

2026 IHS Clinical and Community Workforce Summit

Alzheimer's and Elder Care

Alzheimer's Disease and Related Dementia among Older AI/AN Adults: Emerging Research on Risk Factors and Opportunities (Practice Considerations)

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Outline

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- I. Acknowledgements
 - II. Improving Health Care Delivery Data Project
 - III. American Indian and Alaska Native (AI/AN) Dementia Risks Factors
 - IV. Utilization of Hospital Inpatient Services by AI/AN Adults with Dementia
 - V. Other Information
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I. Acknowledgements



❖ Acknowledgments:

- Our project advisory boards include many persons who work at the IHS, Tribal, and other AI/AN organizations. We thank them for their guidance and expertise.
- Most persons who analyze these data are graduate students enrolled in our university public health masters and doctoral programs.

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❖ **Conflicts of interest:** The authors have nothing to disclose.

II. Improving Health Care Delivery Data Project

- Since 2010, the IHS and Tribes have collaborated with the Centers for American Indian and Alaska Native Health at the University of Colorado and the Department of Epidemiology and Biostatistics, University of California Irvine on the *IHS Improving Health Care Delivery Data Project (IHS Data Project)*.



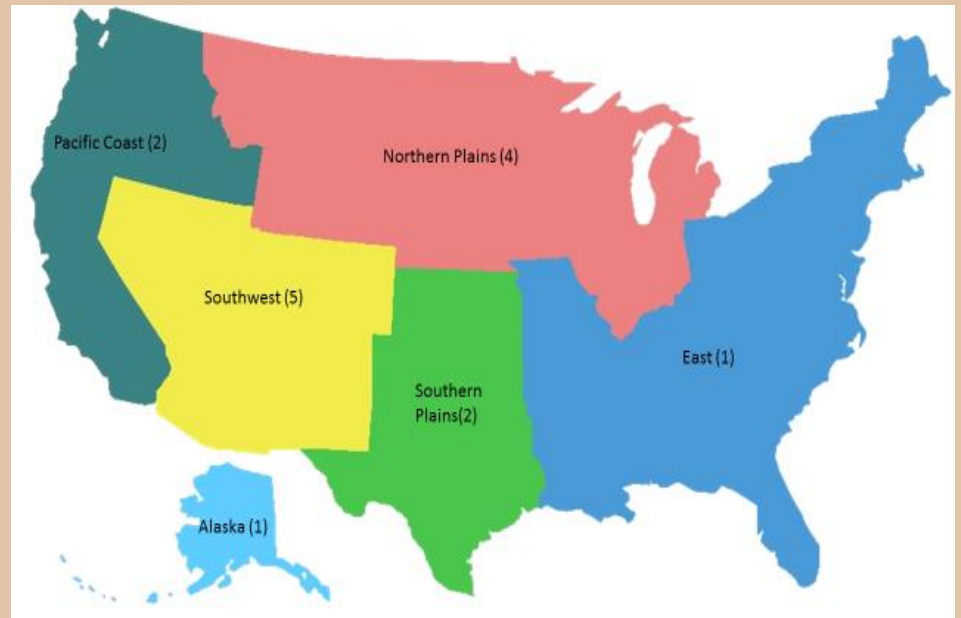
- Synthesizes electronic health record (EHR) and other data from the **IHS National Data Warehouse** and other sources for 15 Service Units for FY2007-2013
- Includes information on health status, utilization, and treatment costs for over **640,000 AI/AN** people, representing nearly **30%** of AI/AN people who use IHS/Tribal services

II. Improving Health Care Delivery Data Project

IHS Data Project

Background: Project personnel partnered with IHS and the Tribal organizations that participate in the IHS Data Project.

Project Goal: Provide information for IHS, Tribal leaders, and communities on chronic diseases among AI/ANs and services provided to meet their needs.



Project's Collaborative Network: The Network includes the Steering and Project Site Committees as well as IHS and Tribal IRBs & other authorities.

II. Improving Health Care Delivery Data Project



Types of Data

Population: American Indian/Alaska Native peoples

Registration data: Age, sex, location

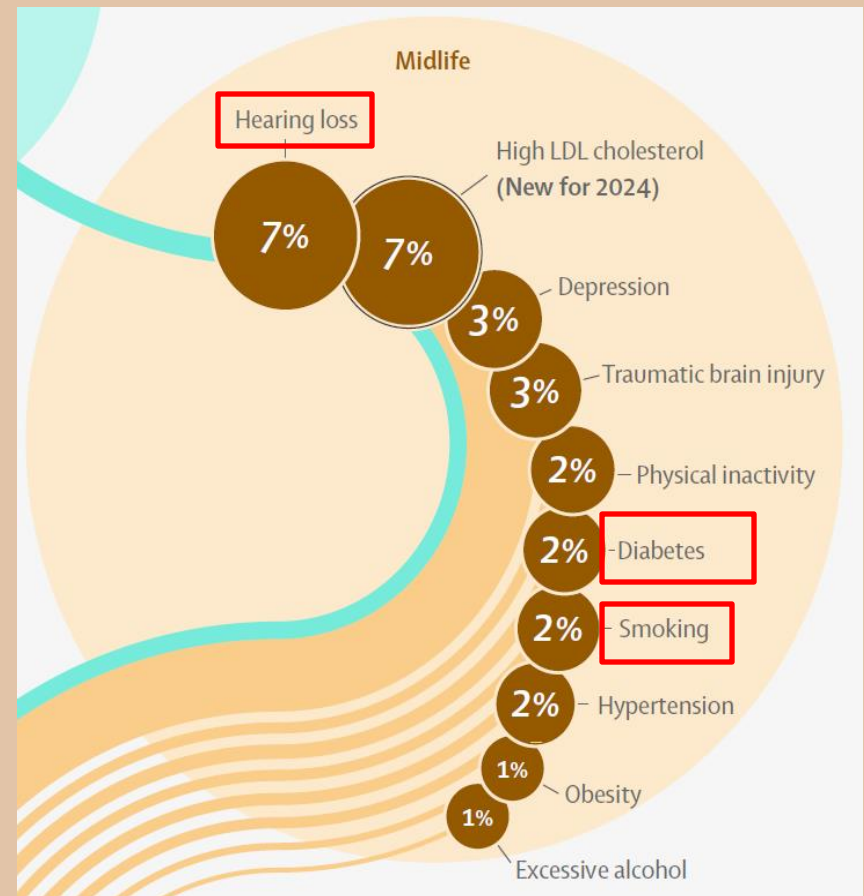
Service utilization: Inpatient and outpatient services, medications

Health status: Diagnoses on service utilization records, height and weight data, laboratory test results, other

Treatment costs: We worked with fiscal experts who had facility expenditures to estimate IHS/Tribal costs of providing services by type.

III. AI/AN Dementia Risk Factors Background

- In studies of other populations, hearing loss, high HDL cholesterol, depression, traumatic brain injury, diabetes, and hypertension were found to be an important preventable risk factor for dementia¹
- AI/ANs bear a disproportionate burden of many established modifiable risk factors for dementia, such as diabetes, smoking, and hearing loss²
- **Limited literature on association between potential risk factors and dementia among AI/AN adults**



1. Livingston, G., Huntley, J., Liu, KY, et al. (2024). Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission. *The Lancet*, 404(10452), 572-628.
2. Li, L, Yang, M, Fan, W, et al. (2025) Hearing loss and subjective cognitive decline in American Indian and Alaska Native adults. *Behavior & Socioeconomics of Aging*. 2025: e70019

III. STUDY #1: Cardiometabolic Conditions and Dementia

OBJECTIVES:

- Examine the association of diabetes, hypertension, and CVD with all-cause dementia among AI/ANs aged 65 years and older.

DATA SOURCE:

- Improving Health Care Delivery Data Project

Goins, TR, Winchester, B, Jiang, L, Grau, L, Reid, M, Corrada, MM, Manson, SM, O'Connell J. (2022) Cardiometabolic conditions and all-cause dementia among American Indian and Alaska Native Peoples. *Journal of Gerontology, Series A, Biological Sciences and Medical Sci.* 77(2):323-330.

III.1. STUDY #1: METHODS

Study Population:

- 1:1 matched sample of 4,074 AI/ANs (2,037 persons with dementia and 2,037 controls)
- Lived in one of the project sites
- IHS active users between 10/10/2012 and 09/30/2013 (FY2013)

Statistical Analysis

- Multiple variable **conditional logistic regressions** for matched data

III.1. STUDY #1: METHODS



Outcome Measure

- Adults were identified as having **prevalent all-cause dementia** if they had at least one qualifying ICD-9 diagnostic code for all-cause dementia during FY2007-2013.

