

PROFILE OF MEDICAL CARE COSTS IN PATIENTS WITH AMYOTROPHIC LATERAL SCLEROSIS IN THE MEDICARE PROGRAM AND UNDER COMMERCIAL INSURANCE

Lisa Meng¹, Scott Jordan¹, Amy Bian¹, Jinsy Andrews¹, Jeremy Shefner², Andrew Wolff¹, Helen Blumen³, Kosuke Iwasaki³, Bruce Pyenson³

¹Cytokinetics, Inc, South San Francisco, CA, USA ²SUNY Upstate Medical University, Syracuse, NY, USA ³Milliman, Inc., New York, NY, USA

BACKGROUND

- Little has been published on cost progression for ALS patients
- Insurer claims data can easily follow hundreds of patients from before diagnosis through death
- Insurance data provide insight into:
 - Patient disease progression
 - Costs before and after diagnosis
 - Costs and timing of supportive services and functional status progression
 - The extent to which decisions on respiratory and feeding support impact costs of care

OBJECTIVE

The primary objective of this analysis was to characterize the medical care costs incurred for ALS patients covered by Medicare and by commercial insurance.

Specific aims are:

- To determine the ALS costs before and after diagnosis for patients already under Medicare coverage
- To describe the ALS cost profile under commercial insurance
 - Cost of care before diagnosis
 - Delay between diagnosis and Medicare eligibility
 - Costs before and after Medicare eligibility
- To provide insight into ALS cost details
 - ALS cost by service category
 - Survival analysis of ALS patients
 - Cost of disability services by disability milestones

METHODS

Data Sources:

- Medical claims databases containing
 - Information on claims paid
 - Demographic information and identifiers to allow longitudinal tracking
 - Diagnosis, procedure and drug details using standard coding systems
- There is no other clinical information in the claims data
- We randomly sampled Medicare data from 5% of all Medicare Part A and Part B covered services nationwide from 2008 through 2010
- Commercial insurance data were obtained from Truven MarketScan, containing approximately 40 million commercially-insured lives

Case Selection:

- ALS patients were identified as:
 - Patients who had 1 inpatient claim or 1 ER visit or ≥ 2 physician claims with ICD9 dx 335.20, and
 - No claims with diagnosis-related group codes of 58, 59, or 60
 - Only ALS patients diagnosed in 2008 through 2010 were included
- 368 ALS patients were identified from a 5% sample of Medicare claims
- 344 ALS patients were identified from the Truven MarketScan commercial database

Disability Milestone Definition:

The following codes in the claim data were used to determine when patients achieved the disability milestones.

Level	Category	ICD-9-CM Code	New Code	ICD-9-CM Code
1	Walkers and Accessories	801.00-801.09		
2	Wheelchairs and Accessories	802.00-802.09		
3	Parenteral Nutrition	86.20-86.29		
4	Non-Invasive Ventilation	86.30-86.39		
5	Invasive Ventilation / Speech Device	86.40-86.49		
6	Hospice	86.50-86.59		

