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High-Cost US Medicare Beneficiaries During 2016

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This article presents analysis of Medicare beneficiaries with very high medical costs during 2016. These beneficiaries are of particular interest and concern, generally being the sickest and medically most complex. Better understanding of these beneficiaries and their treatment could lead to improved quality and efficiency of care. Analysis of their claims can aid projections of the expected level and variance for Medicare fee-for-service, Medicare Advantage, or reinsurance costs.

The aggregate spending on these beneficiaries is disproportionate to their numbers, and very high in absolute terms. In our dataset (the 5% Medicare sample), the 1% highest-cost beneficiaries during 2016 had claims exceeding USD 125,000 and generated 15% of the total allowed claims. Projecting to the USD 663bn in total 2016 Medicare spending, total costs for such beneficiaries were around USD 100bn.[1]

Claim costs that reach these levels indicate intense and usually lengthy medical care. Each of these large claimants underwent a severe medical and personal ordeal, often near or at the end of their lives. The human suffering involved and the potential to ameliorate it are among the crucial reasons to study these claimants.

KEY FINDINGS

- The 1% highest-cost beneficiaries had claims exceeding USD 125,000 and generated 15% of the total claims.
- The 0.1% highest-cost beneficiaries had claims exceeding USD 250,000 and generated 3.5% of the total claims.
- Inpatient claims comprise more than 50% of the large-claim costs.
- Per beneficiary, large-claim costs for disability-eligible beneficiaries are 2–4x the costs for aged-eligible. Disabled individuals tend to have higher health needs and costs.
- Costs for dual-eligible beneficiaries (who are eligible for both Medicare and, due to low income, Medicaid) are 2–3x costs for non-duals beneficiaries. Dual-eligibles have higher rates of chronic illness.
- Costs for ESRD beneficiaries (having end-stage renal disease, permanent kidney failure) are more than 10x costs for the other beneficiary categories.
- For claimants above USD 125,000, costs are highest in the Pacific region and lowest in the Mountain region. Pacific costs are more than 2x Mountain costs, in part due to higher average inpatient hospital costs.
- Males are 25–60% more costly than females, in part due to higher rates of chronic conditions like cardiovascular disease.
- Surprisingly, on the largest claims (more than USD 250,000), the 75+ age group is 20–30% less costly than the 65–74 age group. Tragically, perhaps the oldest, very sick patients are more likely to die before their claims exceed USD 250,000.
- The highest-cost ICD-10 primary diagnosis categories are:
  - Diseases of the circulatory system (19% of costs),
  - Neoplasms (11%),
  - Certain infectious and parasitic diseases, including sepsis (11%), and
  - Diseases of the genitourinary system (the organ system of the reproductive organs and the urinary system), including diabetes (10%).

DATA AND METHODOLOGY

In this paper, we primarily examine claim cost rates above various thresholds. This could correspond to the expected claim cost to a payer (government, insurer or reinsurer). Some previous studies have examined, from various perspectives, high-cost claimants in various populations.[2]

Our data source is the 2016 Medicare 5% sample Limited Data Set from the Centers for Medicare and Medicaid Services (CMS).[3] This dataset includes eligibility and claim information on 3.1 million members, comprising a random sample of 5% of all Medicare beneficiaries. The dataset includes more than USD 18bn in paid claims and more than USD 22bn in allowed claims during 2016.[4] We study the allowed claims in this paper.

The files were stripped of data elements that might permit identification of beneficiaries. The claims include Medicare Parts A and B hospital and outpatient medical services, but not Part D prescription drugs.

In this study, we exclude data from members without both Parts A and B benefits, members without fee-for-service coverage (e.g., those with Medicare Advantage), and a small number of members with erroneous data. With these restrictions, the study dataset includes 1.8 million beneficiaries with USD 21.4bn in allowed claims during 2016.

For this paper, we generally define "large claimants" as those beneficiaries with allowed claim costs over USD 125,000 during 2016.

CLAIM DISTRIBUTION

Examining beneficiaries whose 2016 total allowed claims exceeded various thresholds, we see that a small number of beneficiaries generated a large portion of total claim costs. For example, the 1% of beneficiaries with claims more than USD 125,000 generated more than 15% of total allowed claim costs (over USD 3.2bn).[5] (See Table 1)

We'll study costs two different ways in this paper:

- "Ground-up"—the full allowed claim, as shown in the table above, and
- "Excess"—the portion of the allowed claim above a threshold.[6]

For example, for a beneficiary with USD 400,000 allowed during 2016, the "ground-up" claim is USD 400,000, while the claim "excess" of the USD 125,000 threshold is USD 275,000.

