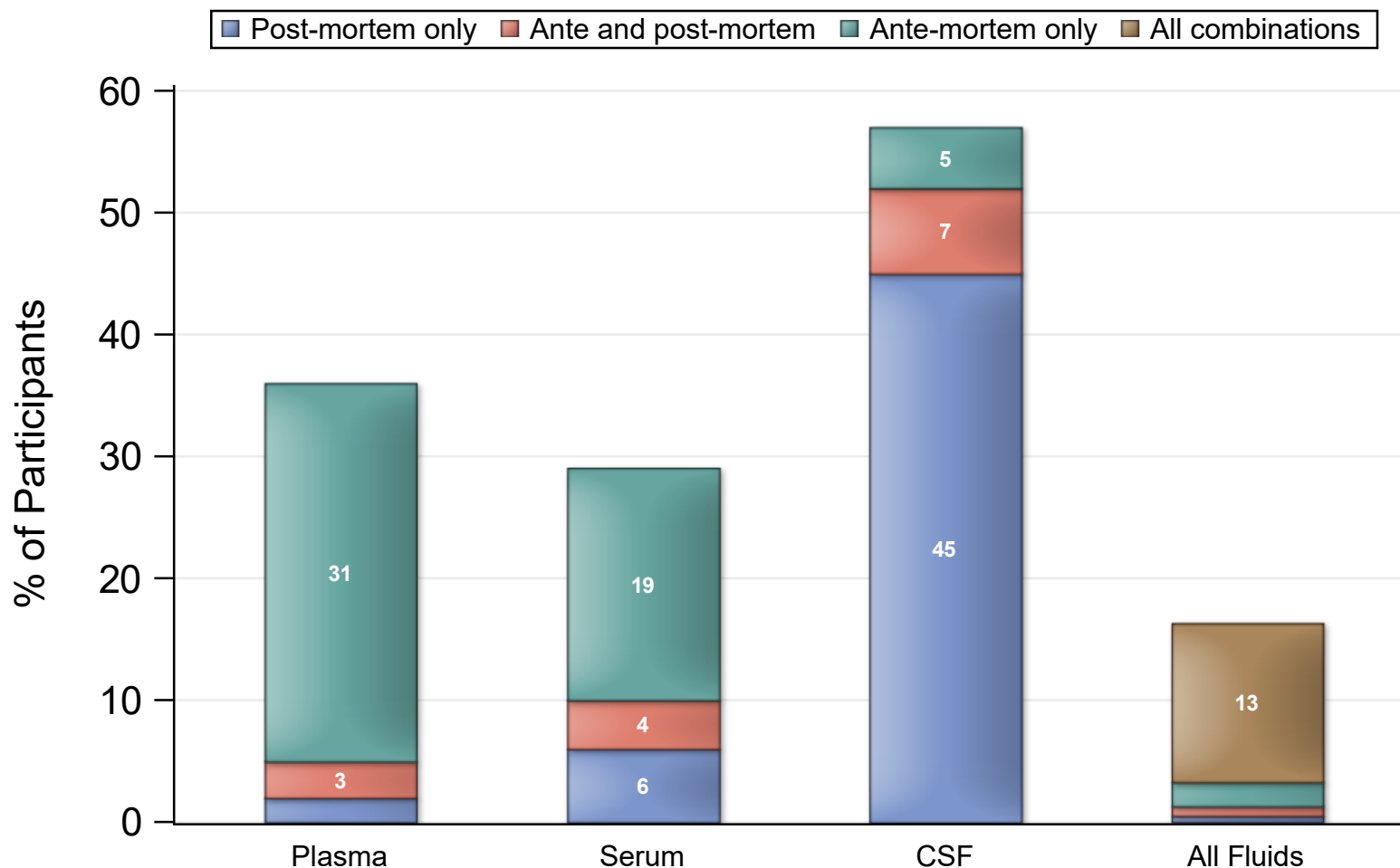
\*Several of the smaller brain categories listed were approved by the Steering Committee on 27JUN2017 to be reported centrally, and thus are currently underreported in the central inventory as sites work towards retrospectively updating specimen records. It is expected that the central inventory, including availability of these specimens, will continue to be updated prospectively.

## Peripheral Organ Specimens Available

Type:	PWH	PWOH
Liver	978	271
Spleen	954	261
Peripheral Nerve	866	241
Adipose Tissue	816	218
Heart	788	205
Muscle	759	218
Bone Marrow	748	199
Lymph Node	747	196
Pituitary Gland	690	120
Kidney	623	202
Lung	582	196
Bowel	354	115
Testes	191	80
Hair	149	10
Eye	38	2
Thymus	30	5



## Available Fluids



\*All combinations (e.g., one specimen might be available ante-mortem while the other two might be ante- and post-mortem or any of the other 23 combinations where all 3 specimen availabilities are not the same).

Please note the totals listed above reflect only those cases who have a fixed brain specimen available and fluids collected within 1 year of death. Percentage labels not shown are 2% or less.

## Demographics\*

<u>N</u>	<u>1073</u>
<u>Age</u>	
Mean	50.8
SD	12.5
25th Percentile	42
Median	50
75th Percentile	59

\*Cases with a fixed brain specimen available with a measurement at baseline and within 1 year of death.

