

Serious Illness and End of Life Care in the Commonwealth

November 02, 2016



MASSACHUSETTS
HEALTH POLICY COMMISSION



AGENDA

- **Defining quality serious illness care & need for improvement in quality**
- Spending and utilization in MA among Medicare decedents
- Analysis of Medicare decedents with poor prognosis cancer
- MA based initiatives and strategies for improvement

Serious illness care is an important focus area for quality improvement and cost containment

- High quality serious illness care addresses medical and emotional needs, with patients receiving care based on their individual preferences and priorities
 - However, numerous challenges often drive a disconnect between best practices and actual practices, with well-documented deficiencies in quality of care
- 25% of all Medicare spending in the US occurs in last year of life
 - Better aligning care with individual patient preferences will not reduce spending in all cases: failure to base care on patient preferences results in some receiving more services than they wish, while others receive less than they wish
 - However, literature suggests that increasing quality of end of life care tends to reduce total healthcare spending overall
- HPC has defined end of life care / serious illness care as critical components of accountable, effective care
 - Investments in improving care through HCII grants and CHART hospital activities
 - Inclusion in ACO certification standards: must support patient-centered advanced illness care

Elements of high quality serious illness care

The terminology of “serious illness care” reflects attending to a patient’s needs and discussing goals and options before death is imminent – challenging decisions are often required even for those who survive

Essential elements of high quality care cited by experts include:

Patients receive care based on their individual preferences and priorities

- As part of Advanced Care Planning, physicians should begin discussing patient goals and preferences early in a patient’s course of illness, before death is imminent

Includes shared decision making:

- Physicians assist patients in choosing course of action, regularly reviewed and updated, based on mutual understanding of full range of choices, and of individual preferences/values
- Facilitates patient autonomy; requires patients to have information about full range of choices, and that preferences for care are documented, readily retrievable, and respected

Includes access to palliative care:

- Includes medical and other efforts to relieve suffering and improve quality of life, including emotional and spiritual support for patients and families/caregivers, in addition to symptom management
 - Efforts can be provided concurrently with curative or life-prolonging treatments
- Plan is conceptualized, created, and coordinated by interdisciplinary team-based approach including care team, family, patient
- Can include hospice care, a type of comprehensive palliative care service that is most frequently provided in the patient’s home (or nursing home), but can also be delivered in a hospital or freestanding facility
 - Hospice providers receive a per diem payment intended to cover all of the patient’s care
 - Medicare requires hospice patients to agree to forgo curative services and must be certified as having less than six months to live; some private insurers are less restrictive

Despite known best practices for serious illness care, patients often do not receive high quality care

Quality of care at the end of life appears to be decreasing in the US overall

- In 2000, **57%** of family members or close friends of decedents reported excellent end of life care, but by 2011-2013 that number had decreased to **47%** of those surveyed
- Those surveyed reported frequent unmet need for pain management, anxiety/sadness, and dyspnea

Individual preferences vary widely, but research suggests many prefer less aggressive treatment

- A study of 1,146 families of decedents found strong correlations between rating “excellent” end of life care and usage of hospice >3 days, no ICU admissions within 30 days of death, and death not in a hospital setting

Intensity of care varies substantially by region across the US, largely impacted by health system characteristics and provider practice patterns

Intensity of service use varies substantially by region across the US and is not explained by patient preferences or illness level

- Regional differences in intensity of care vary **2-fold**, including percentage of patients who die in the hospital, hospital admissions, ICU rates; hospice enrollment also varies widely
- Studies report differences in preferences based on race and ethnic background, but large majority in all groups express preferences not to have intensive care
- Health system characteristics and provider practice patterns are the most predictive factors of the intensity of care that patients receive, with differences in patient characteristics (including race, ethnicity, age, and sex) being less significant
 - Intensity of service use at the end of life by region is highly correlated to overall health spending levels
 - Physicians who practice in regions with more specialists and higher hospital capacity tend to generate more referrals and recommend more intensive strategies for end of life care
 - A study of patients with poor prognosis cancer found that the proportion of a physician's patients who were enrolled in hospice was the most significant predictor of whether the physician's other patients would enroll in hospice

Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL, Pinder EL. The implications of regional variations in Medicare spending. Part 1: the content, quality, and accessibility of care. *Annals of internal medicine*. 2003;138(4). Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ. Variations in the longitudinal efficiency of academic medical centers. *Health Affairs*. 2004;VAR19. Wennberg JE, Fisher ES, Goodman DC, Skinner JS. Tracking the Care of Patients with Severe Chronic Illness-The Dartmouth Atlas of Health Care 2008. Duffy SA, Jackson FC, Schim SM, Ronis DL, Fowler KE. Racial/Ethnic Preferences, Sex Preferences, and Perceived Discrimination Related to End-of-Life Care. *Journal of the American Geriatrics Society*. 2006;54(1):150-7. Obermeyer Z, Powers BW, Makar M, Keating NL, Cutler DM. Physician characteristics strongly predict patient enrollment in hospice. *Health Affairs*. 2015; 34(6).

Massachusetts 2016 survey results indicate need for improvement in quality of care at end of life

Among those in Massachusetts who experienced the death of a loved one in the past 12 months:

Extent to which loved ones' wishes were followed by health care providers at the end of life



Rating of care received at the end of life



Patients often do not receive care according to their preferences

- A 2016 MA survey found **over one-third (35%)** of people with a loved one who died in the past 12 months said that health care providers did not fully follow the person's wishes
- *Significant disparities exist:* White respondents and respondents with higher levels of education were significantly more likely to state that their loved one's wishes were very much followed by providers

20% rated the care their loved one received as fair or poor, and only 27% felt it was excellent

- While 54% of white respondents who had lost someone rated that person's care as excellent or very good, only 35% of non-white respondents felt the same



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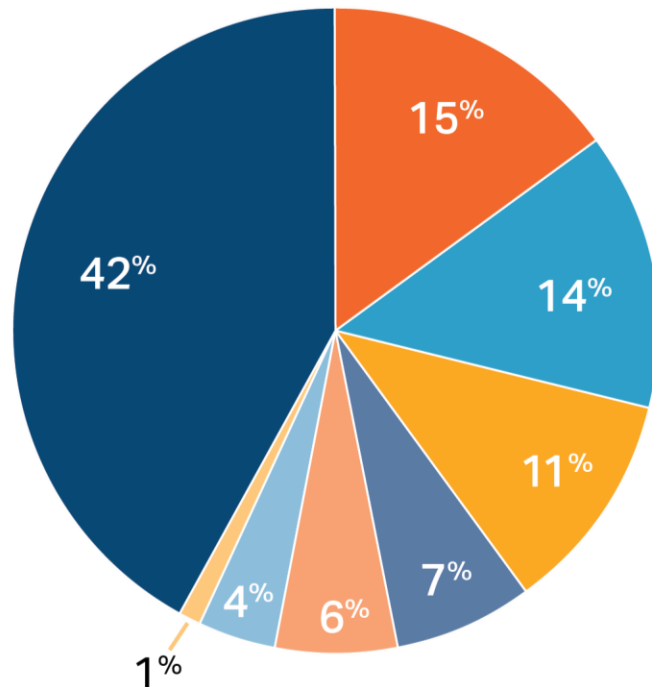
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Data methods

- Using the All-Payer Claims Database, we identified a population of Medicare fee-for-service beneficiaries (65+) who died in 2012 and were continuously enrolled in Medicare Parts A and B in the month of death and 12 months prior
- Nearly all (99.9%) of decedents in the database had a home zip code that could be assigned to an HPC region
- Spending estimates include Medicare and beneficiary payments for Medicare-covered services for 365 days before death (including data for 2011 and 2012)
- Estimates exclude decedents with total spending below the 5th or above the 95th percentile

Among Medicare decedents in Massachusetts, spending in last six months of life is concentrated in the inpatient hospital setting

Total use of Medicare services in last six months of life averaged **\$39,194**, with inpatient hospital spending the largest contributor to spending (~ **42%** of spending)



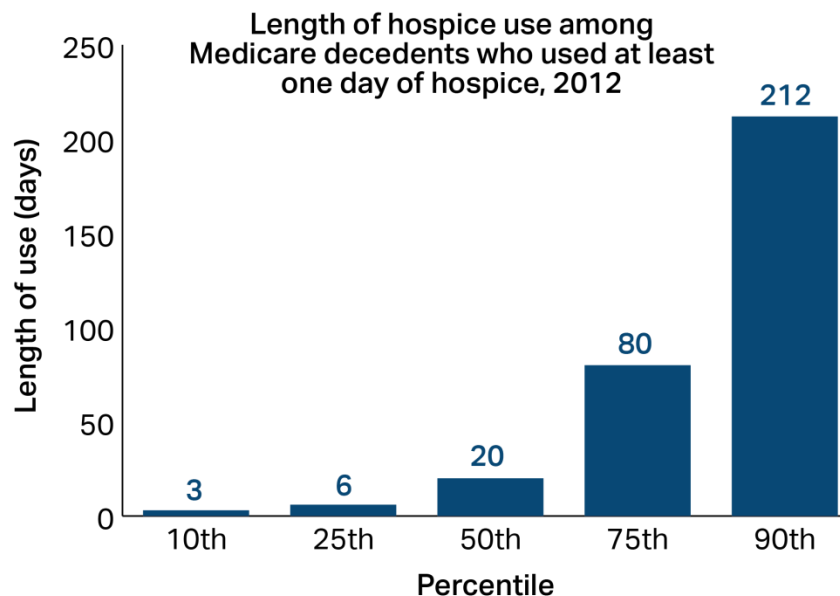
Spending by category in the last six months of life among Medicare decedents, 2012

