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The Rising Cost of Living Longer

Analysis of Medicare Spending by Age for Beneficiaries in Traditional Medicare

Prepared by:

Tricia Neuman, Juliette Cubanski, Jennifer Huang, and Anthony Damico

Kaiser Family Foundation

Introduction

In the context of ongoing discussions about the federal budget and national debt, policymakers, experts, and the media have called attention to the nation's growing aging population and the implications for Medicare and the federal budget. At the same time, geriatricians and other providers who care for older patients are giving greater attention to the question of how best to meet the needs of an aging population. Between 2010 and 2050, the United States population ages 65 and older will nearly double, the population ages 80 and older will nearly triple, and the number of nonagenarians and centenarians—people in their 90s and 100s—will quadruple.¹ The aging of the population has important implications for future Medicare spending because beneficiaries ages 80 and older account for a disproportionate share of Medicare expenditures. According to the Congressional Budget Office, population aging is expected to account for a larger share of spending growth on the nation's major health care programs through 2039 than either “excess spending growth” or subsidies for the coverage expansions provided under the Affordable Care Act.²

To inform discussions about Medicare's role in providing coverage for an aging population and to assess the relationship between Medicare spending and advancing age, this report takes an in-depth look at patterns of Medicare spending by age, overall and by type of service.³ Using the most current Medicare spending data available for beneficiaries in traditional Medicare in 2011 and trends since 2000, the analysis explores the following questions:

- To what extent does Medicare per capita spending rise with age among beneficiaries in traditional Medicare, and at what age does per capita spending reach its peak before starting to decline?
- How does per capita spending for specific Medicare-covered services vary by age for beneficiaries in traditional Medicare over age 65, and how have these patterns changed over time?
- Has Medicare per capita spending for older beneficiaries (ages 80 and older) been increasing over time, after controlling for inflation?
- What is the pattern of per capita spending by age among decedents, and how does spending on decedents affect the pattern of per capita spending among traditional Medicare beneficiaries overall?

This analysis is based on data from a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse (CCW) of the Centers for Medicare & Medicaid Services (CMS) from 2000 to 2011 (the most recent year available when this analysis was conducted) that includes all Medicare-covered claims for services covered under Parts A, B, and D. The analysis excludes beneficiaries who are age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age. The analysis focuses on Medicare beneficiaries over age 65 rather than younger adults who qualify for Medicare because of a permanent disability to develop a better understanding of the relationship between Medicare spending and advancing age.

This study examines patterns of Medicare spending among beneficiaries in traditional Medicare rather than in Medicare Advantage plans because comparable data on Medicare spending by service are not available for this population (Medicare spending for Medicare Advantage enrollees takes the form of monthly capitation payments which are not based on actual service utilization⁴). Because we lack comparable data for the 25 percent of beneficiaries enrolled in Medicare Advantage in 2011, it is not possible to assess whether patterns of service use and spending in traditional Medicare apply to the Medicare population overall. More information about the data, methods, and limitations can be found in the Methodology.

Key Findings

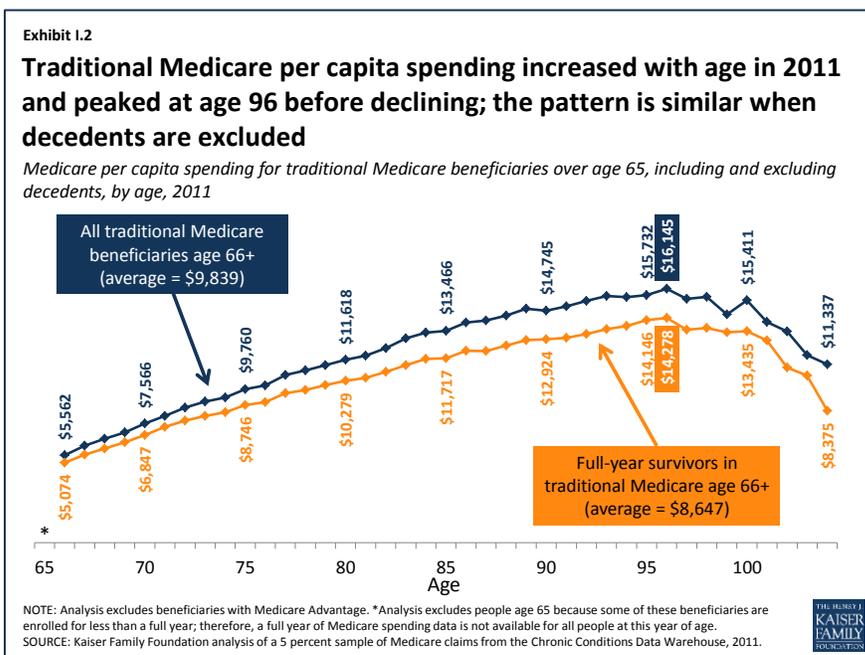
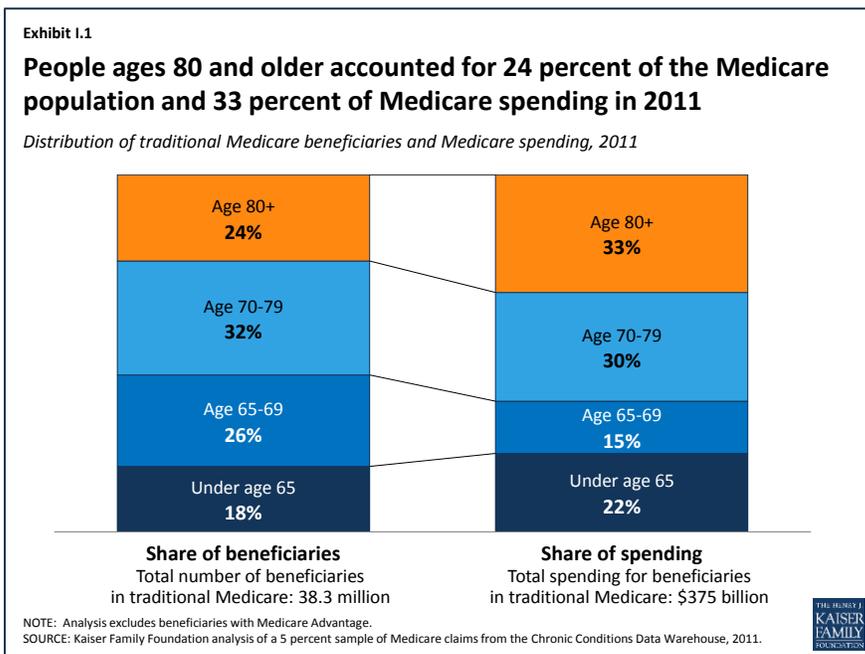
MEDICARE PER CAPITA SPENDING BY AGE AMONG TRADITIONAL MEDICARE BENEFICIARIES OVER AGE 65 IN 2011 AND TRENDS, 2000–2011

- Medicare’s octogenarians, nonagenarians, and centenarians account for a disproportionate share of Medicare spending. In 2011, beneficiaries ages 80 and older comprised 24 percent of the traditional Medicare population, but 33 percent of total Medicare spending on this population (**Exhibit I.1**). In contrast, beneficiaries between the ages of 65 and 69 comprised 26 percent of the traditional Medicare population, but just 15 percent of total Medicare spending.

- In 2011, overall Medicare per capita spending increased with age, peaked at age 96, and then declined gradually for the relatively small number of beneficiaries at older ages (**Exhibit I.2**). Average Medicare per capita spending in 2011 more than doubled between age 70 (\$7,566) and age 96 (\$16,145).

- The increase in Medicare per capita spending as beneficiaries age can be partially, but not completely, explained by the high cost of end-of-life care. Medicare per capita spending among survivors in 2011 (excluding beneficiaries who died during the year) also rises with age and peaks at age 96 (\$14,278) before falling—but the averages are higher when decedents are included (**Exhibit I.2**).

- The pattern of Medicare per capita spending for beneficiaries who died in 2011 is markedly different; it declined steadily with age, falling from \$43,000 among 70-year-olds to under \$20,000 among centenarians. Yet because of higher death rates among older beneficiaries, average per capita spending among all beneficiaries who die at older ages has a greater influence on the estimates of average spending among all beneficiaries at older ages.

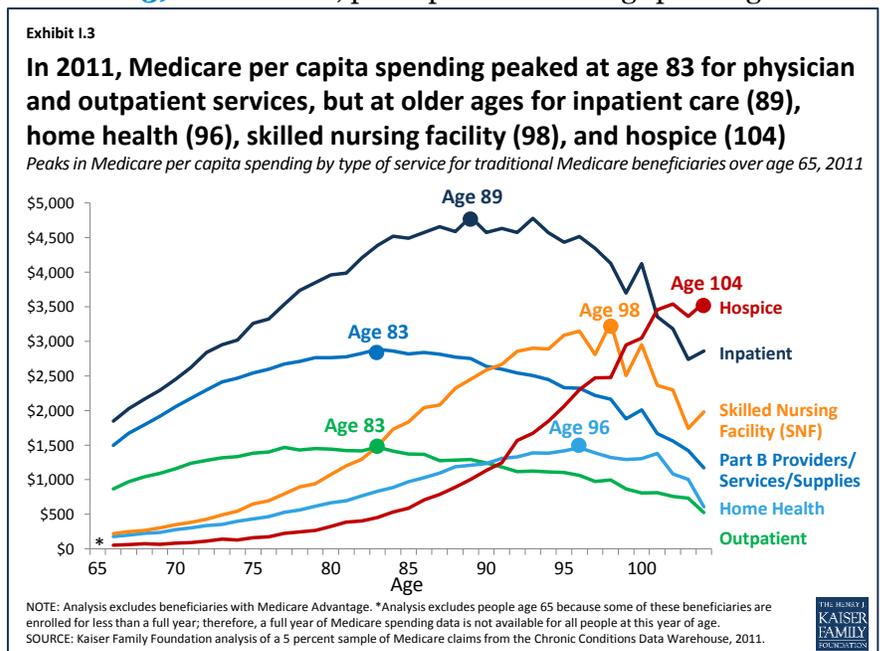


- Between 2000 and 2011, Medicare per capita spending peaked at older ages, and was higher at the peak age in 2011 than in 2000, after controlling for inflation. Medicare per capita spending peaked at age 92 in 2000 (\$9,557 in inflation-adjusted 2011 dollars), rising to age 96 by 2011 (\$15,015 excluding Part D spending and \$16,145 including Part D spending).
- Over time, the difference in Medicare per capita spending between beneficiaries ages 80 and older and younger beneficiaries has widened. In 2011, Medicare per capita spending was 2.5 times greater for 85-year-olds (\$13,466) and 3 times greater for 95-year-olds (\$15,732) than for 66-year-olds (\$5,562).
- Between 2000 and 2011, Medicare per capita spending grew faster for beneficiaries ages 90 and older than for younger beneficiaries over age 65, both including and excluding spending on the Part D prescription drug benefit beginning in 2006. Including Part D spending, per capita spending grew at an average annual rate of 5.8 percent for beneficiaries ages 66 to 69 over these years, rising to 7.3 percent among beneficiaries ages 90 and older.