Table 2 indicates per-beneficiary per-month (PBPM) costs, severity and frequency of claims excess various thresholds.[7]

Table 1
Large Claim Distribution

Threshold	USD 0	USD 125,000	USD 250,000	USD 500,000
Beneficiaries at or Exceeding Threshold	1,810,256	17,291	2147	155
% of Beneficiaries at or Exceeding Threshold	100.00%	0.96%	0.12%	0.01%
Of all Beneficiaries		About 1 in 100	About 1 in 1,000	About 1 in 10,000
Allowed Amount for These Beneficiaries	USD 21,370m	USD 3,224m	USD 738m	USD 105m
% of Allowed Amount for These Beneficiaries	100.0%	15.1%	3.5%	0.5%

Table 2
Large Claim Severity and Frequency

Threshold	USD 0	USD 125,000	USD 250,000	USD 500,000
Beneficiary-Months	20,060,684	190,653	23,533	1,720
PBPM Cost Excess the Threshold	USD 1,065.26	USD 52.96	USD 10.03	USD 1.37
Severity: Average Claim Size Excess the Threshold	USD 11,805	USD 61,441	USD 93,713	USD 176,769
Frequency: Claimants per 1,000 Beneficiary-Years	1,082.81	10.34	1.28	0.09

SERVICE CATEGORY

For the largest claims, inpatient services are a larger portion of the allowed amount. Inpatient hospital costs are generally much higher than costs for outpatient or other services, and the patients are sicker, so the high proportion of inpatient costs in excess claims is expected. (See Figure 1)

ELIGIBILITY CATEGORY

The three main paths to Medicare coverage eligibility are age over 65, disability or end-stage renal disease ("ESRD," permanent kidney failure requiring dialysis or transplant).[8] We observe significantly different excess costs for these three populations.

Costs for disabled beneficiaries exceed costs for aged beneficiaries by about 15% at the ground-up level and are more than double excess USD 125,000. Disabled individuals typically have higher health needs and may have severe medical conditions.

In Table 3, there are ESRD members in all three categories, but the "Other" category is almost entirely ESRD members. ESRD members have ground-up and excess costs far higher than average.

When trying to mitigate large claims, ESRD and disabled beneficiaries should be target segments.

Figure 1
Ground-up Costs by Service Category for Beneficiaries Exceeding Thresholds

