Atherosclerosis Risk in Communities Study

Visit 5 through Visit 11 MRI Reading Center Data (V5_V11_MRI_DERV_NP_240221) Derived Variable Dictionary (v.1)

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Prepared by the Collaborative Studies Coordinating Center

ARIC V5_V11_MRI_DERV_NP Derived Variable Dictionary

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NEW OR CHANGED FROM PREVIOUS DISTRIBUTION

This table describes the changes to the last published V5_V11_MRI_DERV_NP dictionary. As the dataset undergoes modifications, this table will describe the updates made to the previously distributed dataset.

Modification Date	Variable Name	Reason(s) for Change

1. OVERVIEW

The V5_V11_MRI_DERV_NP_240221 dataset contains 3,429 records from 2,355 participants who completed one or more magnetic resonance imaging (MRI) scans at ARIC Visit 5 (2011-13), Visits 6 and 7 (2016-19), or Visits 8 to 11 (2020-24). The dataset employs a long format in which each participant has multiple records. Each record represents a specific scan date. Participants may have more than one scan date within and across visits.

The purpose of the dataset is to provide ARIC collaborators with a set of variables that can be used to perform both cross-sectional and longitudinal analyses. All MRI variables were provided by the Mayo Aging and Dementia Imaging Research Lab. Additional derived variables created by the Coordinating Center are described below. Each respective organization may be contacted for additional details about MRI or derived variables as appropriate.

The dataset naming conventions are as follows: The dataset name retains the retrieval date (ex: V5_V11_MRI_DERV_NP_240221) until the dataset is considered final and frozen. After a dataset is frozen, the retrieval date is dropped from the dataset name (ex: V5_V11_MRI_DERV_NP). Datasets with “NP” in the name have dates removed; instead, dates are replaced with number of follow up days after Visit 1 date. The first two characters refer to the earliest visit included in the dataset. The next two characters indicate the final visit that will be included in the dataset. The variable naming convention is similar. Across-visit variables have identical names. The last digit in the variable name identifies the definition version of a variable.

Detailed information about MRI and PET scan procedures is provided in **Manual 30** in the sections entitled *Brain Magnetic Resonance Imaging (MRI) – Visits 5 through 11* and *Positron Emission Tomography (PET) – Visits 5 to 11*. Recommended analyses are described in the section *Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET) Analyses* of **Manual 30**.

2. ADMINISTRATIVE

2.1 SUBJECTID (ARIC Subject ID (CIR))

Type: Character; length: $7.

2.2 VISIT (Visit)

Description: Visit of MRI scan. Visit is determined based on MRI scan date.

Type: Character; length: $5

Algorithm: If scan date is present and less than 1/1/2016 then VISIT='V5'

If scan date is equal to or greater than 1/1/2016 and less than 1/1/2020 then VISIT='V6V7'

If scan date is equal to or greater than 1/1/2020 then VISIT='V8V11'

Source variable(s): MRI scan date

3. UNHARMONIZED INCIDENTAL FINDINGS

Incidental findings from MRI scans include classifications of "possible" or "definite". The derived variables documented below only count infarctions or microhemorrhages with a "definite" status. Please note that unharmonized incidental findings do not reconcile within-participant differences over time. Consequently, it is possible for a participant to have more infarctions or microhemorrhages at Visit 5 than at subsequent visits as there is often some degree of error when identifying infarctions and microhemorrhages.

3.1 CMHFREQ1 (Frequency of microhemorrhages)

Description: Count of all instances in V5_V11_MRI_FINDINGSREPORT for microhemorrhages classified as "definite" based on incidental findings from a MRI scan.

Type: Numeric

Algorithm: Count of all instances in V5_V11_MRI_FINDINGSREPORT for which STATUS='DEFINITE' or 'Definite' and TYPE='MCH'. If a scan was conducted and no instances are detected, then the value is 0.

Source variable(s): STATUS, TYPE

3.2 SUPERSIDFREQ1 (Frequency of superficial siderosis)

Description: Count of all instances in V5_V11_MRI_FINDINGSREPORT for superficial siderosis classified as “definite” based on incidental findings from a MRI scan.

Type: Numeric

Algorithm: Count of all instances in V5_V11_MRI_FINDINGSREPORT for which STATUS=’DEFINITE’ or ‘Definite’ and TYPE=‘SS’. If a scan was conducted and no instances are detected, then the value is 0.

Source variable(s): STATUS, TYPE

3.3 LARGECORTFREQ1 (Frequency of large cortical infarctions)

Description: Count of all instances in V5_V11_MRI_FINDINGSREPORT for large cortical infarctions classified as “definite” based on incidental findings from a MRI scan.