## Demographics cont.\*

	<u>N</u>	<u>%</u>
<u>Sex</u>		
Male	846	79
Female	220	21
<u>Ethnicity</u>		
Hispanic origin	258	24
<u>Race</u>		
White	580	54
Black	345	32
Other	140	13

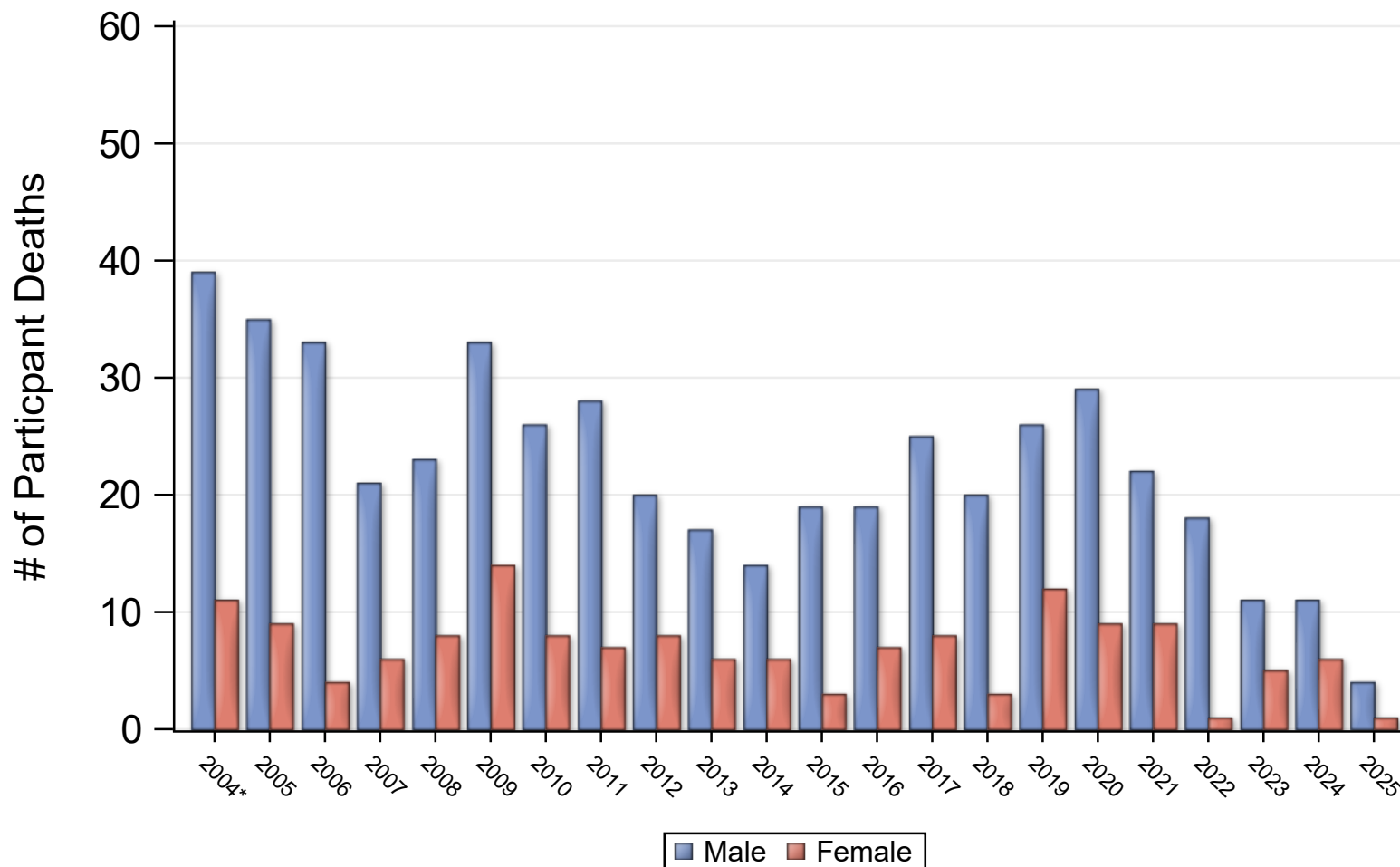
\*Cases with a fixed brain specimen available.

## Demographics cont.\*

	<u>N</u>	<u>%</u>
<u>Furthest Education</u>		
8th grade or less	36	8
Some High School	90	20
High School Graduate	126	28
Some College/Associate's Degree	126	28
College Graduate	40	9
Advanced Degree work	40	9

