Near-Term Utilization and Costs Associated with Progression of Alzheimer's Disease Among US Medicare Beneficiaries

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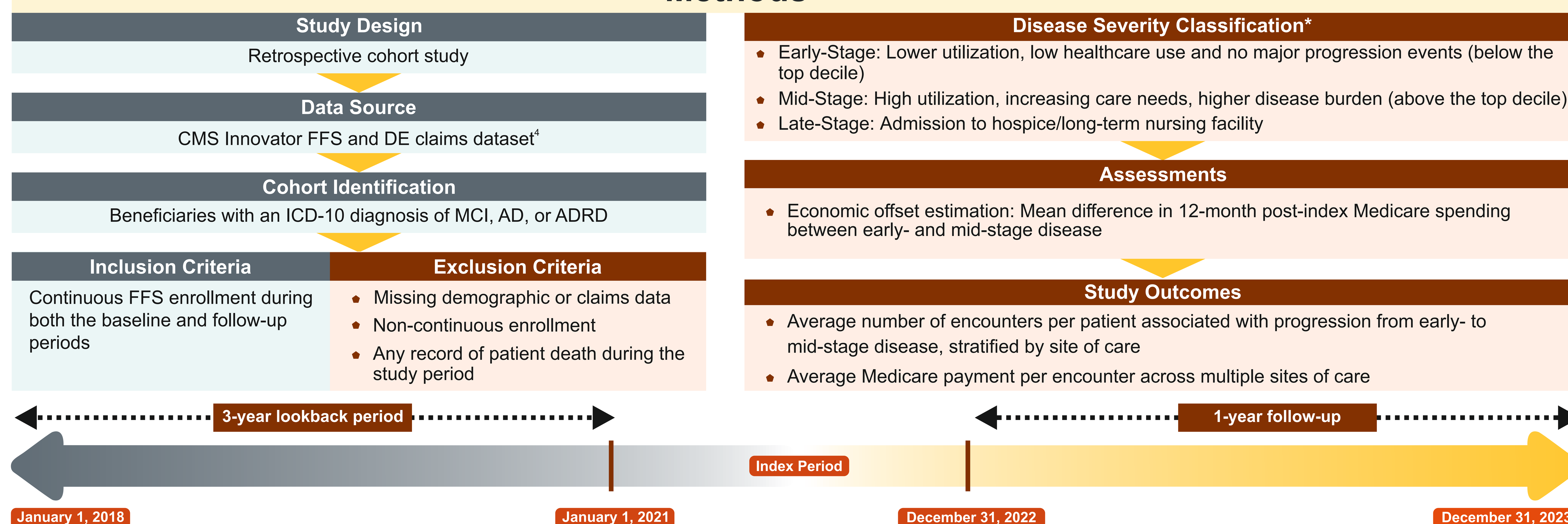
Introduction

- Alzheimer's disease (AD) and related dementias (ADRD) affect over 8 million Medicare beneficiaries[1]
- Disease progression: preclinical → mild cognitive impairment (MCI) → dementia[2]
- Annual care costs reach ~$384 billion, largely covered by Medicare/Medicaid[3]
- Limited data exist on the economic burden of progression from early- to mid-stage disease

Objectives

- To quantify differences in healthcare utilization and Medicare spending between early- and mid-stage patients with MCI, AD, and ADRD following one year of diagnosis
- To estimate the economic value associated with delaying disease progression by one year

Methods



*Disease severity was assessed using utilization-based severity scoring algorithm derived from multi-variable risk model. The scores incorporated acute care utilization, encounter intensity, and sentinel progression events.

AD, Alzheimer's disease; ADRD, Alzheimer's disease-related dementias; CMS, Centers for Medicare & Medicaid Services; DE, dual-eligible; FFS, fee-for-service; ICD, International Classification of Diseases; MCI, mild cognitive impairment.

Results

Study Demographics

- A total of 1,387,310 patients with a mean age of 80.5 years were included in the analysis (**Table 1**)
- Females comprised more than half of the study population, consistent with prior reports[5] (**Table 1**)