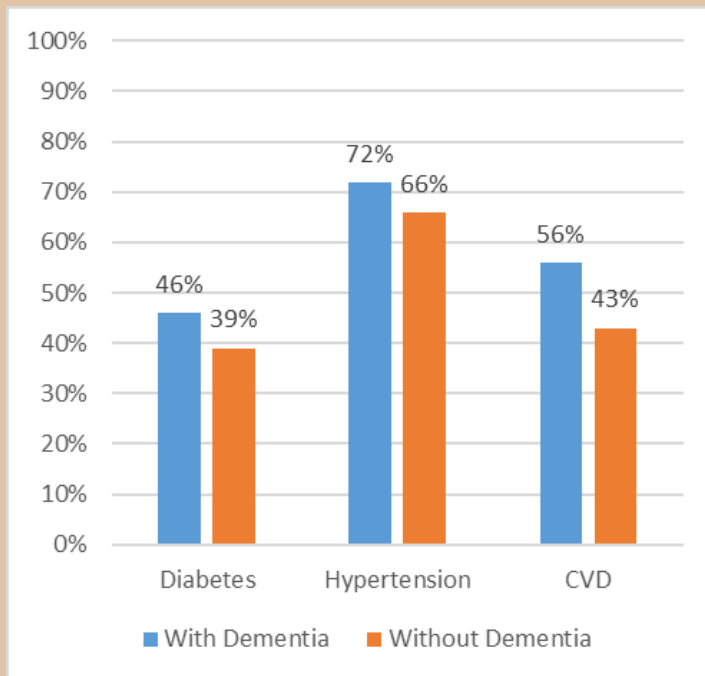
Independent variables

- ICD-9-CM diagnostic codes, recorded in the National Data Warehouse and Purchased and Referred Care inpatient and outpatient service use records, supplemented by blood sugar values, were used to identify diabetes, hypertension, and CVD

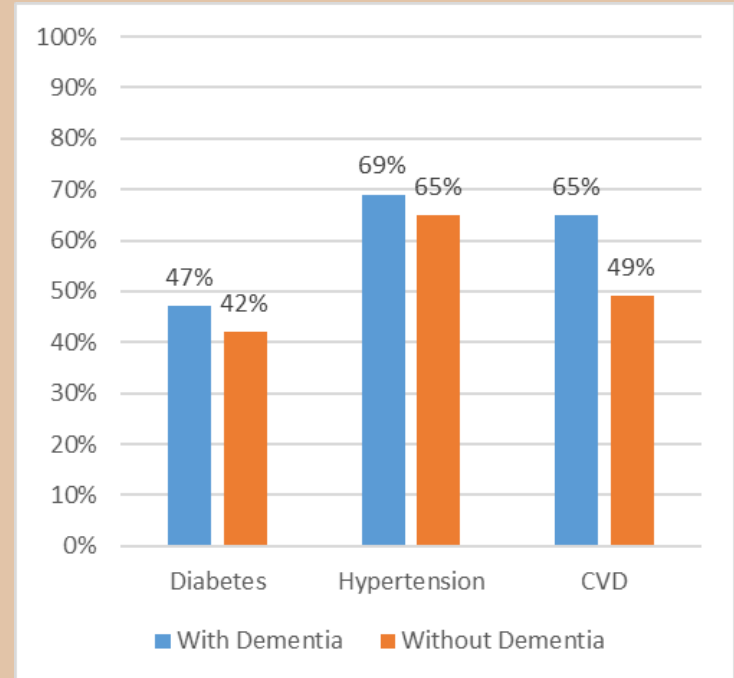
III. STUDY #1: RESULTS

Prevalence of diabetes, hypertension, and cardiovascular disease (CVD) by dementia status and sex

Females



Males



III.1. STUDY #1: RESULTS

Results from multivariable logistic regressions on associations between diabetes, hypertension, and CVD with dementia

	All Adults		Females		Males	
	OR	95% CI	OR	95% CI	OR	95% CI
Diabetes	1.17*	1.02, 1.35	1.20*	1.00, 1.44*	1.13	0.90, 1.41
Hypertension	0.96	0.83, 1.12	1.05	0.87, 1.27	0.82	0.64, 1.07
CVD	1.79***	1.55, 2.07	1.71***	1.43, 2.05	1.94***	1.52, 2.48

OR: Odds ratio; CI: Confidence interval; *, ***: p values < 0.05, <0.001

Among all adults,

- Diabetes was associated with 17% higher odds of dementia.
- Cardiovascular disease was associated with 79% higher odds of dementia.
- After controlling for CVD and diabetes, the association between hypertension and dementia was insignificant.

III. STUDY #2: Associations between Diabetes and Depression with Dementia Risk

OBJECTIVES:

- Evaluate the longitudinal association between depression and diabetes, alone and together, with dementia risk among AI/AN adults
- Investigate sex variabilities in the association between depression and dementia risk among AI/AN people

DATA SOURCE:

- Improving Health Care Delivery Data Project

III. STUDY #2: METHODS

Study Population:

- AI/ANs adults aged ≥ 45 years old in FY 2007
- Used IHS services at least once each year at **baseline** (FY2007 – FY2009 or 10/01/2006 – 09/30/2009)
- Dementia free (or undiagnosed) at baseline
- **Total sample size: N=65,801**

III. STUDY #2: METHODS



Outcome Measure

- Adults were identified as having **incident all-cause dementia** if they had at least one qualifying ICD-9 diagnostic code for all-cause dementia during FY2010-2013.

Main Independent Variable

- Adults were identified as having **depression** at baseline if they had at least one qualifying ICD-9 diagnostic code for depression during baseline (FY2007-2009):

STUDY #2: METHODS

Statistical Analysis

- Descriptive statistics:
t-tests, chi-square tests
- Association analysis:
Cox proportional hazard regression models with age as the time scale

Model 1

Depression + Sex

Model 2

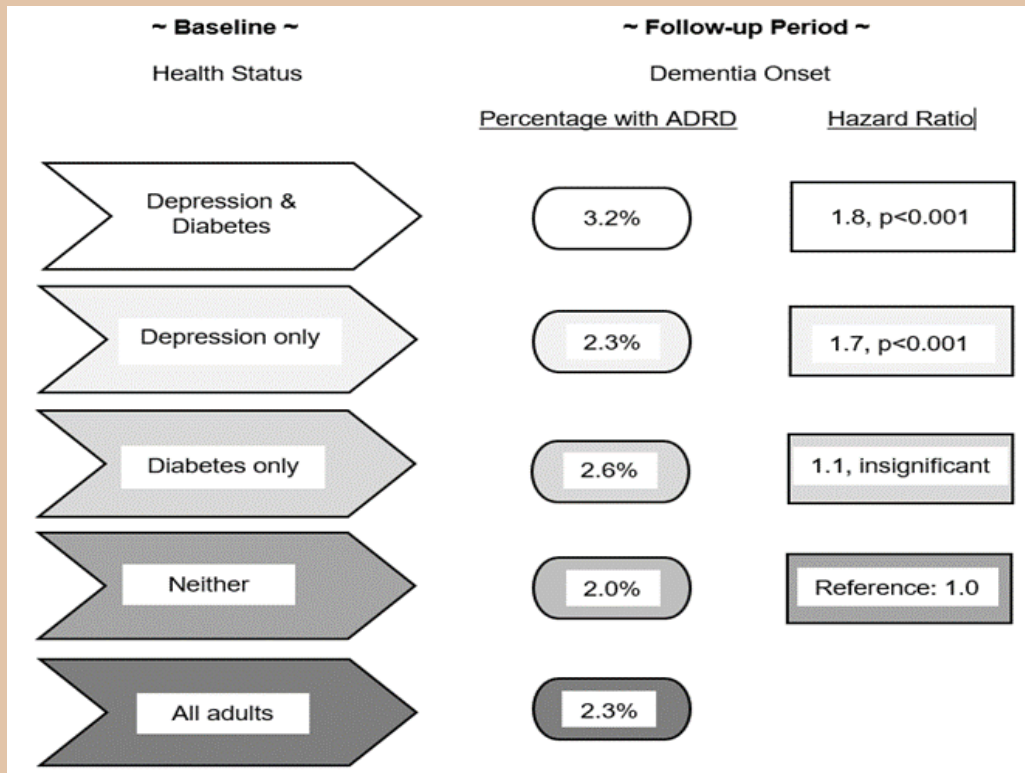
Model 1 + **Project Sites + Health Coverage**
(Medicaid; Private Insurance; Medicare)

Model 3

Model 2 + **Comorbidities**
(cardiovascular disease subtypes, diabetes, chronic renal disease, neuropathy)

