



# **The BIOCARD Study**

Biomarkers of Cognitive Decline Among Normal  
Individuals

**White Matter Hyperintensity MRI  
NIH Limited Dataset**

## Glossary of Terms

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Term	Description
Allowable Codes	codes (and their meanings) allowed to be values for that variable
Audit Findings	error rates based on BIOCARD or NIH phase audits  error rates are calculated as number of errors / total number of variables examined
Baseline visit	date admitted to NIH phase of BIOCARD study <i>[Note: some data may have been collected prior to this date]</i>
Collection	when the variable information was collected (i.e., Baseline, Follow-up)
Comments	further information about the variable not covered in the above fields
Data Type	numeric or character <i>[Note: Dates are numeric data]</i> numeric or character classifications are strictly related to how the data are stored and not how the data should be analyzed
JHU phase	the study phase at JHU from 2009 - present
Missing OK If	instances (such as skips) or reasons why a blank or missing value is acceptable
NA	not applicable for this variable
NIH / NIH phase	the study phase that was performed at the NIH from 1995-2005
Question Text	the question as it appears on the NACC or BIOCARD data collection forms
Short Description	a short explanation of what the variable means
Source	the name of the NACC form, BIOCARD form, or NIH dataset containing the variable information (or "DERIVED" if the variable was derived) and the variable question number located on the form or in the dataset, if applicable
Unknown Code	the codes for the "unknown", "don't know", or missing values for the variable
Variable Name	the name of the variable in the provided dataset <i>[Note: Variables will follow the NACC naming scheme as closely as possible]</i>

## Acronyms and Definitions

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AD	Alzheimer's Disease	JHU	The Johns Hopkins University
CDR	Clinical Dementia Rating	MCI	Mild Cognitive Impairment
CERAD	Consortium to Establish a Registry for Alzheimer's Disease	MMSE	Mini-Mental State Examination
CNS	Central Nervous System	NACC	National Alzheimer's Coordinating Center
CSF	Cerebrospinal Fluid	NIA	National Institute on Aging
CVD	Cardiovascular Disease	NINDS	National Institute of Neurological Disorders and Stroke
CVLT	California Verbal Learning Test	NPI-Q	Neuropsychiatric Inventory Questionnaire
FAQ	Functional Assessment Questionnaire	UPDRS	Unified Parkinson's Disease Rating Scale
FTD	Frontotemporal Degenerations	WAIS	Wechsler Adult Intelligence Scale
GDS	Geriatric Depression Scale	WMS	Wechsler Memory Scale

# White Matter Hyperintensity MRI Data Limited Dataset Characteristics

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Number of variables: 4

Order of variables:

- |             |  |
|-------------|--|
| 1) JHUAONID | <i>Participant ID Anonymized byJHU</i>                               |
| 2) VISITNO  | <i>MRI chronological visit number</i>                                |
| 3) MRIMOBL  | <i>Months since baseline visit</i>                                   |
| 4) WMH      | <i>Global white matter hyperintensity (WMH) volume (in unit mm3)</i> |

## White Matter Hyperintensity MRI NIH

- 1) 

Variable Name	<b>JHUANONID</b>
Short Description	Participant ID Anonymized by JHU
Source	NA
Question Text	NA
Time of Collection	Baseline
Data Type	Character
Allowable Codes	JHU + 6 numbers
Missing OK If	NA
Audit Findings	NA
Comments	None
  
- 2) 

Variable Name	<b>VISITNO</b>
Short Description	MRI chronological visit number
Source	NA
Question Text	NA
Time of Collection	Baseline and Follow-up
Data Type	Numeric
Allowable Codes	NIH visit: Integers and decimals from 0 to 10, where a visit 0 represents a visit that occurred prior to the established baseline date JHU visit: 101, 102, 103, 104, ..... 1XX where XX is from 01 to 99  Visit number 999 used for all participants that have died before a 101 visit for forms: A4, A5, A5a, B1, B2, B3, B3a, B8, B9, and D1. For participants that are alive, an A5 may have a 999 visit number to capture medical data acquired during the NIH phase of the study.
Missing OK If	NA
Audit Findings	No NIH or JHU audit
Comments	Visit when MRI was completed

## White Matter Hyperintensity MRI NIH

### 3) Variable Name **MRIMOBL**

Short Description Months since baseline visit

Source DERIVED

Question Text NA

Time of Collection Follow-up

Data Type Numeric

Allowable Codes Min = 0  
Max = 999

Missing OK If NA

Audit Findings NA

Comments Calculated as months between the baseline start date and the recorded MRI date.

### 4) Variable Name **WMH**

Short Description Measure derived from the axial FLAIR scans and quantified using an automated method described by Decarli et al. (2013; Four Tissue Segmentation in ADNI II

Source MRI scans

Question Text Global white matter hyperintensity (WMH) volume (in unit mm3)

Time of Collection Baseline and Follow-up

Data Type Numeric

Allowable Codes Min = 0  
Max = 126881

Missing OK If NA

Audit Findings NA

Comments Measure derived from the axial FLAIR scans and quantified using an automated method described by Decarli et al. (2013; Four Tissue Segmentation in ADNI II; [https://www.alz.washington.edu/WEB/adni\\_proto.pdf](https://www.alz.washington.edu/WEB/adni_proto.pdf)). For prior BIOCARD publications using these data, see (1) Pettigrew et al. (2020; Cognitive reserve and rate of change in Alzheimer's and cerebrovascular disease biomarkers among cognitively normal individuals; Neurobiology of Aging; doi: 10.1016/j.neurobiolaging.2019.12.003) and (2) Soldan et al. (2020; White matter hyperintensities and CSF Alzheimer disease biomarkers in preclinical Alzheimer disease; Neurology; doi: 10.1212/WNL.0000000000008864).