Spotlight On: Oncology, Musculoskeletal, and ADI

State of Arkansas

Bureau of Legislative Research

Segal

Spotlight On: Oncology (Prevalence and Cost)
All Members

Chronic Condition	January 2020 – December 2020						
	Members	% of all Members	Norm[1]	Medical & Rx Cost	% of Total Cost	Medical & Rx PMPM	PMPM Relative Cost[2]
Oncology	13,313	7.4%	9.8%	$165,154,749	21.2%	$1,058	2.9x

Type of Cancer	Oncology Breakdown							
	Members	% of Oncology Members	Medical & Rx Cost	% of Total Oncology Cost	Medical & Rx PMPM	PMPM Relative Cost[3]	Preventive Screening[4]	Preventive Screening[4] (CY 2019)
Skin Cancer	6,053	45%	$48,369,080	29%	$677	0.6x	NA	NA
Breast Cancer	2,615	20%	$32,752,339	20%	$1,066	1.0x	41%	42%
Prostate Cancer	1,564	12%	$14,284,944	9%	$779	0.7x	56%	56%
Colon Cancer	631	5%	$10,220,826	6%	$1,392	1.3x	32%	33%
Lung Cancer	535	4%	$18,084,807	11%	$2,972	2.8x	NA	NA
Other Cancers	4,746	36%	$112,104,525	68%	$2,036	1.9x	NA	NA

Observations

- 13,313 members are diagnosed with cancer, which is favorable when compared to the norm of 9.8%.

- Oncology make up 21.1% of the total plan spend, with PMPM cost that is 2.9 times costlier than the PMPM cost of the total population.

- Members with skin cancer make up 45% of all cancer patients followed by breast cancer with 20% of all cancer patients.

- Lung cancer, while reflecting 4% of all cancer patients, is the costliest of the top 5 on a PMPM basis.

[1] Based on SHAPE (Segal's internal data warehouse) book-of-business.
[2] Reflects the ratio of PMPM costs of members with oncology to the PMPM of the total enrolled population.
[3] Reflects the ratio of PMPM costs of members with the specific type of cancer to the overall oncology PMPM
[4] Refer to appendix for details on preventive screening.