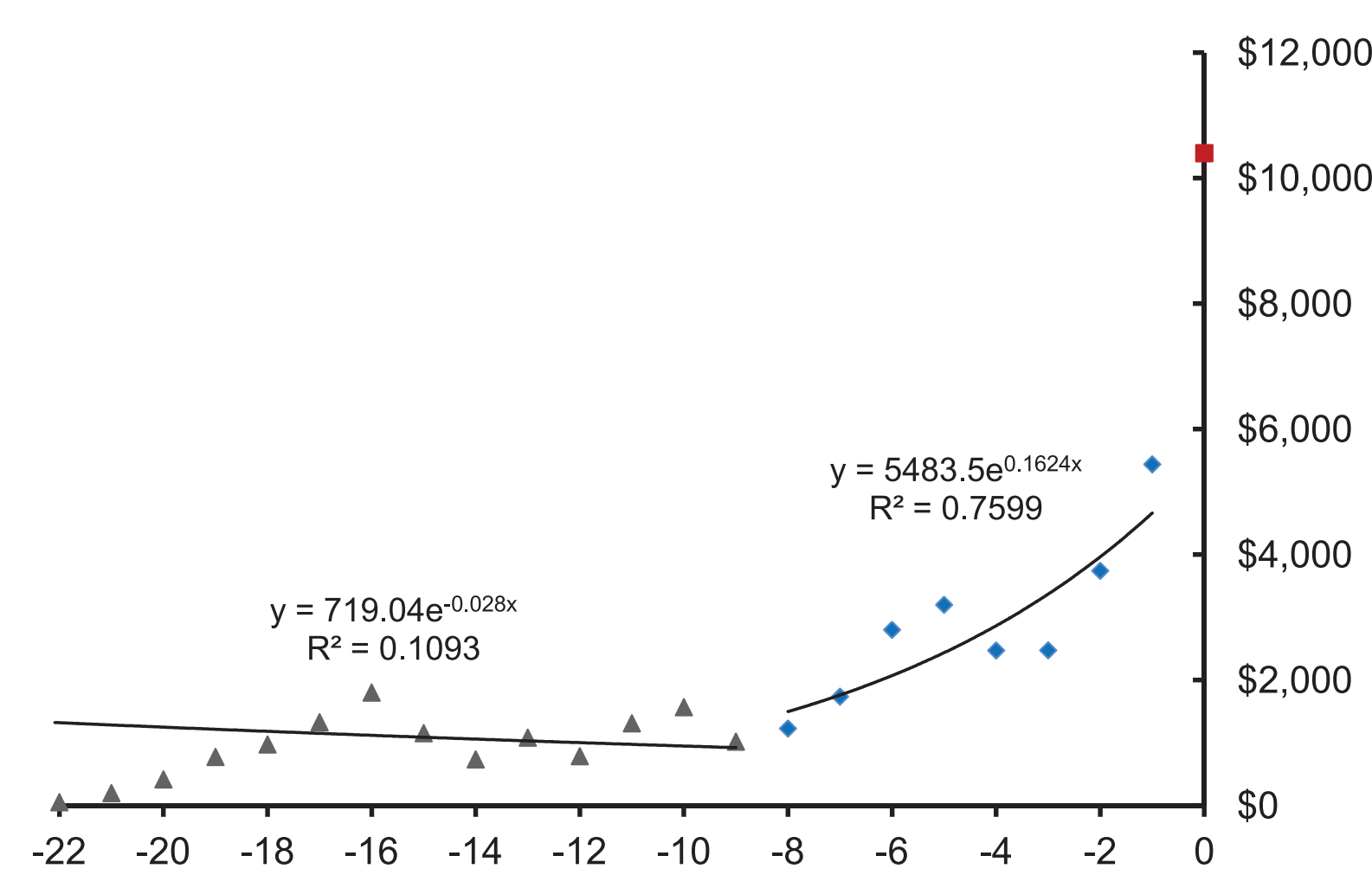
Statistical Analyses:

- Demographic information and claims data were descriptively summarized
- Monthly claims costs were tabulated from one year before the index date until death or through 2010 and modeled exponentially
- Average costs from claims submitted for reimbursement were provided by periods relative to index dates and insurance program
- Patients whose initial diagnosis of ALS occurred while they were covered by Medicare were defined as "pure" Medicare
- Patients whose initial diagnosis of ALS occurred while they were covered by commercial insurance were included with commercial data
- To avoid complications from the often rapid transition from commercial insurance to Medicare, pure Medicare and commercial data were analyzed separately
- For pure Medicare cases, Kaplan-Meier Sample Average (KMSA) was employed to model cumulative costs ...
 - From index date (i.e., diagnosis) until death or through 2010, adjusting for censored cases
 - From index date to disability milestones; different milestones with few cases of similar duration from index month were collapsed for analyses