Acute care hospital inpatient	\$16,477
SNF	\$6,040
Professional services - total	\$5,560
Hospice Services	\$4,426
Other hospital	\$2,475
Acute care hospital outpatient	\$2,403
Home health	\$1,473
DME	\$339
Total spending	\$39,194

Spending in the last six months of life totals over \$1 billion in Massachusetts for the HPC examined Medicare population alone

Many patients who use hospice only receive benefits for a few days before death

- **49%** of all Medicare decedents in MA used hospice for at least one day in the last year of life
- The median length of hospice enrollment in MA was **20 days** in 2012, similar to the national average of **18 days**
- **25%** of all decedents who used hospice were enrolled for less than one week, similar to the national results (in the US overall, the 25th percentile was 5 days)
- Availability of hospice is not likely to explain short use, as every region in the state* has at least one hospice provider and providers travel to the patient's home



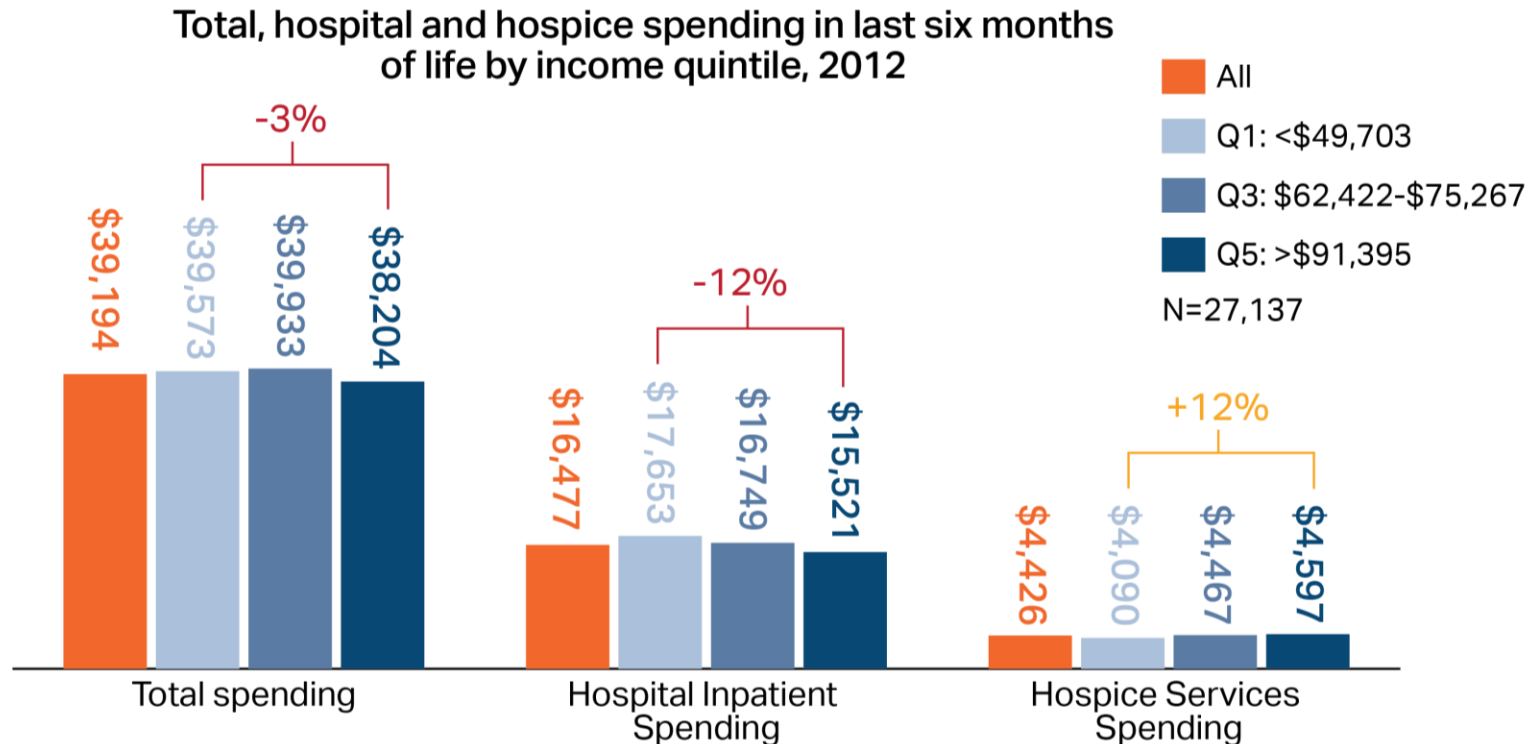
Source: HPC analysis of 2011-2012 APCD Medicare FFS data

Trends of short enrollment in hospice suggest a greater opportunities for patients to benefit from hospice services such as symptom management and support

Decedents from higher income communities have higher hospice spending and lower inpatient hospital spending at the end of life

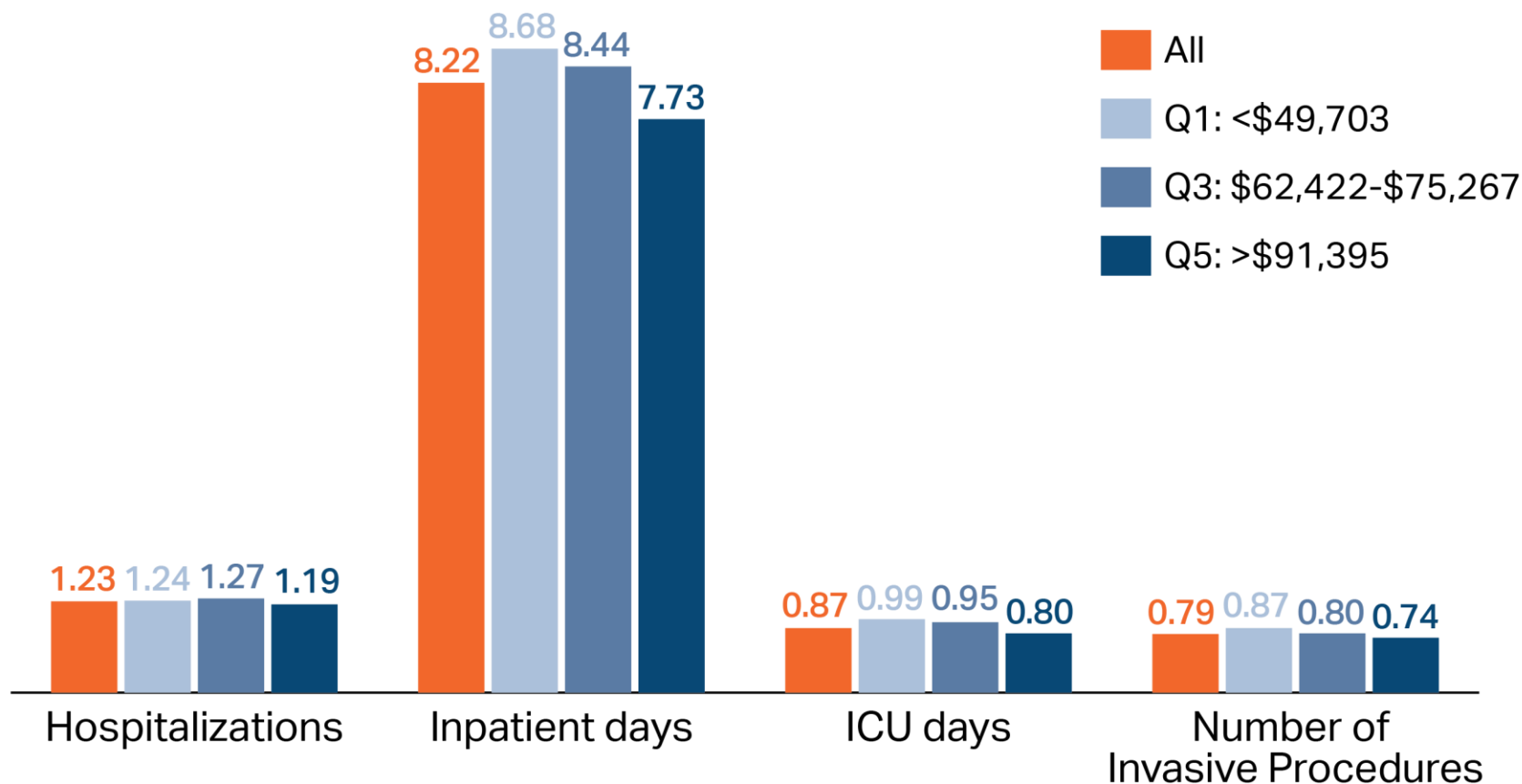
Total spending was slightly lower among decedents from the highest income communities (highest quintile) compared to the lowest income communities (lowest quintile), reflecting lower inpatient hospital spending and higher hospice spending in the highest income communities