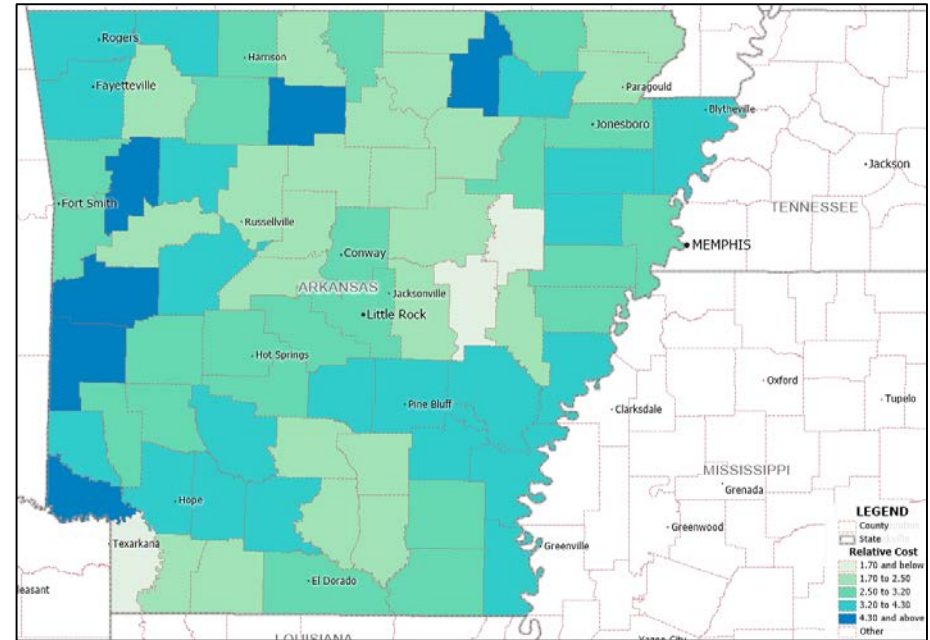# Spotlight On: Oncology (Member Geo-Mapping)
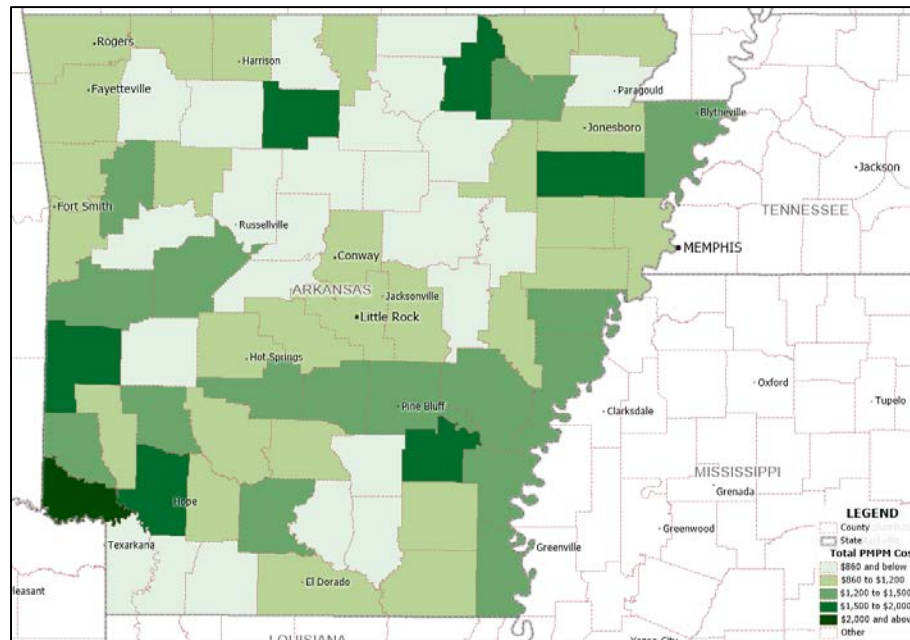## *All Members*
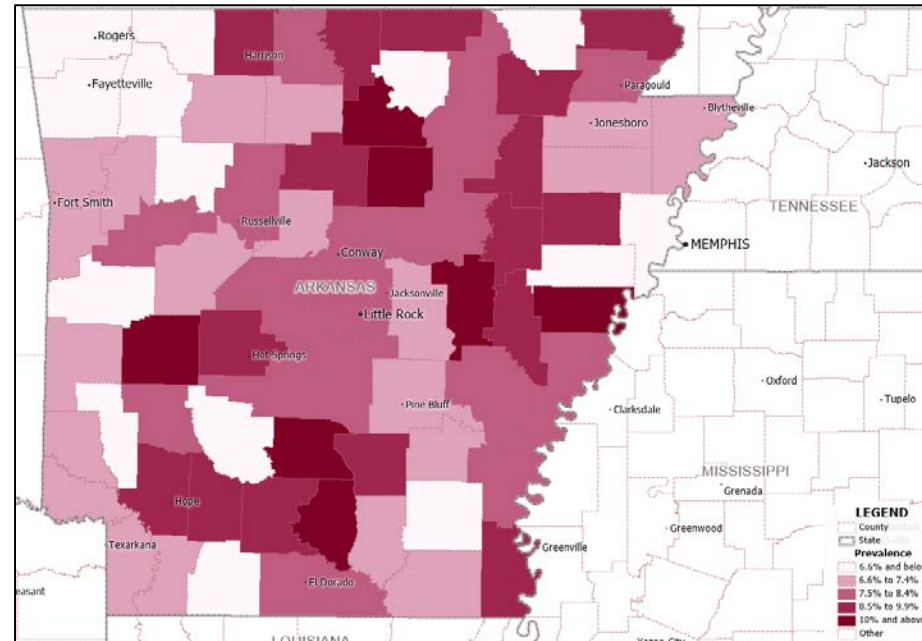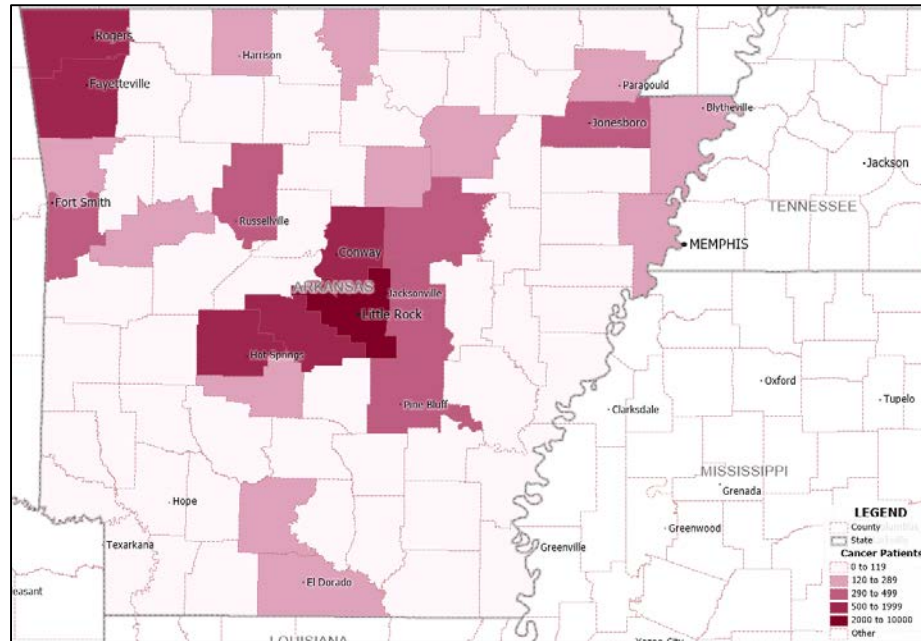
Observations