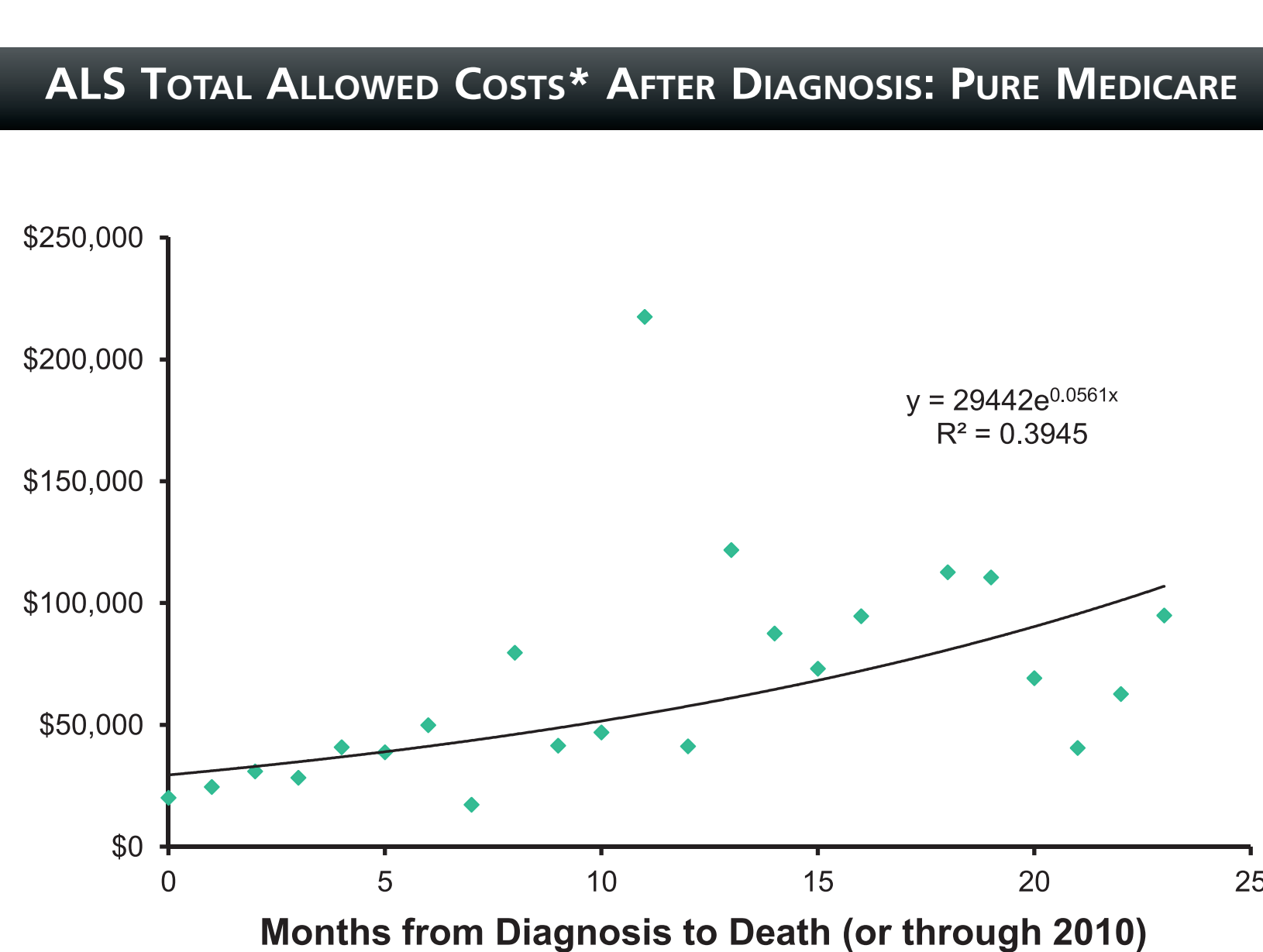
RESULTS: DEMOGRAPHIC DATA

	Pure Medicare	Commercial Insurance
Number of Cases	368	344
Mean Age (SD)	75.3 (6.71)	54.3 (7.98)
Male (%)	48.4%	57.8%
Average of Months before Index Date (SD)	31.2 (9.9)	31.0 (9.7)
Average Months after Index Date (SD)	14.1 (9.9)	13.5 (6.8)

ALS MONTHLY COSTS* TO DIAGNOSIS: PURE MEDICARE



ALS TOTAL ALLOWED COSTS* AFTER DIAGNOSIS: PURE MEDICARE



ALS MONTHLY COSTS PER PATIENT: PURE MEDICARE

	9+ Months Pre-Diagnosis	1 to 8 Months Pre-Diagnosis	Diagnosis Month	Post-Diagnosis Months	Month of Death
Inpatient Facility	\$550	\$1,815	\$7,289	\$1,873	\$2,488
Outpatient Facility	\$118	\$322	\$357	\$245	\$72
Physician	\$306	\$488	\$1,483	\$455	\$384
Durable Medical Equipment	\$29	\$62	\$153	\$506	\$58
Private Duty Nursing / Home Health	\$111	\$157	\$943	\$1,417	\$1,418
Other	\$18	\$41	\$173	\$55	\$131
Total	\$1,133	\$2,885	\$10,398	\$4,551	\$4,551