III. STUDY #2: RESULTS

Depression, Diabetes, and Dementia Risk

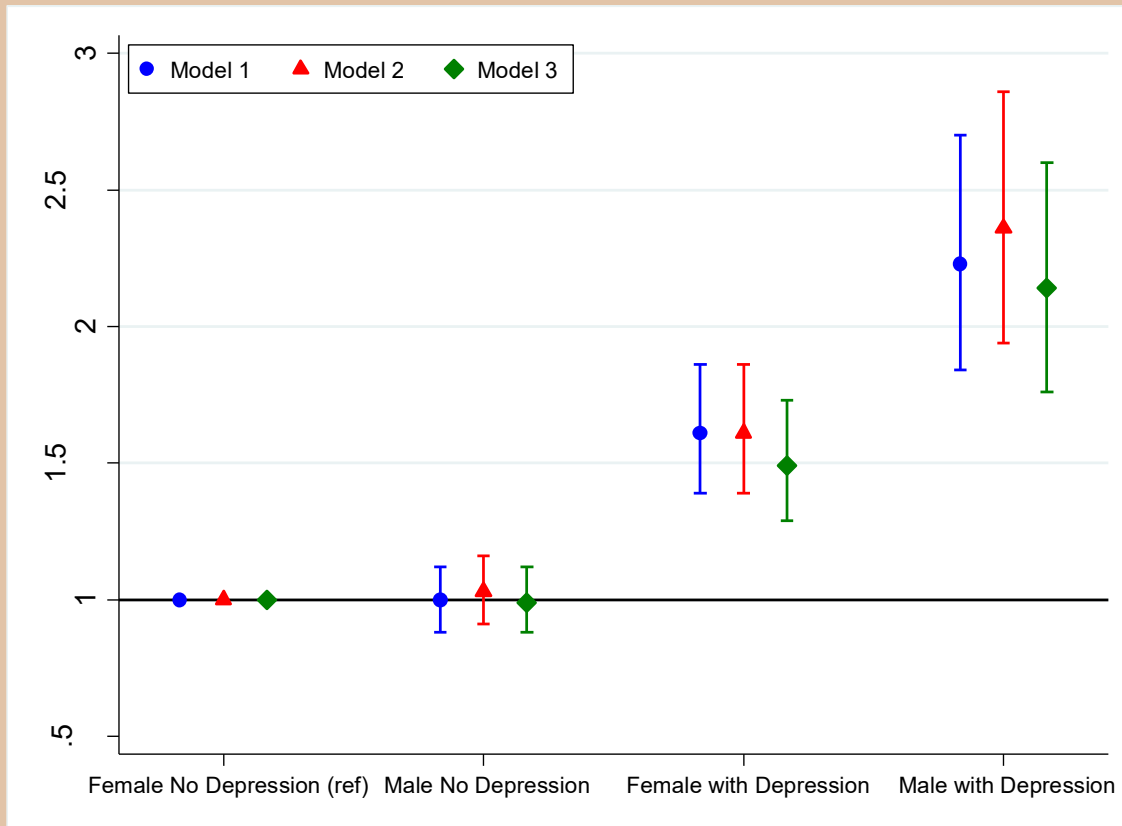


Compared with adults **without diabetes nor depression**:

- **Depression alone** was associated with a higher dementia risk
- **Depression + diabetes** were associated with a higher dementia risk
- No association between **diabetes alone** and dementia risk

III. STUDY #2: RESULTS

Figure 1. Hazard ratios (HRs) for the risk of all-cause dementia by sex and depression status at baseline



Compared to females *without* depression, the risk of dementia was...


- similar (HR=0.99) for males *without* depression
- 49% (HR=1.49) higher for females *with* depression
- 114% higher (HR=2.14,) for males *with* depression

III. Study #3: AI/AN Dementia Risk Factors

Machine learning to predict dementia for American Indian and Alaska Native Peoples

Ports K, Dai J, Conniff K, Corrada MM, Manson SM, O'Connell J, and Jiang L.(2025). Machine learning to predict dementia for American Indian and Alaska Native Peoples. *Lancet Regional Health – Americas*. 43: 101013.

III. STUDY #3: BACKGROUND

- 
- Electronic Health Record (EHR) data have been used to identify patients at high risk of dementia using ML:
 - No additional data collection required
 - Could be a practical and valuable resource for promoting early detection of dementia
 - **To date, no dementia risk prediction model has been developed for AI/AN population**

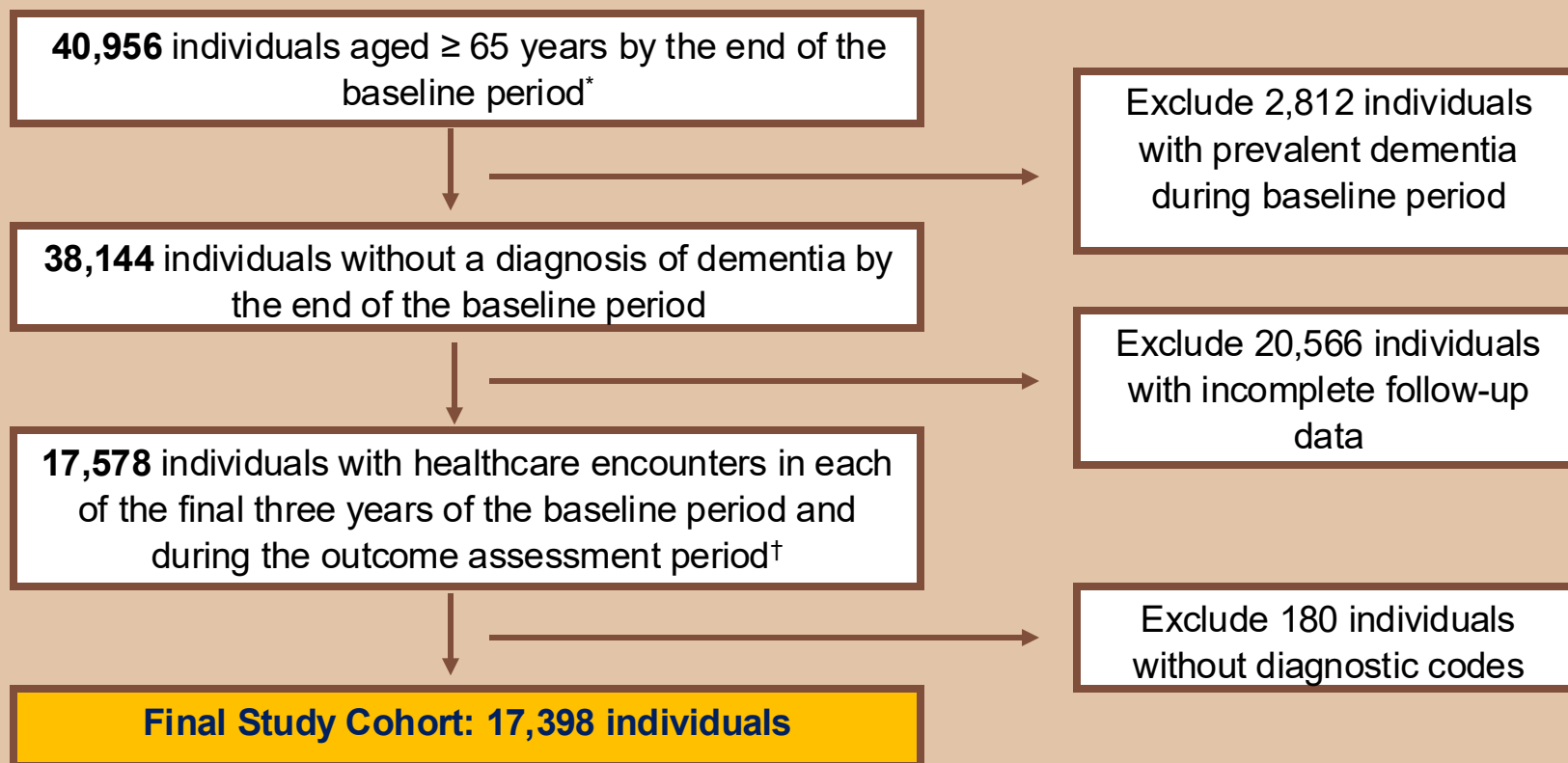
III. STUDY #3: OBJECTIVES

OBJECTIVES:

- Develop and internally validate a two-year risk prediction model of all-cause dementia, which defined based on ICD-9 diagnostic codes, using data from the **IHS Data Project** and machine learning algorithms.
- Compare the data pre-processing efforts and model performance of two machine learning algorithms with traditional Logistic Regression