- The top left map illustrates the distribution of cancer patients by county. The darker red indicating higher patient counts

- The top right map reflects the prevalence of cancer patients compared to total membership in each county. The darker red indicating higher prevalence.

Spotlight On: Oncology (Cost Geo-Mapping)
## *All Members*

Observations

- The top left map illustrates the PMPM cost of cancer patients by county. The darker green indicating PMPM costs.

- The top right map reflects the relative PMPM cost of cancer patients compared to total PMPM cost of the respective. The darker blue indicating higher cost ratio.

Spotlight On: Oncology (Medically Underserved Areas)
All Members

| January 2020 – December 2020 | | | | | | | | | | | |
| Type of Cancer | Fully Underserved[1] ("Full") | | | | Partially Underserved[1] ("Partial") | | | | Variance (Full vs Partial) | | | |
	Members	Medical	Rx	Total	Members	Medical	Rx	Total	Members	Medical	Rx	Total
Skin Cancer	2,771	$449	$230	$679	3,282	$441	$234	$674	-16%	2%	-1%	1%
Breast Cancer	1,105	$839	$236	$1,074	1,510	$855	$205	$1,060	-27%	-2%	15%	1%
Prostate Cancer	667	$486	$314	$800	897	$500	$264	$764	-26%	-3%	19%	5%
Colon Cancer	298	$1,277	$330	$1,607	333	$1,031	$169	$1,200	-11%	24%	95%	34%
Lung Cancer	259	$2,505	$546	$3,051	276	$2,239	$660	$2,899	-6%	12%	-17%	5%
Other Cancers	2,129	$1,551	$465	$2,016	2,617	$1,497	$555	$2,052	-19%	4%	-16%	-2%
All Cancers	5,957	$775	$271	$1,046	7,356	$770	$297	$1,067	-19%	1%	-9%	-2%
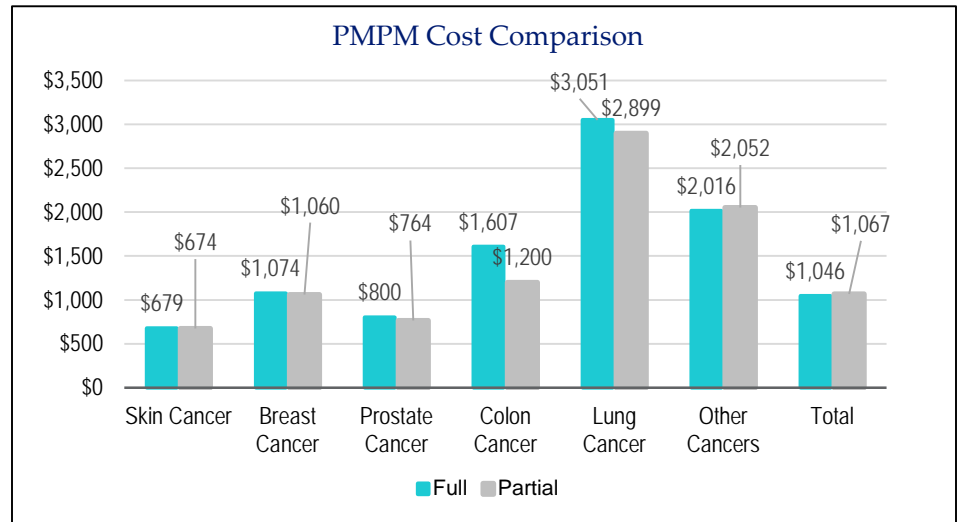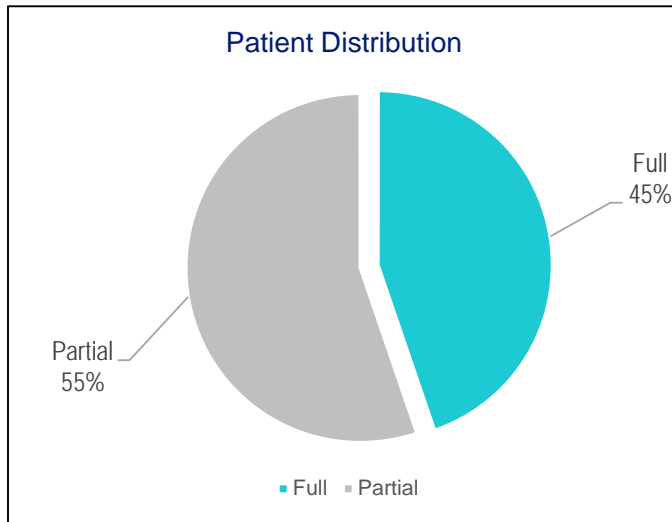
Patient Distribution