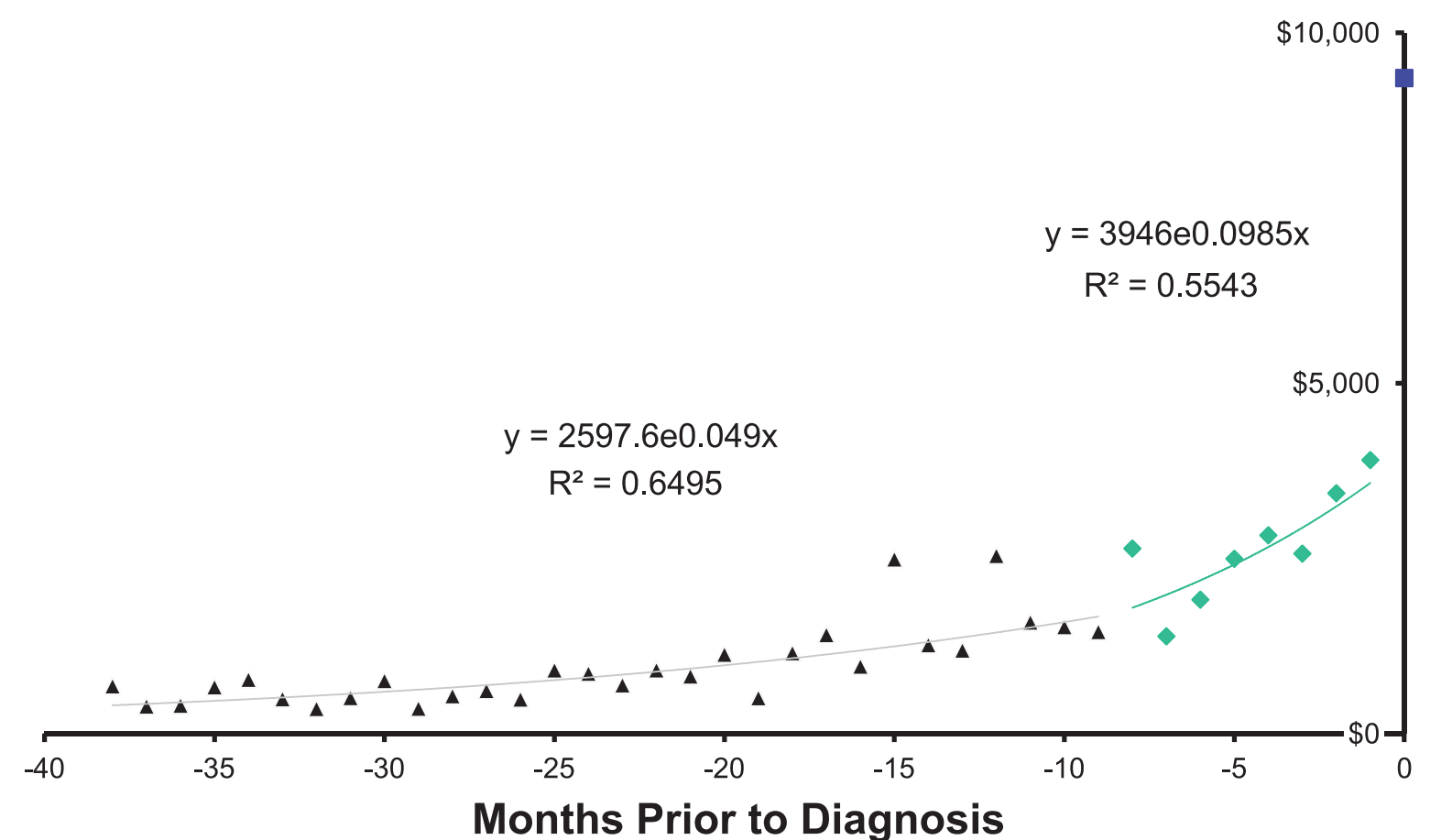
- The highest-cost month was the month of diagnosis ("index month")
- Monthly costs increased exponentially 9 months before the index month
- The cost in the month following the index month was less than the cost in the index month, but monthly costs increased after that
- The month of death included more costs in an inpatient facility

ALS MONTHLY COSTS: COMMERCIAL INSURANCE

	9+ Months Pre-Diagnosis	1 to 8 Months Pre-Diagnosis	Diagnosis Month	Post-Diagnosis Months	Month of Death
Inpatient Facility	\$430	\$840	\$4,767	\$1,532	\$2,554
Outpatient Facility	\$270	\$859	\$1,940	\$659	\$732
Physician	\$288	\$621	\$1,822	\$589	\$442
Durable Medical Equipment	\$33	\$61	\$151	\$355	\$1,447
Private Duty Nursing / Home Health	\$11	\$59	\$135	\$246	\$1,400
Prescription Drugs	\$129	\$194	\$417	\$603	\$525
Other	\$7	\$11	\$122	\$79	\$90
Total	\$1,167	\$2,645	\$9,354	\$4,063	\$7,191