- Differences in service use and spending by community income could potentially reflect factors including differences in condition, preferences, location of care or provider, or provider interaction (e.g. likelihood of advanced care planning discussions occurring)



Among all Medicare decedents, those in highest income communities have the lowest intensity of service use at the end of life

Select metrics of intensity of service use in last six months of life by income quintile, 2012

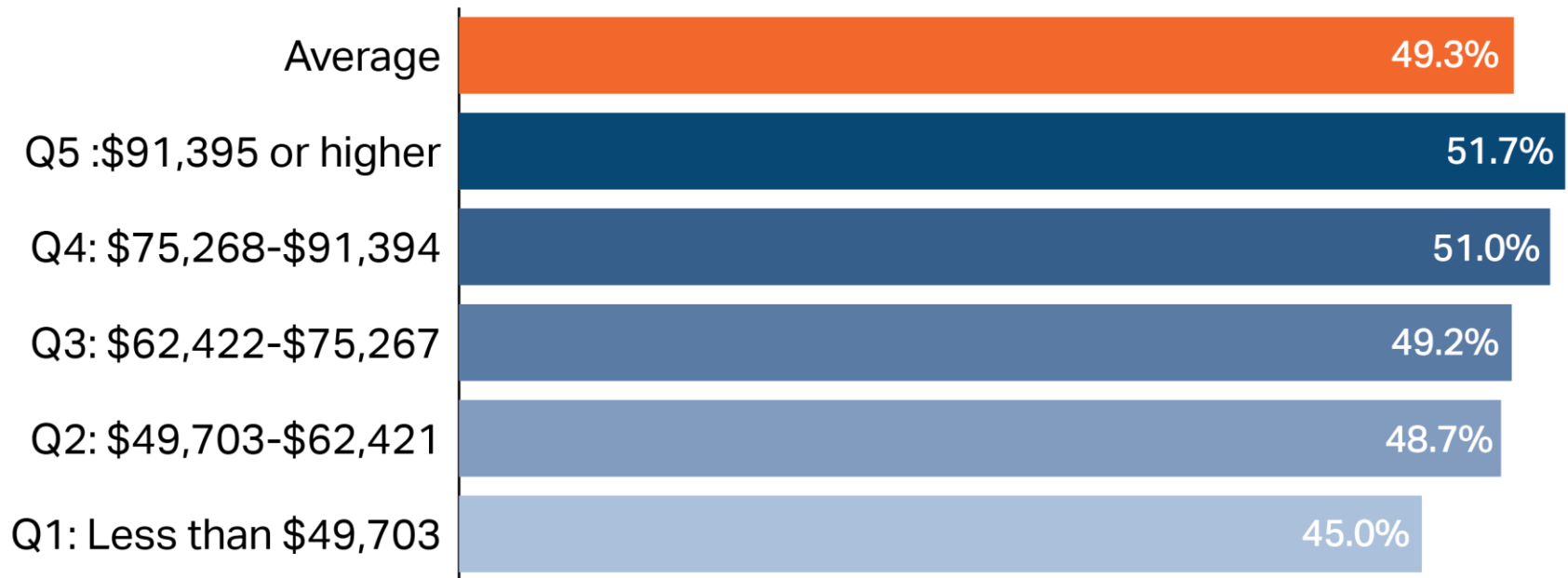


Source: HPC analysis of 2011-2012 APCD Medicare FFS data

Note: Decedents are defined as beneficiaries who died in 2012. Estimates include decedents' use of Medicare-covered services in 2011 and 2012. Estimates exclude decedents with total spending below the 5th percentile or above the 95th percentile. An admission, transfer, and admission from transfer are regarded as a single hospitalization. Spending includes Medicare and beneficiary payments for Medicare-covered services. Invasive procedures are defined as follows: insertion of venous catheter (38.93; 38.95; 38.97; 86.07), endotracheal intubation (96.04; 96.71; 96.72), packed cell transfusion (99.04), platelet or plasma transfusion (99.05; 99.07), noninvasive ventilation (93.9), thoracentesis (34.91), hemodialysis (39.95), cardiopulmonary resuscitation (99.6), closed bronchial biopsy (33.24), arterial catheterization (38.91). Invasive procedure methodology based on: Massachusetts Division of Health Care Finance and Policy. "Hospital Resource Use on End-of-Life Patients Varies." July 2006.

Hospice enrollment varies by income among Medicare decedents

Hospice enrollment in last year of life by income quintile, 2012



Hospice enrollment also varied by age (age 65-74 = 44% versus age 85+ = 52%) and sex (men = 45% versus women = 52%), although results do not control for differences in condition or other factors

While differences in hospice use and service utilization by income may reflect differences in condition or preferences, these differences may also reflect differences in access to care

Compared to the national average, MA has higher hospital use and lower ICU use in the last six months of life

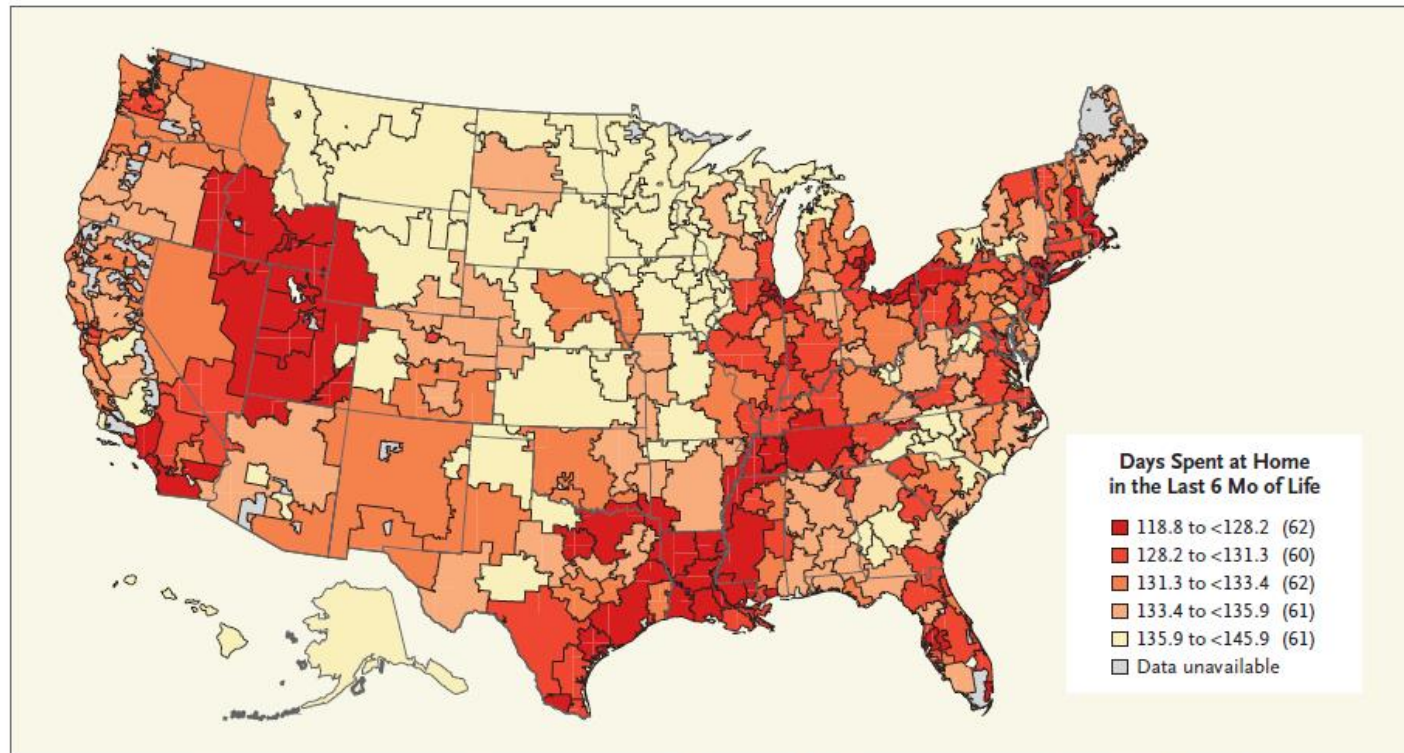
End of life care resource use indicators: MA & OR vs. USA					
<i>Medicare decedents, 2012</i>					
	MA	OR*	US average	10 th percentile	MA Rank
Hospital admissions per 1,000 decedents during the last six months of life (ICU level of care intensity)	429	381	627	361.5	14
Hospital admissions per 1,000 decedents during the last six months of life (overall level of care intensity)	1366	990	1337	1,056	38
Percent of decedents hospitalized at least once during the last six months of life (ICU level of care intensity)	31.2%	28.6%	41.8%	27.6%	14
Percent of decedents hospitalized at least once during the last six months of life (overall level of care intensity)	66.9%	59.1%	68.3%	61.1%	19
Percent of deaths occurring in a hospital	23.6%	18.8%	22.1%	18.1%	34
Average total spending per decedent in last six months of life	\$41,420	\$27,948	\$31,660	\$27,240	45
Percent of decedents enrolled in hospice during the last six months of life	46.1%	55.7%	50.6%	32.2%	33
<i>* Oregon as benchmark of state with “best practices” in end of life care</i>					
<i>Source: Dartmouth Atlas analysis of 2012 Medicare data</i>					

While Massachusetts has a substantially lower use of ICUs in the last six months of life than the US overall, the rate of hospitalizations is higher, consistent with the state’s higher admissions rate among all Medicare beneficiaries

Source: Dartmouth analysis of 2012 Medicare data.