III. STUDY #3: METHODS

Study population



*Five-year baseline period defined from fiscal year FY2007-2011

†Two-year outcome assessment period defined from FY2012-2013

III. STUDY #3: METHODS

Modeling approaches

Baseline Period

Data for AI/AN adults aged 65+ years

- Age & Sex
- Health Conditions
- Other Health Status Measures

Conduct Data Analysis

Basic Method
Logistic Regression

Machine Learning Methods

1. LASSO Regression
2. XGBoost
3. Random Forest

Follow-up Period

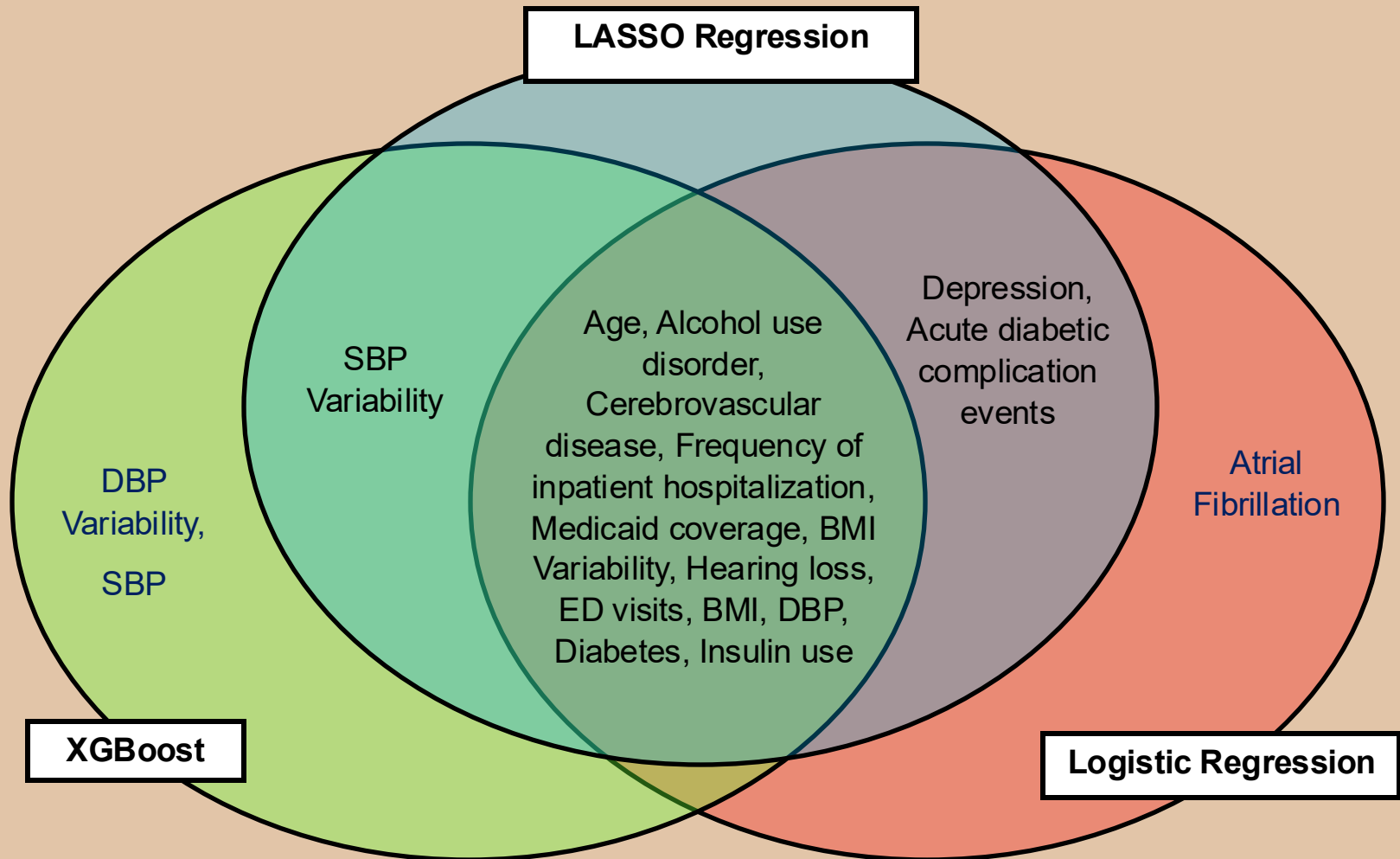
Predict Patient Risk of Dementia



We found 3.5% of patients had dementia

III. STUDY #3: RESULTS

Figure 3: A Venn Diagram comparison of the 15 top predictors for 2-year incident, all-cause dementia across XGBoost, LASSO, and LR algorithms



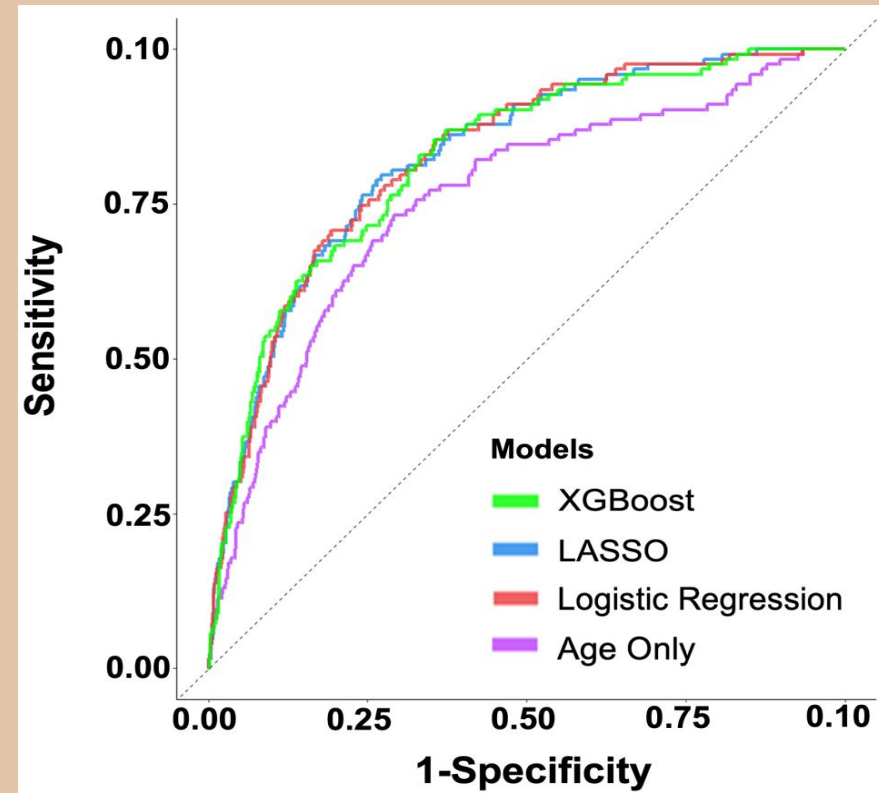
III. STUDY #3: RESULTS

Assessing model performance on test dataset (Internal validation)


Table 2. Comparison of model performance, measured by area under the receiver operator characteristic curve (AUC), on the held-out test dataset

Model	Testing AUC (95% CI*)
Logistic Regression (age only)	0.758 (0.697, 0.822)
Logistic Regression	0.826 (0.728, 0.845)
LASSO	0.826 (0.728, 0.842)
XGBoost	0.822 (0.752, 0.854)

Figure 1. Receiver Operator Characteristic Curves for the Age Only, LASSO (extended), LR (extended), and XGBoost (extended) 2-year Incident, All-Cause Dementia Prediction Models



III. STUDY #3: DISCUSSIONS

- 
- EHR data can reasonably predict the two-year risk of all-cause dementia for IHS users aged ≥ 65 years.
 - For risk prediction models, it is important to compare the accuracy of prediction. Meanwhile, data pre-processing efforts are important to consider.
 - Risk prediction models could help IHS/Tribal clinicians in screening patients for dementia or referring patients to other providers for a dementia evaluation. It may help with early diagnosis and treatment of dementia.

III. Study #4

AI/AN Dementia Risk Factors

Alzheimer's Disease and Related Dementia (ADRD) and Related Health Conditions Among American Indian and Alaska Native Medicare Beneficiaries

Yang M, Abdulsalam R, Fan W, Corrada MM, Manson SM, O'Connell J, Jiang L. (2025) Alzheimer's Disease and Related Dementia and Related Health Conditions Among American Indian and Alaska Native Medicare Beneficiaries. *Alzheimer's & Dementia*. Under revision.

III. STUDY #4: OBJECTIVES



OBJECTIVES:

- To estimate the prevalence of ADRD and ADRD-related health conditions among the AI/AN population.
- To examine their associations with ADRD among the AI/AN population, and to compared them with those in the White population.

III. STUDY #4: Data Source

- ❖ **Centers for Medicare and Medicaid (CMS) Administrative Enrollment and Claims Data**
 - ❖ **Covers 100% of Medicare Fee-For-Service (FFS) beneficiaries aged 65 years and older:**
 - NIHB finding that > 95% older AIAN enrolled in Medicare
 - ❖ Data for adults < 65 years who qualify due to qualifying conditions and disabilities
- ❖ **Medicare data from the CMS, 2019**
 - Person-level Medicare Beneficiary Summary File (MBSF)
 - Available data: age, sex, race, chronic conditions etc.