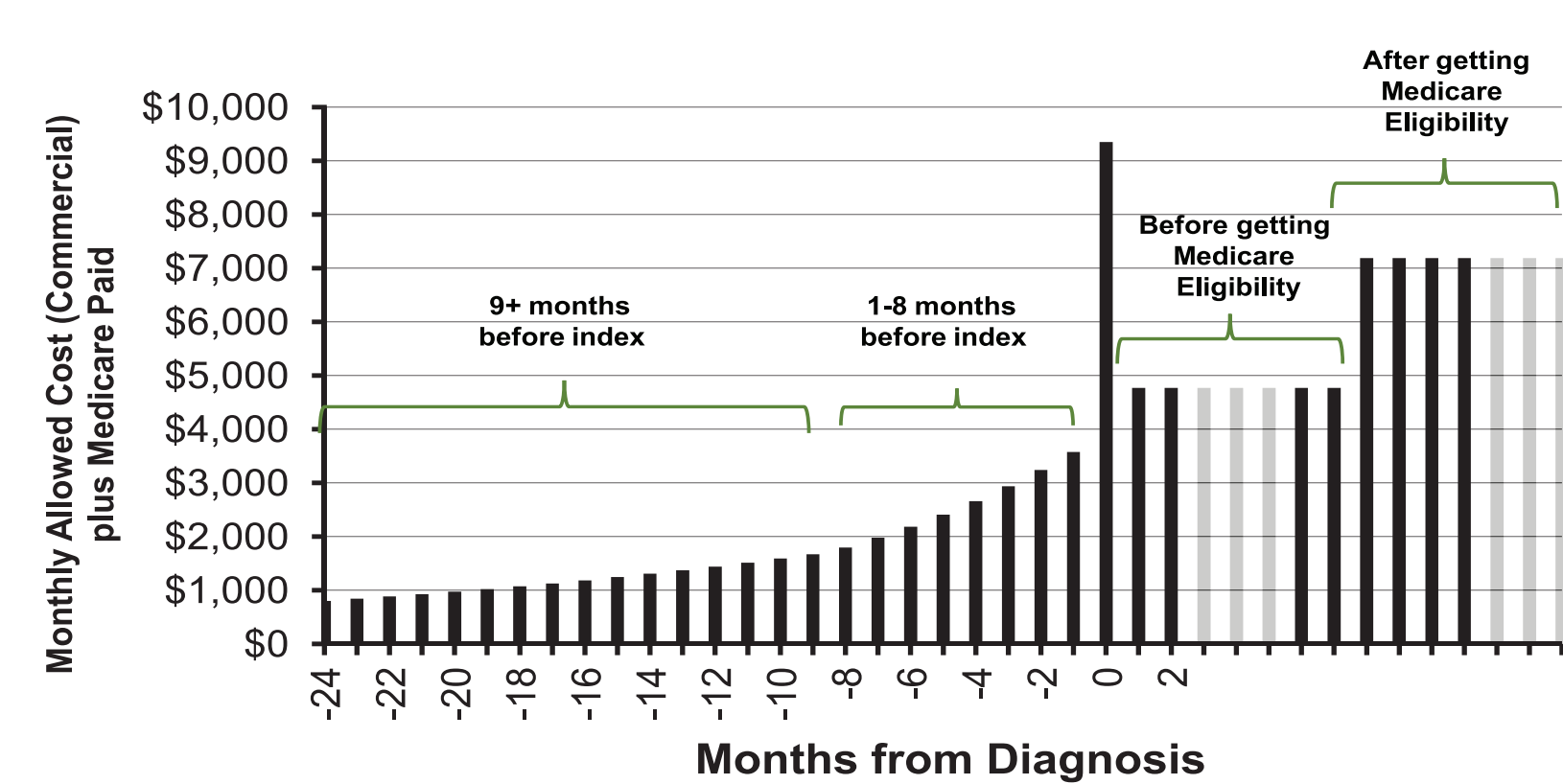
- The highest-cost month was the month of diagnosis ("index month")
- Monthly costs increased exponentially 9 months before the index month
- The cost in the month following the index month was less than the cost in the index month, but monthly costs increased after that
- The month of death occurred was particularly costly