PATTERNS IN TRADITIONAL MEDICARE PER CAPITA SPENDING FOR SELECTED MEDICARE-COVERED SERVICES IN 2011 AND TRENDS, 2000–2011

- The amount of average Medicare per capita spending on many Medicare-covered services in 2011 generally increased with age for beneficiaries in their 70s and 80s and then began to decline for older beneficiaries; the main exceptions were skilled nursing facility (SNF) and home health per capita spending, which increased for beneficiaries in their 90s before declining, and hospice spending which generally increased with age through the 90s and beyond ([Exhibits I.2 and I.3](#)). In contrast, per capita Part D drug spending was roughly constant among beneficiaries in their 60s, 70s, 80s, and 90s.

- In 2011, Medicare per capita spending on hospital inpatient services increased more than 2.5 times from \$1,848 among 66-year-olds to \$4,799 among 89-year-olds before declining among older beneficiaries. While per capita inpatient spending peaks at age 89, spending on inpatient care is relatively similar for beneficiaries between the ages of 84 and 97 (plateauing at around \$4,500 per beneficiary).



- Despite a gradual reduction in Medicare per capita spending for Part B providers, services, and supplies for beneficiaries beginning in their mid to late 80s, per capita spending continues to climb into the mid-90s due to persistent levels of inpatient hospital spending and a sharp rise in skilled nursing facility and hospice spending in the late 80s and 90s. Between ages 86 and 96, Medicare per capita spending on skilled nursing facility services increased by more 50 percent (from \$2,043 to \$3,149) while per capita spending on hospice tripled (from \$706 to \$2,299).

- The relatively high per capita spending among beneficiaries in their mid-to late-90s in 2011 is influenced by skilled nursing facility (SNF), hospice, and (to a lesser extent) home health spending; excluding spending on these services, overall per capita spending peaks at age 89.
- Inpatient hospital care accounted for the largest share of per capita spending among traditional Medicare beneficiaries ages 66 and older in 2011, with the exception of centenarians for whom hospice spending comprised the largest share of their total Medicare per capita spending. As beneficiaries grow older, per capita spending on physician services accounts for a declining share of per capita costs.

Implications

This analysis shows Medicare per person spending rising steadily with age, more than doubling between ages 70 and 95 in 2011, and peaking at age 96, before declining for the relatively small number of beneficiaries at relatively older ages. The cost of care for Medicare beneficiaries who died in 2011 contributes to higher average per capita Medicare costs at all ages, but does not alter the pattern of per capita spending nor does it affect the peak age of Medicare spending in 2011. And over time, Medicare per capita spending has peaked at older ages, from age 92 in 2000 to age 96 in 2011, based on inflation-adjusted dollars.

As adults live into their 80s and beyond, they are more likely to live with multiple chronic conditions and functional limitations, and this combination (compared to having chronic conditions only) is associated with a greater likelihood of emergency department visits and inpatient hospitalizations as well as higher Medicare spending for inpatient hospital, skilled nursing facility, and home health services.⁵ Thus, it is not surprising that Medicare per capita spending is higher, on average, for older beneficiaries compared to those in their 60s and 70s. At the same time, the pattern of increasing per capita spending until beneficiaries are in their mid-90s raises questions as to whether beneficiaries are getting the appropriate mix of services as they age and whether more could be done to improve the management and delivery of medical care for aging Medicare beneficiaries.

The Affordable Care Act (ACA) launched several payment and delivery system reforms that could alter patterns of care and spending for people on Medicare. Several of these initiatives aim to maintain or improve the quality of patient care and lower costs by reducing unnecessary care, managing care for high-need, “at risk” patients, and treating beneficiaries in the most appropriate (least cost) setting.⁶ The ACA also included provisions that aim to reduce unnecessary, preventable hospitalizations, better manage transitions following hospitalizations, and improve care management for beneficiaries who are dually eligible for Medicare and Medicaid.⁷ Recently, the Centers for Medicare & Medicaid Services (CMS) announced it would provide payments to physicians who manage care for beneficiaries with two or more chronic conditions.⁸ These efforts potentially could lower costs and improve care for Medicare patients, including the oldest old.

Consistent with other studies documenting higher costs for patients at the end of life, this analysis shows that Medicare per capita spending was nearly 4-times greater among beneficiaries who died in 2011, on average, than among those who lived the entire year. Yet the analysis also shows that Medicare per capita spending among decedents declines with age, suggesting that patients, families, and providers may be opting for less intensive and less costly end-of-life interventions for beneficiaries as they grow older. This possibility is consistent with the finding that average per capita spending on hospice services among beneficiaries in traditional Medicare increases with age, due to both a larger share of beneficiaries electing hospice at older ages and higher per capita hospice costs for older than younger Medicare beneficiaries who elect hospice care.

As the U.S. population ages, the increase in the number of people on Medicare and the aging of the Medicare population are expected to increase both total and per capita Medicare spending. The increase in per capita spending by age not only affects Medicare, but other payers as well. In fact, other studies have documented increases in both Medicaid and out-of-pocket spending by age, primarily attributable to the cost of long-term services and supports that are not covered by Medicare.^{9,10} Further work is needed to better understand the social, medical, and long-term care needs of older Americans and how best to address those needs. Focusing on ways to improve the management and coordination of care for high-need, high-cost patients, many of whom are among Medicare's oldest beneficiaries, will be essential to meet the needs of an aging population.

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Section 1: Medicare Per Capita Spending By Age Among Traditional Medicare Beneficiaries Over Age 65, 2011

- **Between 2010 and 2050, the population ages 65 and older will double, from about 40 million to 84 million people.** The number of octogenarians (people ages 80 and older) will nearly triple over these years from about 11 million to about 31 million, while the number of nonagenarians and centenarians (those in their 90s and 100s) is projected to quadruple from 2 million to 8 million by 2050.¹ [\(Exhibit 1.1\)](#)
- **Medicare’s octogenarians, nonagenarians, and centenarians account for a disproportionate share of Medicare spending.** In 2011, beneficiaries ages 80 and older comprised 24 percent of the Medicare population but 33 percent of total Medicare spending. In contrast, beneficiaries between the ages of 65 and 69 comprised 26 percent of the Medicare population, but just 15 percent of total Medicare spending.¹¹ [\(Exhibit 1.2\)](#)
- **Among Medicare beneficiaries over age 65, Medicare per capita spending rises gradually with age and peaks at age 96, before declining.** In 2011, average per capita Medicare spending nearly tripled between age 66 (\$5,562) and age 96 (\$16,145), and then fell gradually for the relatively small number of seniors who lived to older ages.¹² [\(Exhibit 1.3\)](#)
- **Medicare per capita spending rises with age, even when the analysis excludes all beneficiaries who died during the year.** Medicare per capita spending among Medicare beneficiaries over age 65 who survived the full year in 2011 (excluding decedents) also rises with age and peaks at age 96 (\$14,278). [\(Exhibit 1.4\)](#)
- **The increase in Medicare per capita spending by age for all Medicare beneficiaries over age 65 is not entirely attributable to end-of-life care nor to higher death rates among older beneficiaries.** Medicare per capita spending is considerably higher for people who die during the year than people who survive the entire year (\$33,486 versus \$8,647 in 2011) and accounts for a disproportionate share of Medicare spending, yet the increase in spending by age is not entirely due to higher spending at the end of life.^{13,14} In fact, Medicare spending for beneficiaries who died during the year declined steadily with age in 2011, from a high of about \$43,000 among 70-year-old decedents, to about \$20,000 among centenarians who died that year.¹⁵ [\(Exhibit 1.5\)](#) The decline in Medicare per capita spending by age among beneficiaries who died during 2011 is largely attributable to a decline in inpatient spending (*see Section 2, Exhibits 2.12 and 2.13 and Table 2 for details on spending by type of service among decedents*). Yet because of higher death rates among older beneficiaries (rising from 2 percent of 70-year-olds to 13 percent of 90-year-olds and 29 percent of 100-year-olds), average per capita spending among beneficiaries who die at older ages has a greater influence on the estimates of average spending among beneficiaries overall at older ages.¹⁶
- **Between 2000 and 2011, the age at which Medicare per capita spending reached its peak increased from age 92 to age 96.** At all ages, Medicare per capita spending was higher in 2011 than in 2000, including adjustments for inflation and the introduction of the Part D prescription drug benefit. In 2000, Medicare per capita spending peaked at \$9,557 (in 2011 dollars) at age 92, while in 2011, Medicare per capita spending peaked at \$16,145 (including Part D spending; \$15,015 excluding Part D spending) at age 96. [\(Exhibit 1.6\)](#)

- **The difference in Medicare per capita spending between beneficiaries ages 80 and older and younger beneficiaries over age 65 has grown wider over time.** For example, in 2011, Medicare per capita spending was 2.5 times greater for 85-year-olds (\$13,466) and 3 times greater for 95-year-olds (\$15,732) than for 66-year-olds (\$5,562). These ratios have increased since 2000, when Medicare per capita spending was 2.3 times greater both for 85-year-olds (\$8,959) and for 95-year-olds (\$9,139) than for 66-year-olds (\$3,908). **(Exhibit 1.7)**
- **Medicare per capita spending grew faster for beneficiaries ages 90 and older than for younger beneficiaries over age 65 between 2000 and 2011.** When spending on the Part D drug benefit is included beginning in 2006, per capita spending grew at an average annual rate of 5.8 percent for beneficiaries ages 66 to 69 between 2000 and 2011, rising to 7.3 percent among beneficiaries ages 90 and older. (When Part D spending is excluded, the average annual growth rates are somewhat lower for each age group but the trend by age is similar.) **(Exhibit 1.8)** During this period, Medicare per capita spending for beneficiaries ages 90 and older increased from \$8,546 in 2000 (in 2011 dollars) to \$14,217 in 2011 (including Part D spending), an increase of 66 percent over these years. This increase was greater than the 43 percent increase among beneficiaries in their 70s and the 51 percent increase among those in their 80s. **(Exhibit 1.9)**

Exhibit 1.1

The U.S. population ages 80 and older will nearly triple between 2010 and 2050; the number of people ages 90 and older will quadruple

U.S. population ages 65 and older, 2010-2050

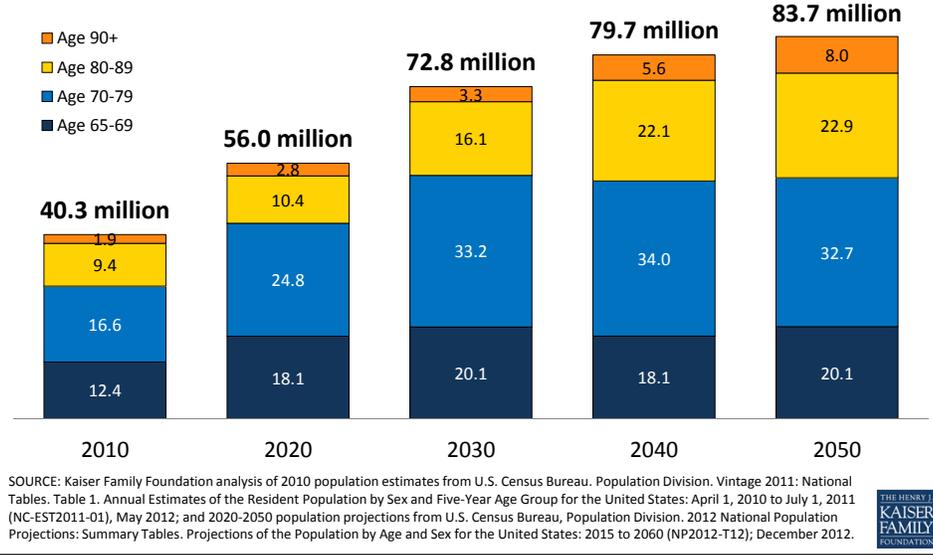


Exhibit 1.2

People ages 80 and older accounted for 24 percent of the Medicare population and 33 percent of Medicare spending in 2011

