2016 National Hospital Ambulatory Medical Care Survey (NHAMCS) Data for Dementia Research

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Overview of the data files
This data dictionary is for the three NHAMCS_cog_2016_XXX files, which include STATA, SAS, and CSV file formats.

The NHAMCS_cog_2016 dataset includes data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) Emergency Department (ED) file. Each row of data in the NHAMCS ED file represents a single patient-visit to an ED. Truncated ICD-10 codes from the DIAG1-DIAG5 variables were used to identify patient-visits where the patient was diagnosed with Alzheimer's disease and related dementias (ADRD). This dataset also includes demographic variables (e.g., age, sex, race), visit- and ED-level weights, strata, and PSU, as well as Reason for Visit codes. Some of these variables were recoded in the following ways:

1. Where applicable, variables from the original dataset were recoded, such that answers of "Not applicable" and "Blank" were set to be missing in this dataset
2. Binary variables were re-coded such that no=0 and yes=1 (e.g., `sex` [1=female, 2=male] was re-coded into the variable `female` [0=no/male, 1=yes/female])
3. Variables that were re-coded include the name of the original NHAMCS variable in the description to allow users to easily look up the original question text and categories in the NHAMCS documentation
4. For STATA users, all variable names have been converted to lowercase

For identifying cognitive impairment/ADRD, the variable `cog_dx` was created to flag patient-visits with an ADRD or other cognitive impairment diagnosis where the diagnosis was NOT flagged as probable, questionable, or ruleout. The variables `cog_dx_code1` through `cog_dx_code5` were created to show users which ICD-10 code was identified as diagnosing ADRD. The variable `any_cog` was created to flag instances where either `alzhd` = 1 or `cog_dx` = 1. `alzhd` is a variable created by NHAMCS and indicates if a patient has Alzheimer's disease regardless of diagnosis for the visit.

Brief and detailed summaries of the variable names, types, descriptions, and mean, minimum, and maximum values are included below. Descriptions of each recoded variable in this dataset include the original NHAMCS variable name. Original variable names, question text, and categories can be found on the NHAMCS Website (https://www.cdc.gov/nchs/ahcd/datasets_documentation_related.htm).

Users of this resource should be familiar with complex survey design and appropriately apply the sample weights, strata, and primary sampling units for any analyses. `patwt` should be used for patient-visit-level analyses; `edwt` should be used for ED-level analyses.

Brief summary of all variables (unweighted)

Variable	Obs	Unique	Mean	Min	Max	Label
year	19467	1	2016	2016	2016	Calendar year
id	19467	361	170.4581	2	362	Visit ID - concatenation of hospcode and patcode
hospcode	19467	232	120.6002	1	232	Hospital number
patcode	19467	174	49.85786	1	174	Patient code
region	19467	4	2.730672	1	4	Geographic region
age	19467	94	38.07942	0	93	Patient age in years
ager	19467	6	3.124159	1	6	Age recode
age65	19467	2	.1562131	0	1	Patient is age 65 or older. 1/0
female	19467	2	.543227	0	1	Recode of sex: Patient is female. 1/0
racereth	19467	4	1.64278	1	4	RACER and ETHNIC combination
paytyper	17915	7	2.511917	1	7	Recoded primary expected source of payment for...
payer	17915	4	1.870388	1	4	recode of paytyper: source of payment
totchron	19224	14	1.083385	0	14	Total number of chronic conditions
rfv1	19438	541	23673.5	10050	89990	Patient's complaint, symptom, or other reason ...
rfv2	12519	595	21980.68	10050	89990	Patient's complaint, symptom, or other reason ...
rfv3	7441	544	20601.65	10050	89990	Patient's complaint, symptom, or other reason ...
rfv4	4201	466	20593.12	10050	89990	Patient's complaint, symptom, or other reason ...
rfv5	2200	382	21035.96	10050	89990	Patient's complaint, symptom, or other reason ...
diag1	19467	1522	.	.	.	Diagnosis #1
diag2	19467	1396	.	.	.	Diagnosis #2
diag3	19467	1072	.	.	.	Diagnosis #3
diag4	19467	823	.	.	.	Diagnosis #4
diag5	19467	578	.	.	.	Diagnosis #5
prdiag1	19368	2	.0035626	0	1	For diagnosis 1, is this probable, questionabl...
prdiag2	10727	2	.0098816	0	1	For diagnosis 2, is this probable, questionabl...
prdiag3	5679	2	.0119739	0	1	For diagnosis 3, is this probable, questionabl...
prdiag4	3145	2	.0073132	0	1	For diagnosis 4, is this probable, questionabl...
prdiag5	1834	2	.0070883	0	1	For diagnosis 5, is this probable, questionabl...
alzhd	19467	2	.0132532	0	1	Does patient have: Alzheimer's disease/Dementia
cog_dx	19467	2	.0106847	0	1	indicator: any cognition-related diagnosis. 1/0
any_cog	19467	2	.0190579	0	1	any cognition-related diagnosis (cog_dx=1) or ...
cog_dx_code1	84	4	.	.	.	identified cognition-related ICD-9 / ICD-10 di...
cog_dx_code2	62	5	.	.	.	identified cognition-related ICD-9 / ICD-10 di...
cog_dx_code3	34	5	.	.	.	identified cognition-related ICD-9 / ICD-10 di...
cog_dx_code4	28	5	.	.	.	identified cognition-related ICD-9 / ICD-10 di...
cog_dx_code5	19	3	.	.	.	identified cognition-related ICD-9 / ICD-10 di...

```
settype        19467      1          3          3          3  Setting type

cstratm        19467      8   3.14e+07   2.01e+07   4.04e+07  Clustered CSTRATM -- masked

cpsum          19467    134   44405.95          1     100228  Clustered CPSUM -- masked

patwt          19467    305   7478.872   40.41293   52250.26  Patient visit weight

edwt             232    223   21.32673    1.40925   102.5765  ED weight

-------------------------------------------------------------------------------------------
```