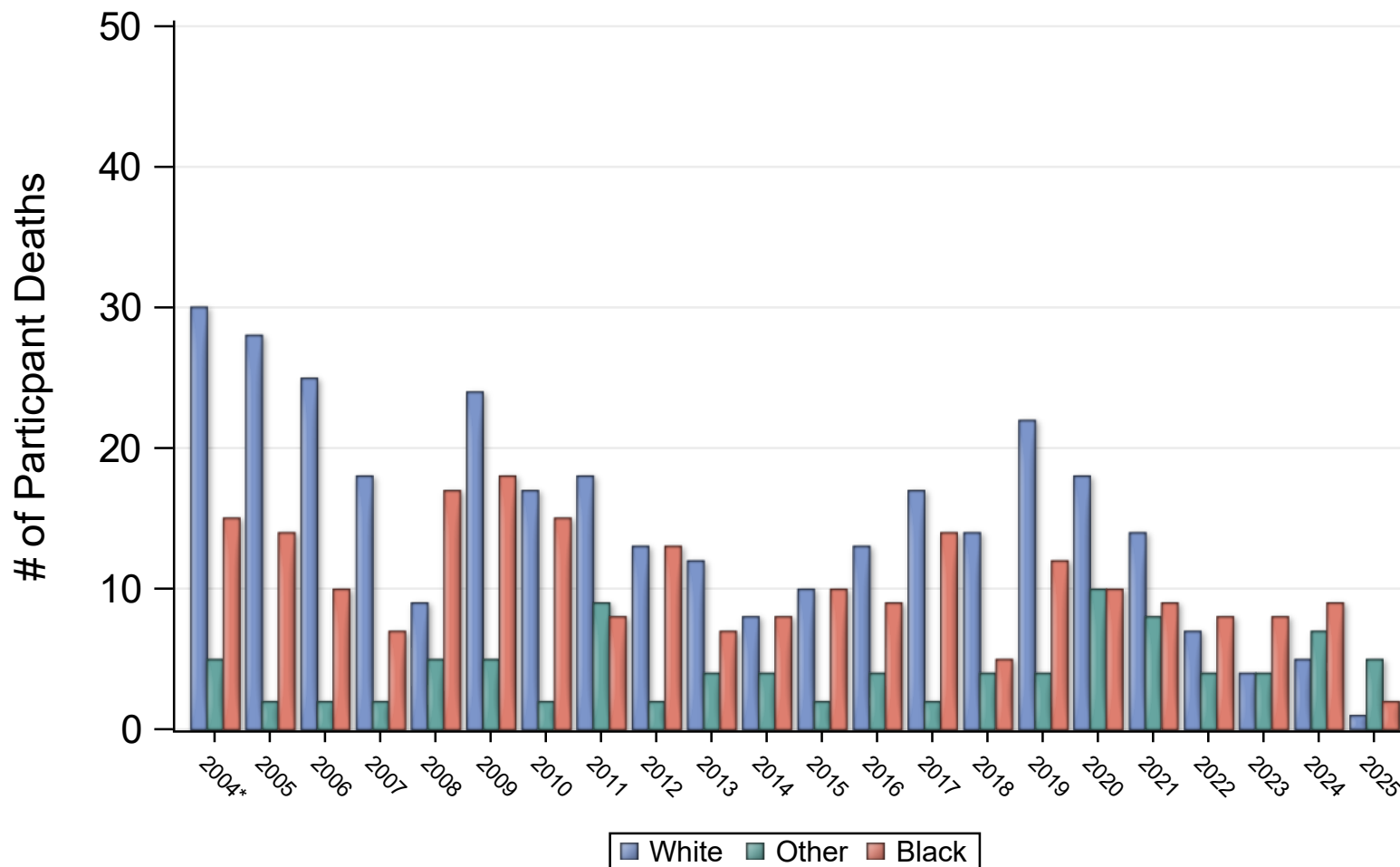
\*Cases with a fixed brain specimen available.

## cART Era Demographics - Sex



\*337 males and 66 females prior to 2004. The NNTC did not collect data before 1998.

## cART Era Demographics - Race



\*250 White, 102 Black, and 51 Other prior to 2004. The NNTC did not collect data before 1998.

## HIV Characteristics of autopsy cases\*

	<u>N</u>	<u>%</u>
<u>Baseline HIV risk</u>		
IV drug use	309	29
Male to male sex	398	37
Heterosexual sex	218	20
Other	148	14
<u>On ART</u>		
at baseline	832	78
at last visit	848	79

\*Cases with a fixed brain specimen available.