Distribution of traditional Medicare beneficiaries and Medicare spending, 2011

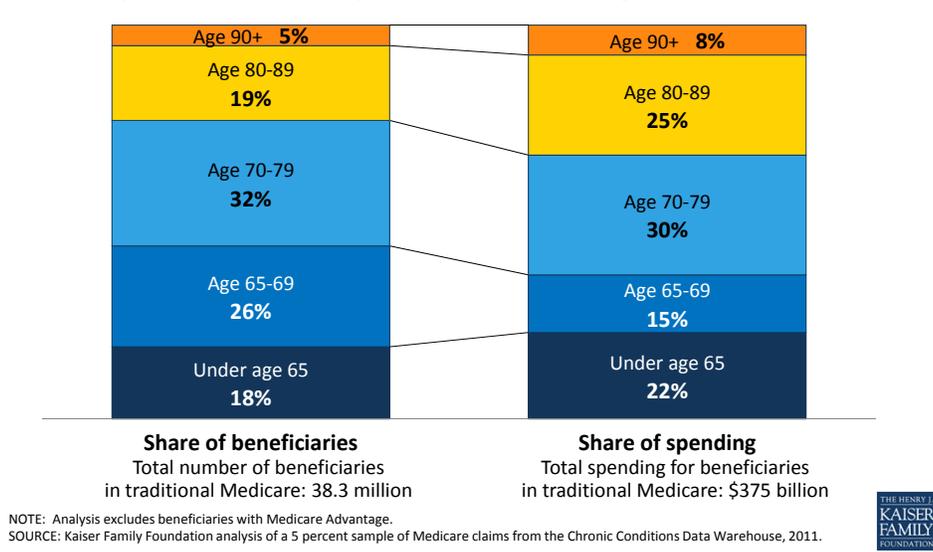
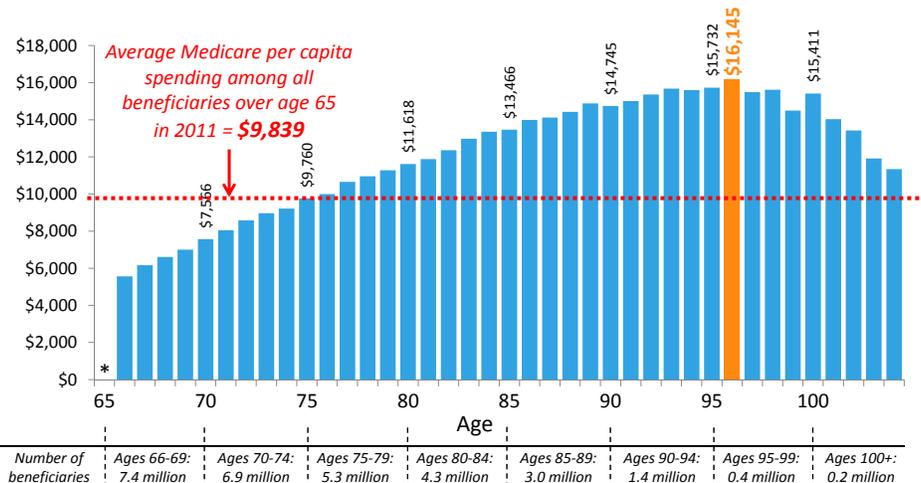


Exhibit 1.3

Among traditional Medicare beneficiaries over age 65, Medicare per capita spending rises with age, peaks at age 96, and then declines

Medicare per capita spending for traditional Medicare beneficiaries over age 65, by age, 2011



Number of beneficiaries	Ages 66-69:	Ages 70-74:	Ages 75-79:	Ages 80-84:	Ages 85-89:	Ages 90-94:	Ages 95-99:	Ages 100+:
	7.4 million	6.9 million	5.3 million	4.3 million	3.0 million	1.4 million	0.4 million	0.2 million

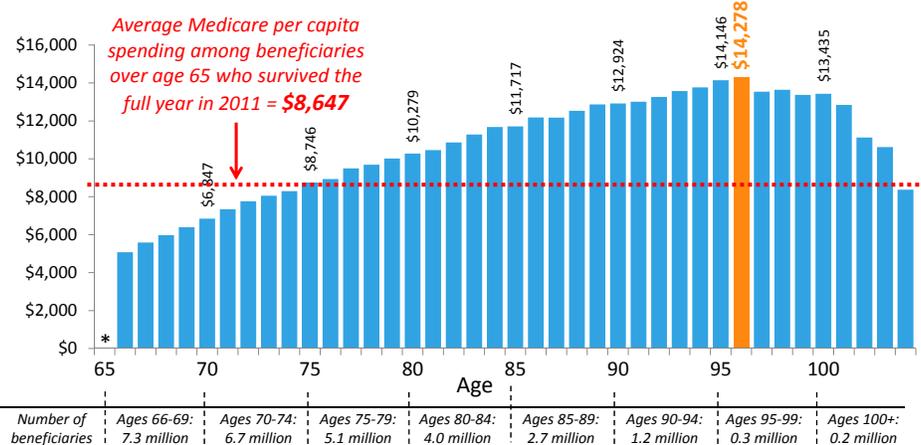
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age.
SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 1.4

Among traditional Medicare beneficiaries over age 65 who survived the full year, Medicare per capita spending rises with age, peaks at age 96, and then declines

Medicare per capita spending for survivors in traditional Medicare over age 65, by age, 2011



Number of beneficiaries	Ages 66-69:	Ages 70-74:	Ages 75-79:	Ages 80-84:	Ages 85-89:	Ages 90-94:	Ages 95-99:	Ages 100+:
	7.3 million	6.7 million	5.1 million	4.0 million	2.7 million	1.2 million	0.3 million	0.2 million

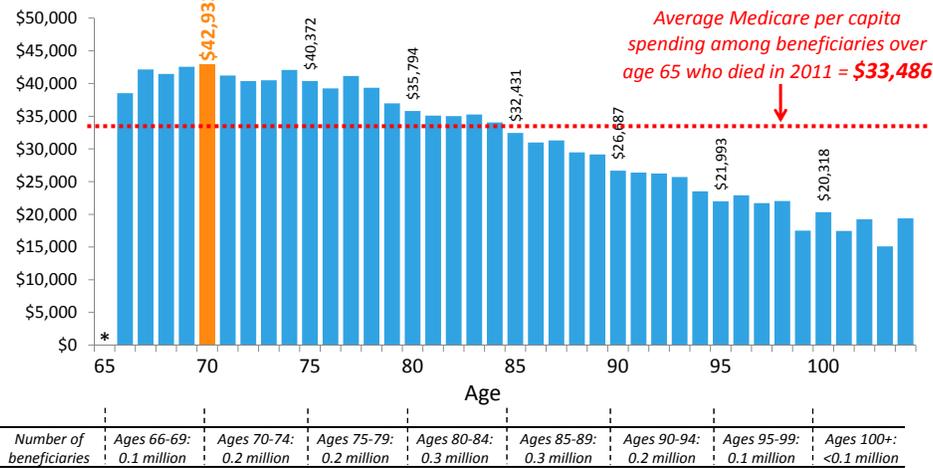
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age.
SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 1.5

Among traditional Medicare beneficiaries over age 65 who die during the year, Medicare per capita spending decreases with age

Medicare per capita spending for decedents in traditional Medicare over age 65, by age, 2011



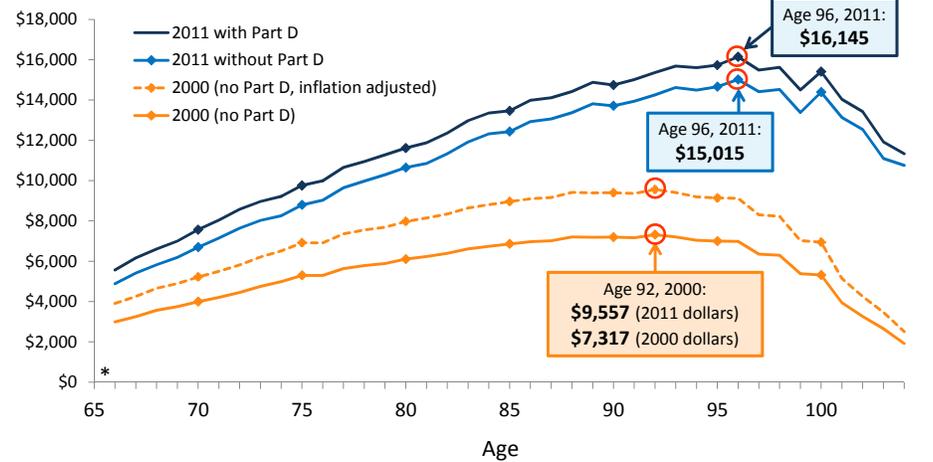
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age. SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 1.6

Among traditional Medicare beneficiaries over age 65, Medicare per capita spending peaked at age 96 in 2011, up from age 92 in 2000

Medicare per capita spending on traditional Medicare beneficiaries over age 65, 2000 and 2011



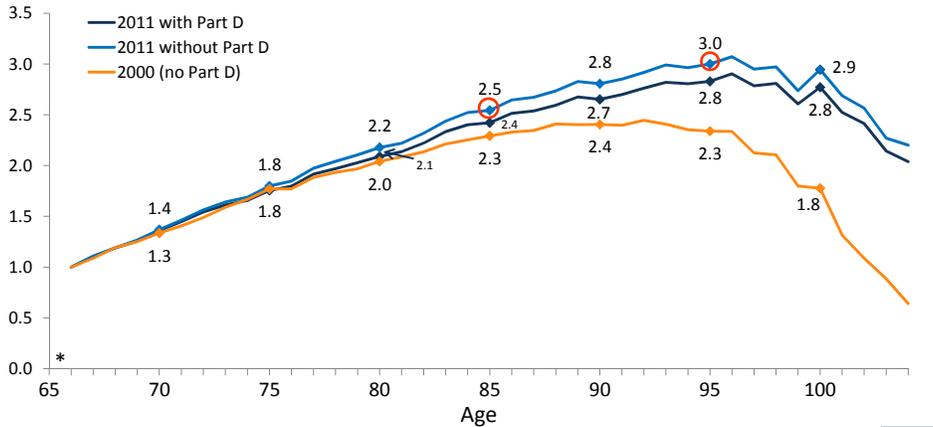
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age. SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 1.7