Detailed summary of all variables (unweighted)

```
-----------------------------------------------------------------------------------------
year                                                                          Calendar year
-----------------------------------------------------------------------------------------

                type:  numeric (int)


               range:  [2016,2016]                  units:  1
       unique values:  1                       missing .:  0/19,467


          tabulation:  Freq.   Value
                       19,467   2016


-----------------------------------------------------------------------------------------
id                                         Visit ID - concatenation of hospcode and patcode
-----------------------------------------------------------------------------------------

                type:  numeric (int)


               range:  [2,362]                       units:  1
       unique values:  361                     missing .:  0/19,467


                mean:  170.458
           std. dev:  77.4589


         percentiles:      10%      25%      50%      75%      90%
                            66      108      171      232      274


-----------------------------------------------------------------------------------------
hospcode                                                                     Hospital number
-----------------------------------------------------------------------------------------

                type:  numeric (int)


               range:  [1,232]                       units:  1
       unique values:  232                     missing .:  0/19,467
```

```
            mean:     120.6

        std. dev:  68.9462


       percentiles:        10%         25%         50%         75%         90%
                            21          61         123         183         213


------------------------------------------------------------------------------------------------------
patcode                                                                                  Patient code
------------------------------------------------------------------------------------------------------


             type:  numeric (int)


            range:  [1,174]                          units:  1
    unique values:  174                          missing .:  0/19,467


             mean:  49.8579

        std. dev:  32.5052


       percentiles:        10%         25%         50%         75%         90%
                             9          22          46          74          96


------------------------------------------------------------------------------------------------------
region                                                                               Geographic region
------------------------------------------------------------------------------------------------------


             type:  numeric (byte)
            label:  REGIONF


            range:  [1,4]                            units:  1
    unique values:  4                            missing .:  0/19,467


       tabulation:  Freq.   Numeric  Label
                    3,013          1  Northeast
                    4,497          2  Midwest
                    6,677          3  South
                    5,280          4  West


------------------------------------------------------------------------------------------------------
age                                                                              Patient age in years
------------------------------------------------------------------------------------------------------
```

```
            type:  numeric (byte)

           label:  AGEF, but 92 nonmissing values are not labeled


           range:  [0,93]                    units:  1
   unique values:  94                     missing .:  0/19,467


        examples:  16
                   29
                   44
                   60


--------------------------------------------------------------------------------------------------
ager                                                                                    Age recode
--------------------------------------------------------------------------------------------------


            type:  numeric (byte)

           label:  AGERF


           range:  [1,6]                     units:  1
   unique values:  6                      missing .:  0/19,467


      tabulation:  Freq.   Numeric  Label
                   3,565        1  Under 15 years
                   2,767        2  15-24 years
                   5,459        3  25-44 years
                   4,635        4  45-64 years
                   1,444        5  65-74 years
                   1,597        6  75 years and over


--------------------------------------------------------------------------------------------------
age65                                                         Patient is age 65 or older. 1/0
--------------------------------------------------------------------------------------------------


            type:  numeric (byte)

           label:  NOYESF


           range:  [0,1]                     units:  1
   unique values:  2                      missing .:  0/19,467
```

```
       tabulation:  Freq.   Numeric  Label
                    16,426        0  No
                     3,041        1  Yes


--------------------------------------------------------------------------------------------------
female                                              Recode of sex: Patient is female. 1/0
--------------------------------------------------------------------------------------------------


              type:  numeric (byte)
             label:  NOYESF


             range:  [0,1]                         units:  1
     unique values:  2                         missing .:  0/19,467


       tabulation:  Freq.   Numeric  Label
                     8,892        0  No
                    10,575        1  Yes


--------------------------------------------------------------------------------------------------
racereth                                            RACER and ETHNIC combination
--------------------------------------------------------------------------------------------------


              type:  numeric (byte)
             label:  RACERETHF


             range:  [1,4]                         units:  1
     unique values:  4                         missing .:  0/19,467


       tabulation:  Freq.   Numeric  Label
                    11,490        1  Non-Hispanic White
                     4,270        2  Non-Hispanic Black
                     2,878        3  Hispanic
                       829        4  Non-Hispanic Other


--------------------------------------------------------------------------------------------------
paytyper                 Recoded primary expected source of payment for this visit (based on hierarchy)
--------------------------------------------------------------------------------------------------


              type:  numeric (byte)
             label:  PAYTYPERF
```

```
         range:  [1,7]                          units:  1
 unique values:  7                            missing .:  1,552/19,467


    tabulation:  Freq.   Numeric  Label
                 5,171         1  Private insurance
                 3,580         2  Medicare
                 6,976         3  Medicaid or CHIP or other
                                  state-based program
                   141         4  Worker's compensation
                 1,527         5  Self-pay
                    97         6  No charge/Charity
                   423         7  Other
                 1,552         .
```