Type: Numeric

Algorithm: Count of all instances in V5_V11_MRI_FINDINGSREPORT for which STATUS=’DEFINITE’ or ‘Definite’ and TYPE=‘Large_Cortical_Infarct’ or ‘Large_Cortical_Infarct_Hemorrhagic’. If a scan was conducted and no instances are detected, then the value is 0.

Source variable(s): STATUS, TYPE

3.4 SMALLCORTFREQ1 (Frequency of small cortical infarctions)

Description: Count of all instances in V5_V11_MRI_FINDINGSREPORT for small cortical infarctions classified as “definite” based on incidental findings from a MRI scan.

Type: Numeric

Algorithm: Count of all instances in V5_V11_MRI_FINDINGSREPORT for which STATUS=’DEFINITE’ or ‘Definite’ and TYPE=‘Small_Cortical_Infarct’ or

'Small_Cortical_Infarct_Hemorrhagic'. If a scan was conducted and no instances are detected, then the value is 0.

Source variable(s): STATUS, TYPE

3.5 SUBCORTFREQ1 (Frequency of subcortical infarctions)

Description: Count of all instances in V5_V11_MRI_FINDINGSREPORT for subcortical infarctions classified as "definite" based on incidental findings from a MRI scan.

Type: Numeric

Algorithm: Count of all instances in V5_V11_MRI_FINDINGSREPORT for which STATUS='DEFINITE' or 'Definite' and TYPE='Sub_Cortical_Infarct' or 'Sub_Cortical_Infarct_Hemorrhagic'. If a scan was conducted and no instances are detected, then the value is 0.

Source variable(s): STATUS, TYPE

3.6 LOBARCMHFREQ1 (Frequency of lobar microhemorrhages)

Description: Count of all instances in V5_V11_MRI_FINDINGSREPORT for lobar microhemorrhages classified as "definite" based on incidental findings from a MRI scan.

Type: Numeric

Algorithm: Count of all instances in V5_V11_MRI_FINDINGSREPORT for which STATUS='DEFINITE' or 'Definite' and TYPE='MCH' and ATLASREGIONS are in any of the following atlas regions:

Atlas Regions	
Periventricular Frontal Left	Periventricular Frontal Right
Subcortical Frontal Left	Subcortical Frontal Right
Periventricular Temporal Left	Periventricular Temporal Right
Subcortical Temporal Left	Subcortical Temporal Right
Periventricular Occipital Left	Periventricular Occipital Right
Subcortical Occipital Left	Subcortical Occipital Right
Periventricular Parietal Left	Periventricular Parietal Right
Subcortical Parietal Left	Subcortical Parietal Right

If a scan was conducted and no instances are detected, then the value is 0.

Source variable(s): STATUS, TYPE, ATLASREGIONS

3.7 DEEPCMHFREQ1 (Frequency of deep cerebral microhemorrhages)

Description: Count of all instances in V5_V11_MRI_FINDINGSREPORT for deep cerebral microhemorrhages classified as “definite” based on incidental findings from a MRI scan.

Type: Numeric

Algorithm: Count of all instances in V5_V11_MRI_FINDINGSREPORT for which STATUS=’DEFINITE’ or ‘Definite’ and TYPE=‘MCH’ and ATLASREGIONS are in any of the following atlas regions:

Atlas Regions	
Left External Capsule	Right External Capsule
Left Internal Capsule	Right Internal Capsule
Left Deep Grey and White	Right Deep Grey and White
Corpus Callosum	
Anterior Corpus Callosum	
Posterior Corpus Callosum	
Central	

If a scan was conducted and no instances are detected, then the value is 0.

Source variable(s): STATUS, TYPE, ATLASREGIONS

3.8 INFRATCMHFREQ1 (Frequency of infratentorial microhemorrhages)

Description: Count of all instances in V5_V11_MRI_FINDINGSREPORT for infratentorial microhemorrhages classified as “definite” based on incidental findings from a MRI scan.

Type: Numeric

Algorithm: Count of all instances in V5_V11_MRI_FINDINGSREPORT for which STATUS=’DEFINITE’ or ‘Definite’ and TYPE=‘MCH’ and ATLASREGIONS are in any of the following atlas regions:

Atlas Regions
Pons
Mid Brain
Medulla
Cerebellum
Brainstem

If a scan was conducted and no instances are detected, then the value is 0.