ALS MONTHLY COSTS* TO DIAGNOSIS: COMMERCIAL



*Average Monthly Cost per Patient

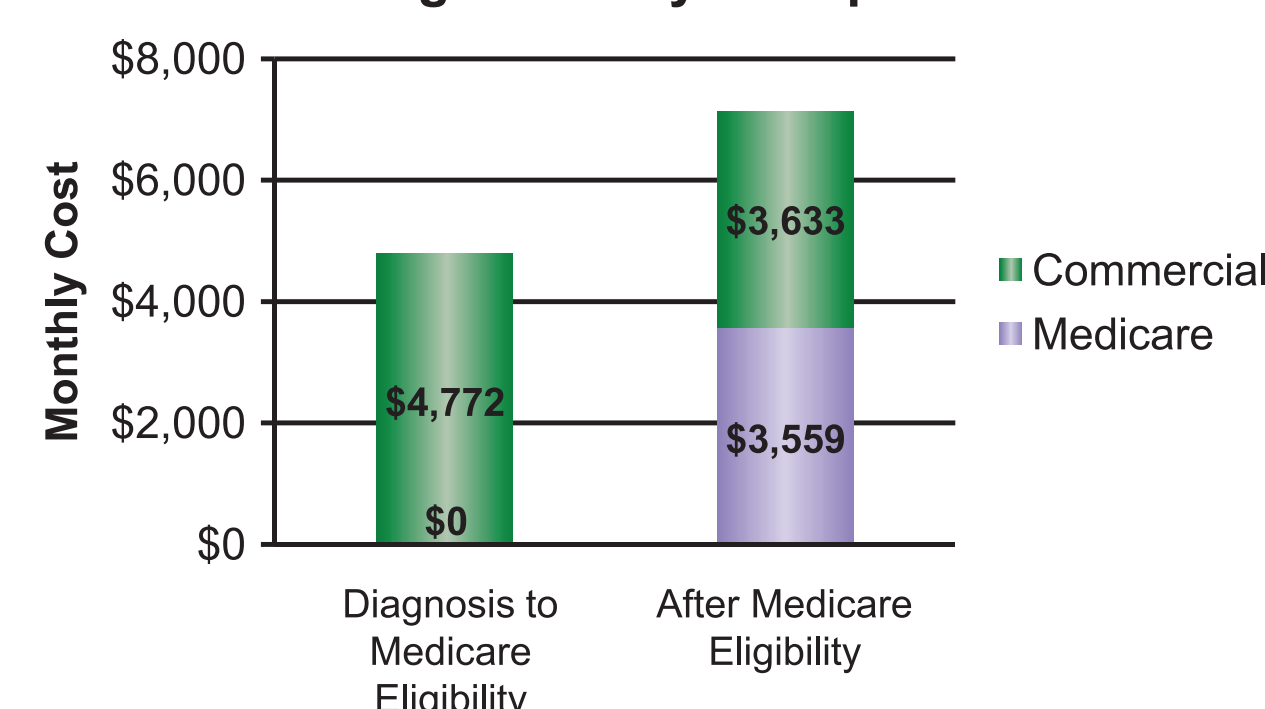
ALS COSTS DURING INSURANCE TRANSITION



Patients who transitioned to Medicare did so an average of 7.5 months after diagnosis