Medicare per capita spending in 2011 was 2.5 times greater for 85-year-olds and 3 times greater for 95-year-olds than for 66-year-olds; these ratios have increased since 2000

Ratio of Medicare per capita spending on traditional Medicare beneficiaries over age 66 to 66-year-olds, 2000 and 2011



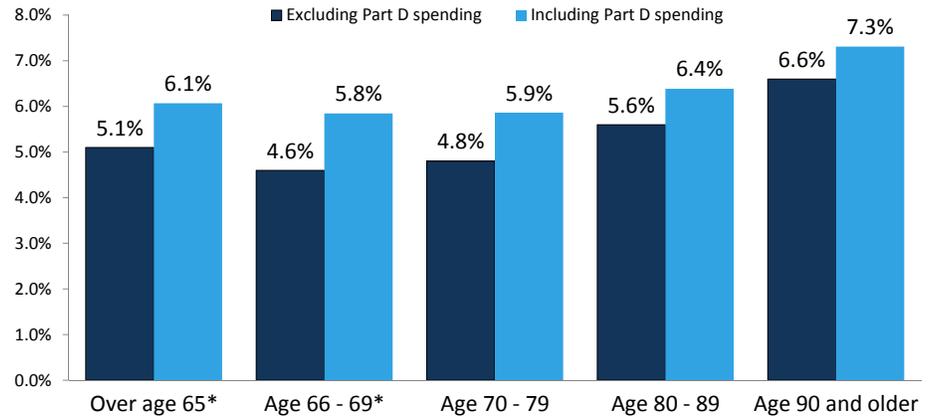
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Exhibit 1.8

Medicare per capita spending grew faster for traditional Medicare beneficiaries ages 90 and older than for younger beneficiaries over age 65 between 2000 and 2011

Average annual growth rate in Medicare per capita spending for traditional Medicare beneficiaries over age 65, by age group, 2000-2011



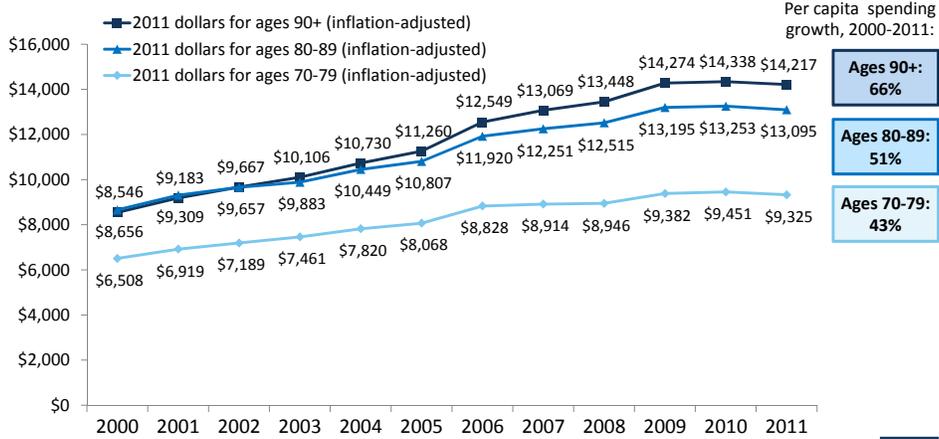
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age. SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 1.9

Medicare per capita spending increased more for traditional Medicare beneficiaries ages 90 and older than for younger people over age 65, after controlling for inflation, between 2000 and 2011

Inflation-adjusted Medicare per capita spending for traditional Medicare beneficiaries over age 65, by age group, 2000-2011



NOTE: Analysis excludes beneficiaries with Medicare Advantage. Analysis includes Part D spending beginning in 2006.
 SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Section 2: Patterns in Traditional Medicare Per Capita Spending for Selected Medicare-covered Services in 2011 and Trends, 2000–2011

- **Medicare per capita spending for various Medicare-covered services peaked at different ages in 2011.** For example, Medicare per capita spending for inpatient care peaked at age 89, while per capita spending for both Part B providers/services/supplies and hospital outpatient services peaked at age 83. For skilled nursing facility, home health, and hospice services, spending reached its highest level among the oldest old beneficiaries: ages 98, 96, and 104, respectively. **(Exhibit 2.1)**
 - The relatively high per capita spending among beneficiaries in their mid-to late-90s in 2011 is influenced by skilled nursing facility (SNF), hospice, and (to a lesser extent) home health spending; excluding spending on these services, overall per capita spending peaks at age 89.
- **The amount of average Medicare per capita spending on most types of services generally rises and then falls with age, with the exception of hospice spending, which peaks among the oldest beneficiaries, and Part D prescription drug spending which is roughly similar among beneficiaries at different ages.** **(Exhibit 2.2)** For example, in 2011:
 - Medicare per capita spending for inpatient hospital care increased more than 2.5 times from a low of \$1,848 among 66-year-olds to a high of \$4,799 among 89-year-olds, and then decreased somewhat to \$4,432 for 95-year-olds and \$4,122 for 100-year-olds. While inpatient spending peaked at age 89 in 2011, spending on inpatient care was relatively similar for beneficiaries between the ages of 84 and 97 (plateauing at around \$4,500).
 - Medicare per capita spending for Part B providers, services, and supplies roughly doubled from \$1,368 at age 66 to a high of \$2,670 at age 83, before declining.
- **Despite a gradual reduction in Medicare per capita spending for Part B providers, services, and supplies for beneficiaries beginning in their mid to late 80s, per capita spending continues to climb into the mid-90s due to persistent levels of inpatient hospital spending and a sharp rise in skilled nursing facility and hospice spending in the late 80s and 90s.**
 - Between ages 86 and 96, Medicare per capita spending on skilled nursing facility services increased by more 50 percent (from \$2,043 to \$3,149) while per capita spending on hospice tripled (from \$706 to \$2,299).
 - The increase in Medicare per capita spending on skilled nursing facility, home health, and hospice services at older ages is attributable to both a larger share of older beneficiaries using these services compared to younger beneficiaries and higher per capita costs for older users of these services compared to younger users.
- **The distribution of Medicare per capita spending on different types of Medicare-covered service varied by age in 2011.** **(Exhibit 2.3)**
 - Inpatient hospital spending was the largest component of total Medicare per capita spending for beneficiaries at all ages over age 65 in 2011, except for centenarians, for whom hospice spending comprised the largest share of total per capita spending.
 - Between the ages of 70 and 95, Medicare spending on Part B providers/services/supplies declined as a share of total per capita spending from 27 percent to 15 percent, while spending on skilled nursing facility

services quadrupled as a share of total per capita spending, rising from 5 percent at age 70 to 20 percent at age 95. Between ages 70 and 95, spending on home health services doubled as a share of total per capita spending, from 4 percent to 9 percent, and spending on hospice services increased from 1 percent of total per capita spending at age 70 to 13 percent at age 95.

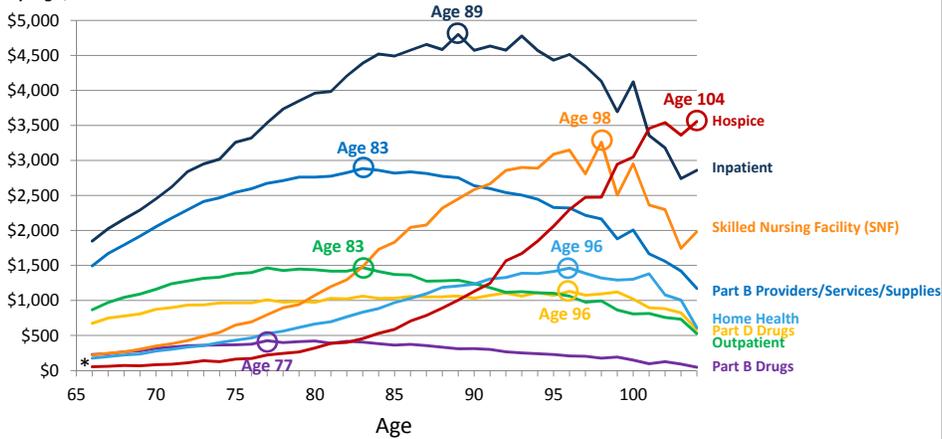
- **Between 2000 and 2011, Medicare per capita spending increased with age, both overall and by type of service.** For example:
 - **In both 2000 and 2011, Medicare per capita spending for inpatient hospital care increased with age, peaking for beneficiaries in their late 80s and early 90s.** The per capita spending increase between 2000 and 2011 for inpatient care was relatively modest for most beneficiaries over age 65 compared to the increase in per capita spending for other types of services, except for the centenarians who account for a very small share of the population (~200,000 beneficiaries). **(Exhibit 2.4)**
 - **The spending pattern for Medicare per capita spending for Part B providers, services, and supplies in 2011 is similar to what it was in 2000—increasing with age and peaking for beneficiaries in their early 80s.** Medicare per capita spending on Part B providers, services, and supplies was about 30 percent higher in 2011 than in 2000 for beneficiaries at all ages, after adjusting for inflation. **(Exhibit 2.5)**
 - **Medicare per capita spending on hospital outpatient services more than doubled at all ages between 2000 and 2011, after controlling for inflation.** In both 2000 and 2011, Medicare per capita spending on hospital outpatient services peaked for beneficiaries in their late 70s and early 80s, but was considerably higher at all ages in 2011 than in 2000. **(Exhibit 2.6)**
 - **In 2011, Medicare per capita spending on skilled nursing facility, home health, and hospice services increased at older ages, and the increase in per capita spending on these services by age was somewhat steeper in 2011 than in 2000.** For example, in 2011, between ages 85 and 95, Medicare per capita spending increased from \$1,832 to \$3,088 for skilled nursing facility services, from \$969 to \$1,415 for home health services, and from \$588 to \$2,063 for hospice care. After controlling for inflation, Medicare per capita spending on skilled nursing facility services for 95-year-olds was about two times greater in 2011 than in 2000 (\$3,088 versus \$1,576), about two times greater for home health services (\$1,415 versus \$721), and nearly five times greater for hospice care in 2011 than in 2000 (\$2,063 versus \$414). **(Exhibits 2.7, 2.8, and 2.9)**
 - **In both 2000 and 2011, Medicare per capita spending for Part B drugs reached its peak for beneficiaries in their late 70s and early 80s, before declining.** Per capita spending on Part B drugs was 50 percent higher or more at all ages in 2011 than in 2000, after controlling for inflation. **(Exhibit 2.10)**
 - **In contrast to other services where Medicare per capita spending in 2011 increased fairly steadily with age, Medicare per capita spending on prescription drugs covered under Part D was relatively constant across different years of age, but dropped off sharply for beneficiaries beginning at around age 100.** (Trend data for 2000 is not available because the Part D benefit started in 2006.) **(Exhibit 2.11)**
- **The decline in Medicare per capita spending by age among beneficiaries who died during 2011 is largely attributable to a decline in inpatient spending.** For example, Medicare per capita spending on inpatient services among beneficiaries who died in 2011 was \$24,508 for 70-year-olds but \$11,446 among 90-year-olds. Among beneficiaries over age 65 who died in 2011, Medicare per capita

spending for hospice care increased gradually with age, and accounted for a larger share of Medicare per capita spending at older ages; per capita hospice spending was \$2,252 for decedents age 70 and \$3,821 for decedents age 90. **(Exhibits 2.12 and 2.13)**