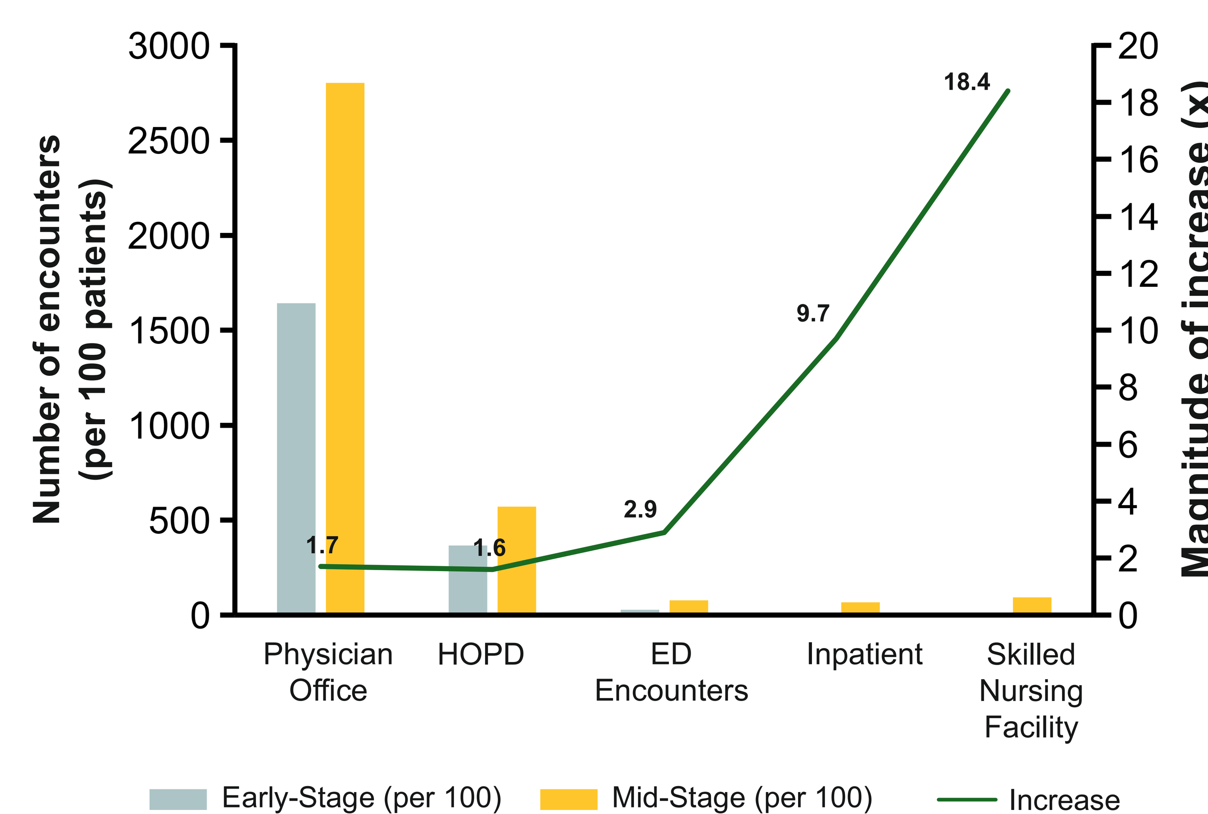
Table 1: Baseline Characteristics

Population (n)	1,387,310
Sex (%)	
Male	40.5%
Female	59.5%
Mean Age (yrs)	80.5
Race/Ethnicity Distribution (%)	
White	81.29%
Black	9.68%
Other	4.07%
Asian	2.53%
Hispanic	2.43%

Healthcare Utilization and Cost

- Post-index period showed sharp increase in Skilled Nursing Facility (18.4x) and Inpatient (9.7x) utilization across stages (**Figure 1**)

Figure 1: Encounters per 100 Patients in the 12-Month Post-Index, by Site of Care



Setting	Early-Stage (Per 100)	Mid-Stage (Per 100)
Physician Office	1,641	2,801
HOPD	365	570
ED Encounters	27	77
Inpatient	7	68
Skilled Nursing Facility	5	92

ED, emergency department; HOPD, hospital outpatient department.

Table 2: Average CMS Payment per Encounter, by Site of Care

Setting	Early-Stage	Mid-Stage	% Difference (Early vs Mid-Stage)
Physician Office	$480	$507	5.63%
HOPD	$9,550	$15,187	59.03%
ED Encounters	$1,157	$1,393	20.40%
Inpatient	$13,876	$13,877	0.01%
Skilled Nursing Facility	$7,420	$7,623	2.74%

CMS, Centers for Medicare & Medicaid Services; ED, emergency department; HOPD, hospital outpatient department.

- Mean CMS payment per encounter rose markedly from early to mid-stage, especially in HOPD ($9,550 vs $15,187) and ED ($1,157 vs $1,393) (**Table 2**)

Table 3: Total Per-Patient Spending, by Site of Care

Setting	Early-Stage (Per Patient)	Mid-Stage (Per Patient)
Physician Office	$7,871	$14,198
HOPD	$34,847	$86,600
ED Encounters	$313	$1,071
Inpatient	$989	$9,448
Skilled Nursing Facility	$364	$6,993
Total	**$44,384**	**$118,310**

ED, emergency department; HOPD, hospital outpatient department.

- Transition to mid-stage increased first-year costs by ~$74K per patient, driven largely by higher HOPD spending ~$52K (**Table 3**)

Conclusions

- Progression from early to mid-stage AD, ADRD, and MCI is associated with a marked increase in high-acuity resource utilization and overall costs
- Early identification and interventions that delay disease progression have the potential to yield near-term cost savings for payers and healthcare systems, while reducing the clinical and economic burden on patients and caregivers

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