## *HIV Characteristics at time of death\**

### CD4 Count (N=680)

25th Percentile	22
Median	106.5
75th Percentile	274

### Log Plasma Viral Load\*\* (N=621)

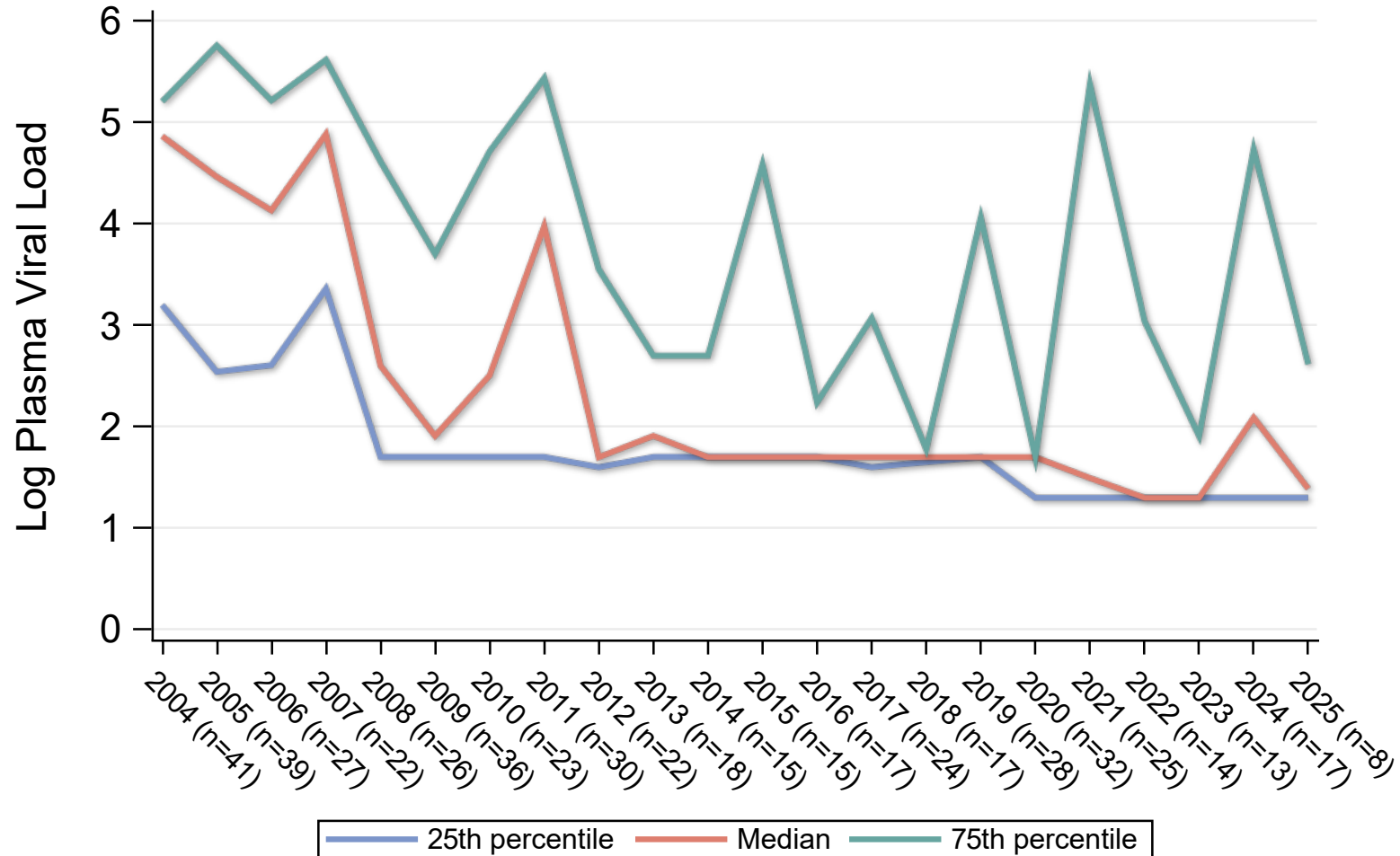
25th Percentile	1.70
Median	3.41
75th Percentile	5.10

\*Cases with a fixed brain specimen available with a measurement at baseline and within 1 year of death.

\*\*Among those with known ARV medication status. 7 participants had detectable VL values of 0 where a viral log could not otherwise be calculated.



