Healthcare Resource Utilization and Costs Associated with Depression Among People with Alzheimer's Disease - A Retrospective Cohort Study

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BACKGROUND

- Alzheimer's disease (AD) is the most common cause of dementia and a leading cause of death in the US [1]
- AD leads to progressive cognitive decline, disability, and increased healthcare utilization [2]
- Depression and other neuropsychiatric symptoms affect 30–50% of individuals with AD [3]
- Depression is associated with more severe AD pathological changes and faster cognitive decline [4]
- The healthcare and economic burden of comorbid depression in AD in the US remains understudied

OBJECTIVE

To evaluate the healthcare resource utilization (HCRU) and costs associated with comorbid depression among people with AD in the US

DISCUSSION/CONCLUSION

Comorbid depression in AD is associated with ~$13K higher annual healthcare costs, driven by outpatient (~50%, +$6,590) and inpatient care ~30% (+$3,975)

Findings highlight the need for improved screening, treatment, and care strategies for individuals with AD and comorbid depression.

These results may also inform coverage policies, utilization management decisions, and the development of value-based care models.

Limitations: Claims analyses lack clinical detail and rely on coding accuracy, limiting assessment of disease severity and causal inference.

[1] 10.37765/ajmc.2020.88482
[2] 10.1016/j.jalz.2015.01.007
[3] 10.1186/s13195-023-01279-6
[4] 10.1016/j.jad.2023.06.046

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Methods

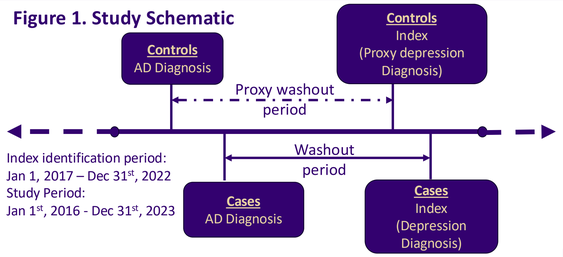
Study Design: Retrospective cohort study using MarketScan Research Databases from Jan 2016 to Dec 2023

Sample Selection:

AD cohort (control) : Adults with newly diagnosed AD between 2017–2022 and no depression diagnosis

Depression cohort (case) : Adults with AD who were diagnosed with depression within 3 years following their AD diagnosis.

Figure 1. Study Schematic



Analysis:

- Propensity score matching (PSM) was conducted to control for baseline characteristics using the nearest-neighbor method with a caliper of 0.05 and a 1:6 matching ratio.
- Outcomes were measured over a 1-year follow-up
  - Costs were analyzed using a two-part model (probit for part one; GLM with gamma distribution for part two) and adjusted to 2024 U.S. dollars (CPI)
  - HCRU was assessed using negative binomial regression.
  - Average marginal effects (AME) were calculated to improve interpretability of the regression models.

Results

Table 1. Baseline Characteristics After PSM*

Characteristics	AD N = 3,976	AD with Depression N = 14,412	Standardized Mean Differences
Age (years), mean (SD)	82 (9)	82 (9)	0.0078
Female, n (%)	9,550 (66%)	2,771 (70%)	-0.0014
Insurance			
Commercial, n (%)	713 (4.9%)	195 (4.9%)	0.0034
Medicare, n (%)	13,695 (95%)	3,779 (95%)	-0.0034
Index Year			
2017, n (%)	3,864 (27%)	1,014 (26%)	0.0065
2018, n (%)	2,473 (17%)	684 (17%)	0.0023
2019, n (%)	1,394 (9.7%)	318 (8.0%)	-0.0024
2020, n (%)	2,721 (19%)	975 (25%)	-0.0035
2021, n (%)	1,952 (14%)	474 (12%)	0.0049
2022, n (%)	2,004 (14%)	509 (13%)	-0.0093
Region			
Northeast, n (%)	2,770 (19%)	679 (17%)	-0.0007
Midwest, n (%)	6,671 (46%)	1,987 (50%)	-0.0035
South, n (%)	3,743 (26%)	1,019 (26%)	0.0014
West, n (%)	1,224 (8.5%)	289 (7.3%)	0.0055
Elixhauser Comorbidity Index, mean (SD)	6 (7)	6 (8)	-0.0107

Listed variables in Table 1 were used in PSM

Table 2 Average Annual Healthcare Use Per Person (Unadjusted)

Mean (SD)	AD N = 14,412	AD with Depression N = 3,976	p-value
Outpatient Visits	7.76 (10.79)	8.80 (13.63)	0.4
Inpatient Admissions	0.22 (0.57)	0.39 (0.74)	<0.001
Inpatient Length of Stay (days)	1.24 (4.67)	2.75 (8.27)	<0.001
Prescription Claims	30.62 (34.80)	54.28 (47.14)	<0.001
ED and Urgent Care Visits	0.89 (1.73)	1.50 (2.53)	<0.001

Figure 2. Average Annual Healthcare Costs per Person (Unadjusted)

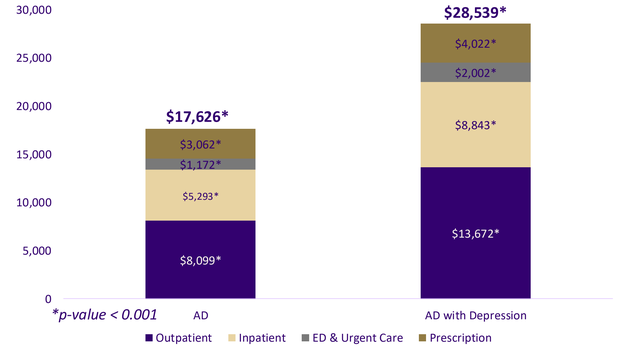


Figure 3. Incremental Healthcare Use Associated with Comorbid Depression

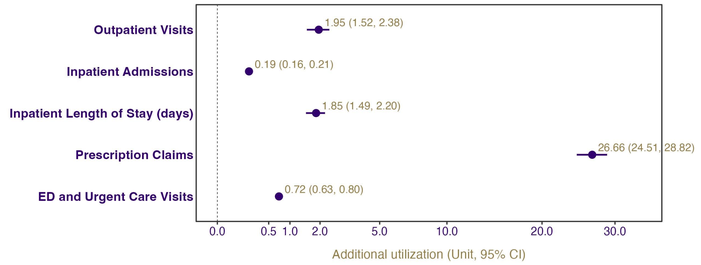
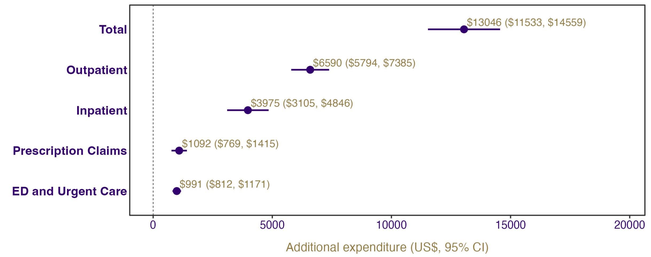


Figure 4. Incremental Healthcare Cost Associated with Comorbid Depression



On average, people with AD and depression had higher healthcare utilization and costs over the one-year follow-up period, including more outpatient visits (+1.95 visits; +$6,590), greater inpatient use (+0.19 admissions and +1.85 additional inpatient days; +$3,975), more pharmacy claims (+26.7 prescription claims; +$1,092), and more ED/urgent care visits (+0.72 visits; +$991), contributing to ~$13,046 higher total healthcare costs.