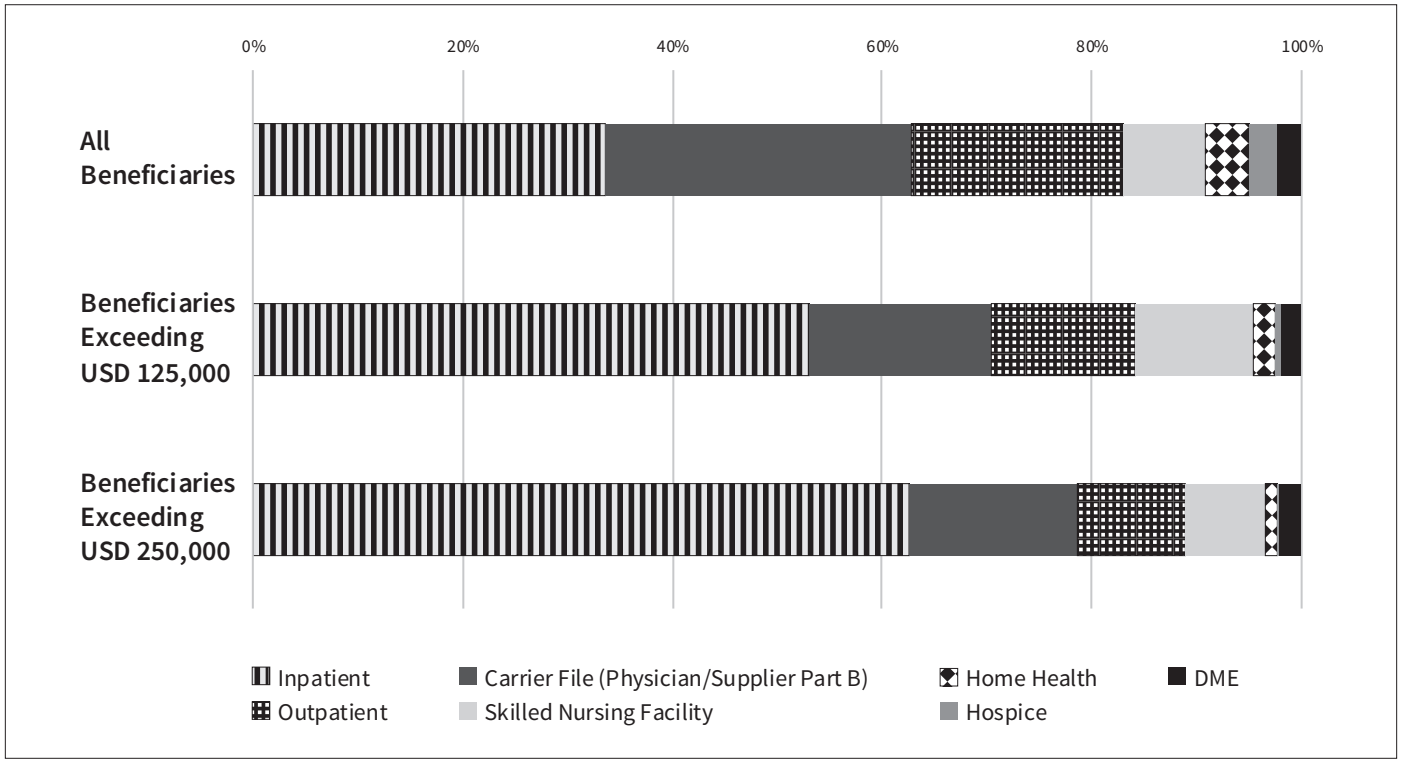


Table 3
PBPM by Eligiblity Category

Eligiblity Category	Beneficiaries	Ground-up PBPM Costs	PBPM Costs Excess USD 125,000	PBPM Costs Excess USD 250,000
Total	**1,810,256**	**USD 1,065.26**	**USD 52.96**	**USD 10.03**
Aged	1,494,339	USD 1,031.59	USD 42.32	USD 6.71
Disabled	311,345	USD 1,173.00	USD 96.43	USD 24.53
Other (Mostly ESRD)	4,581	USD 5,605.98	USD 748.03	USD 153.87

BENEFICIARY STATUS

As stated in a CMS publication, "'dual-eligible beneficiaries are generally described as beneficiaries eligible for both Medicare and Medicaid."[9] Dual-eligible individuals may receive full Medicaid benefits or partial assistance through several programs.

Most beneficiaries are "non-dual" (not receiving any Medicaid benefits or other assistance).

Dual-eligible individuals "experience high rates of chronic illness, with many having long-term care needs and social risk factors."[10] As a result, higher costs are observed on dual-eligible members, particularly at the larger claim levels. (See Table 4)

REGION

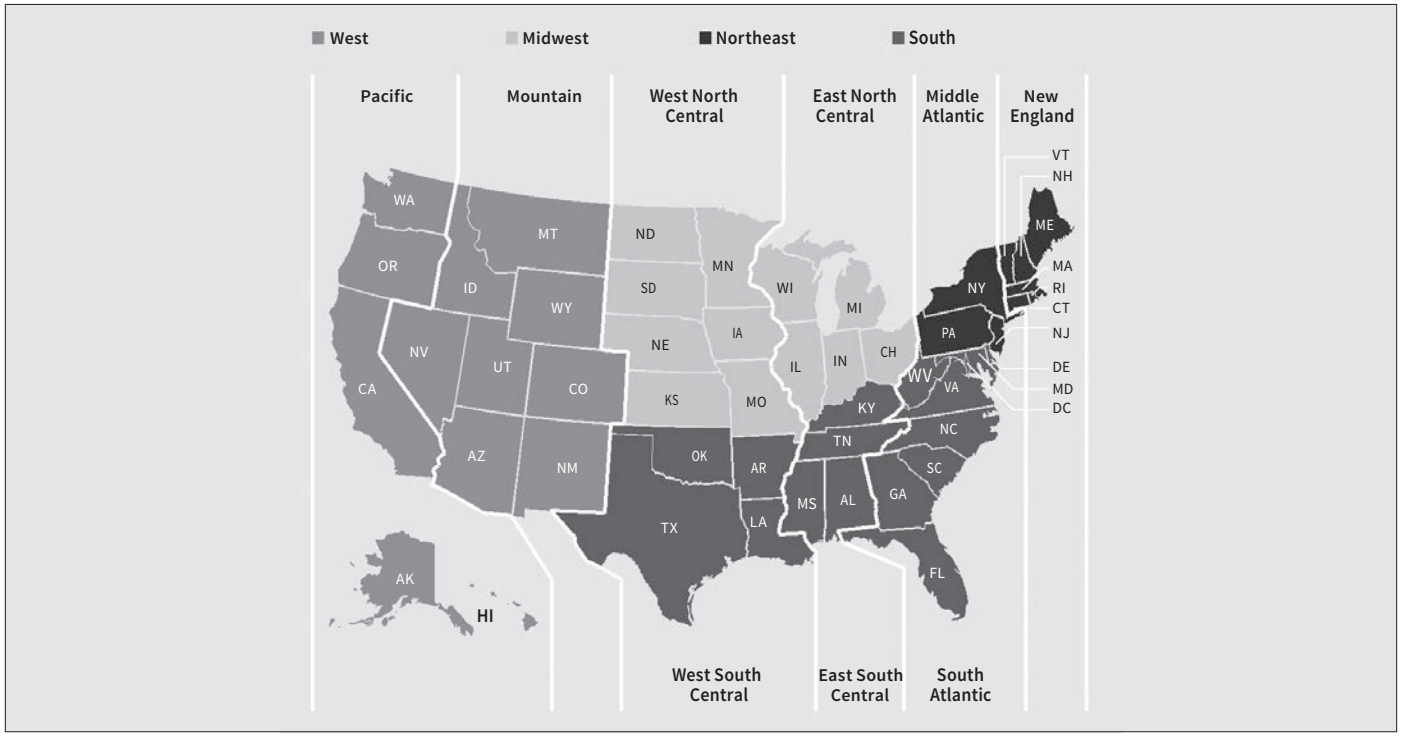
The U.S. Census Bureau groups states into nine regions.[11,12] (See Figure 2)