III. STUDY #4: Methods

Study Population: All AI/AN and 5% random sample of non-Hispanic White beneficiaries **age 68+**

- Nearly continuous enrollment in fee-for-service (FFS) Medicare Part A and Part B

Measures: Health conditions were identified using

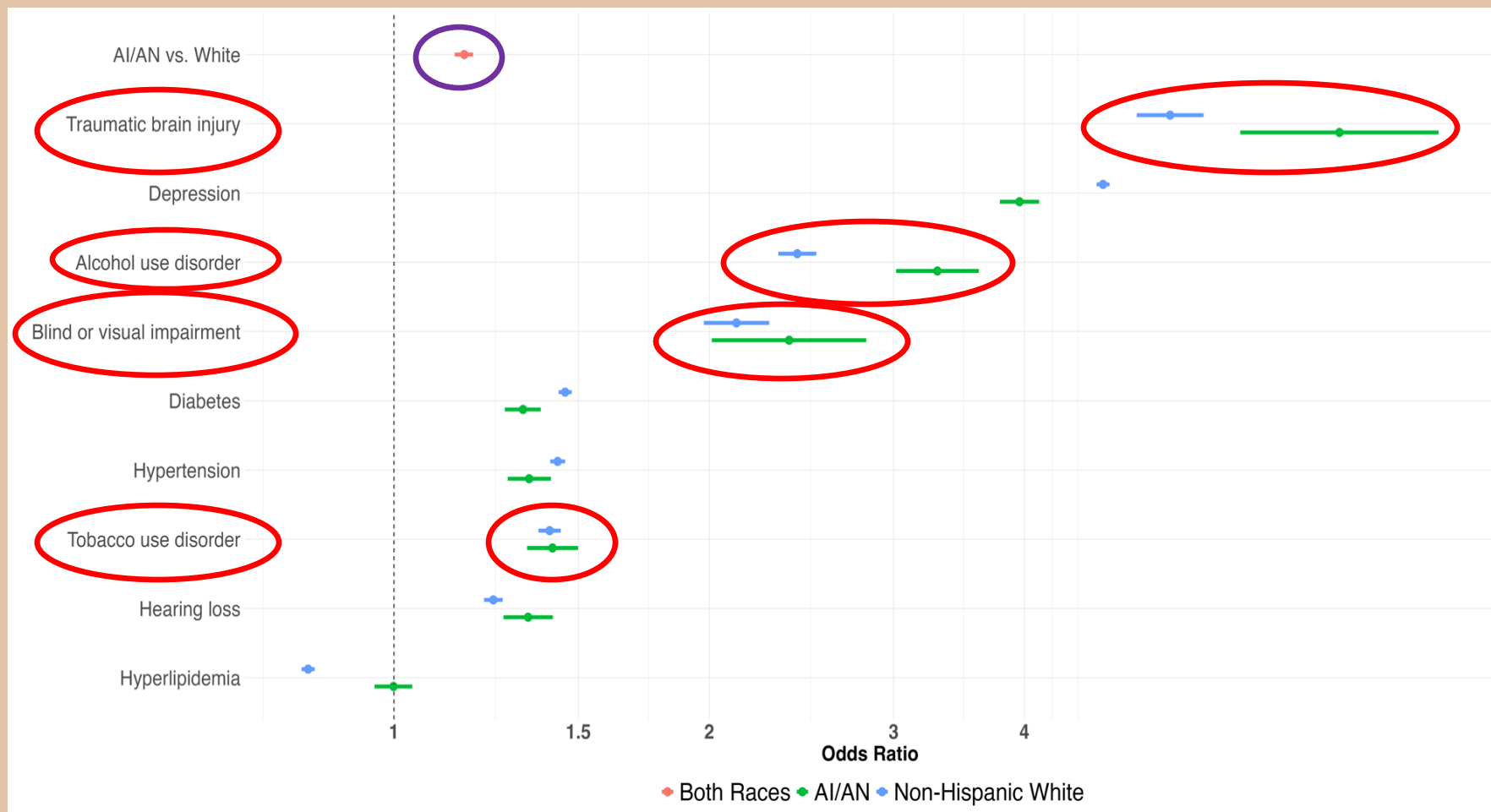
- MBSF 27 Chronic Conditions Data Warehouse (CCW) Chronic Conditions Segment
- Other Chronic or Potentially Disabling Conditions Segment.

III. STUDY #4: Results

Table 1. Prevalence of health conditions among AI/AN and White Medicare beneficiaries aged 68+ years, 2019.

	AI/AN (N= 112,280)	White (N=1,010,862)
ADRD (Age Adjusted)	15.6%	13.3%
Lancet Risk Factors		
Hypertension	71524 (63.7%)	638349 (63.1%)
Diabetes	48803 (43.5%)	266101 (26.3%)
Hyperlipidemia	46396 (41.3%)	549377 (54.3%)
Depression	17703 (15.8%)	172147 (17.0%)
Tobacco use disorder	13312 (11.9%)	69160 (6.8%)
Deafness or hearing impairment	11042 (9.8%)	76925 (7.6%)
Alcohol use disorder (AUD)	3120 (2.8%)	15111 (1.5%)
Blindness or visual impairment	731 (0.7%)	4140 (0.4%)
Traumatic brain injury (TBI)	437 (0.4%)	3932 (0.4%)

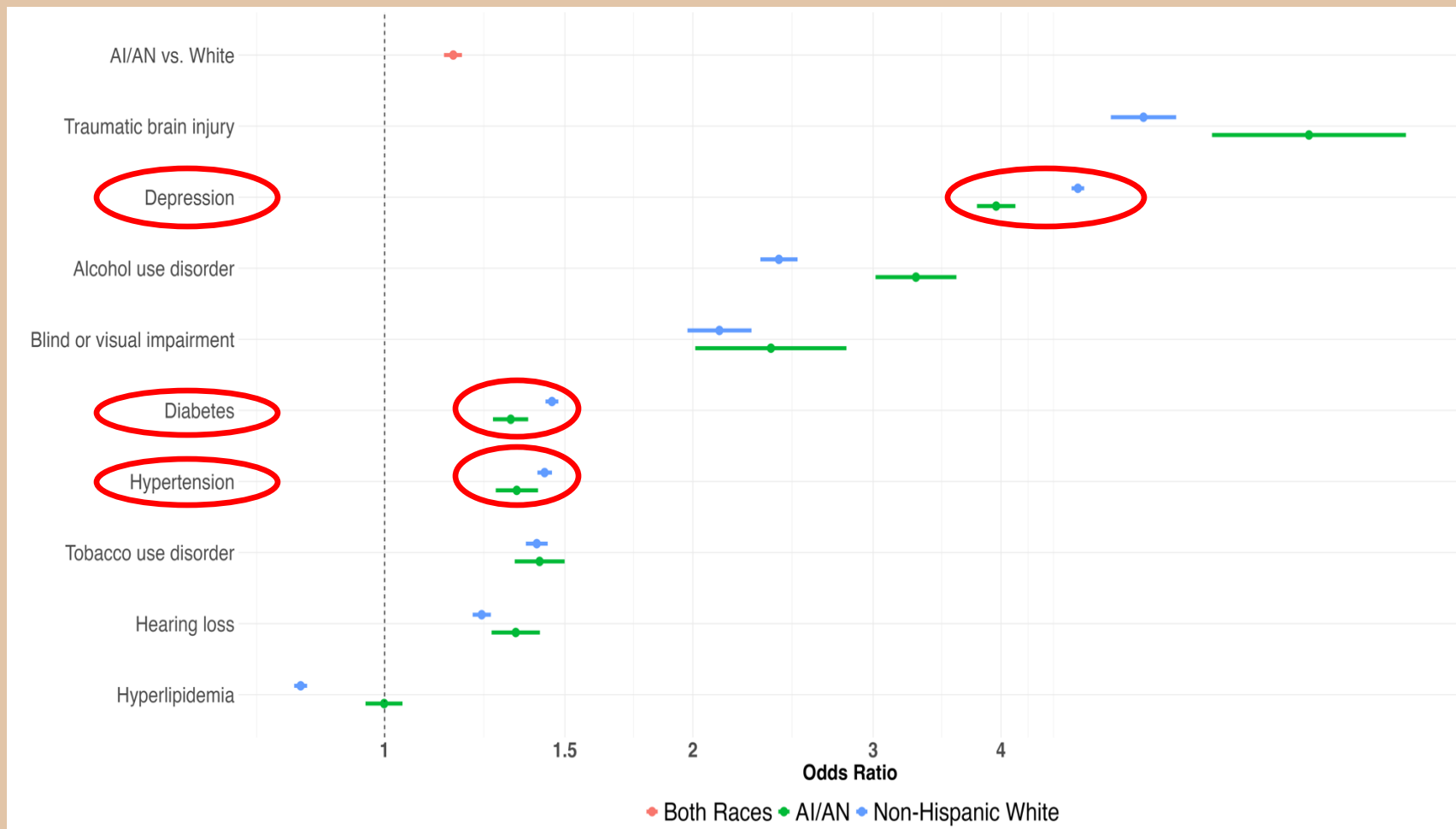
Figure 1. Prevalence of health conditions among AI/AN and White Medicare beneficiaries aged 68+ years, 2019.