----
payer   recode of paytyper: source of payment

```
          type:  numeric (byte)
         label:  payerlbl


         range:  [1,4]                          units:  1
 unique values:  4                            missing .:  1,552/19,467


    tabulation:  Freq.   Numeric  Label
                  5,171        1  Private insurance
                 10,556        2  Medicare/Medicaid/CHIP
                  1,527        3  Self-pay
                    661        4  Other
                  1,552        .
```

----
totchron   Total number of chronic conditions

```
          type:  numeric (byte)
         label:  TOTPROCF, but 14 nonmissing values are not labeled


         range:  [0,14]                         units:  1
```

```
       unique values:  14                            missing .:  243/19,467


             examples:  0

                        0

                        1

                        2


----------------------------------------------------------------------------------------------------
rfv1                         Patient's complaint, symptom, or other reason for visit #1 - detailed category
----------------------------------------------------------------------------------------------------


                 type:  numeric (long)
                label:  RFVF


                range:  [10050,89990]                  units:  1
       unique values:  541                            missing .:  29/19,467


             examples:  12100 Headache, pain in head

                        15153 Tongue inflammation, infection, swelling

                        18650 Skin lesion

                        41150 Medication, other and unspecified kinds


----------------------------------------------------------------------------------------------------
rfv2                         Patient's complaint, symptom, or other reason for visit #2 - detailed category
----------------------------------------------------------------------------------------------------


                 type:  numeric (long)
                label:  RFVF


                range:  [10050,89990]                  units:  1
       unique values:  595                            missing .:  6,948/19,467


             examples:  14150 Shortness of breath

                        18600 Skin rash

                        58050 Motor vehicle accident, type of injur...

                        .


----------------------------------------------------------------------------------------------------
rfv3                         Patient's complaint, symptom, or other reason for visit #3 - detailed category
----------------------------------------------------------------------------------------------------
```

```
                 type:  numeric (long)
                label:  RFVF


                range:  [10050,89990]              units:  1
        unique values:  544                     missing .:  12,026/19,467


             examples:  15451 Abdominal pain, cramps, spasms, NOS
                        .
                        .
                        .


-------------------------------------------------------------------------------------------------
rfv4                     Patient's complaint, symptom, or other reason for visit #4 - detailed category
-------------------------------------------------------------------------------------------------


                 type:  numeric (long)
                label:  RFVF


                range:  [10050,89990]              units:  1
        unique values:  466                     missing .:  15,266/19,467


             examples:  51150 Sprain and strain of knee
                        .
                        .
                        .


-------------------------------------------------------------------------------------------------
rfv5                     Patient's complaint, symptom, or other reason for visit #5 - detailed category
-------------------------------------------------------------------------------------------------


                 type:  numeric (long)
                label:  RFVF


                range:  [10050,89990]              units:  1
        unique values:  382                     missing .:  17,267/19,467


             examples:  .
                        .
                        .
```

.