Exhibit 2.1

Medicare per capita spending peaks around age 90 for inpatient care and at age 98 for SNF services; spending for Part B providers/services/supplies and outpatient care peaks at younger ages

Peaks in Medicare per capita spending by type of service for traditional Medicare beneficiaries over age 65, by age, 2011



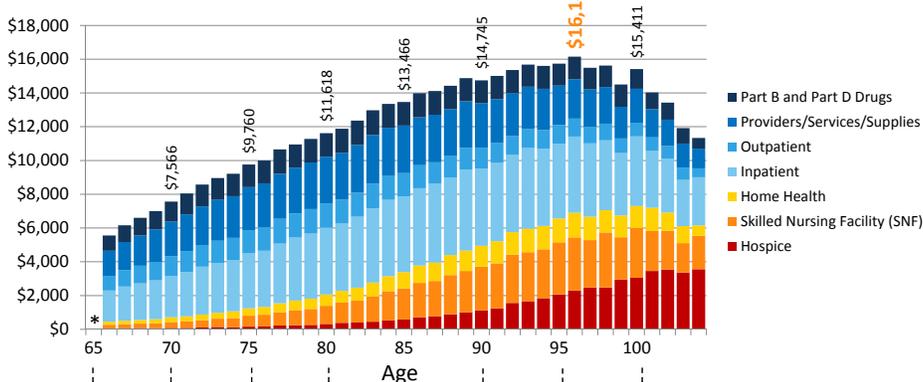
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age. SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.2

Average Medicare per capita spending on most types of services generally rises and then falls with age, with the exception of SNF, home health, and hospice spending which increase at older ages

Medicare per capita spending by type of service for traditional Medicare beneficiaries over age 65, by age, 2011



Number of beneficiaries	66-69:	70-74:	75-79:	80-84:	85-89:	90-94:	95-99:	100+:
	7.4 mil	6.9 mil	5.3 mil	4.3 mil	3.0 mil	1.4 mil	0.4 mil	0.2 mil

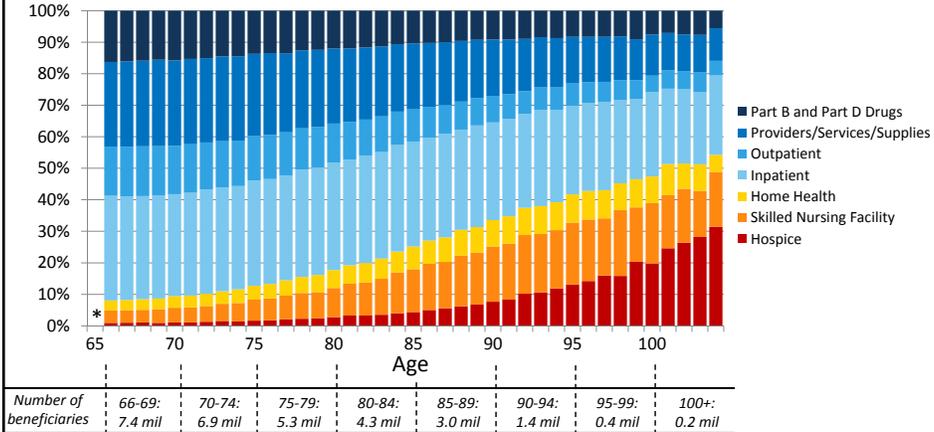
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age. SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.3

As beneficiaries age, a larger share of Medicare per capita spending is devoted to skilled nursing facility and hospice services, and a smaller share for providers/services/supplies and prescription drugs

Distribution of Medicare per capita spending by type of service for traditional Medicare beneficiaries over age 65, by age, 2011



Number of beneficiaries	66-69:	70-74:	75-79:	80-84:	85-89:	90-94:	95-99:	100+:
	7.4 mil	6.9 mil	5.3 mil	4.3 mil	3.0 mil	1.4 mil	0.4 mil	0.2 mil

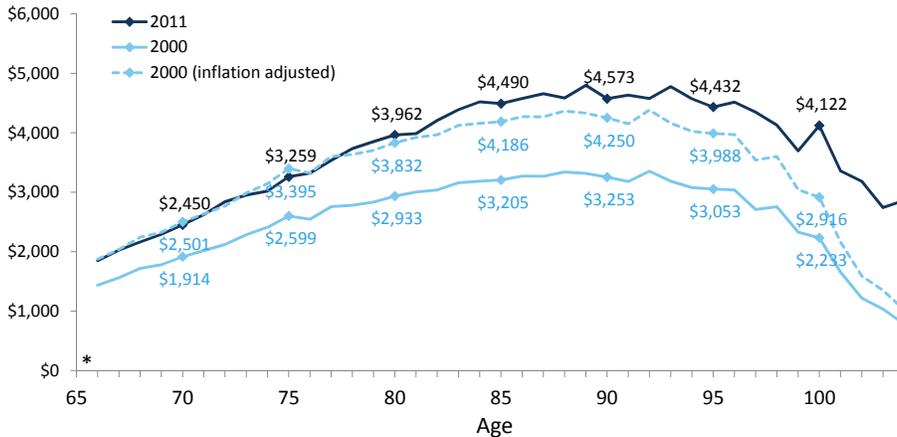
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age. SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.4

In 2011, Medicare per capita spending for inpatient hospital services peaked for beneficiaries in their late 80s and early 90s, similar to the spending pattern in 2000

Medicare per capita spending for inpatient services for traditional Medicare beneficiaries over age 65, by age, 2000 and 2011



NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age. SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.5

Medicare per capita spending for Part B providers/services/supplies peaked at age 83 in 2011, similar to the pattern in 2000; per capita spending increased at all ages over this time period

Medicare per capita spending for Part B providers/services/supplies for traditional Medicare beneficiaries over age 65, by age, 2000 and 2011



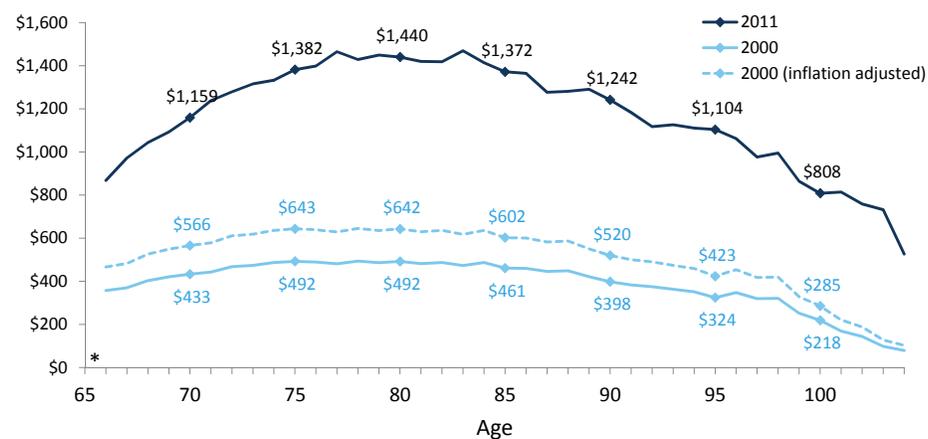
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age.
SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.6

In both 2000 and 2011, Medicare per capita spending on hospital outpatient services peaked for people in their late 70s and early 80s, but was considerably higher at all ages in 2011 than in 2000

Medicare per capita spending for outpatient services for traditional Medicare beneficiaries over age 65, by age, 2000 and 2011



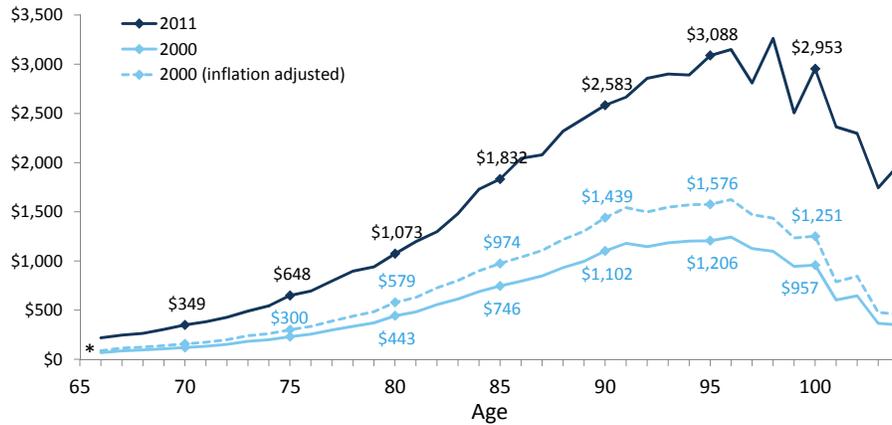
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age.
SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.7

In 2011, as in 2000, Medicare per capita spending on skilled nursing facility services increased with age and peaked for those in their mid-to-late 90s, but was much higher in 2011 than in 2000

Medicare per capita spending for skilled nursing facility services for traditional Medicare beneficiaries over age 65, by age, 2000 and 2011



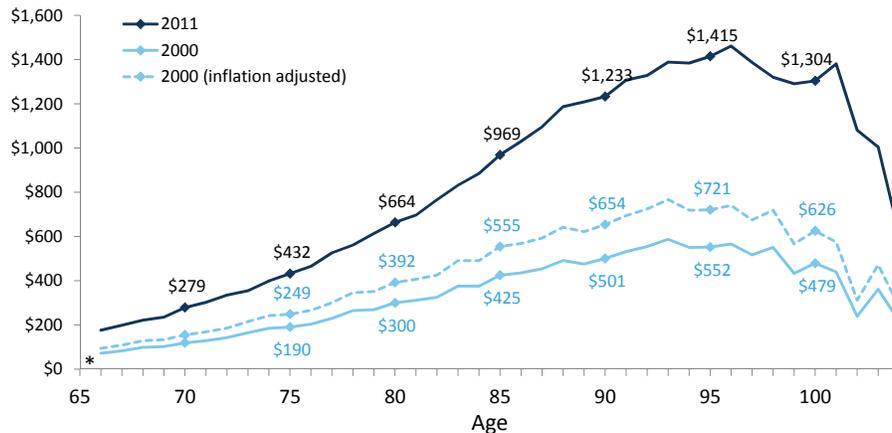
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age.
SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.8

In 2011, Medicare per capita spending on home health services increased with age and dropped off steeply after age 100; the spending increase and decrease were less pronounced in 2000

Medicare per capita spending for home health services for traditional Medicare beneficiaries over age 65, by age, 2000 and 2011