^a The odds ratio for AI/AN vs. White was from an overall multivariable logistic regression model that includes both AI/AN and White beneficiaries

^b ORs for *Lancet Risk Factors* are from a race-stratified multivariable model that included age, sex, and all 9 *Lancet Risk Factors*.

Figure 1. Prevalence of health conditions among AI/AN and White Medicare beneficiaries aged 68+ years, 2019.



^a The odds ratio for AI/AN vs. White was from an overall multivariable logistic regression model that includes both AI/AN and White beneficiaries

^b ORs for *Lancet Risk Factors* are from a race-stratified multivariable model that included age, sex, and all 9 *Lancet Risk Factors*.

III. Study #5

AI/AN Dementia Risk Factors

Race and Ethnicity and Comorbidities Among Medicare Beneficiaries With Young-Onset Dementia (YOD)

Dai J, Chau T, Corrada MM, Manson SM, O'Connell J, Jiang L. (2025) Race and Ethnicity and Comorbidities Among Medicare Beneficiaries With Young-Onset Dementia. *JAMA Network Open*. 8(8):e2528001.

III. STUDY #5: OBJECTIVES

OBJECTIVES:

- To estimated YOD prevalence and examined the associations between comorbidities and YOD among Medicare beneficiaries aged 45-64 years across racial/ethnic groups.

Data Source:

- This cross-sectional study used Medicare data from January 2022 to December 2022.
- Data were extracted from MBSF for Medicare beneficiaries aged 45 to 64 years with almost-continuous fee-for-service coverage in 2022.

III. STUDY #5: Results

Table 1. Characteristics of Medicare Beneficiaries Aged 45 to 64 Years by Racial and Ethnic Group, 2022

Characteristic	Beneficiaries, No. (%)					
	American Indian or Alaska Native (n = 25 006)	Asian (n = 46 901)	Black (n = 359 877)	Hispanic (n = 213 747)	White (n = 1 543 700)	Full cohort (N = 2 189 231)
Beneficiaries with YOD, No.	655	1380	13 149	6090	49 818	71 092
Age-standardized YOD prevalence, % ^a	2.69	3.02	3.76	2.73	3.23	3.27
Age group, y						
45-49	3783 (15.13)	7175 (15.30)	53 499 (14.87)	31 851 (14.90)	204 322 (13.24)	300 630 (13.73)
50-54	5085 (20.34)	9582 (20.43)	70 666 (19.64)	41 479 (19.41)	286 795 (18.58)	413 607 (18.89)
55-59	6873 (27.49)	12 811 (27.31)	101 523 (28.21)	60 764 (28.43)	426 770 (27.65)	608 741 (27.81)
60-64	9265 (37.05)	17 333 (36.96)	134 189 (37.29)	79 653 (37.27)	625 813 (40.54)	866 253 (39.57)
Sex						
Male	12 705 (50.81)	23 693 (50.52)	181 723 (50.50)	113 313 (53.01)	807 079 (52.28)	1 138 513 (52.01)
Female	12 301 (49.19)	23 208 (49.48)	178 154 (49.50)	100 434 (46.99)	736 621 (47.72)	1 050 718 (47.99)

III. STUDY #5: Results

eTable 6. Medicare Beneficiaries Aged 45 Years and Older with Young Onset Dementia (YOD) or Alzheimer's Disease and Related Dementias (ADRD), 2022

	AI/AN	Asian	Black	Hispanic	White	Full cohort
# of adult beneficiaries aged 45+	129,036	802,342	1,905,584	1,481,058	22,506,467	26,824,487
# of adult beneficiaries aged 45-64	25,006	46,901	359,877	213,747	1,543,700	2,189,231
% of 45-64 among adults aged 45+ ^a	19.38	5.85	18.89	14.43	6.86	8.16
# of those with ADRD aged 45+	10,093	65,237	187,517	127,755	1,726,586	2,117,188
# of YOD aged 45-64	655	1,380	13,149	6,090	49,818	71,092
% of YOD among adults with ADRD [‡] aged 45+ ^b	6.49	2.12	7.01	4.77	2.89	3.36

^aThe proportions of Medicare beneficiaries aged 45-64 years among those aged 45 and older was calculated by dividing the number of Medicare beneficiaries aged 45-64 (numerator) by the total number of Medicare beneficiaries aged 45 and older (denominator) for each racial/ethnic group

^bThe proportions of adults with YOD among those aged 45 and older with ADRD was calculated by dividing the number of YOD (numerator) by the total number of individuals aged 45 and older with ADRD (denominator) for each racial/ethnic group

Abbreviations: YOD; young-onset dementia; ADRD: Alzheimer's disease and related dementias

III. STUDY #5: Results

Table 4. Multivariable Logistic Regression of Comorbidities on Young-Onset Dementia by Racial and Ethnic Groups, 2022

Variable	OR (95% CI)					
	American Indian or Alaska Native (n = 25 006)	Asian (n = 46 901)	Black (n = 359 877)	Hispanic (n = 213 747)	White (n = 1 543 700)	Full cohort (N = 2 189 231)
Demographics						
Age (per 5 y)	1.40 (1.29-1.51) ^a	1.33 (1.26-1.41) ^a	1.47 (1.45-1.50) ^a	1.39 (1.35-1.42) ^a	1.35 (1.34-1.37) ^a	1.38 (1.37-1.39) ^a
Male vs female sex	1.24 (1.05-1.46) ^a	1.12 (1.00-1.26)	1.34 (1.29-1.40) ^a	1.31 (1.24-1.38) ^a	1.17 (1.15-1.19) ^a	1.21 (1.19-1.23) ^a
Comorbidities						
Diabetes	1.16 (.98-1.37)	1.12 (1.00-1.26)	1.36 (1.31-1.41) ^a	1.15 (1.08-1.21) ^a	1.10 (1.08-1.12) ^a	1.15 (1.13-1.17) ^a
Any cardiovascular disease	2.84 (2.38-3.38) ^a	3.30 (2.92-3.71) ^a	3.83 (3.67-3.99) ^a	3.21 (3.03-3.40) ^a	2.69 (2.64-2.74) ^a	2.91 (2.86-2.95) ^a
Depression	3.21 (2.70-3.81) ^a	3.72 (3.32-4.17) ^a	3.87 (3.72-4.02) ^a	3.95 (3.74-4.18) ^a	3.35 (3.28-3.42) ^a	3.51 (3.45-3.57) ^a
Traumatic brain injury	9.68 (7.20-13.01) ^a	6.74 (5.13-8.86) ^a	6.21 (5.60-6.88) ^a	7.05 (6.17-8.05) ^a	6.24 (6.00-6.49) ^a	6.35 (6.13-6.57) ^a
Alcohol use disorder	2.46 (2.03-3.00) ^a	1.87 (1.49-2.36) ^a	1.73 (1.63-1.84) ^a	1.83 (1.68-2.00) ^a	1.91 (1.86-1.97) ^a	1.88 (1.83-1.93) ^a
Hearing loss	1.49 (1.12-2.00)	1.48 (1.19-1.85) ^a	1.42 (1.31-1.55) ^a	1.42 (1.27-1.58) ^a	1.75 (1.70-1.82) ^a	1.66 (1.62-1.71) ^a

Abbreviation: OR, odds ratio.

^a $P < .001$ indicates statistical significance.

IV. Findings on Utilization of Hospital Inpatient Services by AI/AN Adults with Dementia



Findings from 3 studies:

1. **IHS Data Project:** IHS/Tribal expenditures for treatment of AI/AN adults with Alzheimer's disease and related dementias
2. **Medicare data:** Hospital utilization and expenditures for AI/AN and non-Hispanic white adults with ADRD
3. **Medicare data:** Unplanned hospitalizations among AI/AN adults with ADRD

Please note that for simplicity in the presentation, we refer to **dementia** and **ADRD** for “Alzheimer's disease and related dementias.”

Study 1: IHS Data Project. IHS/Tribal expenditures for treatment of adults with ADRD

Question

- ❖ How much does it cost to treat adults with ADRD within IHS/Tribal systems?