In excess of the USD 125,000 level, the Pacific region has the highest cost and the Mountain region has the lowest. These cost differences are primarily driven by frequency (the number of large claims that occur) and secondarily by severity (the size of the excess claim). In part, this is due to higher inpatient per-day costs in the Pacific region.[13]

Table 4
PBPM by Beneficiary Status

Beneficiary Status	Beneficiaries	Ground-up PBPM Costs	PBPM Costs Excess USD 125,000	PBPM Costs Excess USD 250,000
Total	**1,810,256**	**USD 1,065.26**	**USD 52.96**	**USD 10.03**
ESRD	22,188	USD 7,187.13	USD 1,055.21	USD 192.59
Full or partial dual, non-ESRD	363,319	USD 1,337.23	USD 77.28	USD 16.48
Non-dual, non-ESRD	1,424,749	USD 908.45	USD 32.24	USD 5.76

Figure 2
U.S. Census Bureau Regions



"Other" in Table 5 includes U.S. territories.

GENDER AND AGE

Because under-65 members are usually disabled or ESRD, PBPM costs are significantly higher.

Males are much more costly than females at the excess levels. In part, this is due to higher rates of chronic conditions (including cancer, cardiovascular disease or diabetes) in age 65+ men than in women.[14]

Surprisingly, at the USD 250,000 excess level, the age 75+ population is less costly (per beneficiary) than the age 65–74 population. This is due to both lower frequency and lower severity. This is an unexpected result. Tragically, perhaps the oldest, very sick patients are more likely to die before their claims have time to exceed USD 250,000.

Table 5
PBPM by Region

Region	Beneficiaries	Ground-up PBPM Costs	PBPM Costs Excess USD 125,000	PBPM Costs Excess USD 250,000
Total	**1,810,256**	**USD 1065.26**	**USD 52.96**	**Suppressed**
Pacific	224,149	USD 1091.83	USD 78.60	USD 18.71
Mountain	116,619	USD 935.32	USD 35.01	USD 6.41
West North Central	127,214	USD 967.95	USD 35.89	USD 7.31
West South Central	198,083	USD 1114.79	USD 53.14	USD 8.24
East North Central	282,621	USD 1064.93	USD 50.71	USD 9.53
East South Central	130,081	USD 993.13	USD 35.13	USD 5.81
New England	102,648	USD 1096.22	USD 51.07	USD 9.72
Middle Atlantic	232,083	USD 1176.89	USD 74.16	USD 15.08
South Atlantic	387,144	USD 1057.93	USD 45.57	USD 7.01
Other	9,614	USD 541.59	USD 18.95	Suppressed