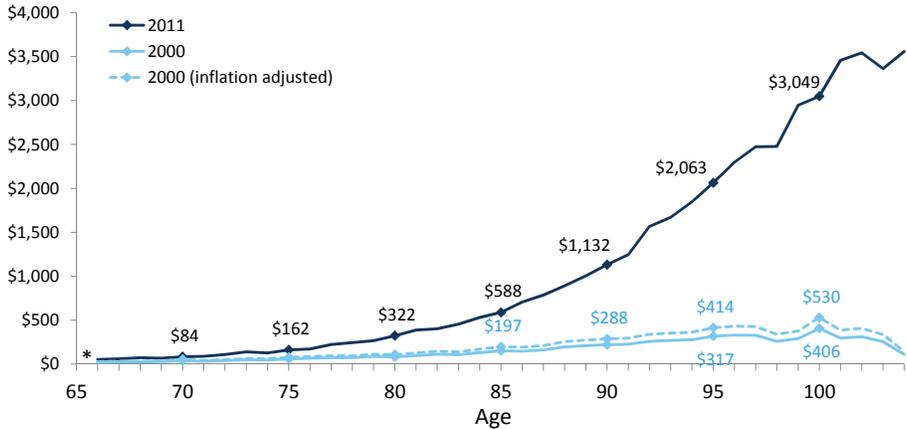
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age.
SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.9

In 2011, Medicare per capita spending for hospice care increased dramatically with age, and was substantially higher for people ages 90 and older than in 2000

Medicare per capita spending for hospice care for traditional Medicare beneficiaries over age 65, by age, 2000 and 2011



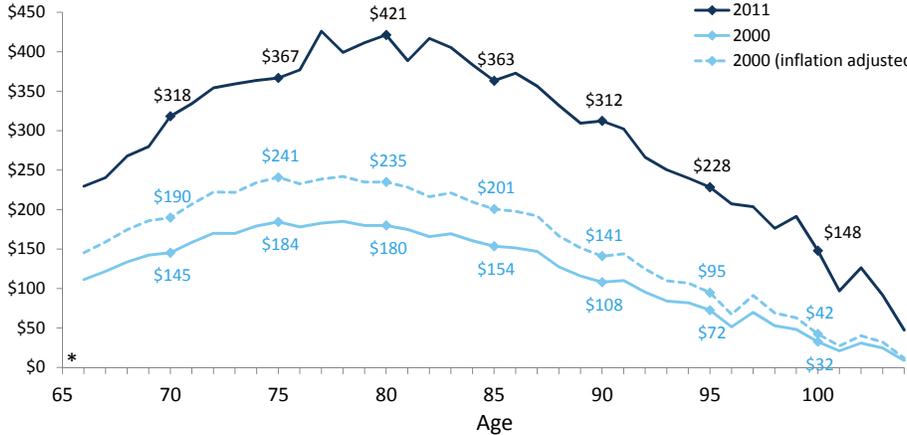
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age. SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.10

In 2011, Medicare per capita spending for Part B drugs peaked for beneficiaries in their late 70s and early 80s, similar to the spending pattern in 2000

Medicare per capita spending for Part B drugs for traditional Medicare beneficiaries over age 65, by age, 2000 and 2011



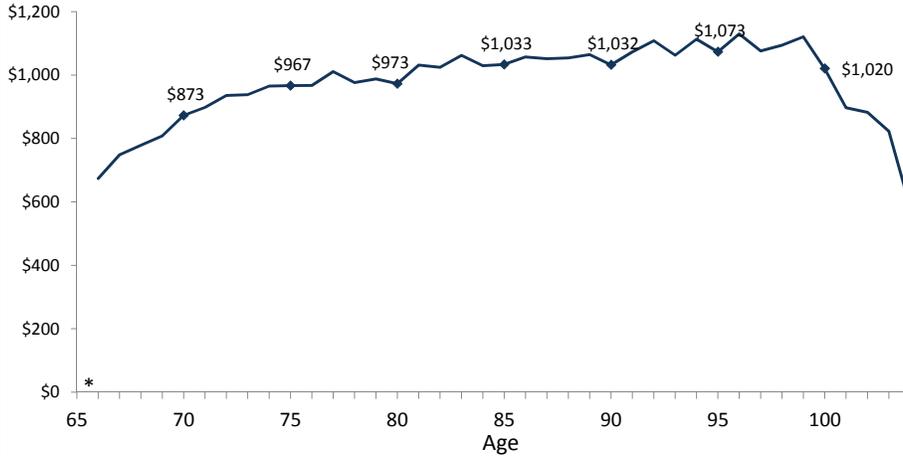
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age. SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.11

In 2011, Medicare per capita Part D spending increased gradually with age, and fell off sharply for the small number of centenarians

Medicare per capita spending for Part D for traditional Medicare beneficiaries over age 65, by age, 2011



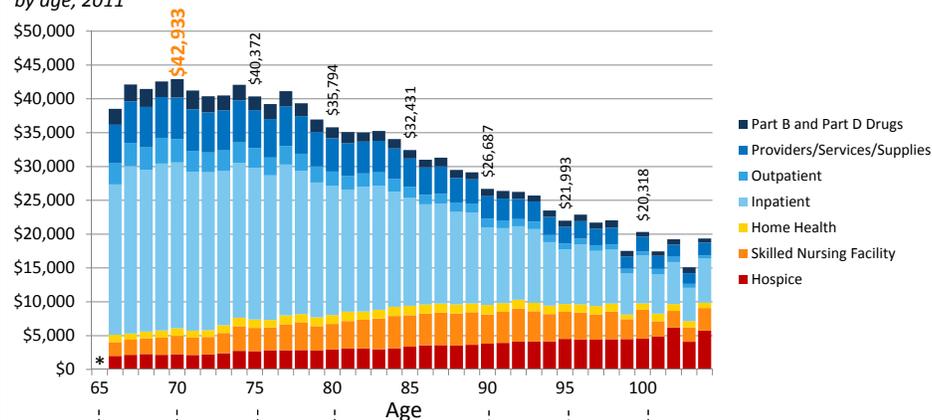
NOTE: Trend data for 2000 is not available because Part D was enacted in 2006. Analysis excludes beneficiaries with Medicare Advantage.
 *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age.
 SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.12

Among beneficiaries who died in 2011, the decline in Medicare per capita spending by age was mainly due to lower inpatient spending

Medicare per capita spending by type of service for decedents in traditional Medicare over age 65, by age, 2011



Number of beneficiaries	66-69:	70-74:	75-79:	80-84:	85-89:	90-94:	95-99:	100+:
	0.1 mil	0.2 mil	0.2 mil	0.3 mil	0.3 mil	0.2 mil	0.1 mil	<0.1 mil

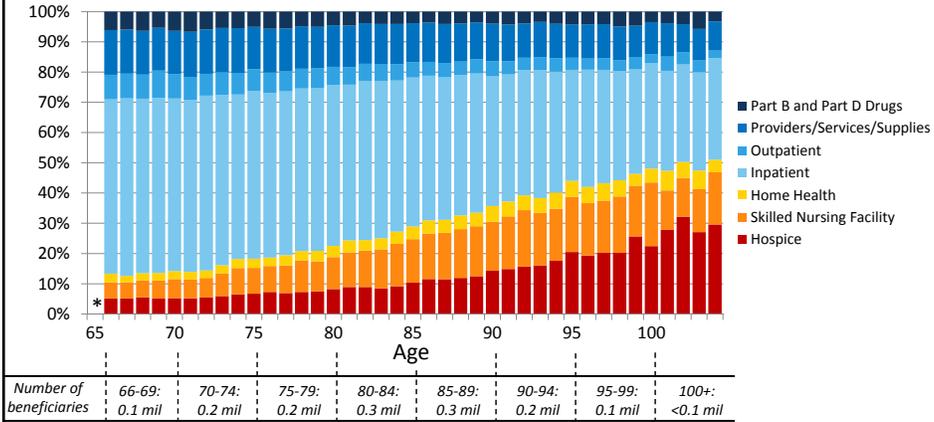
NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age.
 SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Exhibit 2.13

Among beneficiaries who died in 2011, the share of total Medicare per capita spending for inpatient care declined with age, while the share for hospice care increased with age

Distribution of Medicare per capita spending by type of service for decedents in traditional Medicare over age 65, by age, 2011



Number of beneficiaries	66-69:	70-74:	75-79:	80-84:	85-89:	90-94:	95-99:	100+:
	0.1 mil	0.2 mil	0.2 mil	0.3 mil	0.3 mil	0.2 mil	0.1 mil	<0.1 mil

NOTE: Analysis excludes beneficiaries with Medicare Advantage. *Analysis excludes people age 65 because some of these beneficiaries are enrolled for less than a full year; therefore, a full year of Medicare spending data is not available for all people at this year of age.
SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the Chronic Conditions Data Warehouse, 2011.



Tricia Neuman and Juliette Cubanski are with the Kaiser Family Foundation; Jennifer Huang was formerly with the Foundation; Anthony Damico is an independent consultant.

Appendix 1: Methodology

Description of the data. This analysis is based on data from a random 5 percent sample of Medicare beneficiaries from the Chronic Condition Data Warehouse (CCW) of the Centers for Medicare & Medicaid Services (CMS) from 2000 to 2011. The CCW includes Medicare administrative enrollment for all Medicare beneficiaries and claims data for beneficiaries enrolled in traditional Medicare; encounter data is not available for beneficiaries enrolled in Medicare Advantage plans. The CCW also contains all Part D events (prescription drug fill records) from the start of the Part D benefit in 2006, regardless of whether the beneficiary was enrolled in a Medicare Advantage plan or a stand-alone prescription drug plan. This analysis is based on data from the Cost and Use segment of the CCW, which contains summarized patient-level utilization information, by care setting for the calendar year of the data file. It also includes Medicare and beneficiary payment information overall and by setting. The following types of services and settings are included in this file: hospital outpatient, acute inpatient, non-acute inpatient, skilled nursing facility, hospice, home health, physician office services, ambulatory surgery center, evaluation and management, anesthesia, dialysis, imaging, tests, durable medical equipment, Part B drugs, other Part B procedures, other Part B claims, and Part D drugs.

Sample. The analysis focuses on beneficiaries over age 65 in traditional Medicare, excluding beneficiaries enrolled in Medicare Advantage and those who are under age 65. Beneficiaries age 65 were excluded from the analysis of per capita spending because the analysis is based on a comparison of full-year per capita Medicare spending at each age and many beneficiaries age 65 are enrolled in Medicare for less than a full year, depending on their month of enrollment in Medicare; therefore a full year of Medicare spending data is not available for all people at this age. The number of unweighted cases in 2011 declined from 96,517 66-year-olds (weighted $n = 1,930,340$) to 245 104-year-olds (weighted $n = 4,900$). The analysis excludes spending for beneficiaries enrolled in Medicare Advantage plans because Medicare spending on this population takes the form of a monthly capitation payment to private plans and is not based on actual service utilization. The analysis excludes spending for beneficiaries under age 65 who qualify for Medicare because of a permanent disability because this analysis is focused on spending patterns by age among older beneficiaries.