ALS COSTS BEFORE AND AFTER MEDICARE ELIGIBILITY

Average Monthly Cost per Patient



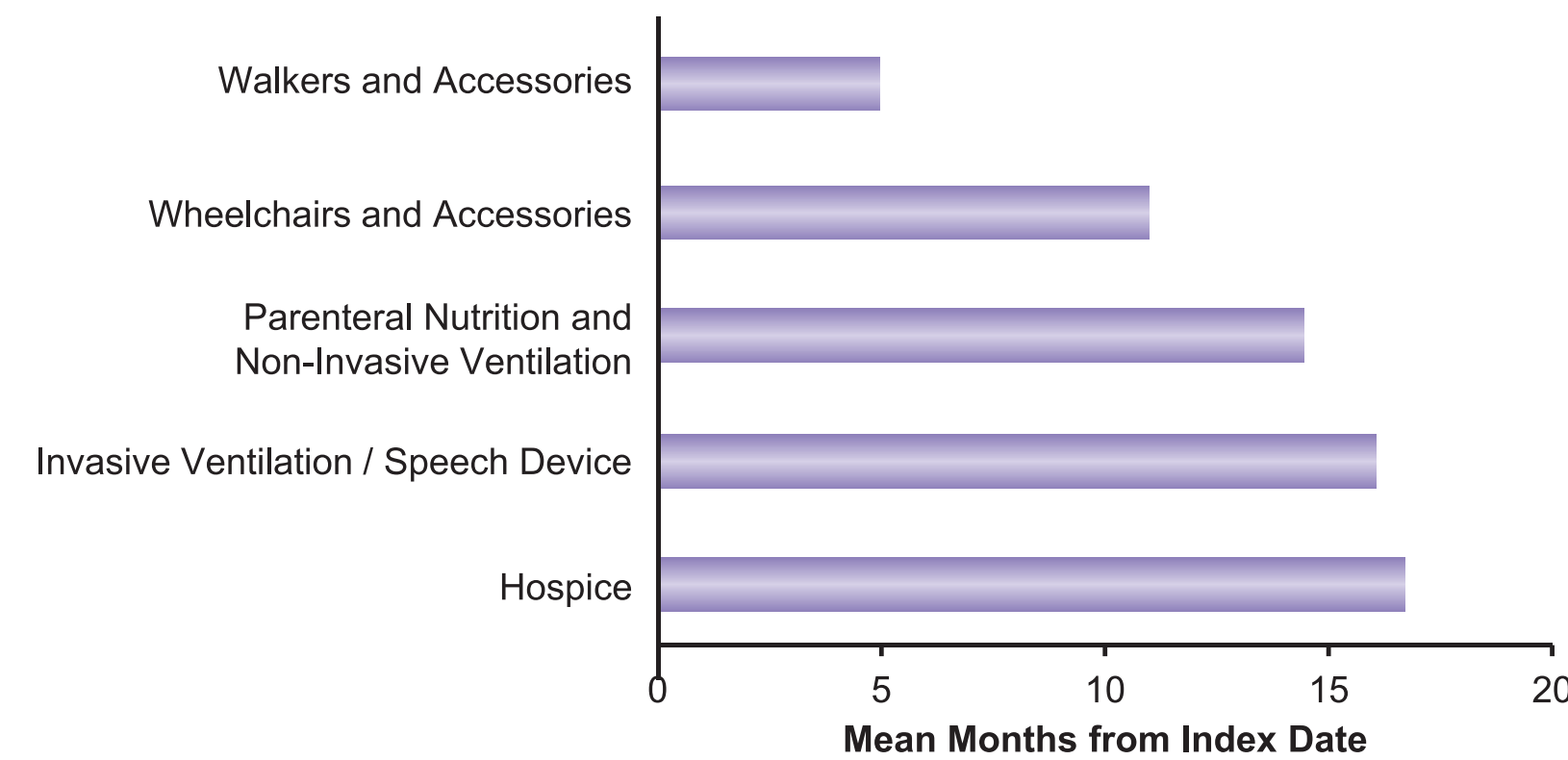
- After obtaining Medicare, the combined average monthly cost was \$7,191
- \$3,559 was paid by Medicare
- This amount is lower than the cost in pure Medicare cases by about \$1,000

TOTAL COSTS* TO DISABILITY MILESTONES: PURE MEDICARE

#	Milestone description (Based on Service Codes)	# of Cases	Mean Months from Index Date	95% CIs of Mean Months from Index Date	KMSA Total Cost Estimates
0	No service	245	n/a	n/a	n/a
1	Walkers and Accessories	10	4.9	4.84, 4.98	\$33,641
2	Wheelchairs and Accessories	27	10.9	10.50, 11.32	\$54,985
3	Artificial Nutrition / Noninvasive Ventilation	55	14.4	13.50, 15.21	\$58,973
4	Invasive ventilation / Speech Device	30	16.1	15.46, 16.77	\$73,609
5	Hospice	48	16.6	11.83, 17.13	\$76,179