Table 6
PBPM by Gender/Age

Gender—Age	Beneficiaries	Ground-up PBPM Costs	PBPM Costs Excess USD 125,000	PBPM Costs Excess USD 250,000
Total	**1,810,256**	**USD 1,065.26**	**USD 52.96**	**USD 10.03**
F <65	149,262	USD 1,273.51	USD 92.26	USD 19.24
F 65–74	469,931	USD 814.47	USD 35.61	USD 5.79
F 75+	370,748	USD 1,277.47	USD 34.60	USD 4.10
M <65	159,899	USD 1,177.94	USD 114.75	USD 32.33
M 65–74	412,154	USD 847.29	USD 50.43	USD 9.86
M 75+	248,262	USD 1,365.38	USD 55.78	USD 7.98

DIAGNOSES

Among claimants exceeding USD 125,000, the highest-cost ICD-10 primary diagnoses are diseases of the circulatory system, neoplasms and certain infectious and parasitic diseases (including sepsis). (See Figure 3 and Table 7)

CONCLUSION

In this paper, we explored 2016 Medicare large-claim costs, which are driven by hospital inpatient costs. A disproportionate percentage of the excess costs correspond to the highest claimants. We identified segments with significantly higher costs than average, including ESRD, disabled and dual-eligible beneficiaries; certain regions like the Pacific states; and men. For the largest claims, age 75+ PMPM excess costs were found to be lower than 65–74 costs. Diseases of the circulatory system were the most common diagnosis among excess claims.

This analysis focused on costs and results from 2016 only. Further analyses could develop in the following directions:

Figure 3
Highest-cost ICD-10 Primary Diagnoses

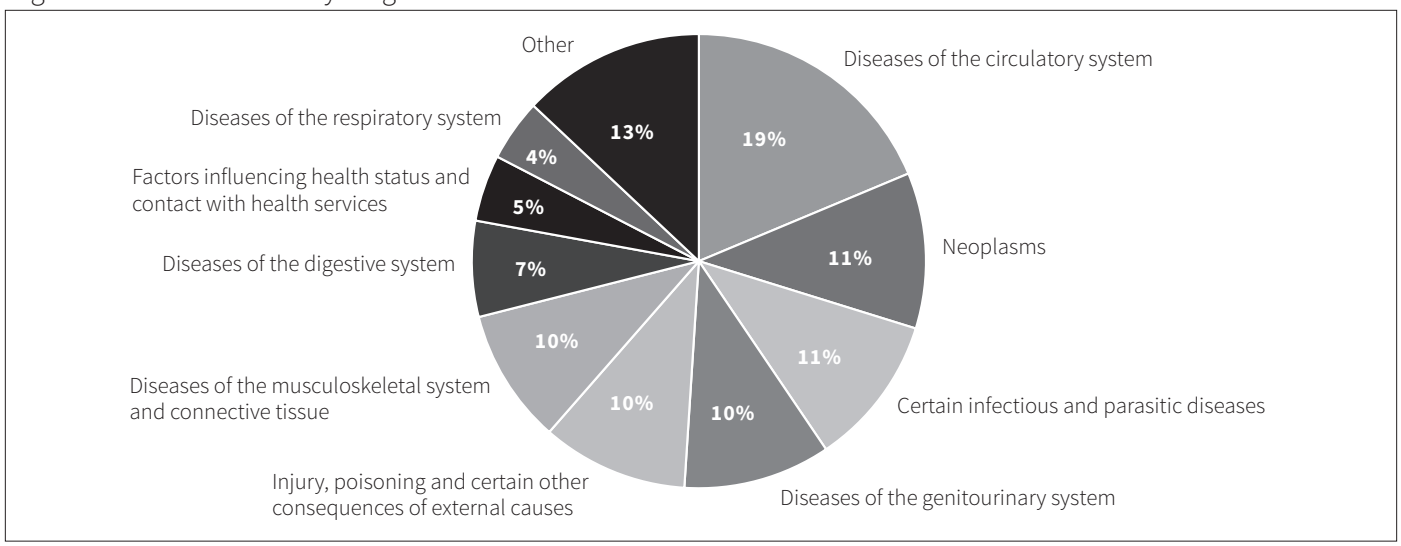


Table 7
Ground-up Allowed Costs by ICD-10 Range, for Beneficiaries with Claims Exceeding USD 125,000