## cART Era Viral Load

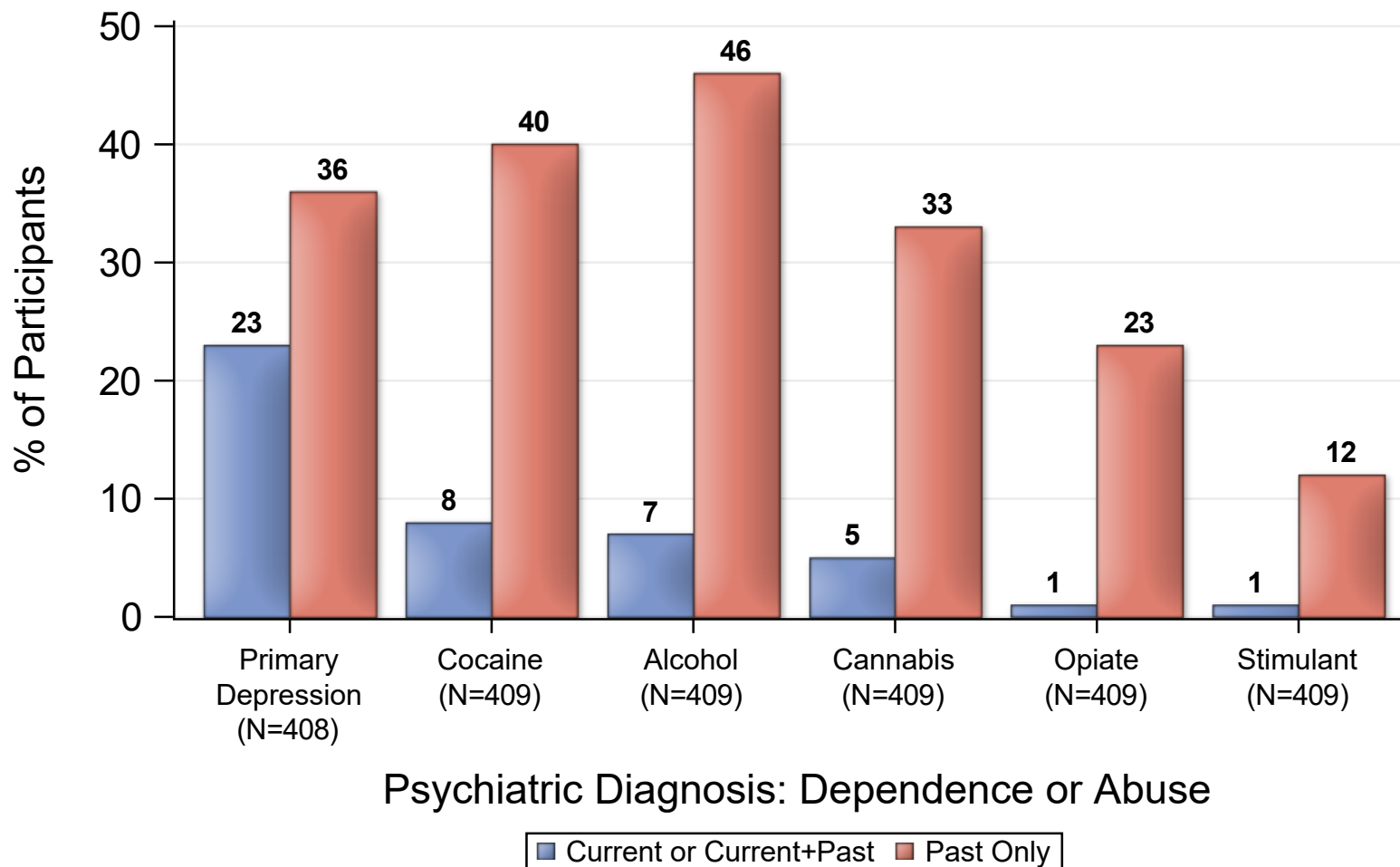


\*Among those who have died during the cART era.

## Pathological Conditions: Year of Autopsy

Type:	Year of Autopsy				Total Cases
	1998-2004	2005-2011	2012-2018	2019-present	
<i>Total Fixed Specimens</i>	396	219	150	162	927
Normal/minor neuropath changes	102 (26%)	71 (32%)	29 (19%)	9 (6%)	211 (23%)
Other non-infectious pathology	75 (19%)	70 (32%)	58 (39%)	51 (31%)	254 (27%)
Alzheimer's type 2 gliosis	71 (18%)	24 (11%)	18 (12%)	13 (8%)	126 (14%)
Focal infarct	50 (13%)	38 (17%)	30 (20%)	43 (27%)	161 (17%)
HIV encephalitis	58 (15%)	16 (7%)	3 (2%)	1 (1%)	78 (8%)
Hypoxic/ischemic damage	32 (8%)	40 (18%)	26 (17%)	36 (22%)	134 (14%)
Aseptic Leptomeningitis	28 (7%)	16 (7%)	23 (16%)	8 (5%)	75 (8%)
Microglial nodule encephalitis	34 (9%)	6 (3%)	4 (3%)	4 (2%)	48 (5%)
Hemorrhage-parenchymal	17 (4%)	10 (5%)	12 (8%)	14 (9%)	53 (6%)
Progressive Multifocal Leukoencephalopathy	22 (6%)	12 (5%)	2 (1%)	3 (2%)	39 (4%)
Cryptococcus	14 (4%)	8 (4%)	1 (1%)	1 (1%)	24 (3%)
Primary CNS lymphoma	23 (6%)	5 (2%)	5 (3%)	3 (2%)	36 (4%)
Other infections	17 (4%)	7 (3%)	7 (5%)	13 (8%)	44 (5%)
Cytomegalovirus encephalitis	20 (5%)	3 (1%)	0 (0%)	3 (2%)	26 (3%)