----
diag1   Diagnosis #1
----

                type: string (str4)

       unique values: 1,522   missing "": 0/19,467

            examples: "J029"
                       "M519"
                       "R103"
                       "S134"

----
diag2   Diagnosis #2
----

                type: string (str4)

       unique values: 1,396   missing "": 0/19,467

            examples: "-9"
                       "-9"
                       "I509"
                       "R098"

----
diag3   Diagnosis #3
----

                type: string (str4)

       unique values: 1,072   missing "": 0/19,467

            examples: "-9"
                       "-9"
                       "-9"
                       "I120"

```
--------------------------------------------------------------------------------------------------
diag4                                                                             Diagnosis #4
--------------------------------------------------------------------------------------------------

              type:  string (str4)


      unique values:  823                        missing "":  0/19,467


           examples:  "-9"
                      "-9"
                      "-9"
                      "-9"



--------------------------------------------------------------------------------------------------
diag5                                                                             Diagnosis #5
--------------------------------------------------------------------------------------------------

              type:  string (str4)


      unique values:  578                        missing "":  0/19,467


           examples:  "-9"
                      "-9"
                      "-9"
                      "-9"



--------------------------------------------------------------------------------------------------
prdiag1                              For diagnosis 1, is this probable, questionable, or ruleout?
--------------------------------------------------------------------------------------------------

              type:  numeric (byte)
             label:  PRDIAGF


             range:  [0,1]                            units:  1
      unique values:  2                         missing .:  99/19,467


        tabulation:  Freq.   Numeric  Label
                     19,299        0  No
                         69        1  Yes
```