Data Set

- ❖ IHS Data Project
- ❖ One year – fiscal year 2013

Study population

- ❖ Identified adults with ADRD aged 65 years and older (n=921)
- ❖ Included data for adults without ADRD matched by age, sex, location (n=921)
- ❖ Included data for 10 or 15 Project Sites

Measures

- ❖ Health status – diagnosed conditions
- ❖ Health expenditures by type of service

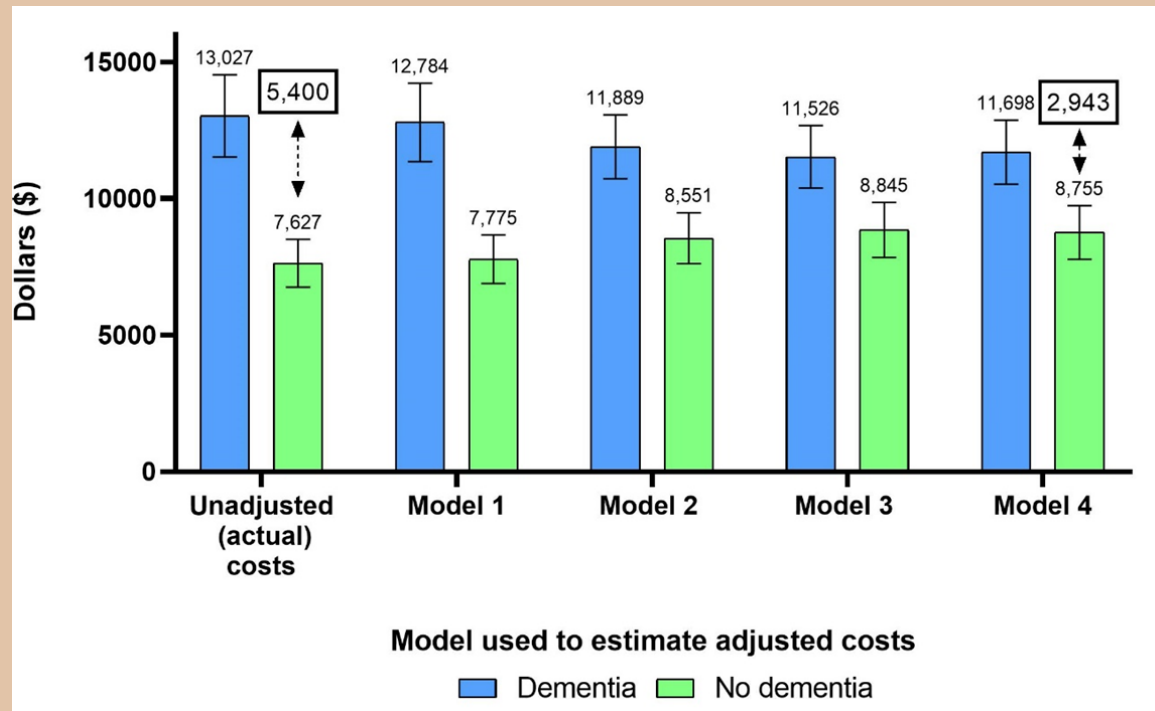
Study 1: IHS Data Project. IHS/Tribal expenditures for treatment of adults with ADRD

The health status of AI/AN adults with and without ADRD

Health status	With dementia		Without dementia		Chi Square P-value
	#	Percent (Column)	#	Percent (Column)	
CVD	601	65.3	472	51.3	<0.0001
Diabetes	508	55.2	451	49.0	0.01
Hypertension	722	78.4	688	74.7	0.06
Renal Disease	274	29.8	191	20.7	<0.0001
Amputation	25	2.7	15	1.6	0.11
Mental health disorder	375	40.7	172	18.7	<0.0001
Alcohol/drug use disorder	83	9.0	21	2.3	<0.0001
Tobacco use disorder	65	7.1	41	4.5	0.02
Liver disease	73	7.9	34	3.7	0.0001
Malignant cancer	90	9.8	82	8.9	0.5218

Study 1: IHS Data Project. IHS/Tribal expenditures for treatment of adults with ADRD

Total treatment costs for adults with and without ADRD



The unadjusted cost difference was \$5,400.

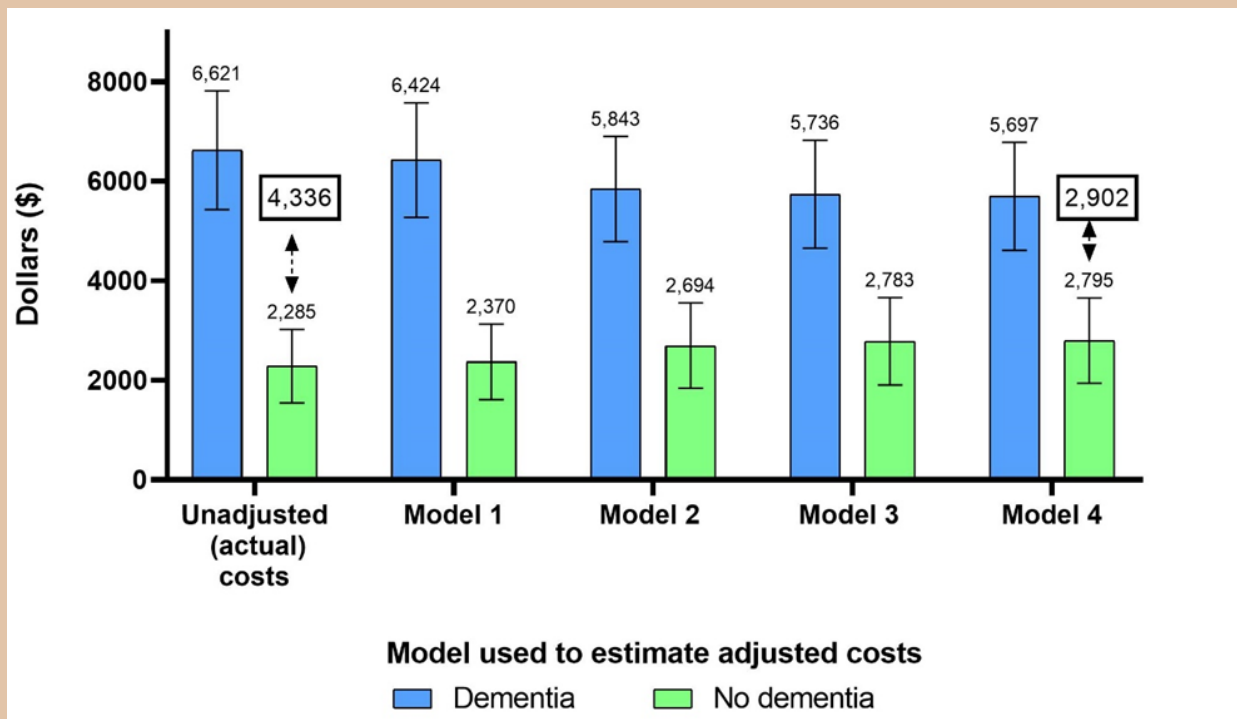
Model 4 adjusted for differences in health status and health coverage between the 2 groups.

The fully adjusted cost difference (Model 4) was \$2,943.

Total treatment costs for adults with ADRD were ~\$3,000 higher.

1. IHS Data Project: IHS/Tribal expenditures for treatment of adults with dementia

Hospital inpatient costs for adults with and without ADRD



The unadjusted cost difference was \$4,336.

The fully adjusted cost difference (Model 4) was \$2,902.

Nearly all of the cost differences were for hospital inpatient costs.

Study 2: Medicare data. Hospital utilization and expenditures for adults with dementia

Question

- ❖ How does hospital utilization among AI/AN adults with dementia compare to that for non-Hispanic white (White) adults with dementia?

Data Set

- ❖ 2019 Medicare data

Study population

- ❖ AI/AN and White adults with ADRD aged 65 years and older

Measures

- ❖ Hospital utilization and Medicare expenditures
- ❖ Health status – diagnosed conditions
- ❖ Social determinants of health (SDOH)
 - Health coverage: Medicaid, Part D medication
 - We classified patient zip codes as areas that were
 - Metropolitan or non-metropolitan
 - Level of social disadvantageage (index based on Census)

Study 2: Medicare data. Hospital utilization and expenditures for adults with dementia

Hospital inpatient utilization and expenditures for AI/AN and White adults with ADRD. 2019.

	AI/AN adults	White adults
All adults		
Percent with 1+ hospitalizations	45.5%	40.8%
Average number of hospital days	4.8	3.8
Average Medicare hospital expenditures	\$12,502	\$9,213
Adults with 1+ hospitalizations		
Average number of inpatient hospital days	10.6	9.3
Average number of hospital days	\$27,501	\$22,603

AI/AN adults with ADRD, compared to White adults with ADRD had higher utilization and expenditures.

Study 2: Medicare data. Hospital utilization and expenditures for adults with dementia

Age, sex, health status, and social determinants of health were associated with hospital utilization.