Full 45%
Partial 55%

- Full
- Partial

PMPM Cost Comparison

- Full
- Partial

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[1] As identified by Arkansas Department of Health. Data Source: Health Resources & Services Administration (HRSA). Counties are tagged as fully Underserved or partially underserved. For the purposes of this analysis, Grant county– an untagged county by HRSA - was designated as partially underserved.

Spotlight On: Oncology (Medically Underserved Areas)
All Members

Skin Cancer	Fully Underserved[1] ("Full")			Partially Underserved[1] ("Partial")			Variance (Full vs Partial)		
Service Category	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter
Inpatient Hospital	407	$2,502,185	$6,148	476	$2,807,602	$5,898	-14%	-11%	4%
Hi-Tek Imaging	948	$551,671	$582	1,145	$620,646	$542	-17%	-11%	7%
Emergency Room	610	$347,470	$570	516	$281,849	$546	18%	23%	4%
Urgent Care	43	$3,272	$76	79	$5,125	$65	-46%	-36%	17%
Scripts	1,896	$7,537,387	$3,975	2,218	$9,060,770	$4,085	-15%	-17%	-3%

Breast Cancer	Fully Underserved[1] ("Full")			Partially Underserved[1] ("Partial")			Variance (Full vs Partial)		
Service Category	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter
Inpatient Hospital	181	$1,137,683	$6,286	198	$1,265,626	$6,392	-9%	-10%	-2%
Hi-Tek Imaging	530	$474,475	$895	732	$679,648	$928	-28%	-30%	-4%
Emergency Room	232	$143,617	$619	299	$187,897	$628	-22%	-24%	-1%
Urgent Care	30	$1,682	$56	34	$2,613	$77	-12%	-36%	-27%
Scripts	705	$3,067,580	$4,351	1,016	$3,636,923	$3,580	-31%	-16%	22%

Prostate Cancer	Fully Underserved[1] ("Full")			Partially Underserved[1] ("Partial")			Variance (Full vs Partial)		
Service Category	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter
Inpatient Hospital	121	$599,869	$4,958	160	$1,054,122	$6,588	-24%	-43%	-25%
Hi-Tek Imaging	293	$204,317	$697	432	$311,928	$722	-32%	-34%	-3%
Emergency Room	140	$71,361	$510	153	$69,962	$457	-8%	2%	11%
Urgent Care	6	$213	$36	22	$1,046	$48	-73%	-80%	-25%
Scripts	458	$2,441,985	$5,332	636	$2,788,379	$4,384	-28%	-12%	22%

[1] As identified by Arkansas Department of Health. Data Source: Health Resources & Services Administration (HRSA). Counties are tagged as fully Underserved or partially underserved. For the purposes of this analysis, Grant county– an untagged county by HRSA - was designated as partially underserved.