Note: Results for percentage enrolled in hospice and total hospice differ from HPC estimates. Total spending displayed here for Massachusetts (\$41,420) are calculated by the Dartmouth Atlas group and are slightly higher than the HPC results displayed on slide 9 (\$39,194). Differences may be due in part to HPC exclusion of patients with outlier spending (patients with the highest and lowest 5% of spending), potential differences in data cleaning techniques, etc.

Massachusetts (particularly Eastern MA) ranks among the lowest for average numbers of days spent at home in the last six months life among Medicare decedents, a patient-centered outcome measure



Mean Number of Days Spent at Home in the Last 6 Months of Life, by Hospital Referral Region, for Medicare Beneficiaries Who Died in 2012 or 2013.

Findings of high institutionalization at the end of life in Massachusetts are consistent with practice patterns favoring institutionalization across many measures in the state, including high rates of hospital admissions and institutional post-acute care



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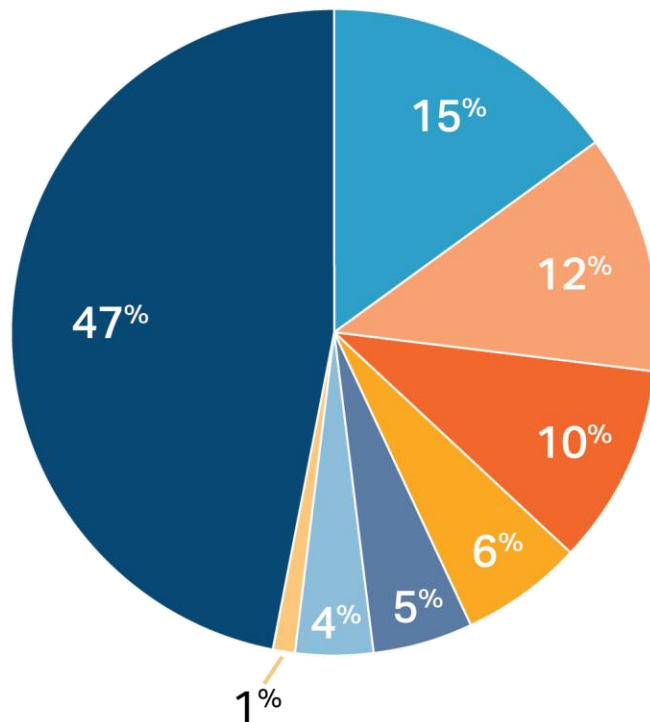
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Analysis of Medicare decedents in Massachusetts with poor prognosis cancer

- Focusing on decedents with poor prognosis cancer reduces limitation that differences by population or region may be due to differences in patient cause of death
- Poor prognosis cancer patients defined using ICD-9 codes corresponding to poor-prognosis malignancies used by Obermeyer et al. (*JAMA*, 2014)
- Using the All-Payer Claims Database, we defined a base population of Medicare fee-for-service beneficiaries (65+) who died in 2012 and were continuously enrolled in Medicare Parts A and B in the month of death and 12 months prior
- Identified the poor prognosis subset using APCD claims data to flag Medicare patients who died in 2012 who presented with a relevant ICD-9 code in the 12 months prior to death
- Estimates exclude decedents with total spending below the 5th or above the 95th percentile

Among Medicare decedents with poor prognosis cancer, spending distribution is similar to the total population of Medicare decedents, but with more hospital spending and less spending on hospice and SNFs

Total use of Medicare services in last six months of life averaged **\$67,600**, with inpatient hospital spending the largest contributor to spending (~**47%** of spending)



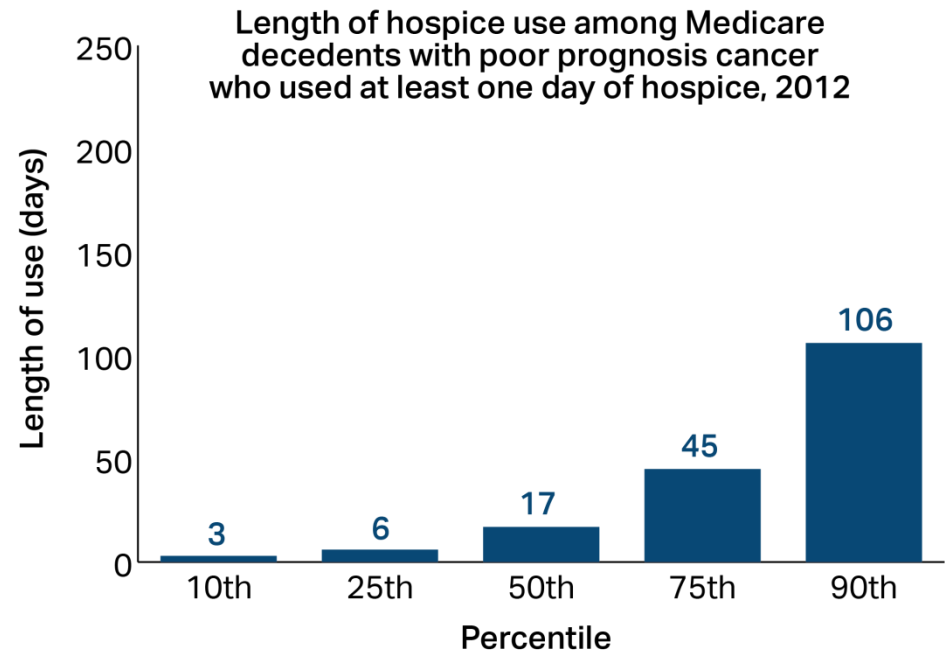
Spending by category in the last six months of life among Medicare decedents with poor prognosis cancer, 2012

Acute care hospital inpatient	\$31,459
Professional services - total	\$10,291
Acute care hospital outpatient	\$8,426
SNF	\$6,865
Hospice Services	\$4,220
Other hospital	\$3,057
Home health	\$2,597
DME	\$696
Total Spending	\$67,611

Hospice enrollment is higher among poor prognosis cancer patients, but share of decedents with short use is the same as in the total decedent population

Length of use

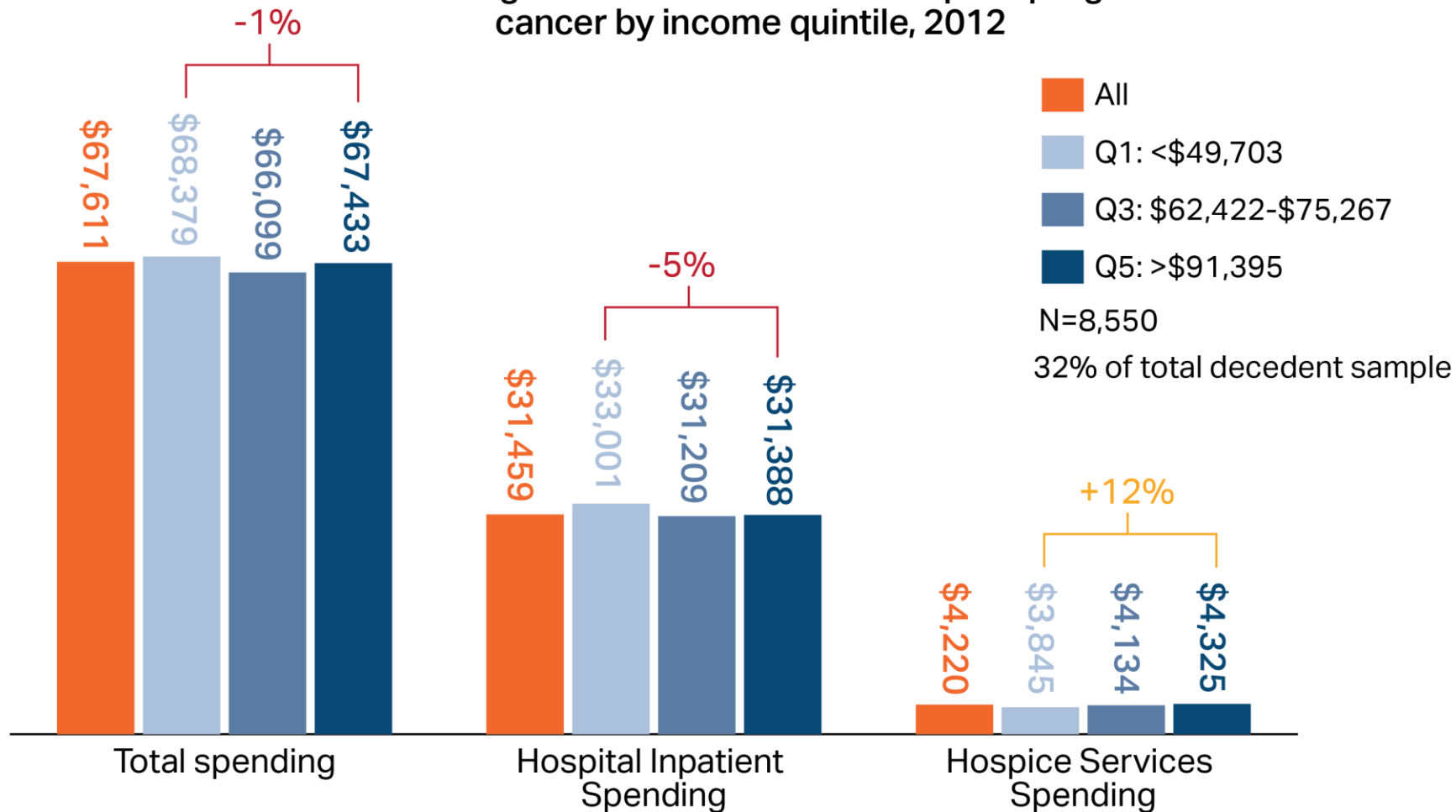
- 61% of Medicare decedents with poor prognosis cancer used hospice in the last year of life, higher than enrollment across all Medicare decedents (49%)
- 25% of all decedents who used hospice were enrolled for less than one week (6 days), the same as the total population of Medicare decedents in Massachusetts