Patient Characteristics	AI/AN adults (N=16,188) Marginal effects (CI)	White adults (N=133,841) Marginal effects (CI)
Demographic		
Age (years)	0.01* (0.01 - 0.01)	0.01* (0.01 - 0.01)
Sex=F (compared to male)	-0.11* (-0.15 - -0.06)	-0.11* (-0.13 - -0.10)
Number of chronic conditions		
0 - 2		
3 - 4	1.07* (0.98 - 1.17)	1.20* (1.16 - 1.23)
5 - 6	1.93* (1.84 - 2.02)	2.08* (2.04 - 2.11)
7+	2.80* (2.71 - 2.89)	2.88* (2.85 - 2.92)
Social determinants of health		
Person-level: Health coverage		
No Medicaid, had Part D	-0.08 (-0.14 - -0.02)	-0.03 (-0.05 - -0.01)
No Medicaid, no Part D		
Had Medicaid	-0.05 (-0.10 - 0.00)	-0.18* (-0.20 - -0.15)
Area-level		
More disadvantaged neighborhood (SDI > 85%) ¹	0.20* (0.15 - 0.24)	-0.01 (-0.03 - 0.02)
Non-metropolitan	0.11* (0.06 - 0.15)	0.01 (-0.01 - 0.03)
Hospital bed availability above median ²	0.02 (-0.02 - 0.07)	-0.01 (-0.03 - 0.01)

CI: Confidence interval; * p<.001

¹ Neighborhood disadvantage was identified using the Social Deprivation Index (SDI), compiled from US Census Data.

² Hospital bed availability (beds per 10,000 people) by county was calculated from national data.

Study 3: Medicare data. Unplanned hospitalizations among AI/AN adults with dementia



Question: What types of unplanned hospital admissions are AI/AN adults with ADRD having?

Data Set

- ❖ **2017-2022:** 6 years of Medicare data

Study population

- ❖ **AI/AN with ADRD** aged 65 years and older in 2017, and who lived through the study time period (6 years)

Measures

- ❖ Many are similar to the previous study
- ❖ Added: Unplanned hospitalizations

Study 3: Medicare data. Unplanned hospitalizations among AI/AN adults with dementia



Unplanned hospitalizations: 2 types of admissions that were identified using information recorded on hospital inpatient records(e.g., diagnostic codes):

1. Potentially Preventable Hospitalizations:¹ Inpatient admission for conditions that may be preventable through access to outpatient services.

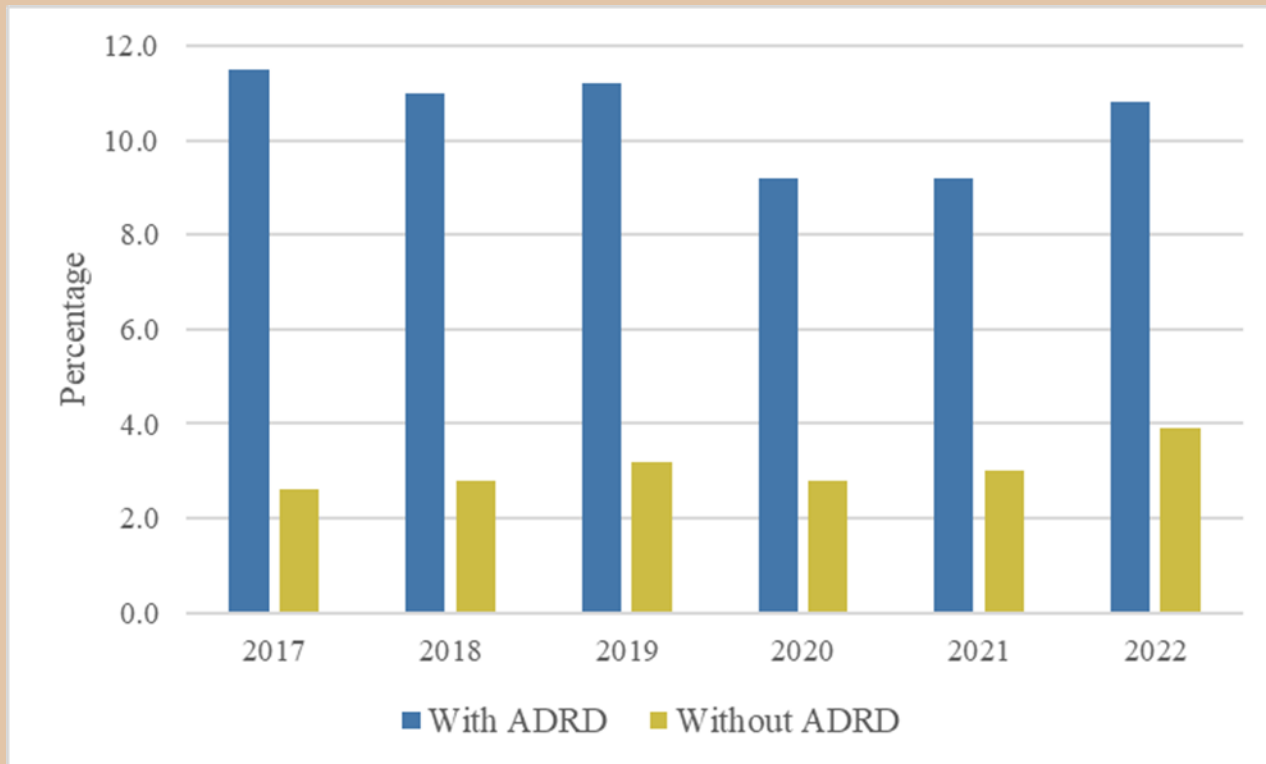
2. Hospital Readmissions:² Inpatient admission within 30 days of prior hospital discharge for unplanned reasons.

¹ Identified using nationally recognized algorithms from the agency for Healthcare Research and Quality (AHRQ).

² Identified using nationally recognized algorithms from the Centers for Medicare and Medicaid Services (CMS).

Study 3: Medicare data. Unplanned hospitalizations among AI/AN adults with dementia

Each year, adults with dementia had a higher percentage of 1+ unplanned hospitalizations each year.



On average, across the 6-year period, 10.3% of adults with dementia had an unplanned hospitalization during a year.

Study 3: Medicare data. Unplanned hospitalizations among AI/AN adults with dementia

Adults with dementia were more likely to have 1+ unplanned hospitalizations, even after adjusting for comorbidities. Patient comorbidities increased odds.

Multivariable regression analyses. Association of ADRD with 1+ unplanned hospitalizations among adults aged ≥ 68 years. 2017 - 2022.

	1+ Unplanned hospitalizations			
	Unadjusted model		Adjusted model ¹	
	Odds Ratio	Confidence Interval	Odds Ratio	Confidence Interval
ADRD	3.617	3.422 - 3.824	1.731	1.621 - 1.847
Other chronic conditions				
Acute myocardial infarction			3.727	3.397 - 4.088
Atrial fibrillation			1.540	1.457 - 1.627
Cancer			1.343	1.259 - 1.432
Chronic kidney disease			1.773	1.690 - 1.860
COPD			2.615	2.489 - 2.747
Diabetes			1.400	1.335 - 1.468
Depression			1.533	1.453 - 1.617
Heart failure			2.896	2.745 - 3.056
Hypertension			1.979	1.812 - 2.163
Ischemic heart disease			1.359	1.292 - 1.430
Stroke/TIA			1.843	1.727 - 1.966

ADRD: Alzheimer's disease and related dementias; COPD: chronic obstructive pulmonary disease; TIA: transient ischemic attack.

All estimates were significant at $p < 0.001$.

¹ The adjusted model controlled for age, sex, health coverage, and SDOH.

Key Findings across the 3 Studies



Hospitalizations

- ❖ Approximately 45% of AI/AN adults with dementia are hospitalized during a year

Reasons for Hospitalizations

- ❖ Approximately 10% of AI/AN adults with dementia are hospitalized for a potentially preventable reason or for an unplanned readmission

Discussion:

- ❖ Hospitalizations impact the quality of life for patients and caregivers
- ❖ Research is needed on dementia care coordination / treatment programs and their association with potential reductions in hospital inpatient utilization by adults with dementia

V. Other Information

Value of Conducting Analyses of Existing Data

Existing data sources include

- ❖ IHS National Data Warehouse
- ❖ Medicare administrative data

Benefits

- ❖ Data are de-identified
- ❖ Data for many adults who live throughout the country
- ❖ Identify adults with dementia through use of diagnostic codes recorded on their service utilization records or self-reports of cognitive decline

Challenges

- ❖ Identification of AI/AN adults
- ❖ Data are not as detailed as clinic and hospital EHR data and notes
- ❖ Do not identify adults with dementia who are undiagnosed
- ❖ Have limited information socio-demographic-cultural characteristics

IV. Contact Information



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Conflicts of interest: The authors have nothing to disclose.

Thank You!