Spotlight On: Oncology (Medically Underserved Areas)
All Members

Colon Cancer	Fully Underserved[1] ("Full")			Partially Underserved[1] ("Partial")			Variance (Full vs Partial)		
Service Category	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter
Inpatient Hospital	96	$766,547	$7,985	128	$946,082	$7,391	-25%	-19%	8%
Hi-Tek Imaging	196	$292,137	$1,490	205	$228,938	$1,117	-4%	28%	33%
Emergency Room	98	$67,199	$686	74	$40,660	$549	32%	65%	25%
Urgent Care	3	$390	$130	3	$234	$78	0%	67%	67%
Scripts	212	$1,139,964	$5,377	211	$658,891	$3,123	0%	73%	72%

Lung Cancer	Fully Underserved[1] ("Full")			Partially Underserved[1] ("Partial")			Variance (Full vs Partial)		
Service Category	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter
Inpatient Hospital	128	$870,180	$6,798	139	$1,855,953	$13,352	-8%	-53%	-49%
Hi-Tek Imaging	220	$422,593	$1,921	224	$362,087	$1,616	-2%	17%	19%
Emergency Room	133	$85,186	$640	62	$43,414	$700	115%	96%	-9%
Urgent Care	2	$18	$9	53	$304	$6	-96%	-94%	58%
Scripts	195	$1,580,193	$8,104	193	$2,107,546	$10,920	1%	-25%	-26%

All Cancers	Fully Underserved[1] ("Full")			Partially Underserved[1] ("Partial")			Variance (Full vs Partial)		
Service Category	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter	Encounters	Total Cost	Cost per Encounter
Inpatient Hospital	1,184	$10,949,817	$9,248	1,388	$13,747,952	$9,905	-15%	-20%	-7%
Hi-Tek Imaging	2,619	$2,413,059	$921	3,277	$2,743,097	$837	-20%	-12%	10%
Emergency Room	1,435	$948,504	$661	1,372	$905,345	$660	5%	5%	0%
Urgent Care	101	$7,493	$74	229	$12,159	$53	-56%	-38%	40%
Scripts	4,111	$18,942,944	$4,608	5,115	$25,654,567	$5,016	-20%	-26%	-8%

[1] As identified by Arkansas Department of Health. Data Source: Health Resources & Services Administration (HRSA). Counties are tagged as fully Underserved or partially underserved. For the purposes of this analysis, Grant county– an untagged county by HRSA - was designated as partially underserved.

Key Takeaways From Oncology Review

1. Communicate and incentivize age/gender specific cancer screenings

2. Enhance utilization management programs that require adherence to national standards of oncology care (NCCN Guidelines and appropriate genetic testing)

3. Connect oncology patients to nationally recognized Oncology Centers of Excellence (COE) virtually

4. Established vendor partnerships exist within different carriers and independent cancer care centers can offer virtual consultation