Source: HPC analysis of 2011-2012 APCD Medicare FFS data

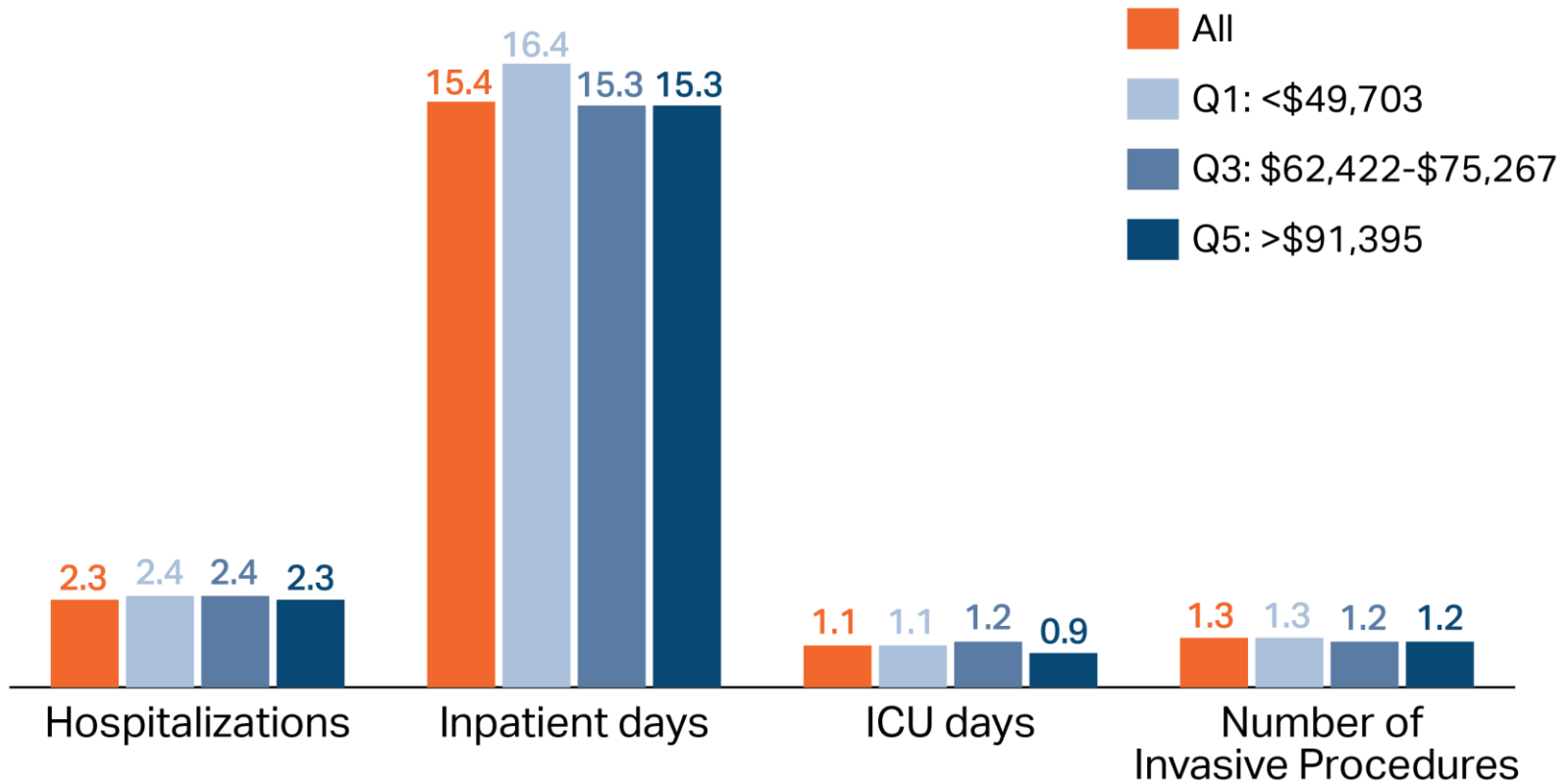
Among decedents with poor prognosis cancer, those from higher income communities have higher hospice spending and lower inpatient hospital spending at the end of life

Total, hospital and hospice spending in last six months of life among Medicare decedents with poor prognosis cancer by income quintile, 2012



Among decedents with poor prognosis cancer, those in higher income communities have the lowest intensity of service use at the end of life, but the difference by income is less than in the total decedent population

Select metrics of intensity of service use in last six months of life among Medicare decedents with poor prognosis cancer by income quintile, 2012

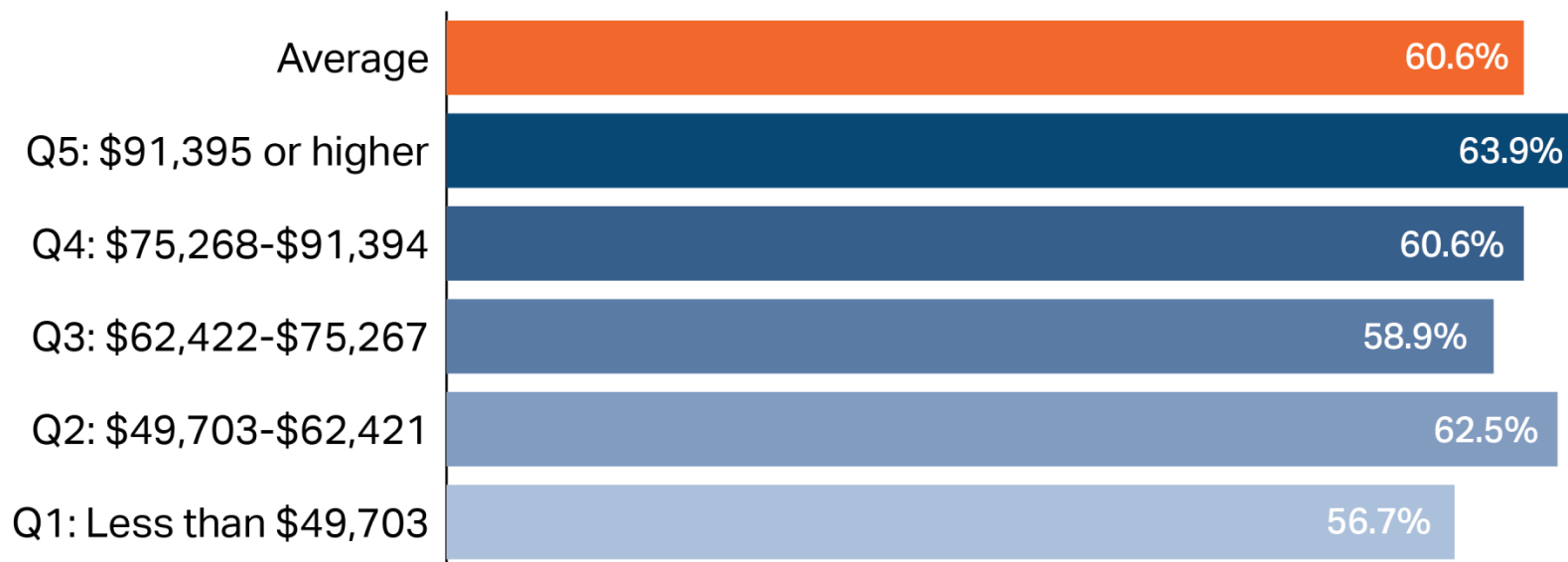


Source: HPC analysis of 2011-2012 APCD Medicare FFS data

Note: Decedents are defined as beneficiaries who died in 2012 with an ICD-9 code corresponding to poor prognosis malignancies (see Obermeyer et al, JAMA, 2014). Estimates include decedents' use of Medicare-covered services in 2011 and 2012. Estimates exclude decedents with total spending below the 5th percentile or above the 95th percentile. An admission, transfer, and admission from transfer are regarded as a single hospitalization. Spending includes Medicare and beneficiary payments for Medicare-covered services. Invasive procedures are defined as follows: insertion of venous catheter (38.93; 38.95; 38.97; 86.07), endotracheal intubation (96.04; 96.71; 96.72), packed cell transfusion (99.04), platelet or plasma transfusion (99.05; 99.07), noninvasive ventilation (93.9), thoracentesis (34.91), hemodialysis (39.95), cardiopulmonary resuscitation (99.6), closed bronchial biopsy (33.24), arterial catheterization (38.91). Invasive procedure methodology based on: Massachusetts Division of Health Care Finance and Policy. "Hospital Resource Use on End-of-Life Patients Varies." July 2006.