Methods. For this analysis, we calculated Medicare per capita spending for beneficiaries at each year of age overall and by type of service. Age was determined as of December 31 in each year of the analysis (2000-2011). If the beneficiary died, the age was determined based on age at the time of death. We aggregated spending on certain types of services into larger categories. Spending on Part B providers/services/supplies includes all spending on Part B physician services, other Part B carriers, durable medical equipment, tests, imaging, other procedures, dialysis, anesthesia, evaluation and management, and ambulatory surgery center services. Spending on hospital inpatient services includes acute inpatient care and other non-acute inpatient services. When we refer to post-acute care, we are referring to skilled nursing facility and home health services.

To adjust Medicare per capita spending estimates for the years 2000 to 2010 to 2011 dollars, we used the Bureau of Labor Statistics' Consumer Price Index (CPI) Inflation calculator.¹⁷ The CPI inflation calculator uses the average Consumer Price Index for a given calendar year. These data represent changes in prices of all goods and services purchased for consumption by urban households.

Limitations. This study describes but does not explain the pattern of Medicare per capita spending by age, and is not designed to assess factors related to the recent slow growth in total and per capita Medicare

spending. Because the 5 percent sample includes Medicare spending but not spending among other payers, this analysis does not examine how Medicaid and other payers' spending varies by age, in relation to Medicare spending. The 5 percent sample does not include patient characteristics, such as functional impairment, so the analysis does not control for covariates that could help explain patterns in spending and service use.

Our results reflect patterns of spending among traditional Medicare beneficiaries, but not the total Medicare population. Because we lack comparable data for the 25 percent of beneficiaries enrolled in Medicare Advantage in 2011, it is not possible to assess whether patterns of service use and spending in traditional Medicare apply to the Medicare population overall.

Appendix 2: Data Tables

Table1: Number of Traditional Medicare Beneficiaries over Age 65, Overall and for Survivors and Decedents, by Age, 2011

AGE	Overall		Survivors		Decedents	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
All 66+	1,439,676	28,793,520	1,370,351	27,407,020	69,325	1,386,500
66	96,517	1,930,340	95,109	1,902,180	1,408	28,160
67	93,560	1,871,200	92,080	1,841,600	1,480	29,600
68	93,353	1,867,060	91,694	1,833,880	1,659	33,180
69	88,334	1,766,680	86,847	1,736,940	1,487	29,740
70	77,273	1,545,460	75,733	1,514,660	1,540	30,800
71	71,692	1,433,840	70,208	1,404,160	1,484	29,680
72	67,395	1,347,900	65,707	1,314,140	1,688	33,760
73	66,584	1,331,680	64,726	1,294,520	1,858	37,160
74	61,984	1,239,680	60,292	1,205,840	1,692	33,840
75	58,943	1,178,860	57,053	1,141,060	1,890	37,800
76	56,197	1,123,940	54,233	1,084,660	1,964	39,280
77	53,008	1,060,160	51,061	1,021,220	1,947	38,940
78	49,220	984,400	47,134	942,680	2,086	41,720
79	48,423	968,460	46,152	923,040	2,271	45,420
80	46,595	931,900	44,149	882,980	2,446	48,920
81	46,054	921,080	43,404	868,080	2,650	53,000
82	42,425	848,500	39,803	796,060	2,622	52,440
83	40,799	815,980	37,914	758,280	2,885	57,700
84	39,115	782,300	36,185	723,700	2,930	58,600
85	35,526	710,520	32,525	650,500	3,001	60,020
86	32,763	655,260	29,627	592,540	3,136	62,720
87	30,218	604,360	27,145	542,900	3,073	61,460
88	26,613	532,260	23,644	472,880	2,969	59,380
89	23,587	471,740	20,676	413,520	2,911	58,220
90	20,870	417,400	18,108	362,160	2,762	55,240
91	17,094	341,880	14,538	290,760	2,556	51,120
92	13,071	261,420	10,959	219,180	2,112	42,240
93	11,084	221,680	9,159	183,180	1,925	38,500
94	8,472	169,440	6,879	137,580	1,593	31,860
95	6,512	130,240	5,196	103,920	1,316	26,320
96	4,941	98,820	3,871	77,420	1,070	21,400
97	3,688	73,760	2,809	56,180	879	17,580
98	2,651	53,020	2,026	40,520	625	12,500
99	1,903	38,060	1,386	27,720	517	10,340
100	1,198	23,960	854	17,080	344	6,880
101	819	16,380	608	12,160	211	4,220
102	557	11,140	399	7,980	158	3,160
103	393	7,860	279	5,580	114	2,280
104	245	4,900	179	3,580	66	1,320

NOTE: Analysis includes beneficiaries in traditional Medicare only (excludes beneficiaries with Medicare Advantage).

SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the CMS Chronic Conditions Data Warehouse, 2011.

Table 2: Amount and Distribution of Medicare Per Capita Spending Overall and By Type of Service for Traditional Medicare Beneficiaries over Age 65, by Age, 2011

AGE	TOTAL PER CAPITA		Inpatient hospital		Outpatient hospital		Part B providers/ services/ supplies		Part B and D prescription drugs		Skilled nursing facility		Home health		Hospice	
	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%
All 66+	\$9,839	100%	\$3,230	33%	\$1,239	13%	\$2,336	24%	\$1,255	13%	\$911	9%	\$538	5%	\$331	3%
66	5,562	100	1,848	33	868	16	1,494	27	903	16	219	4	176	3	53	1
67	6,163	100	2,025	33	972	16	1,671	27	989	16	247	4	199	3	60	1
68	6,605	100	2,163	33	1,043	16	1,794	27	1,047	16	264	4	222	3	72	1
69	6,998	100	2,292	33	1,093	16	1,919	27	1,088	16	304	4	236	3	67	1
70	7,566	100	2,450	32	1,159	15	2,054	27	1,191	16	349	5	279	4	84	1
71	8,046	100	2,623	33	1,239	15	2,177	27	1,232	15	383	5	302	4	89	1
72	8,577	100	2,841	33	1,279	15	2,296	27	1,290	15	428	5	335	4	109	1
73	8,963	100	2,951	33	1,316	15	2,415	27	1,297	14	490	5	355	4	139	2
74	9,217	100	3,019	33	1,333	14	2,467	27	1,329	14	543	6	399	4	126	1
75	9,760	100	3,259	33	1,382	14	2,543	26	1,333	14	648	7	432	4	162	2
76	9,993	100	3,321	33	1,398	14	2,596	26	1,344	13	695	7	465	5	173	2
77	10,656	100	3,536	33	1,465	14	2,673	25	1,437	13	796	7	526	5	223	2
78	10,951	100	3,734	34	1,429	13	2,711	25	1,376	13	896	8	562	5	244	2
79	11,282	100	3,850	34	1,449	13	2,763	24	1,399	12	941	8	614	5	266	2
80	11,618	100	3,962	34	1,440	12	2,763	24	1,394	12	1,073	9	664	6	322	3
81	11,883	100	3,985	34	1,420	12	2,776	23	1,420	12	1,198	10	697	6	388	3
82	12,358	100	4,208	34	1,419	11	2,825	23	1,441	12	1,297	10	766	6	402	3
83	12,978	100	4,388	34	1,469	11	2,884	22	1,467	11	1,483	11	832	6	455	4
84	13,353	100	4,521	34	1,414	11	2,860	21	1,413	11	1,730	13	885	7	530	4
85	13,466	100	4,490	33	1,372	10	2,818	21	1,396	10	1,832	14	969	7	588	4
86	13,987	100	4,575	33	1,365	10	2,838	20	1,430	10	2,043	15	1,030	7	706	5
87	14,116	100	4,657	33	1,276	9	2,815	20	1,408	10	2,078	15	1,096	8	785	6
88	14,423	100	4,585	32	1,281	9	2,773	19	1,386	10	2,320	16	1,188	8	891	6
89	14,881	100	4,799	32	1,290	9	2,752	18	1,374	9	2,451	16	1,209	8	1,005	7
90	14,745	100	4,573	31	1,242	8	2,640	18	1,344	9	2,583	18	1,233	8	1,132	8
91	15,011	100	4,633	31	1,183	8	2,599	17	1,376	9	2,667	18	1,307	9	1,246	8
92	15,361	100	4,575	30	1,117	7	2,542	17	1,375	9	2,857	19	1,329	9	1,567	10
93	15,682	100	4,778	30	1,126	7	2,505	16	1,313	8	2,900	18	1,389	9	1,671	11
94	15,602	100	4,571	29	1,111	7	2,446	16	1,353	9	2,890	19	1,384	9	1,847	12
95	15,732	100	4,432	28	1,104	7	2,329	15	1,302	8	3,088	20	1,415	9	2,063	13
96	16,145	100	4,514	28	1,062	7	2,322	14	1,337	8	3,149	20	1,462	9	2,299	14
97	15,490	100	4,346	28	976	6	2,218	14	1,279	8	2,809	18	1,387	9	2,474	16
98	15,620	100	4,129	26	995	6	2,165	14	1,270	8	3,263	21	1,321	8	2,477	16
99	14,497	100	3,697	26	864	6	1,881	13	1,312	9	2,506	17	1,291	9	2,947	20
100	15,411	100	4,122	27	808	5	2,007	13	1,168	8	2,953	19	1,304	8	3,049	20
101	14,034	100	3,358	24	814	6	1,667	12	994	7	2,363	17	1,381	10	3,458	25
102	13,427	100	3,181	24	758	6	1,559	12	1,009	8	2,298	17	1,081	8	3,541	26
103	11,919	100	2,741	23	732	6	1,421	12	914	8	1,744	15	1,005	8	3,362	28
104	11,337	100	2,861	25	526	5	1,171	10	630	6	1,982	17	610	5	3,558	31

NOTE: Analysis includes beneficiaries in traditional Medicare only (excludes beneficiaries with Medicare Advantage).
 SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the CMS Chronic Conditions Data Warehouse, 2011.