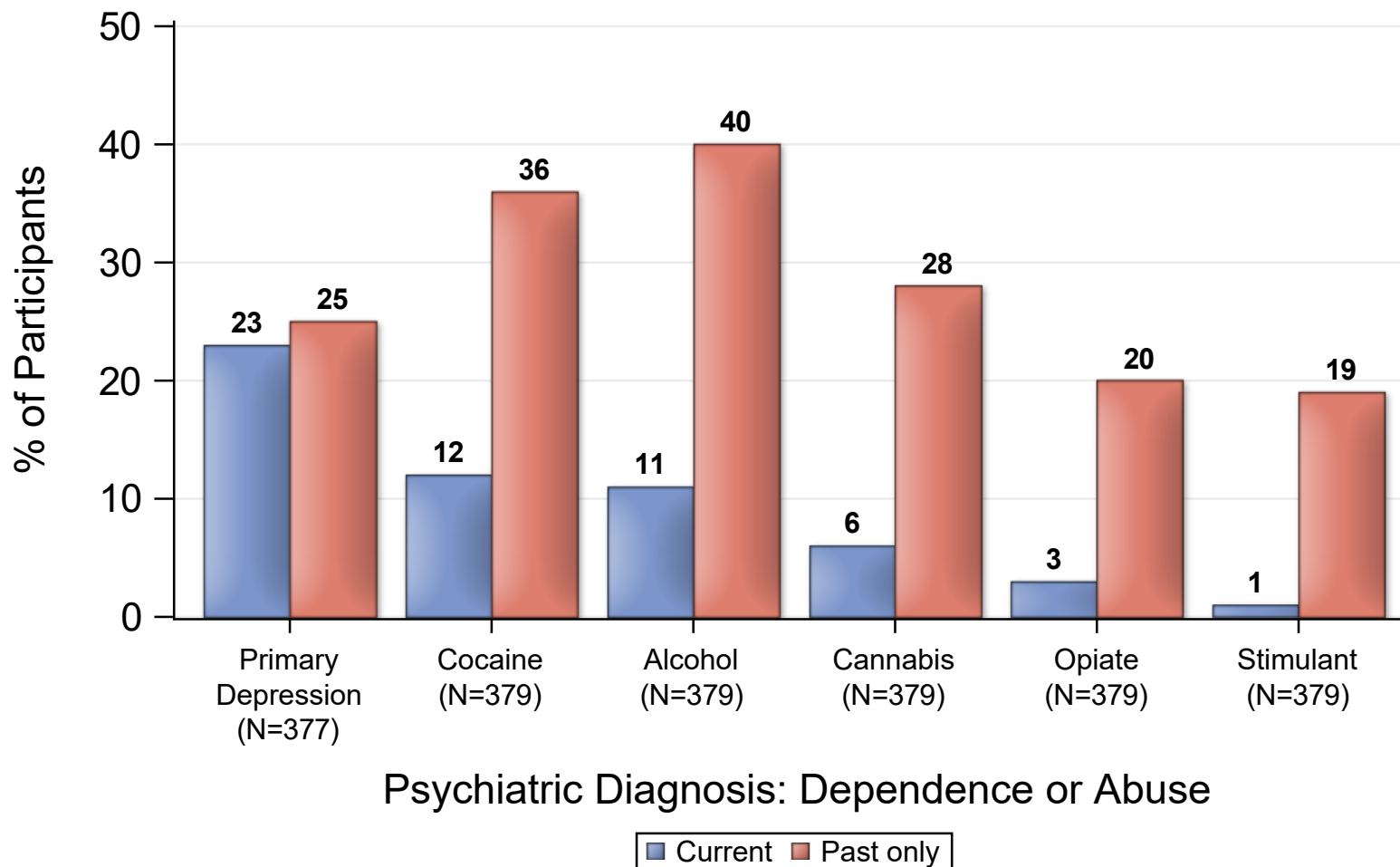
## Last Psychiatric Diagnosis



46% are Normal/Test Not Administered

\*Please note the totals listed above reflect only those cases who have a fixed brain specimen available and data from the PRISM/CIDI evaluation before death.

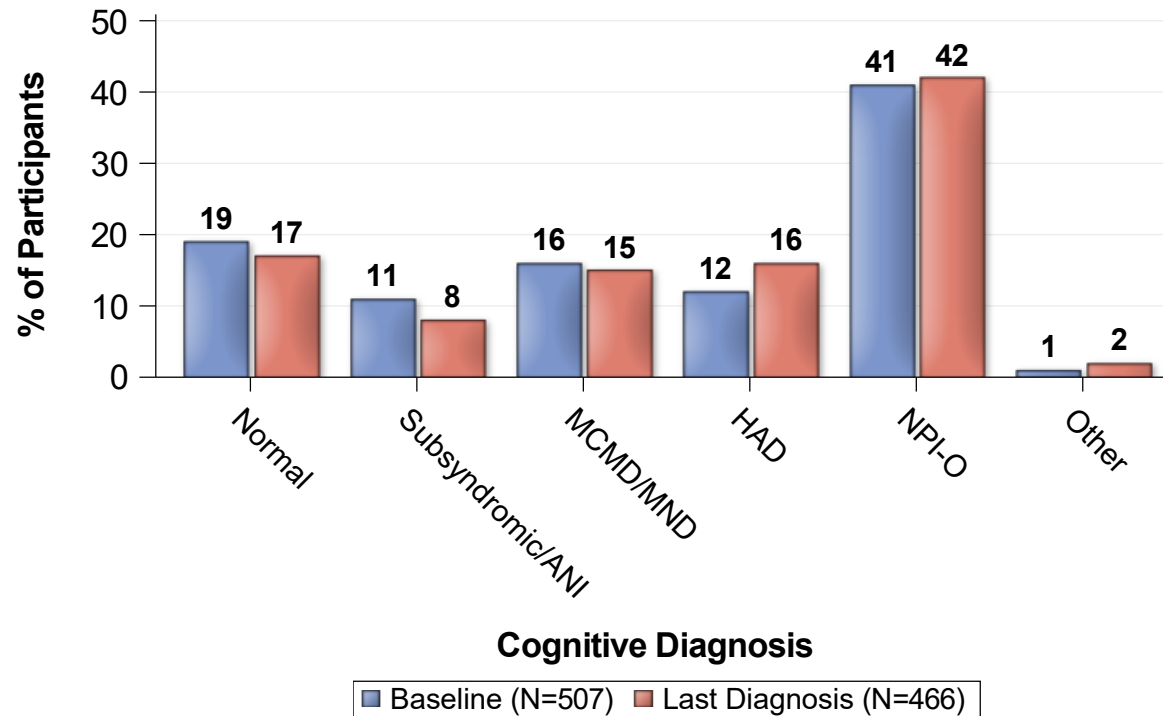
## Baseline Psychiatric Diagnosis



16% are Normal/Test Not Administered

\*Please note the totals listed above reflect only those cases who have a fixed brain specimen available and data from the PRISM/CIDI evaluation closest to baseline.