Hospice enrollment varies by income among Medicare decedents with poor prognosis cancer

Hospice enrollment in last six months of life among Medicare decedents with poor prognosis cancer by income quintile, 2012

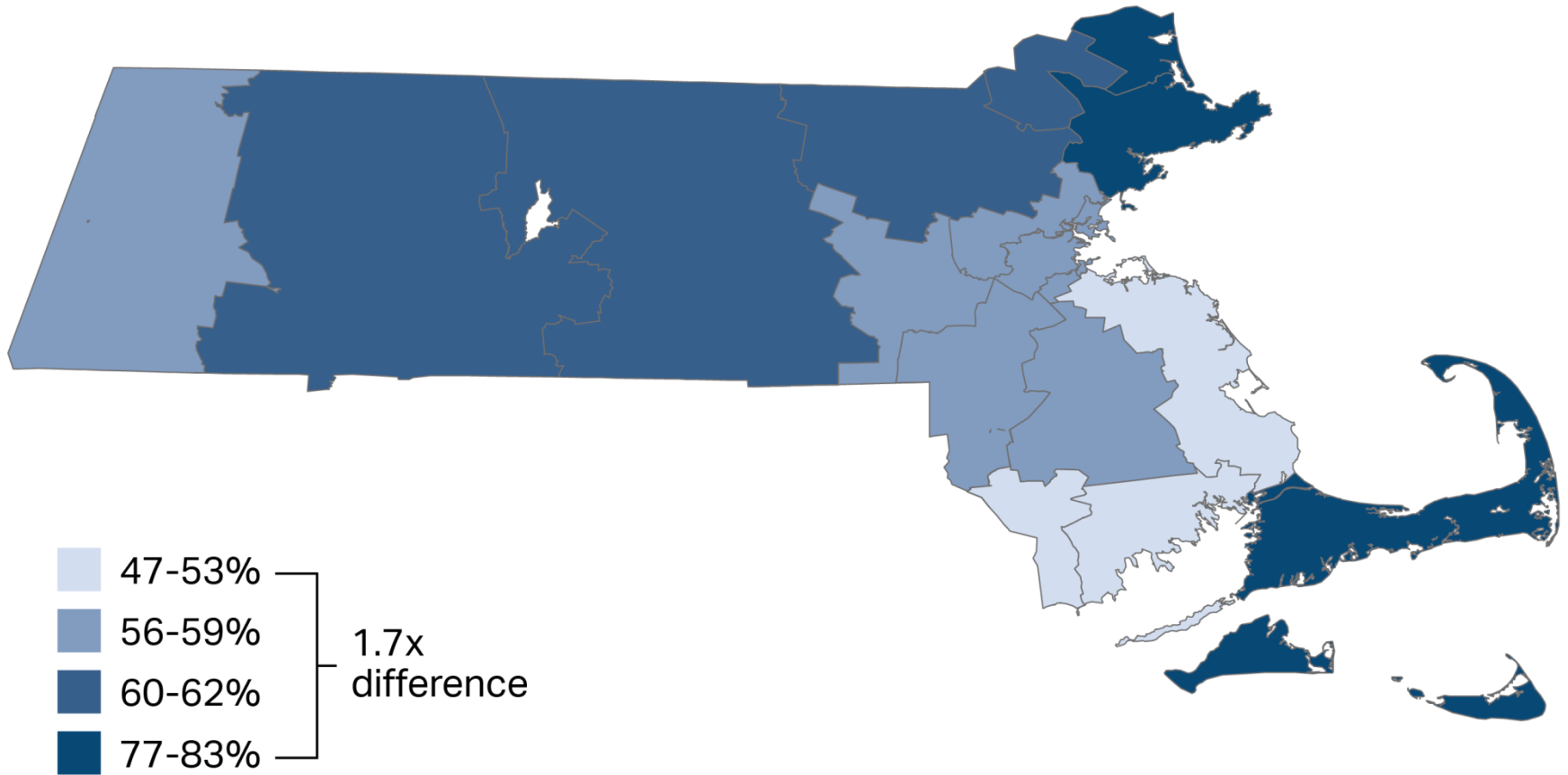


Variation in hospice enrollment

- Differences in hospice enrollment were minimal by age (age 65-74 = 60% versus age 85+ = 61%), but varied by sex (men = 57% versus women = 64%) and income
 - Difference by income among decedents with poor prognosis cancer is similar to difference by income in the total Medicare decedent population
- However, hospice enrollment and service use varied more by region than by age, sex, or income

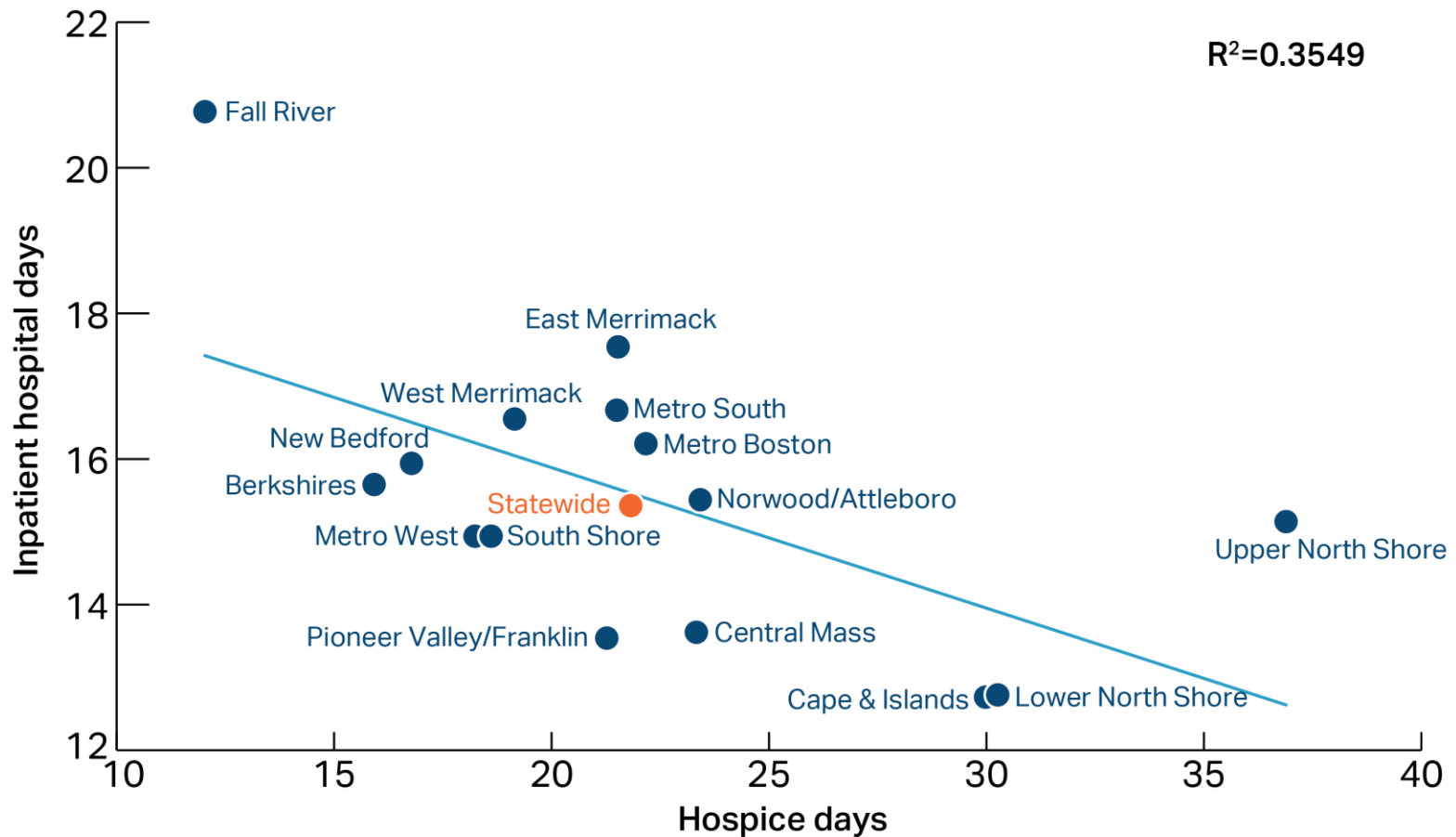
Hospice enrollment in last year of life varies widely by region within Massachusetts among Medicare decedents with poor prognosis cancer, 2012

