Methodology Appendix for Patient Cost Scenarios

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In September-December 2016, experts at Avalere Health, LLC, the American Cancer Society and the American Cancer Society Cancer Action Network (ACS CAN) created three profiles of cancer patients and treatment regimens. Avalere analysts ran each patient profile through three insurance scenarios and calculated patient out-of-pocket costs and total healthcare costs. These profiles can be found at https://www.acscan.org/policy-resources/costs-cancer. Following is detailed methodology for each patient profile and each insurance scenario.

Note that numbers used in the report have been rounded to the nearest dollar.

Mary – Stage I Breast Cancer

Mary had Stage I breast cancer. She had one tumor that measured 1 cm in size. Her breast cancer was hormone-receptive positive and HER2 negative. Her RT-PCR score was 20, which meant that her cancer might come back, so Mary chose to have adjuvant chemotherapy. Her oncologist also recommended radiation treatment to stop her cancer from returning. Mary was diagnosed in January. Mary's treatment regimen was based on National Comprehensive Cancer Network (NCCN) Guidelines for patients with Mary's profile. The treatment regimen included:

- Mammogram
- Ultrasound
- CBC and liver function tests
- Breast MRI
- Core needle biopsy
- Lumpectomy (surgery)
- Sentinel lymph node biopsy
- Hormone receptor and oncotype tests
- Chemotherapy – dose-dense AC and paclitaxel
- Supportive care drugs – filgrastim, aprepitant, dexamethasone, ondansetron
- Monitoring blood tests
- EBRT (radiation)
- Adjuvant hormone therapy – letrozole
- Multiple primary care provider visits
- Multiple specialist visits with a medical oncologist, radiation oncologist, breast surgeon

Tom – Stage IIB Colon Cancer

Tom had stage IIB colon cancer that did not obstruct the bowels. He also had 2 adenomatous polyps which were removed during his colonoscopy. Tom's treatment regimen was based on NCCN Guidelines for patients with Tom's profile. The treatment regimen included:

- Screening FIT test
- Diagnostic colonoscopy including removal of polyps
- Pathology test of polyps
- Biopsy of lesion
- CBC and chemistry profile tests
- CT scan

- Colectomy and lymphadenectomy (surgery)
- Molecular testing for MSI
- Adjuvant chemotherapy – FOLFOX regimen
- Supportive care drugs – aprepitant, dexamesthasone, ondansetron
- Multiple primary care provider visits
- Multiple specialist visits with a medical oncologist, surgeon, and gastroenterologist
- Multiple post-treatment CEA blood tests

Kathy – Stage IV Lung Cancer

Kathy had stage IV lung cancer: a large adenocarcinoma in the left lung, with extensive bone metastases. Kathy was a former smoker such that she met the U.S. Preventive Services Task Force criteria of high risk for lung cancer and was eligible for screening. Kathy's treatment regimen was based on NCCN Guidelines for patients with Kathy's profile. The treatment regimen included:

- Screening – low-dose CT scan
- CT scan
- CBC and blood chemistry tests
- Spirometry test
- Lung needle biopsy with pathology review
- Molecular testing – EGFR and ALK
- Emergency room services
- 1st line chemotherapy – Cisplatin and Pemetrexed
- 2nd line immunotherapy – Novolumab
- Supportive care drugs – aprepitant, dexamesthasone, ondansetron
- Multiple primary care provider visits
- Multiple specialist visits with a pulmonologist, pathologist, medical oncologist, and palliative care specialist
- Multiple PET scans to monitor progress of chemotherapy

Employer-Sponsored Insurance Scenario

The treatment costs used in this model for medical treatments were average commercial costs across payers taken from 2014 MEPS (Medical Expenditure Panel Survey) and HCUP (Healthcare Cost and Utilization Project) data sets. 2014 is the most recent year available for these data sets. In instances where commercial rates were not available, 100 percent of published 2016 Medicare rates from the following fee schedules were used: Medicare Physician Fee Schedule, Outpatient Prospective Payment System, Inpatient Prospective Payment Systems, and Clinical Lab Fee Schedule.

