**Cohort Creation**

Abbreviations: ADRD-Alzheimer's disease and related dementias, AMI-acute myocardial infarction, COPD-chronic obstructive pulmonary disease, FFS – fee-for-service, MBSF – master beneficiary summary file, CCW-chronic conditions data warehouse, SNF-skilled nursing facility, NJ-SHO-New Jersey Safety and Health Outcomes Data Warehouse

1. Initial groups
   1. Bynum-Standard based ADRD diagnosis1
      1. Using the “Bynum-Standard” 1-year algorithm in the cited literature, we identified individuals with a diagnosis of ADRD between 1/1/2010 and 12/31/2017. The date of the claim that satisfies the algorithm is the index date for this group.
   2. Control diagnoses
      1. Identify anyone with an incident diagnosis of AMI, asthma, COPD, or diabetes between 1/1/2010 and 12/31/2017 using the MBSF file and CCW indicators of disease. The date of the incident diagnosis is the index date for these controls.
   3. Claims based controls
      1. Identify anyone in the carrier, inpatient, or SNF claims files with a Medicare claim between 1/1/2010 and 12/31/2017. Keep only one claim per month per individual as analyses are conducted at the month level. The date of the claim is the index date for these controls.
2. Medicare enrollment
   1. Restrict to 4 years of continuous FFS and Parts A and B enrollment prior to the index date. This covers the 3 years of lookback plus one additional year of Medicare enrollment for identification of comorbidities. Use the MBSF enrollment file for this.
   2. The original entitlement to Medicare must be due to age and not other disability which may be a confounder. Use the MBSF enrollment file for this.
3. Age
   1. Restrict to individuals 69 years or older at the index date. This is to ensure four years of prior continuous Medicare enrollment which should only begin at age 65 if individuals are entitled due to age and not disability. This should be done using the index date and date of birth obtained from the MBSF file.
4. Residence
   1. Restrict to individuals with a New Jersey residence during the 3 years of lookback and including the year of the index date. This is done at the year level as the residence variable found in the MBSF enrollment file is yearly.
5. Driver’s license
   1. Using the linked NJ-SHO data, identify those with a full license during the 3 years of lookback. The license may be suspended and unknown start dates for a full license are accepted if a permit or probationary license start date occurs prior to the start of lookback.
6. Prior ADRD diagnosis
   1. Exclude anyone with a prior ADRD diagnosis according to either the CCW indicators of ADRD from the MBSF files, or a prior ADRD diagnosis according to the Bynum-Standard algorithm, as described in step 1. This is to ensure an incident ADRD diagnosis for the ADRD group, and to prevent misclassification bias in the control groups.
7. Recent healthcare encounter
   1. Exclude anyone without a carrier, inpatient, or SNF Medicare claim within 14 months prior to the index date. This is to allow for the possibility of an earlier diagnosis for groups with a diagnosis for an index date. This criteria was not applied to the claims control group.
8. Matching
   1. Match each individual in the ADRD group with individuals in each control group. This will result in 5 cohorts, one for each control group. Matching is 1:1 with replacement. The matching criteria is floored age, sex, and calendar quarter of the index date.

**References**

1. McCarthy EP, Chang CH, Tilton N, Kabeto MU, Langa KM, Bynum JPW. Validation of Claims Algorithms to Identify Alzheimer’s Disease and Related Dementias. *J Gerontol A Biol Sci Med Sci*. 2021;77(6):1261-1271. doi:10.1093/gerona/glab373