14

```
                          99              .



--------------------------------------------------------------------------------------------------------
prdiag2                                      For diagnosis 2, is this probable, questionable, or ruleout?
--------------------------------------------------------------------------------------------------------


              type:  numeric (byte)
             label:  PRDIAGF


             range:  [0,1]                               units:  1
     unique values:  2                              missing .:  8,740/19,467


        tabulation:  Freq.   Numeric  Label
                    10,621         0  No
                       106         1  Yes
                     8,740         .



--------------------------------------------------------------------------------------------------------
prdiag3                                      For diagnosis 3, is this probable, questionable, or ruleout?
--------------------------------------------------------------------------------------------------------


              type:  numeric (byte)
             label:  PRDIAGF


             range:  [0,1]                               units:  1
     unique values:  2                              missing .:  13,788/19,467


        tabulation:  Freq.   Numeric  Label
                     5,611         0  No
                        68         1  Yes
                    13,788         .



--------------------------------------------------------------------------------------------------------
prdiag4                                      For diagnosis 4, is this probable, questionable, or ruleout?
--------------------------------------------------------------------------------------------------------


              type:  numeric (byte)
             label:  PRDIAGF


             range:  [0,1]                               units:  1
```

```
         unique values:  2                              missing .:  16,322/19,467


            tabulation:  Freq.   Numeric  Label
                         3,122         0  No
                            23         1  Yes
                        16,322         .


-----------------------------------------------------------------------------------------------------
prdiag5                                    For diagnosis 5, is this probable, questionable, or ruleout?
-----------------------------------------------------------------------------------------------------


                  type:  numeric (byte)
                 label:  PRDIAGF


                 range:  [0,1]                              units:  1
         unique values:  2                              missing .:  17,633/19,467


            tabulation:  Freq.   Numeric  Label
                         1,821         0  No
                            13         1  Yes
                        17,633         .


-----------------------------------------------------------------------------------------------------
alzhd                                              Does patient have: Alzheimer's disease/Dementia
-----------------------------------------------------------------------------------------------------


                  type:  numeric (byte)
                 label:  NOYESF


                 range:  [0,1]                              units:  1
         unique values:  2                              missing .:  0/19,467


            tabulation:  Freq.   Numeric  Label
                        19,209         0  No
                           258         1  Yes


-----------------------------------------------------------------------------------------------------
cog_dx                                             indicator: any cognition-related diagnosis. 1/0
-----------------------------------------------------------------------------------------------------
```

```
                 type:  numeric (byte)
                label:  NOYESF


                range:  [0,1]                          units:  1
        unique values:  2                         missing .:  0/19,467


           tabulation:  Freq.   Numeric  Label
                        19,259        0  No
                           208        1  Yes


------------------------------------------------------------------------------------------------
any_cog                      any cognition-related diagnosis (cog_dx=1) or patient indicated to have dementia
------------------------------------------------------------------------------------------------


                 type:  numeric (byte)
                label:  NOYESF


                range:  [0,1]                          units:  1
        unique values:  2                         missing .:  0/19,467


           tabulation:  Freq.   Numeric  Label
                        19,096        0  No
                           371        1  Yes


------------------------------------------------------------------------------------------------
cog_dx_code1                          identified cognition-related ICD-9 / ICD-10 diagnosis code from diag1
------------------------------------------------------------------------------------------------


                 type:  string (str4)


        unique values:  4                        missing "":  19,383/19,467


           tabulation:  Freq.  Value
                        19,383  ""
                             9  "F039"
                             5  "G309"
                             1  "G318"
                            69  "R418"


------------------------------------------------------------------------------------------------
```

```
cog_dx_code2                        identified cognition-related ICD-9 / ICD-10 diagnosis code from diag2
------------------------------------------------------------------------------------------------------

                 type:  string (str4)


         unique values:  5                          missing "":  19,405/19,467


           tabulation:  Freq.  Value
                       19,405  ""
                            7  "F028"
                           16  "F039"
                            4  "G309"
                            1  "G318"
                           34  "R418"


------------------------------------------------------------------------------------------------------
cog_dx_code3                        identified cognition-related ICD-9 / ICD-10 diagnosis code from diag3
------------------------------------------------------------------------------------------------------

                 type:  string (str4)


         unique values:  5                          missing "":  19,433/19,467


           tabulation:  Freq.  Value
                       19,433  ""
                            3  "F028"
                           10  "F039"
                            1  "G309"
                            1  "G318"
                           19  "R418"


------------------------------------------------------------------------------------------------------
cog_dx_code4                        identified cognition-related ICD-9 / ICD-10 diagnosis code from diag4
------------------------------------------------------------------------------------------------------

                 type:  string (str4)


         unique values:  5                          missing "":  19,439/19,467


           tabulation:  Freq.  Value
```

```
                      19,439  ""
                          1  "F028"
                         11  "F039"
                          8  "G309"
                          2  "G318"
                          6  "R418"


-------------------------------------------------------------------------------------------------
cog_dx_code5                              identified cognition-related ICD-9 / ICD-10 diagnosis code from diag5
-------------------------------------------------------------------------------------------------


              type:  string (str4)


      unique values:  3                        missing "":  19,448/19,467


         tabulation:  Freq.  Value
                      19,448  ""
                          6  "F028"
                         12  "F039"
                          1  "R418"


-------------------------------------------------------------------------------------------------
settype                                                                                Setting type
-------------------------------------------------------------------------------------------------


              type:  numeric (byte)
             label:  SETTYPF


             range:  [3,3]                        units:  1
      unique values:  1                        missing .:  0/19,467


         tabulation:  Freq.   Numeric  Label
                      19,467        3  NHAMCS - ED


-------------------------------------------------------------------------------------------------
cstratm                                                                      Clustered CSTRATM -- masked
-------------------------------------------------------------------------------------------------


              type:  numeric (long)
```

```
              range:  [20116200,40400000]          units:  100
      unique values:  8                          missing .:  0/19,467


         tabulation:  Freq.   Value
                      1,565   20116201
                      2,019   20216201
                      1,676   20316201
                      3,371   20416201
                      1,448   40100000
                      2,478   40200000
                      5,001   40300000
                      1,909   40400000


-------------------------------------------------------------------------------------------------
cpsum                                                                    Clustered CPSUM -- masked
-------------------------------------------------------------------------------------------------


               type:  numeric (long)


              range:  [1,100228]                    units:  1
      unique values:  134                        missing .:  0/19,467


               mean:  44405.9
           std. dev:    49733


        percentiles:       10%       25%       50%       75%       90%
                             8        21        39    100114    100205


-------------------------------------------------------------------------------------------------
patwt                                                                     Patient visit weight
-------------------------------------------------------------------------------------------------


               type:  numeric (float)


              range:  [40.41293,52250.258]          units:  .00001
      unique values:  305                        missing .:  0/19,467


               mean:  7478.87
           std. dev:   6717.2
```

```
         percentiles:        10%        25%        50%        75%        90%

                           1314.4    2873.27    5621.11    9784.18      15155


-------------------------------------------------------------------------------------------------
edwt                                                                                    ED weight
-------------------------------------------------------------------------------------------------


            type:  numeric (float)


           range:  [1.40925,102.57653]           units:  .00001
   unique values:  223                         missing .:  19,235/19,467


            mean:   21.3267
        std. dev:   20.474


         percentiles:        10%        25%        50%        75%        90%

                          4.05351    7.32976     14.525    27.6287    47.6966
```