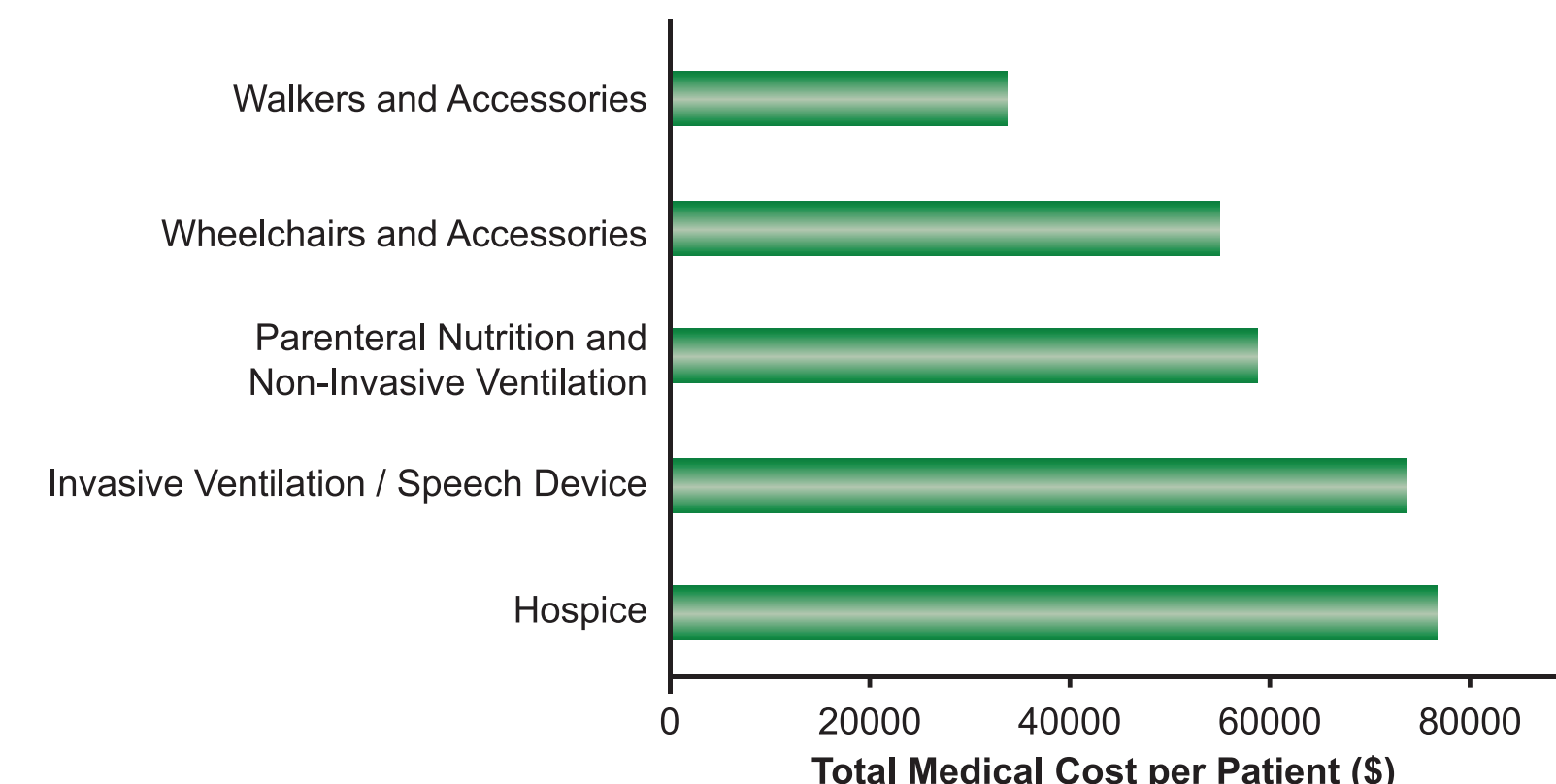
*Average per Patient

TIME TO DISABILITY MILESTONES: PURE MEDICARE



Months from index date to disability milestones increased rapidly along with the severity of physical impairment in Medicare cases

COST TO DISABILITY MILESTONES: PURE MEDICARE



The cumulative cost from index date to disability milestones increased substantially with the severity of physical impairment in Medicare cases

DISCUSSION

This analysis only includes Medicare and commercial costs; out of pocket costs likely increase the economic burden significantly

The increasingly important roles of risk adjusters, reinsurance and pooling were not assessed in this analysis

Limited duration of follow-up makes many of our conclusions tentative

Nevertheless, these results provide an initial estimate of the economic burden associated with disability milestones in ALS medical care

It will be important to explore whether delaying time to disability milestones reduces costs, as agents that improve function in ALS patients are developed

CONCLUSIONS

Medical costs in the diagnosis month were significantly higher than other months

Costs started to increase exponentially within about 8 months before the index month for both Medicare and commercial cases

Costs in the month following the index month were less than the costs in the index month, but monthly costs increased after that

Each insurance program reduced its costs after patients became eligible for Medicare but the combination of the costs increased by 50%

No trend in costs was observed during the coverage transition to Medicare

Approximately 30% of ALS patients are already receiving supportive services for disabilities at the time of diagnosis

Medical costs increased rapidly and substantially with each disability milestone