## Cognitive Diagnosis



ANI = Asymptomatic Neurocognitive Impairment

MCMD = Minor Cognitive Motor Disorder

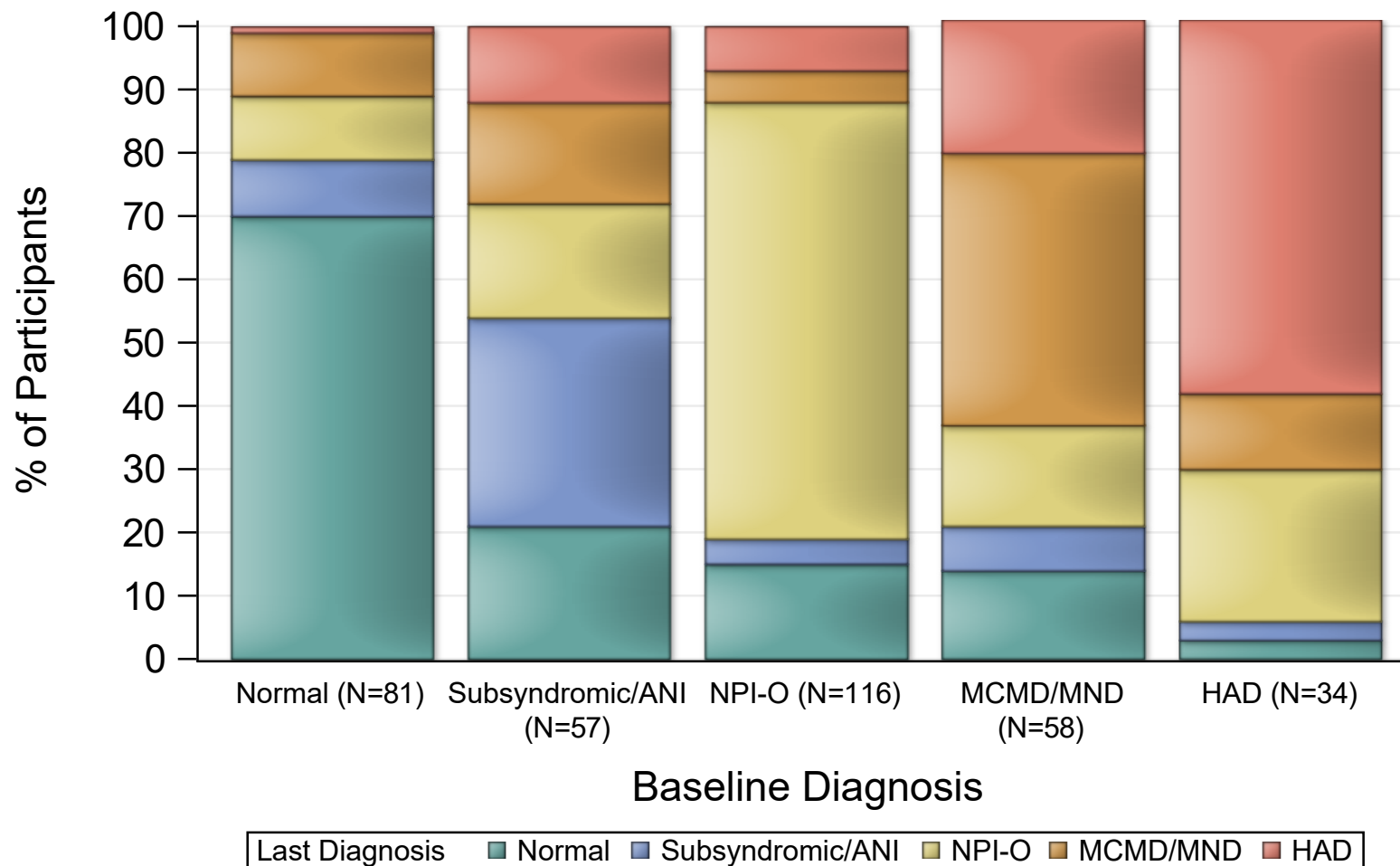
MND = Minor Neurocognitive Disorder

HAD = HIV-Associated Dementia

NPI-O = Neuropsychological Impairment - Other cause, not HIV

\*Please note the totals listed above reflect only those cases who have a fixed brain specimen available.