ICD-10 Code Range of Primary Diagnosis	Description	Highest-Cost Condition in the Category	Percentage of Costs
100-199	Diseases of the circulatory system	Heart disease	19%
C00-D49	Neoplasms	Cancers	11%
A00-B99	Certain infectious and parasitic diseases	Sepsis	11%
N00-N99	Diseases of the genitourinary system	Chronic kidney disease (inc. ESRD)	10%
S00-T88	Injury, poisoning and certain other consequences of external causes	Surgical and medical complications	10%
J00-J99	Diseases of the respiratory system	Respiratory failure	10%
Z00-Z99	Factors influencing health status and contact with health services	Chemotherapy, Immunotherapy	7%
K00-K95	Diseases of the digestive system	Gastrointestinal hemorrhage	5%
M00-M99	Diseases of the musculoskeletal system and connective tissue	Muscle weakness	4%
Various	Other		13%

- Discussing the many ways to improve care and control high-claim costs through active claims management. CMS, payers, vendors and reinsurers have a variety of programs.
- Updating with 2017 data, and studying year-to-year trends and variability.
- Obtaining and including Part D drug claim data.
- Applying a statistical model to separate the influence of the various characteristics studied in this paper.
- Expanding clinical interpretation and analyzing utilization patterns.
- Assessing the potential variance in large-claim costs for a population.

The topic of large claimants in Medicare is of interest in its own right and connects with other important areas, including Medicare's funding status and the quality and efficiency of care. We look forward to conducting further research and welcome any comments or questions. ■

This article is online at *https://www.swissre.com/dam/jcr:c659499b-c3ff-4167-b842-a437c393f6bc/2019-08-us-medicare-beneficiaries.pdf*.

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ENDNOTES

1 Medicare Payment Advisory Commission, "Health Care Spending and the Medicare Program," June 2018, *www.medpac.gov/docs/default-source/data-book/jun18_databookentirereport_sec.pdf*.

2 A few examples: Society of Actuaries, "Predicting High-Cost Members in the HCCI Database," September 2018; AHPI and Leavitt Partners, "High Cost Claimants: Private vs. Public Sector Approaches," 2016; California HealthCare Foundation, "Where the Money Goes: Understanding Medi-Cal's High-Cost Beneficiaries," 2010; Swiss Re, "A look at two new (surprising) drivers in catastrophic exposures," 2018; Milliman, "Considerations Regarding The Next Generation ACO Stop-Loss Methodology," 2017; Troutman, Mark and Jackson, Larry, "Contingencies: Managing Catastrophic Medical Claims—Prescription Drug Trends," February 2019; Sun Life Financial, "2018 Sun Life Stop-Loss Research Report—High-cost Claims and Injectable Drug Claims," 2018; Swiss Re, "Swiss Re Large Claim Research Newsletter—2018 Edition," 2018.

3 *https://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/LimitedDataSets/index.html*.

4 The "allowed" amount for a claim is the full amount paid to the provider. The amount paid by the Medicare program is typically lower than the allowed amount because some portion may be paid by the beneficiary or by another payer (like the beneficiary's employer).

5 The MEDPAC data book on 2013 claims indicated that the highest-cost 1% of beneficiaries accounted for 17% of costs. Medicare Payment Advisory Commission, "Health Care Spending and the Medicare Program," June 2018, *www.medpac.gov/docs/default-source/data-book/jun18_databookentirereport_sec.pdf*.

6 This is particularly important for "excess reinsurance" contracts, which reimburse the payer for the excess claim amount.

7 PBPM cost = severity × frequency / 12,000. For the USD 0 threshold (that is, all claimants), the frequency is higher than 1,000 because many beneficiaries are not enrolled for the full year.

8 U.S. Department of Health and Human Services, "Who is eligible for Medicare?" accessed March 2019, *https://www.hhs.gov/answers/medicare-and-medicaid/who-is-elibible-for-medicare/index.html*.

9 *https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/Medicare_Beneficiaries_Dual_Eligibles_At_a_Glance.pdf*.

10 Centers for Medicare and Medicaid Services, "People Dually Eligible for Medicare and Medicaid—Fact Sheet," March 2019, *https://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/Downloads/MMCO_Factsheet.pdf*.

11 *https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf*.

12 Map obtained from *https://www.kisspng.com/png-united-states-census-bureau-region-geography-censu-4783355/preview.html*.

13 Henry J Kaiser Family Foundation, "Hospital Adjusted Expenses per Inpatient Day," accessed May 2019, *https://www.kff.org/health-costs/state-indicator/expenses-per-inpatient-day/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D*.

14 Centers for Disease Control and Prevention, National Center for Health Statistics, "Percent of U.S. Adults 55 and Over with Chronic Conditions," accessed May 2019, *https://www.cdc.gov/nchs/health_policy/adult_chronic_conditions.htm*.