The costs used in this model for pharmacological treatments were as follows. For intravenous drugs, average sales price (ASP) data from the Centers for Medicare and Medicaid Services (CMS) October 2016 pricing file were used, reflecting ASP plus 6 percent. Though some plans may reimburse based on other methodologies, their methodologies are not always made publicly available, which creates challenges in estimating precise payment amounts; using the Medicare rate should serve as a reasonable estimate for most payers. For oral drugs, prices were obtained from the Medicare Plan Finder, assuming the patient lived in California zip code 94203. These data were used to represent negotiated prices similar to those negotiated by a large employer.

It was assumed that all treatment received was in-network and covered – note that patient costs would likely increase with out-of-network or non-covered treatments.

Patient out-of-pocket costs were calculated by applying a typical plan design for an employer-sponsored insurance plan. Patients were assumed to live in California, work for the state of California, and be eligible for active employee health insurance benefits. The state of California is one of the largest employers in the state. Plan design was taken from a common CalPERS health insurance plan in 2016. The patients' $154 monthly premium represented 21.5 percent of total premium costs. The patients' employer covered the other 78.5 percent of premium costs ($561 per month). The patients' plan year was January 1st – December 31st. The employer-sponsored insurance plan had the following design:

	Patient Cost-Sharing
In-Network Deductible	$500
Out-of-Network Deductible	$500
In-Network Out-of-Pocket Limit	$4,850
Out-of-Network Out-of-Pocket Limit	N/A
Co-insurance Maximum	$3,000
Pharmacy Out-of-Pocket Limit	$2,000
PCP Visit Co-pay	$20
Specialist Visit Co-pay	$20
Preventive Care/Screening	None
Outpatient Surgery Facility Fee	20% Co-insurance
Outpatient Surgery Physician/Surgeon Fee	20% Co-insurance
Diagnostic Test	20% Co-insurance
Imaging	20% Co-insurance
Generic Drugs	$5 / 30 day supply $10 / 90 day supply Not Covered: 100% OOP
Preferred Brand Drugs	$20 / 30 day supply $40 / 90 day supply Not Covered: 100% OOP
Non-Preferred Brand Drugs	$50 / 30 day supply $100 / 90 day supply Not Covered: 100% OOP
Specialty Drugs	$50 / 30 day supply $100 / 90 day supply Not Covered: 100% OOP

Medicare Scenario

The treatment costs used in this model for medical treatments are a combination of prices provided by MEPS and HCUP (because they represent national averages) and 2016 Medicare rates from the following fee schedules: Medicare Physician Fee Schedule for physician rates, the Outpatient Prospective Payment System, the Inpatient Prospective Payment Systems, and the Clinical Lab Fee Schedule.

The costs used in this model for pharmacological treatments were as follows. For intravenous drugs, average sales price (ASP) data from the Centers for Medicare and Medicaid Services (CMS) October 2016 pricing file were used, reflecting ASP plus 6 percent. For oral drugs, prices were obtained from the Medicare Plan Finder, assuming the patient lived in Florida zip code 33033.

It was assumed that all treatment received was in-network and covered – note that patient costs would likely increase with out-of-network or non-covered treatments.

Patient out-of-pocket costs were calculated by applying published Medicare cost-sharing and premium rates. Patients were assumed to live in Florida, which has a large population of Medicare enrollees. Patients were assumed to be eligible for premium-free Medicare Part A. Patients paid $122 per month in premiums for Medicare Part B. Patients enrolled in the most popular Medicare Part D plan, AARP Medicare Rx Preferred, for which they paid $64 per month in premiums. Patients also enrolled in the most popular Medigap plan (Humana policy F*), for which they paid $415 in premiums per month. Patients were assumed to have enrolled in Medicare immediately after becoming eligible at age 65.