## Change in Cognitive Diagnosis



## Neurologic Diagnoses\*

	<u>Last Dx</u>		<u>Baseline</u>	
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
<b><u>Clinical Myelopathy</u></b>	<u>(N=442)</u>		<u>(N=507)</u>	
HIV associated	50	11	57	11
Other	9	2	12	2
None	383	87	438	86
<b><u>Neuropathy</u></b>	<u>(N=377)</u>		<u>(N=437)</u>	
HIV associated DSP	175	46	172	39
Nucleoside associated	4	1	3	1
HIV/nucleoside	46	12	62	14
None	152	40	200	46

\*Cases with a fixed brain specimen available.

## Participants Reporting Concomitant Medications

Medication	# of Pts (N=612)	%
Central Nervous System Agents	538	87.9
Anti-infective Agents	482	78.8
Gastrointestinal Drugs	413	67.5
Cardiovascular Drugs	323	52.8
Vitamins	307	50.2
Hormones and Synthetic Substitutes	297	48.5
Electrolytic, Caloric, and Water Balance	274	44.8
Autonomic Drugs	235	38.4
Blood Formation, Coagulation, and Thrombosis Agents	208	34
Antihistamine Drugs	142	23.2
Skin and Mucous Membrane Agents	135	22.1
Miscellaneous Therapeutic Agents	118	19.3
Antineoplastic Agents	110	18
Eye, Ear, Nose, and Throat (EENT) Preparations	84	13.7
Respiratory Tract Agents	58	9.5
Local Anesthetics	35	5.7
Pharmaceutical Aids	24	3.9
Smooth Muscle Relaxants	20	3.3
No medication use reported on at least one occasion	17	2.8
Blood Derivatives	17	2.8



## Ancillary Lab Measurements

Ancillary Lab	Total # records overall	% cohort with at least 1 measure	Total # cases with baseline measure	% cohort with baseline & one other measure
<b>Miscellaneous Hematology</b>				
Red blood cells	2194	20	161	9
Mean Corpuscular Hemoglobin (MCH)	2186	20	162	9
Mean Corpuscular Volume (MCV)	4958	59	515	23
Mean Corpuscular Hemoglobin Concentration (MCHC)	2197	20	162	9
Blood Red cell Distribution Width (RDW)	2079	13	99	6
Blood Rapid Plasma Reagin (RPR)	439	22	152	4
Blood Neutrophil Percent	4597	50	439	20
Blood Lymphocyte Percent	4828	57	498	22
Blood Monocyte Percent	4703	57	497	22
Blood Eosinophil Percent	4672	56	495	22
Blood Basophil Percent	4660	56	492	21
Blood Mean Platelet Volume (MPV)	1590	10	75	5
Blood CD3 Percent	173	9	75	3
Blood CD3 Absolute	60	2	11	0
<b>Miscellaneous Serology &amp; virology</b>				
Blood Hepatitis B Surface Antigens	540	35	284	5
Blood Hepatitis B Surface Antibodies	510	33	263	5
Blood Hepatitis B Core Antibodies	455	31	244	4
Blood Hepatitis B Viral Load	57	4	21	0
Blood Hepatitis C Antibodies (HCV)	722	46	323	7
Blood Hepatitis C Viral Load	293	19	110	2
<b>Miscellaneous Serology &amp; virology</b>				
COVID-19 Test Results (qualitative)	75	2	3	0

## Ancillary Lab Measurements cont.

Ancillary Lab	Total # records overall	% cohort with at least 1 measure	Total # cases with baseline measure	% cohort with baseline & one other measure
<b>Miscellaneous Blood Chemistries</b>				
Glucose	4857	61	527	23
Hemoglobin A1c	515	15	66	3
Sodium	4381	61	527	23
Calcium	4179	60	510	21
Chloride	4181	58	491	21
Potassium	4287	58	493	21
Total Protein	3110	55	460	19
Alkaline Phosphatase	3299	58	498	21
AST	3228	56	471	20
ALT	3309	57	481	20
Total Bilirubin	3402	60	518	23
Direct Bilirubin	517	14	98	4
Creatinine	4419	62	534	23
BUN	4351	61	529	22
CO2	4358	57	484	20
PT	1633	37	288	13
INR	1612	35	271	12
Urate	127	8	56	1
Triglycerides	1009	30	195	7
Cholesterol	1005	29	192	7
LDL	828	22	119	5
HDL	877	23	128	6
Phosphorus	1055	15	116	4
LDH	308	11	84	2
TSH	173	7	37	1
T4	24	2	6	0

## Ancillary Lab Measurements cont.

Ancillary Lab	Total # records overall	% cohort with at least 1 measure	Total # cases with baseline measure	% cohort with baseline & one other measure
<u>Miscellaneous CSF values</u>				
CSF-VDRL Test	193	5	37	2
<u>Miscellaneous Urine values</u>				
Urinalysis: Glucose	1430	36	303	13
Urinalysis: Protein	1456	37	307	13
Urinalysis: pH	1437	36	305	13
Urinalysis: Specific Gravity	1437	36	306	13
Urinalysis: Ketones	1429	36	304	13
Urinalysis: Bilirubin	1431	36	302	13
Urine Toxicology; Methamphetamine	572	15	111	8
Urinalysis: Red Blood Cells	946	30	219	8
Urinalysis: White Blood Cells	938	30	216	8