Hospice enrollment in last year of life by region among Medicare decedents with poor prognosis cancer, 2012



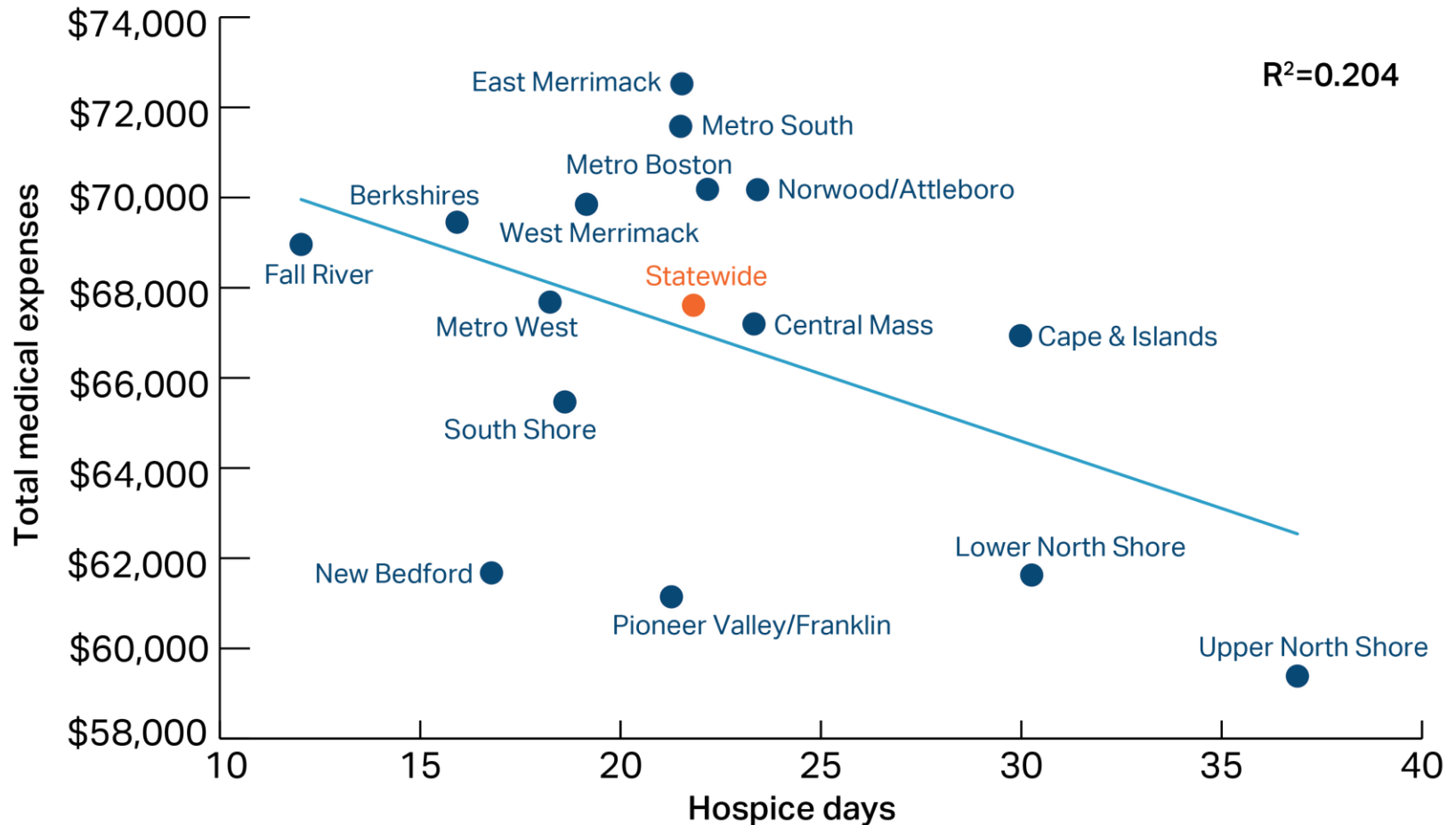
Regions with higher hospice use tend to have lower hospital use

Average number of days of hospice and inpatient hospital days in last six months of life among Medicare decedents with poor prognosis cancer, 2012



Regions with higher hospice use tend to have lower total medical spending

Average hospice days and total medical spending in last six months of life for Medicare decedents with poor prognosis cancer, 2012



Conclusions

Poor prognosis cancer analysis

- Higher hospice use was correlated with lower hospital use and total spending in this population, reflecting national results with this patient population
- Differences in hospice enrollment by sex and income were moderate, but the variation by region was more pronounced
 - Even areas with highest hospice enrollment have room for improvement
- Regional differences are not likely due to patient characteristics, but instead may support the conclusions from national research that local practice patterns, health system characteristics, and individual physician tendencies to refer to hospice are the most significant predictors of hospice use
 - More research is needed to better understand provider differences in Massachusetts

Conclusions

Overall Conclusions

- Difference in use by population and region as well as late enrollment trends suggest need for attention to access to care, particularly earlier conversations about preferences and shared decision making regarding options
 - Need to ensure that patients with serious illness have access to palliative care services before enrolling in hospice, given the current Medicare hospice requirement to forgo curative treatment
- In Massachusetts, over \$1 billion is spent on the last six months of life in the Medicare population alone, but widespread, severe problems in quality persist (2016 UMass survey) and variation by region and population suggests issues in access to care
- These findings emphasize the urgent need for improvement in the Commonwealth, including leveraging and expanding on current initiatives



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Recent initiatives position MA to be a leader in improving serious illness care

Leadership from state government

- Recommendations from 2010 Massachusetts Expert Panel on End of Life Care (created under Chapter 305 of the Acts of 2008)
- Requirements in Chapter 224 of the Acts of 2012 for providers to inform patients with serious illness about their options, implemented by Department of Public Health (DPH) in 2014
- Establishment of DPH interdisciplinary advisory council on palliative care and quality of life (2015)

Improve patient engagement

Increase portable documentation of patient preferences

- DPH implemented Medicare Orders for Life Sustaining Treatment (MOLST) program for documenting advanced directives



Physician training

- Ariadne Labs – a joint center between Brigham and Women’s Hospital and Harvard TH Chan School of Public Health – emphasizes open communication with patients and families/caregivers and approaches to identify patients at high risk of death



Changing practice culture through institutional policies

- DFCI requires universal documentation of health care proxy in EMRs
- BIDMC expanded its definition of informed consent:
 - In implementing state law and DPH regulations, informed consent for patients with serious advancing illness requires offering information and counseling to the patient about palliative care and end of life options, and documenting having done so in the medical record

Massachusetts Serious Illness Care Coalition and other task forces



As part of the Health Care Innovation Investment (HCII) Program, the HPC awarded Care Dimensions \$750,000 to reduce inpatient use and increase conversations and hospice use in patients with serious illness

Primary Aim

Reduce emergency department and inpatient utilization by 30% for 528 high-risk patients with life-limiting illness

Secondary Aims

Secondary Aim 1: Increase hospice length of stay by 5% for the target population by the end of the Implementation Period.

Secondary Aim 2: Achieve a 90% rate of completion of advance directives conversations for the enrolled population by the end of the Implementation Period.

Service Model

Integrate palliative care staff into primary care sites to increase early identification of patients requiring those services, and bridge the gap in care that occurs between curative care and end of life care by utilizing telemedicine technology.

Partner

- North Shore Physicians Group, Inc.



Total Initiative Cost	Requested HPC Funding	Estimated Savings
\$750,000	\$750,000	\$7,233,600

Previously identified strategies to improve serious illness care in Massachusetts for discussion

2010 Massachusetts Expert Panel Recommendations:

1. Inform and empower residents of Massachusetts
2. Support a health care system that ensures high quality patient-centered care
3. Ensure a knowledgeable, competent, and compassionate workforce
4. Create financing structures that promote patient-centered care
5. Create a responsible entity to ensure excellent and accountability
6. Employ quality indicators and performance measurement

A 2014 report evaluated progress against the 2010 recommendations and detailed priorities for further action in each area

Highlight: Need for state-wide outcomes-based quality measurement

- Develop and implement regularly administered post-death survey of family/caregivers of decedents
- Adapt existing vehicles to measure and track progress on serious illness care, such as Cost Trends Report dashboard and patient surveys
- Ensure accountability for progress as a state, and health care organizations (providers and insurers)

Next steps

- Engage with MA Serious Illness Care Coalition and others on these findings
 - Opportunities for collaboration with other state government partners
- Update results with 2015 data and include time trends
 - Issue policy brief in 2017 with updated analyses
- Explore opportunities to expand data capabilities to include decedents covered by payers other than Medicare and other demographic differences
- Explore opportunities to link practice pattern variation to health systems
- Dashboard metrics
- Additional research
 - What additional data or analyses would be valuable?