The Medicare plan year was January 1st – December 31st. Patients' Medicare Part D plan had the following design:

	Patient Cost-Sharing
Deductible	$0
Out-of-pocket limit	$4,850 catastrophic limit
Tier 1: Preferred Generic Drugs	$2 Co-pay
Tier 2: Generic Drugs	$15 Co-pay
Tier 3: Preferred Brand Drugs	$36 Co-pay
Tier 4: Non-Preferred Brand Drugs	40% Co-insurance
Tier 5: Specialty Drugs	33% Co-insurance

Patients' Medigap Policy F* had the following design:

	Patient Cost-Sharing
Part A Co-insurance and hospital costs	0%
Part B Co-insurance or Co-payments	0%
Blood (first 3 pints)	0%
Part A hospice Co-insurance or Co-payment	0%
SNF care	0%
Part A deductible	0%
Part B deductible	0%
Part B excess charge	0%
Foreign travel	20%

*Note that while Medigap Policy F remains the most popular Medigap plan design, it will no longer be enrolling Medicare beneficiaries as of January 1, 2020. As enrollment in this plan decreases, the premiums are likely to increase.

Individual Market Insurance Scenario

The treatment costs used in this model were average commercial costs across private payers taken from MEPS and HCUP data sets. 2014 is the most recent year available for these data sets. In instances where commercial rates were not available, 100 percent of published 2016 Medicare rates from the following fee schedules were used: Medicare Physician Fee Schedule, Outpatient Prospective Payment System, Inpatient Prospective Payment Systems, and Clinical Lab Fee Schedule.

The costs used in this model for pharmacological treatments are as follows. For intravenous drugs, average sales price (ASP) data from the Centers for Medicare and Medicaid Services (CMS) October 2016 pricing file were used, reflecting ASP plus 6 percent. Though some plans may reimburse based on other methodologies, their methodologies are not always made publicly available, which creates challenges in estimating precise payment amounts; using the Medicare rate should serve as a reasonable estimate for most payers. For oral drugs, prices were obtained from the Medicare Plan Finder, assuming the patient lived in Texas zip code 77025. These data were used to represent negotiated prices similar to those negotiated by an insurance plan.

It was assumed that all treatment received was in-network and covered – note that patient costs would likely increase with out-of-network or non-covered treatments.

Patient out-of-pocket costs were calculated by applying a typical plan design for an individual market plan in 2016 (including requirements and limits applied by the Affordable Care Act). Patients were assumed to live in Texas, with an annual income of $35,000 and have individual-only coverage. Patients chose a Molina Silver 250 plan through www.Healthcare.gov. Patients' total monthly premium was $544, but because of tax subsidies they only paid $279 per month. Patients were not eligible for cost-sharing reductions. Patients paid the non-smoker premium rate. The individual market plan year was January 1st – December 31st.

The patients' plan had the following design:

	Patient Cost-Sharing
Deductible	$0
Out-of-Pocket Limit	$6,850
PCP Visit Co-pay	$30
Specialist Visit Co-pay	$75
Other practitioner office visit	$30
X-ray Co-pay	$85
Blood Work Co-pay	$45
Imaging (CT/PET scans, MRIs)	40% Co-insurance
Preventive Care/Screening	$0
Generic Drugs	$35
Preferred Brand Drugs	$80
Non-Preferred Brand Drugs	40% Co-insurance
Specialty Drugs	40% Co-insurance
Outpatient Surgery Facility Fee	40% Co-insurance

	Patient Cost-Sharing
Outpatient Surgery Physician/Surgeon Fees	40% Co-insurance
Emergency Room Services Co-pay	$500
Emergency Medical Transportation Co-pay	$500
Inpatient Hospital Stay Facility Fee	40% Co-insurance
Inpatient Hospital Physician/Surgeon Fee	40% Co-insurance
Chemotherapy	$85 per visit

The Costs of Cancer: Addressing Patient Costs report and accompanying materials can be found at https://www.acscan.org/policy-resources/costs-cancer.