

ADNI Dataset

Predicting Alzheimer's Disease given a MCI patient's characteristics

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Load Data Set

```
library(ADNIMERGE)
data(adnimerge)
```

Data Cleaning

We are subsetting to baseline visits only here.

Data Imputation

```
##
## iter imp variable
## 1 1 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 1 2 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 1 3 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 1 4 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 1 5 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 1 6 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 1 7 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 1 8 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 1 9 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 1 10 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 2 1 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 2 2 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 2 3 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 2 4 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 2 5 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 2 6 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 2 7 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 2 8 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 2 9 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 2 10 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 3 1 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 3 2 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 3 3 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 3 4 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 3 5 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
## 3 6 AGE FAQ MMSE ADAS11 ADAS13 ADASQ4 RAVLT.immediate RAVLT.learning RAVLT.forgetting
```

[illegible]

##	9	1	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	9	2	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	9	3	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	9	4	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	9	5	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	9	6	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	9	7	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	9	8	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	9	9	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	9	10	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	10	1	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	10	2	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	10	3	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	10	4	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	10	5	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	10	6	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	10	7	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	10	8	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	10	9	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting
##	10	10	AGE	FAQ	MMSE	ADAS11	ADAS13	ADASQ4	RAVLT.immediate	RAVLT.learning	RAVLT.forgetting

Exploratory Analysis

Summary Statistics

Characteristic	0, N = 1,586	1, N = 425
Participant roster ID	4,623 (2,036, 6,329)	1,243 (626, 4,415)
Sex		
Female	795 (50%)	176 (41%)
Male	791 (50%)	249 (59%)
Age	72 (67, 77)	74 (70, 79)
Education	16.00 (14.00, 18.00)	16.00 (14.00, 18.00)
Marital		
Divorced	185 (12%)	27 (6.4%)
Married	1,133 (71%)	340 (80%)
Never married	78 (4.9%)	9 (2.1%)
Unknown	9 (0.6%)	0 (0%)
Widowed	180 (11%)	49 (12%)
Unknown	1	0
Baseline Dx		
CN	510 (32%)	33 (7.8%)
SMC	348 (22%)	6 (1.4%)
EMCI	357 (23%)	66 (16%)
LMCI	371 (23%)	320 (75%)
AD	0 (0%)	0 (0%)
CDR-SB	0.00 (0.00, 1.00)	1.50 (1.00, 2.50)
FAQ	0.00 (0.00, 1.00)	3.00 (1.00, 7.00)
MMSE	29.00 (28.00, 30.00)	27.00 (26.00, 29.00)
ADAS 11	6.7 (4.0, 9.0)	11.3 (8.7, 15.0)
ADAS 13 (including Delayed Word Recall and Number Cancellation)	10 (7, 15)	20 (15, 24)
ADAS Delayed Word Recall	3.00 (2.00, 5.00)	7.00 (5.00, 9.00)

Characteristic	0, N = 1,586	1, N = 425
RAVLT Immediate (sum of 5 trials)	41 (34, 50)	29 (24, 35)
RAVLT Learning (trial 5 - trial 1)	5.00 (4.00, 7.00)	3.00 (2.00, 5.00)
RAVLT Forgetting (trial 5 - delayed)	4.00 (2.00, 6.00)	5.00 (3.00, 6.00)
RAVLT Percent Forgetting	40 (20, 64)	80 (50, 100)
Logical Memory - Delayed Recall	10.0 (7.0, 13.0)	4.0 (1.0, 8.0)
Trails B	78 (60, 105)	109 (78, 158)

Data Visualization