Methodology Appendix for Patient Cost Scenarios
September 2020

In July-September 2020, the American Cancer Society and the American Cancer Society Cancer Action Network (ACS CAN) created six profiles of cancer patients and treatment regimens. Analysts used the National Comprehensive Cancer Network (NCCN) guidelines to verify treatment regimens and ran each patient profile through at least one of five insurance scenarios and calculated patient out-of-pocket costs and total healthcare costs. These profiles can be found at *https://www.fightcancer.org/costsofcancer*.

Following is detailed methodology for each patient profile and each insurance scenario.

1. **Patient Profiles**

Tom – Stage IIB Colon Cancer

Tom had stage IIB colon cancer. Tom's treatment regimen was based on NCCN Guidelines with Tom's profile. The treatment regimen included:

- Screening FIT test
- Colonoscopy
- Biopsy of lesion
- Pathology test of polyps
- CBC and chemistry profile tests
- CT scan
- Colectomy and lymphadenectomy (surgery)
- Molecular testing for MSI
- Adjuvant chemotherapy – FOLFOX regimen (flurouracil, leucovorin, oxaliplatin)
- 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. Kathy's treatment regimen was based on NCCN Guidelines 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, ALK, ROS1, BRAF V600E, and PDL-1
- 1st line chemotherapy – Pembrolizumab, Cisplatin, and Pemetrexed
- 2nd line immunotherapy – Nivolumab
- Supportive care drugs – aprepitant, dexamesthasone, ondansetron, and prednisone
- Emergency room visit
- Primary care provider visit
- Multiple specialist visits with a pulmonologist, medical oncologist, and palliative care specialist
- Multiple PET scans to monitor progress of chemotherapy

Mary – Stage III Breast Cancer

Mary had Stage III breast cancer. Mary's treatment regimen was based on NCCN Guidelines with Mary's profile. The treatment regimen included:

- Mammogram
- Ultrasound
- CBC and liver function tests
- Breast MRI
- Core needle biopsy

- Hormone receptor and oncotype tests
- Lumpectomy (surgery)
- Axillary lymph node dissection
- Chemotherapy – AC and pertuzumab + trastuzumab + paclitaxel
    - Use of a biosimilar, Kanjinti (trastuzumab-anns) in one scenario.
- Supportive care drugs– aprepitant, dexamethasone, ondansetron, olanzapine, famoitidine, diphenhydramine, and dexamethasone
- Monitoring blood tests
- EBRT (radiation)
- Multiple primary care provider visits
- Multiple specialist visits with a medical oncologist, radiation oncologist, breast surgeon

Brian - Stage II Diffuse Large B-Cell Lymphoma

Brian had stage II blood cancer. Brian's treatment regimen was based on NCCN Guidelines with Brian's profile. The treatment regimen included:

- Regular blood tests including CBC with differential and blood chemistry tests
- Bone marrow biopsy
- Multiple whole body PET/CT before, during, and after chemotherapy
- Echocardiogram
- Diagnostic CT of the chest, abdomen, and pelvis
- Regular CT scans
- Chemotherapy RCHOP – Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisone
- Supportive care drugs – diphenhydramine, pegfilgrastim, aprepitant, dexamethasone, ondansetron, olanzapine
- Multiple primary care provider visits
- Multiple specialist visits with a hematologist, medical oncologist

Shonda – Stage IV Pancreatic Cancer

Shonda had stage IV pancreatic cancer. Shonda's treatment regimen was based on NCCN Guidelines for patients with Shonda's profile. The treatment regimen included:

- Pancreatic protocol CT scan
- Endoscopic ultrasound and endoscopic retrograde cholangiopancreatography (ERCP)
- Blood tests including a CA-19-9 test
- Molecular testing – BRCA1, BRCA2, PALB2, MSI test, MMR test
- Chest and pelvis CT scan
- Palliative care consultation
- Regular CT scans to track progression
- Regular blood tests before chemotherapy administration
- 1st line chemotherapy - FOLFIRINOX – Oxaliplatin, Leucovorin, Irinotecan, and Fluorouracil
- Supportive care for FOLFIRINOX – filgrastim, aprepitant, ondansetron, and olanzapine
- 2nd line chemotherapy - Gemcitabine
- Supportive care for Gemcitabine – aprepitant, filgrastim, ondansetrom, and olanzapine
- Gastronomy tube placement following progression
- Multiple primary care provider visits
- Multiple specialist visits with a medical oncologist, gastroenterologist, and palliative care specialist

Franklin – Stage III Prostate Cancer
Franklin had stage III prostate cancer. Franklin's treatment regimen was based on NCCN Guidelines for patients with Franklin's profile. The treatment regimen included:

- Annual physical and digital rectal exam
- Multiple PSA tests
- CT scan of abdomen and pelvis
- Bone scans
- mpMRI
- Core biopsy
- Germline tests for BRCA1, BRCA2, ATM, CHEK2, PALB2, MLH1, MSH2, MSH6, PMS2
- Radical prostatectomy
- Lymph node removal
- EBRT (radiation)
- 1st line hormone therapy - ADT Nilutamide
- 2nd line hormone therapy - Abiraterone acetate and leuprolide acetate for depot suspension
- Supportive therapy – prednisone
- Regular blood tests
- Multiple specialist visits with a medical oncologist, surgical oncologist, and radiation oncologist

2. Insurance Benefit Designs

Employer-Sponsored Insurance Scenario
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 2020. The selected plan's $169.21 monthly enrollee premium represented 21.5 percent of total premium costs. The employer covered the other 78.5 percent of premium costs ($787.00 per month). The plan year was January 1st – December 31st. The employer-sponsored insurance plan had the following design:

	Patient Cost-Sharing
In-Network Deductible	$500
In-Network Out-of-Pocket Limit	$3,000
PCP Visit Co-pay	$20
Specialist Visit Co-pay	$35
Preventive Care/Screening	$0
Outpatient Surgery Facility Fee	20% Co-insurance
Outpatient Surgery Physician/Surgeon Fee	20% Co-insurance
X-Ray	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% Co-insurance

Medicare Scenario

Patient out-of-pocket costs were calculated by applying published Medicare cost-sharing and premium rates. Patients were assumed to live in Florida (ZIP code 33935), which has a large population of Medicare enrollees. Patients were assumed to be eligible for premium-free Medicare Part A. Patients paid $144.60 per month in premiums for Medicare Part B. Patients enrolled in the most popular Medicare Part D plan, SilverScript Choice (Plan ID S5601-022-0), for which they paid $25.20 per month in premiums. Patients also enrolled in the most popular Medigap plan G (Humana policy G*), for which they paid $235.50 in premiums per month. The premium applied is the median of the range for male and female beneficiaries (premium range for Medigap plan G was $183-$297 for a male and $174-$259 for a female). Patients were assumed to have enrolled in Medicare immediately after becoming eligible at age 65.

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

	Patient Cost-Sharing
Deductible	$250
Out-of-pocket limit	No cap
Catastrophic threshold	$6,350
Tier 1: Preferred Generic Drugs	• Initial coverage phase: $0 • Coverage gap phase: 25% • Catastrophic coverage phase: $3.60(generic)/$8.95 (brand) or 5%
Tier 2: Generic Drugs	• Initial coverage phase: $1 • Coverage gap phase: 25% • Catastrophic coverage phase: $3.60(generic)/$8.95 (brand) or 5%

Tier 3: Preferred Brand Drugs	• Initial coverage phase: $47 • Coverage gap phase: 25% • Catastrophic coverage phase: $3.60(generic)/$8.95 (brand) or 5%
Tier 4: Non-Preferred Brand Drugs	• Initial coverage phase: 38% • Coverage gap phase: 25% • Catastrophic coverage phase: $3.60(generic)/$8.95 (brand) or 5%
Tier 5: Specialty Drugs	• Initial coverage phase: 28% • Coverage gap phase: 25% • Catastrophic coverage phase: $3.60(generic)/$8.95 (brand) or 5%

Medigap Policy G* 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%

*The prior edition of this report used Medigap Policy F, but that plan is no longer enrolling Medicare beneficiaries (as of January 1, 2020). Plan G was selected because it is the most popular option following plan F (link). It is also fairly similar in the extent to which it covers OOP costs for beneficiaries.

Individual Market Insurance Scenario

Patient out-of-pocket costs were calculated by applying a typical plan design for an individual market plan in 2020 (including requirements and limits applied by the Affordable Care Act). Patients were assumed to live in Texas (ZIP code 77025), with an annual income of $38,280 and have individual-only coverage. Patients chose a Molina Constant Care Silver 250 plan through www.Healthcare.gov. All plans were sorted by silver metal level with the lowest premium. The first Molina plan option was selected (to

remain consistent with the carrier used in the last iteration of the report). Because exchange plans can vary their premiums based on age, sex, and tobacco use, the 4 patients using an exchange plan would have different total premiums. However, because the Advance Premium Tax Credit (APTC) is tied to the enrollee's income and the price of a benchmark silver plan, the portion of the premium that each of these individuals would pay is actually quite similar, ranging from $320 to $328 per month (average of $324.20). The patient premium for the 60-year-old man (used for both the colon and prostate cancer scenarios) is the closest to the average of the premiums for all 4 patients (colon cancer (male, 60), lung cancer (female, 60), blood cancer (male, 30), and prostate (male, 60) scenarios). Therefore, the $324.66 premium was used for all 4 patients under the Exchange plan design, but in a real-life scenario, the total premiums and APTCs would vary across these patients. 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 selected plan had the following design:

	Patient Cost-Sharing
Deductible	$6,500
Out-of-Pocket Limit	$8,150
PCP Visit Co-pay	$30
Specialist Visit Co-pay	$75
X-ray Co-pay	40%
Blood Work Co-pay	40%
Preventive Care/Screening	$0
Generic Drugs	$25
Preferred Brand Drugs	$65
Non-Preferred Brand Drugs	50% Co-insurance
Specialty Drugs	50% Co-insurance
Outpatient Surgery Facility Fee	40% Co-insurance
Outpatient Surgery Physician/Surgeon Fees	40% Co-insurance
Emergency Room Services Co-pay	40% Co-insurance
Inpatient Hospital Stay Facility Fee	40% Co-insurance
Inpatient Hospital Physician/Surgeon Fee	40% Co-insurance

Small Group High Deductible Insurance Scenario

Patient out-of-pocket costs were calculated by applying a typical plan design for a high deductible insurance plan. Patients were assumed to live in Texas (ZIP code 77025). Plan design was pulled from ehealthinsurance.com and the best-selling plan was selected - BCBS Silver HMO (Plan ID 803-S640ADT). The total monthly premium paid by the patient was $142.68. The plan year was January 1st – December 31st. The plan had the following design:

	Patient Cost-Sharing
Deductible	$6,000
Out-of-Pocket Limit	$8,150
PCP Visit Co-pay	$40

Specialist Visit Co-pay	$80
X-ray Co-pay	10% Co-insurance
Imaging (CT/PET scans, MRIs)	$250
Preventive Care/Screening	$0
Preferred Generic Drugs	$0
Non-Preferred Generic Drugs	$10
Preferred Brand Drugs	$50
Non-Preferred Brand Drugs	$100
Preferred Specialty Drugs	$150
Non-Preferred Specialty Drugs	$250
Outpatient Surgery Facility Fee	$200 + 10% Co-Insurance
Outpatient Surgery Physician/Surgeon Fees	10% Co-insurance
Emergency Room Services Co-pay	$500 + 10% Co-insurance
Emergency Medical Transportation Co-pay	10% Co-insurance
Inpatient Hospital Stay Facility Fee	$250 + 10% Co-insurance
Inpatient Hospital Physician/Surgeon Fee	10% Co-insurance

Short-Term, Limited-Duration Insurance (STLDI) Scenario

Patient out-of-pocket costs were calculated by applying a typical plan design for a short-term, limited-duration insurance plan. Patients were assumed to live in Texas (ZIP code 77025). Plan design was taken from the best-selling United Health Short Term Medical Value health insurance plan in 2020. The monthly premium paid by the patient was $156.48. Outpatient prescription drugs were not covered by this plan, meaning that enrollees pay for 100% of pharmacy prescription drug costs. All other treatments were assumed to be covered by the plan according to the design below, with the exception of fertility services. The plan year was January 1st – December 31st.

The selected plan had the following design:

	Patient Cost-Sharing
Deductible	$12,500
Out-of-Pocket Limit	$22,500
PCP Visit	30% Co-insurance
Specialist Visit	30% Co-insurance
X-ray	30% Co-insurance
Blood Work	30% Co-insurance
Imaging (CT/PET scans, MRIs)	$250
Pharmacy prescription drugs	N/A
Inpatient prescription drugs	30% Co-insurance
Outpatient Surgery	30% Co-insurance
Emergency Room Services	30% Co-insurance
Inpatient Hospitalization	30% Co-insurance
Coverage period maximum	$2 million

3. Treatment Costs

The costs for medical treatments were gathered from various Centers for Medicare and Medicaid Services (CMS) datasets. For the Medicare scenarios, 100 percent of published Medicare rates were used. For the other 4 insurance designs (employer, exchange, small group high deductible, and STLDI), 160 percent of published Medicare rates were used. Treatment costs were collected from Calendar year (CY) 2020 Medicare Physician Fee Schedule, the CY 2020 Outpatient Prospective Payment System and Ambulatory Surgical Center final rule with correction notice, and the Fiscal Year (FY) 2020 Inpatient Prospective Payment System final rule with correction notice. The 2020 CPT Professional Edition and January 1, 2020 Alphanumeric HCPCS file were also used to gather procedural codes. For the fertility preservation service (sperm banking), Medicare data were not available so fees were collected from the Fairfax Cryobank Houston and Southwest Florida Fertility Clinic (a fertility clinic around each ZIP code examined). Labs costs were collected from the CMS CY 2020 Medicare Physician Fee Schedule and the CY 2020 Clinical Laboratory Fee Schedule files.

The costs for pharmacological treatments were as follows. For intravenous drugs, average sales price (ASP) data from the CMS July 2020 ASP 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. Prices were pulled for each ZIP code (33935, FL and 77025, TX) and applied based on the profile calculated. 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 (except for outpatient drugs under the STLDI plan)– note that patient costs would likely increase with out-of-network or non-covered treatments.