Source variable(s): STATUS, TYPE, ATLASREGIONS

4. HARMONIZED INCIDENTAL FINDINGS

When participants are assessed at multiple visits, incidental findings are compared and harmonized utilizing an approach recommended by the Mayo Aging and Dementia Imaging Research Lab. The following two rules are used to define a progressive number of infarctions and microhemorrhages.

Rule One: If a value from an earlier visit is greater than the value of the most recent visit, then the earlier value will be changed to match the later value.

Rule Two: If a value is the same at the earliest and latest visit, but different in between, then the value will be changed to match the other two visits.

Example 1. Rule One Applied to Visit 5

	Unharmonized	Harmonized
Visit 5	1	0
Visits 6 and 7	0	0
Visits 8 to 11	0	0

Example 2. Rule Two Applied to Visits 6 and 7

	Unharmonized	Harmonized
Visit 5	1	1
Visits 6 and 7	0	1
Visits 8 to 11	1	1

Example 3. Rule One Applied to Visit 5 and Rule Two Applied to Visits 6 and 7

	Unharmonized	Harmonized
Visit 5	3	1
Visits 6 and 7	0	1
Visits 8 to 11	1	1

Example 4. Rule One and Rule Two Not Applied

	Unharmonized	Harmonized
Visit 5	0	0
Visits 6 and 7	1	1
Visits 8 to 11	3	3

4.1 CMHFREQ2 (Progressive frequency of microhemorrhages)

Description: Modified progression of microhemorrhages over time

Type: Numeric

Algorithm: = CMHFREQ1, if the participant is assessed at one visit. If the participant is assessed at multiple visits, then CMHFREQ1 values are compared and harmonized using Rule One and Rule Two.

Source variable(s): CMHFREQ1

4.2 SUPERSIDFREQ2 (Progressive frequency of superficial siderosis)

Description: Modified progression of superficial siderosis over time

Type: Numeric

Algorithm: = SUPERSIDFREQ1, if the participant is assessed at one visit. If the participant is assessed at multiple visits, then SUPERSIDFREQ1 values are compared and harmonized using Rule One and Rule Two.

Source variable(s): SUPERSIDFREQ1

4.3 LARGECORTFREQ2 (Progressive frequency of large cortical infarctions)

Description: Modified progression of large cortical infarctions over time

Type: Numeric

Algorithm: = LARGECORTFREQ1, if the participant is assessed at one visit. If the participant is assessed at multiple visits, then LARGECORTFREQ1 values are compared and harmonized using Rule One and Rule Two.

Source variable(s): LARGECORTFREQ1

4.4 SMALLCORTFREQ2 (Progressive frequency of small cortical infarctions)

Description: Modified progression of small cortical infarctions over time

Type: Numeric

Algorithm: = SMALLCORTFREQ1, if the participant is assessed at one visit. If the participant is assessed at multiple visits, then SMALLCORTFREQ1 values are compared and harmonized using Rule One and Rule Two.

Source variable(s): SMALLCORTFREQ1

4.5 SUBCORTFREQ2 (Progressive frequency of subcortical infarctions)

Description: Modified progression of subcortical infarctions over time

Type: Numeric

Algorithm: = SUBCORTFREQ1, if the participant is assessed at one visit. If the participant is assessed at multiple visits, then SUBCORTFREQ1 values are compared and harmonized using Rule One and Rule Two.

Source variable(s): SUBCORTFREQ1

4.6 LOBARCMHFREQ2 (Progressive frequency of lobar microhemorrhages)

Description: Modified progression of lobar microhemorrhages over time

Type: Numeric

Algorithm: = LOBARCMHFREQ1, if the participant is assessed at one visit. If the participant is assessed at multiple visits, then LOBARCMHFREQ1 values are compared and harmonized using Rule One and Rule Two.

Source variable(s): LOBARCMHFREQ1

4.7 DEEPCMHFREQ2 (Progressive frequency of deep cerebral microhemorrhages)

Description: Modified progression of deep cerebral microhemorrhages over time

Algorithm: = DEEPCMHFREQ1, if the participant is assessed at one visit. If the participant is assessed at multiple visits, then DEEPCMHFREQ1 values are compared and harmonized using Rule One and Rule Two.

Source variable(s): DEEPCMHFREQ1

4.8 INFRATCMHFREQ2 (Progressive frequency of infratentorial microhemorrhages)

Description: Modified progression of infratentorial microhemorrhages over time

Type: Numeric

Algorithm: = INFRATCMHFREQ1, if the participant is assessed at one visit. If the participant is assessed at multiple visits, then INFRATCMHFREQ1 values are compared and harmonized using Rule One and Rule Two.

Source variable(s): INFRATCMHFREQ1