Table 3: Amount and Distribution of Medicare Per Capita Spending Overall and By Type of Service for Decedents in Traditional Medicare over Age 65, by Age, 2011

AGE	TOTAL PER CAPITA		Inpatient hospital		Outpatient hospital		Part B providers/ services/ supplies		Part B and D prescription drugs		Skilled nursing facility		Home health		Hospice	
	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%
All 66+	\$33,486	100%	\$16,998	51%	\$1,998	6%	\$4,485	13%	\$1,582	5%	\$3,944	12%	\$1,245	4%	\$3,235	10%
66	38,529	100	22,209	58	3,134	8	5,686	15	2,356	6	2,051	5	1,086	3	2,007	5
67	42,136	100	24,748	59	3,435	8	6,137	15	2,500	6	2,223	5	920	2	2,172	5
68	41,462	100	23,920	58	3,308	8	5,981	14	2,648	6	2,328	6	987	2	2,290	6
69	42,564	100	24,651	58	3,822	9	6,028	14	2,285	5	2,547	6	1,057	2	2,173	5
70	42,933	100	24,508	57	3,426	8	6,173	14	2,728	6	2,711	6	1,135	3	2,252	5
71	41,226	100	23,471	57	3,118	8	6,132	15	2,763	7	2,576	6	1,030	2	2,135	5
72	40,382	100	23,336	58	2,922	7	5,918	15	2,380	6	2,604	6	1,013	3	2,208	5
73	40,506	100	22,793	56	3,056	8	5,926	15	2,185	5	2,994	7	1,144	3	2,408	6
74	42,077	100	22,898	54	3,017	7	6,207	15	2,307	5	3,650	9	1,250	3	2,748	7
75	40,372	100	22,410	56	2,916	7	5,627	14	2,031	5	3,439	9	1,232	3	2,717	7
76	39,242	100	21,375	54	2,640	7	5,687	14	2,220	6	3,364	9	1,101	3	2,855	7
77	41,141	100	22,296	54	2,713	7	5,833	14	2,292	6	3,756	9	1,404	3	2,847	7
78	39,344	100	21,153	54	2,558	7	5,532	14	1,907	5	4,105	10	1,214	3	2,877	7
79	36,959	100	19,919	54	2,382	6	5,070	14	1,867	5	3,642	10	1,309	4	2,771	7
80	35,794	100	19,075	53	2,126	6	4,930	14	1,612	5	3,773	11	1,317	4	2,960	8
81	35,092	100	18,059	51	2,025	6	4,829	14	1,629	5	4,002	11	1,406	4	3,142	9
82	35,025	100	18,444	53	1,965	6	4,696	13	1,353	4	4,230	12	1,216	3	3,120	9
83	35,256	100	18,326	52	2,002	6	4,660	13	1,445	4	4,550	13	1,280	4	2,992	8
84	34,051	100	17,016	50	1,861	5	4,513	13	1,390	4	4,772	14	1,367	4	3,131	9
85	32,431	100	15,958	49	1,626	5	4,201	13	1,243	4	4,668	14	1,373	4	3,361	10
86	30,994	100	14,826	48	1,419	5	4,032	13	1,124	4	4,678	15	1,341	4	3,575	12
87	31,306	100	14,753	47	1,487	5	4,034	13	1,280	4	4,809	15	1,342	4	3,602	12
88	29,486	100	13,680	46	1,312	4	3,718	13	1,160	4	4,749	16	1,343	5	3,524	12
89	29,148	100	13,415	46	1,363	5	3,560	12	1,047	4	4,816	17	1,295	4	3,651	13
90	26,687	100	11,446	43	1,330	5	3,314	12	1,066	4	4,314	16	1,396	5	3,821	14
91	26,382	100	11,083	42	1,148	4	3,213	12	1,120	4	4,589	17	1,301	5	3,928	15
92	26,240	100	10,871	41	1,071	4	2,970	11	1,029	4	4,890	19	1,295	5	4,114	16
93	25,716	100	10,900	42	1,087	4	2,988	12	885	3	4,468	17	1,255	5	4,135	16
94	23,508	100	9,386	40	1,050	4	2,679	11	950	4	4,043	17	1,255	5	4,144	18
95	21,993	100	8,085	37	883	4	2,424	11	926	4	4,004	18	1,162	5	4,510	21
96	22,897	100	8,878	39	846	4	2,580	11	970	4	3,974	17	1,226	5	4,424	19
97	21,716	100	8,139	37	845	4	2,429	11	908	4	3,745	17	1,249	6	4,400	20
98	22,033	100	7,969	36	789	4	2,442	11	1,092	5	4,099	19	1,179	5	4,464	20
99	17,518	100	6,056	35	712	4	1,812	10	818	5	2,945	17	682	4	4,494	26
100	20,318	100	7,080	35	623	3	2,144	11	707	3	4,269	21	931	5	4,563	22
101	17,454	100	5,775	33	816	5	1,928	11	667	4	2,277	13	1,133	6	4,856	28
102	19,238	100	6,205	32	779	4	1,783	9	800	4	2,464	13	1,012	5	6,195	32
103	15,099	100	4,913	33	577	4	1,578	10	864	6	2,148	14	931	6	4,088	27
104	19,372	100	6,512	34	477	2	1,871	10	629	3	3,348	17	800	4	5,735	30

NOTE: Analysis includes beneficiaries in traditional Medicare only (excludes beneficiaries with Medicare Advantage).
 SOURCE: Kaiser Family Foundation analysis of a 5 percent sample of Medicare claims from the CMS Chronic Conditions Data Warehouse, 2011.

Endnotes

- ¹ The population age 80 and older was 11.3 million in 2010 and is projected to grow to 30.9 million in 2050. The population age 90 and older was 1.9 million in 2010 and is projected to grow to 8.0 million in 2050. 2010 population estimates are from U.S. Census Bureau, Population Division. Vintage 2011: National Tables. Table 1. Annual Estimates of the Resident Population by Sex and Five-Year Age Group for the United States: April 1, 2010 to July 1, 2011 (NC-EST2011-01); 2012 May; <https://www.census.gov/popest/data/national/asrh/2011/tables/NC-EST2011-01.xls>. 2050 population estimates are from U.S. Census Bureau, Population Division. 2012 National Population Projections: Summary Tables. Projections of the Population by Age and Sex for the United States: 2015 to 2060 (NP2012-T12). Middle series; 2012 Dec; <https://www.census.gov/population/projections/files/summary/NP2012-T12.xls>.
- ² Between 2014 and 2050, the Medicare population is projected to grow from 54 to 93 million beneficiaries, and during this time period, net Medicare spending is expected to rise from 3.0% of GDP to 5.5% in 2050; see Congressional Budget Office, "The 2014 Long-Term Budget Outlook," available at <http://www.cbo.gov/publication/45471>.
- ³ This report is being released along with a companion article in the journal *Health Affairs*; see Patricia Neuman, Juliette Cubanski, and Anthony Damico, "Medicare Per Capita Spending By Age And Service: New Data Highlights Oldest Beneficiaries," *Health Affairs* Web First January 2015; in print February 2015.
- ⁴ For a more detailed description of the methodology used by Medicare to pay private plans, see Medicare Payment Advisory Commission, "Medicare Advantage Program Payment System," October 2013, http://www.medpac.gov/documents/MedPAC_Payment_Basics_13_MA.pdf.
- ⁵ Harriet Komisar and Judy Feder, "Transforming Care for Medicare Beneficiaries with Chronic Conditions and Long-Term Care Needs: Coordinating Care Across All Services," Georgetown University, October 2011, available at http://www.cahpf.org/docuserfiles/georgetown_trnsfrming_care.pdf.
- ⁶ Many of these initiatives are being run out of the newly-created Innovation Center within the Centers for Medicare & Medicaid Services (CMS); see "About the CMS Innovation Center," <http://innovation.cms.gov/About/index.html>.
- ⁷ Congressional Budget Office, "Dual-Eligible Beneficiaries of Medicare and Medicaid: Characteristics, Health Care Spending, and Evolving Policies," June 2013, available at <http://www.cbo.gov/publication/44308>.
- ⁸ Centers for Medicare & Medicaid Services, "Medicare Program; Revisions to Payment Policies under the Physician Fee Schedule, Clinical Laboratory Fee Schedule, Access to Identifiable Data for the Center for Medicare and Medicaid Innovation Models & Other Revisions to Part B for CY 2015," available at http://www.ofr.gov/OFRUpload/OFRData/2014-26183_PI.pdf.
- ⁹ Analysis of Medicaid per enrollee spending by age group is available from Centers for Medicare & Medicaid Services, Table 25, Medicaid Per-enrollee Spending by Gender and Age Group, Calendar Years 2002, 2004, 2006, 2008, 2010, available at <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/2010GenderandAgeTables.pdf>.
- ¹⁰ Analysis of out-of-pocket spending by age group is available from Juliette Cubanski, Christina Swoope, Anthony Damico, and Tricia Neuman, "How Much is Enough How Much Is Enough? Out-of-Pocket Spending Among Medicare Beneficiaries: A Chartbook," Kaiser Family Foundation, July 2014, available at <http://kff.org/health-costs/report/how-much-is-enough-out-of-pocket-spending-among-medicare-beneficiaries-a-chartbook/>.
- ¹¹ These estimates have changed little since 2000. In 2000, beneficiaries ages 80 and over comprised 25 percent of the Medicare population and 33 percent of total Medicare spending; beneficiaries between the ages of 65 and 69 comprised 22 percent of the Medicare population, but just 14 percent of total Medicare spending.
- ¹² These findings are generally consistent with data reported by the Congressional Budget Office (CBO) showing Medicare per capita spending for services covered under Parts A and B for beneficiaries enrolled under traditional Medicare rising from \$4,500 for 66-year-olds to \$8,500 for 75-year-olds and \$12,500 for those ages 85 and older; see CBO, "The 2014 Long-Term Budget Outlook," July 2014, available at <http://www.cbo.gov/publication/45471>. Unlike CBO, our analysis includes Part D spending. Our results also are consistent with analysis showing Medicare costs for beneficiaries age 65 and older rise until around age 90, when they start to decline; see Dale Yamamoto, "Health Care Costs—From Birth to Death," Society of Actuaries, June 2013, available at http://www.healthcostinstitute.org/files/Age-Curve-Study_o.pdf.
- ¹³ In 2011, 4.8 percent of beneficiaries in traditional Medicare ages 66 and over died during the year; their spending accounted for 17.5 percent of traditional Medicare spending for beneficiaries in this age group.
- ¹⁴ For an analysis of Medicare spending in the last year of life, see Steve Calfo, Jonathan Smith, and Mark Zezza, "Last Year of Life Study," Centers for Medicare & Medicaid Services Office of the Actuary, available at https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/ActuarialStudies/downloads/Last_Year_of_Life.pdf.
- ¹⁵ We examined the hypothesis that the decline in per capita spending by age among decedents could be attributed to fewer months of Medicare spending among older than younger decedents; that is, whether lower per capita spending among older than younger decedents could be due to the oldest beneficiaries surviving fewer months than younger beneficiaries. However, we did not observe such a pattern. On average, decedents of all ages lived about six months in the year, with virtually no variation across ages that could

explain the decline in spending among decedents by age. Due to data constraints, we were unable to look at spending among decedents in the last 12 months of life.

¹⁶ For example, among 70-year-olds, average Medicare per capita spending is more than six times greater for beneficiaries who died in 2011 than among beneficiaries who survived (\$42,933 versus \$6,847); however, just 2 percent of 70-year olds died that year, so the relatively high cost of 70-year-olds who died in 2011 increases the overall average only modestly (\$7,566 for 70-year-olds overall versus \$6,847 for survivors only, a difference of \$719). In contrast, among 90-year-olds, average Medicare per capita spending was two times greater among beneficiaries who died than survived in 2011 (\$26,687 vs. \$12,924), but because 13 percent of 90-year-olds died that year, the decedents raised average per capita spending by \$1,821 (\$14,745 versus \$12,924 for survivors).

¹⁷ Available at http://www.bls.gov/data/inflation_calculator.htm.



THE HENRY J. KAISER FAMILY FOUNDATION

Headquarters

2400 Sand Hill Road
Menlo Park, CA 94025
Phone 650-854-9400 Fax 650-854-4800

Washington Offices and Barbara Jordan Conference Center

1330 G Street, NW
Washington, DC 20005
Phone 202-347-5270 Fax 202-347-5274

www.kff.org

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