Contact Information

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Massachusetts Health Policy Commission:**

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HPC-INFO@state.ma.us

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Appendix

Selected measures of service use and spending among decedents in 2012: Medicare fee-for-service beneficiaries by age, sex, and income quintile

	Age				Sex		Income Quintile				
	All	65-74	75-84	85+	Men	Women	Bottom Quintile	Quintile 2	Quintile 3	Quintile 4	Top Quintile
Number of decedents ^a	27,137	4,162	8,489	14,486	11,344	15,793	4,665	5,694	5,697	5,762	5,262
Distribution of decedents	100%	15%	31%	53%	42%	58%	17%	21%	21%	21%	19%
12 months before death											
Average number of hospice days	32.3	22.2	27.8	37.8	24.9	37.6	30.1	31.9	32.2	32.8	34.2
Percent using any hospice in year prior to death	49.3%	43.8%	46.9%	52.2%	45.1%	52.3%	45.0%	48.7%	49.2%	51.0%	51.7%
6 months before death											
Acute care hospitals											
Number of hospitalizations per decedent	1.23	1.37	1.36	1.11	1.31	1.17	1.24	1.24	1.27	1.20	1.19
Number of inpatient days per decedent	8.22	9.77	9.51	7.01	8.87	7.75	8.68	8.33	8.44	7.98	7.73
Number of ICU days per decedent	0.87	1.35	1.14	0.58	1.02	0.77	0.99	0.89	0.95	0.77	0.80
Number of Non-ICU days per decedent	7.3	8.4	8.4	6.4	7.8	7.0	7.7	7.4	7.5	7.2	6.9
Non-acute hospitals ^b											
Number of hospitalizations per decedent	0.10	0.12	0.12	0.08	0.12	0.09	0.09	0.10	0.11	0.10	0.10
Average number of invasive procedures per hospitalized decedent	0.79	1.26	1.01	0.53	0.93	0.69	0.87	0.78	0.80	0.77	0.74
Spending per decedent											
All services	\$39,194	\$45,670	\$43,517	\$34,799	\$41,524	\$37,520	\$39,573	\$39,502	\$39,933	\$38,845	\$38,204
Acute care hospital inpatient	\$16,477	\$20,964	\$19,343	\$13,508	\$18,075	\$15,330	\$17,653	\$16,992	\$16,749	\$15,668	\$15,521
Other hospital inpatient	\$1,805	\$2,079	\$2,226	\$1,479	\$2,139	\$1,565	\$1,484	\$1,770	\$1,997	\$1,911	\$1,813
Acute care hospital outpatient	\$2,403	\$5,317	\$2,992	\$1,221	\$2,971	\$1,996	\$2,180	\$2,266	\$2,482	\$2,579	\$2,490
Other hospital outpatient	\$670	\$701	\$686	\$651	\$682	\$661	\$818	\$686	\$652	\$658	\$547
Hospice Services	\$4,426	\$3,461	\$3,953	\$4,981	\$3,568	\$5,043	\$4,090	\$4,357	\$4,467	\$4,563	\$4,597
SNF	\$6,040	\$3,747	\$5,826	\$6,825	\$5,966	\$6,093	\$6,051	\$6,028	\$6,072	\$6,194	\$5,856
Home health	\$1,473	\$1,452	\$1,544	\$1,437	\$1,525	\$1,435	\$1,366	\$1,445	\$1,487	\$1,466	\$1,589
DME	\$339	\$609	\$410	\$220	\$379	\$310	\$381	\$335	\$330	\$311	\$348
Professional services - total	\$5,560	\$7,341	\$6,536	\$4,477	\$6,219	\$5,087	\$5,551	\$5,623	\$5,697	\$5,495	\$5,443

Note: Decedents are defined as beneficiaries who died in 2013. Estimates include decedents' use of Medicare-covered services in 2012 and 2013. Estimates exclude decedents with total spending below the 5th percentile or above the 95th percentile. An admission, transfer, and admission from transfer are regarded as a single hospitalization. Invasive procedures are defined as follows: insertion of venous catheter (38.93; 38.95; 38.97; 86.07), endotracheal intubation (96.04; 96.71; 96.72), packed cell transfusion (99.04), platelet or plasma transfusion (99.05; 99.07), noninvasive ventilation (93.9), thoracentesis (34.91), hemodialysis (39.95), cardiopulmonary resuscitation (99.6), closed bronchial biopsy (33.24), arterial catheterization (38.91). Spending includes Medicare and beneficiary payments for Medicare-covered services.

^a Includes inpatient stays in long-term care, psychiatric, rehabilitation, and VA hospitals.

Service use and spending among decedents in 2012: Medicare fee-for-service beneficiaries with poor prognosis cancers by age, sex, and income quintile

	Age				Sex		Income quintiles				
	All	65-74	75-84	85+	Men	Women	Bottom Quintile	Quintile 2	Quintile 3	Quintile 4	Top Quintile
Number of decedents ^a	8,550	3,162	3,614	1,774	4,205	4,345	1,376	1,711	1,793	1,963	1,702
Distribution of decedents	100%	37%	42%	21%	49%	51%	16%	20%	21%	23%	20%
12 months before death											
Average number of hospice days	24.23	24.65	22.39	27.22	21.22	27.14	22.57	26.9	24.44	20.92	26.48
Percent using any hospice in year prior to death	60.6%	60.3%	60.8%	61.1%	56.7%	64.4%	56.7%	62.5%	58.9%	60.6%	63.9%
6 months before death											
Acute care hospitals											
Number of hospitalizations per decedent	2.32	2.39	2.35	2.15	2.4	2.26	2.38	2.23	2.37	2.34	2.32
Number of inpatient days per decedent	15.36	15.84	15.49	14.25	15.61	15.13	16.44	14.83	15.33	15.21	15.26
Number of ICU days per decedent	1.06	1.34	0.98	0.72	1.14	0.98	1.08	0.95	1.2	1.19	0.86
Number of Non-ICU days per decedent	14.3	14.49	14.52	13.53	14.46	14.15	15.36	13.88	14.13	14.02	14.4
Non-acute hospitals ^b											
Number of hospitalizations per decedent	0.13	0.13	0.14	0.09	0.14	0.12	0.11	0.13	0.13	0.13	0.12
Average number of invasive procedures per hospitalized decedent	1.25	1.41	1.22	1.04	1.4	1.11	1.28	1.18	1.21	1.39	1.19
Spending per decedent											
All services	\$67,611	\$72,219	\$67,967	\$58,671	\$69,261	\$66,014	\$68,379	\$66,782	\$66,099	\$69,305	\$67,433
Acute hospital inpatient	\$31,459	\$34,042	\$31,525	\$26,720	\$32,864	\$30,099	\$33,001	\$30,342	\$31,209	\$31,684	\$31,388
Other hospital inpatient	\$2,769	\$2,622	\$3,159	\$2,234	\$2,957	\$2,587	\$2,037	\$2,768	\$2,748	\$3,360	\$2,631
Acute hospital outpatient	\$8,426	\$11,702	\$7,733	\$3,996	\$9,130	\$7,743	\$7,898	\$7,490	\$8,094	\$9,494	\$8,926
Other hospital outpatient	\$288	\$276	\$238	\$414	\$307	\$271	\$406	\$227	\$251	\$252	\$336
Hospice Services	\$4,220	\$4,400	\$3,963	\$4,421	\$3,649	\$4,772	\$3,845	\$4,698	\$4,134	\$4,026	\$4,325
SNF	\$6,865	\$4,988	\$7,153	\$9,624	\$6,432	\$7,284	\$7,888	\$7,418	\$6,235	\$6,960	\$6,039
Home health	\$2,597	\$2,553	\$2,640	\$2,589	\$2,547	\$2,646	\$2,349	\$2,689	\$2,630	\$2,505	\$2,767
DME	\$696	\$754	\$786	\$410	\$713	\$680	\$574	\$819	\$755	\$674	\$635
Professional services - total	\$10,291	\$10,881	\$10,769	\$8,264	\$10,663	\$9,931	\$10,381	\$10,330	\$10,042	\$10,349	\$10,385

Note: Decedents are defined as beneficiaries who died in 2012. Estimates include decedents' use of Medicare-covered services in 2011 and 2012. Estimates exclude decedents with total spending below the 5th percentile or above the 95th percentile. An admission, transfer, and admission from transfer are regarded as a single hospitalization. Invasive procedures are defined as follows: insertion of venous catheter (38.93; 38.95; 38.97; 86.07), endotracheal intubation (96.04; 96.71; 96.72), packed cell transfusion (99.04), platelet or plasma transfusion (99.05; 99.07), noninvasive ventilation (93.9), thoracentesis (34.91), hemodialysis (39.95), cardiopulmonary resuscitation (99.6), closed bronchial biopsy (33.24), arterial catheterization (38.91). Spending includes Medicare and beneficiary payments for Medicare-covered services.

^a Includes inpatient stays in long-term care, psychiatric, rehabilitation, and VA hospitals.

Hospice enrollment in last year of life varies widely by region within Massachusetts among Medicare decedents with poor prognosis cancer, 2012