Spotlight On: Musculoskeletal (Overview)
All Members

Type of Surgery	January 2019 – December 2029					
	Patients	Surgeries	% of All Surgeries	Total Cost	Cost per Surgery	ALOS[1]
Femur/Knee	444	489	35%	$4,937,676	$10,097	4.2
Pelvis/Hip	341	368	26%	$3,541,713	$9,624	4.6
Spine	228	244	17%	$5,951,990	$24,393	6.5
Shoulder	103	109	8%	$890,284	$8,168	3.2
General	57	63	4%	$3,431,020	$54,461	21.8
Lower Leg/Ankle	50	56	4%	$830,163	$14,824	11.1
Foot/Toes	27	32	2%	$336,611	$10,519	8.3
Neck/Thorax	15	15	1%	$288,152	$19,210	5.4
Head	8	10	1%	$2,072,234	$207,223	40.9
Upper Arm/Elbow	10	10	1%	$95,990	$9,599	5.4
Hand/Fingers	6	6	0%	$38,287	$6,381	4.0
Forearm/Wrist	4	4	0%	$7,030	$1,757	3.5
Abdomen	2	2	0%	$30,164	$15,082	3.5
Back/Flank	1	1	0%	$45,725	$45,725	5.0
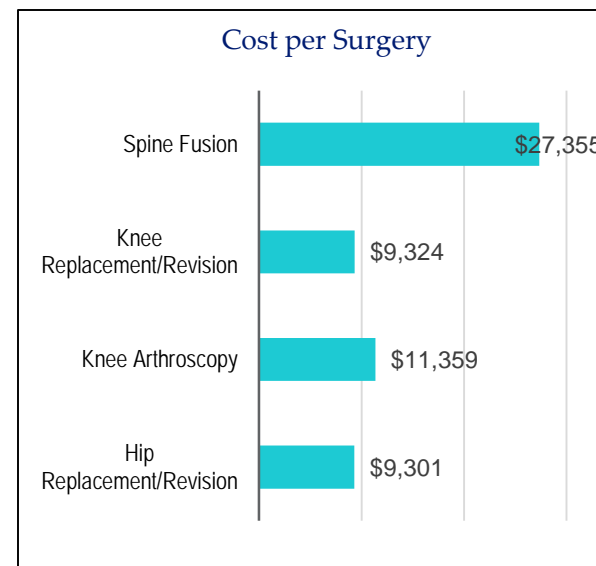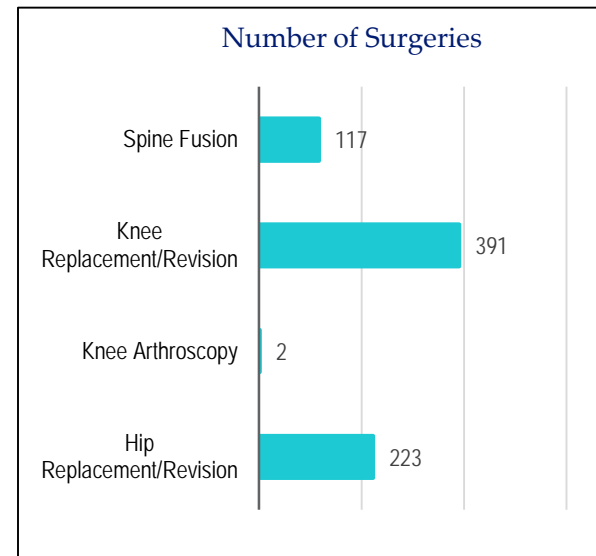
Select Type of Surgery	Oncology Breakdown				
	Patients	Surgeries	Total Cost	Cost per Surgery	ALOS[1]
Hip Replacement/Revision	223	240	$2,232,244	$9,301	2.4
Knee Arthroscopy	2	2	$22,717	$11,359	8.0
Knee Replacement/Revision	391	421	$3,925,564	$9,324	3.4
Spine Fusion	117	120	$3,282,622	$27,355	4.1

Number of Surgeries

- Spine Fusion — 117
- Knee Replacement/Revision — 391
- Knee Arthroscopy — 2
- Hip Replacement/Revision — 223

Cost per Surgery

- Spine Fusion — $27,355
- Knee Replacement/Revision — $9,324
- Knee Arthroscopy — $11,359
- Hip Replacement/Revision — $9,301

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[1] ALOS means average length of stay.

Spotlight On: Musculoskeletal (Medically Underserved Areas)
All Members

	January 2020 – December 2020											
	Fully Underserved[1] ("Full")				Partially Underserved[1] ("Partial")				Variance (Full vs Partial)			
Type of Surgery	Patients	Surgeries	Total Cost	Cost per Surgery	Patients	Surgeries	Total Cost	Cost per Surgery	Patients	Surgeries	Total Cost	Cost per Surgery
Femur/Knee	174	194	$1,839,879	$9,484	270	295	$3,097,797	$10,501	-36%	-34%	-41%	-10%
Pelvis/Hip	136	149	$1,458,132	$9,786	205	219	$2,083,582	$9,514	-34%	-32%	-30%	3%
Spine	103	109	$2,577,925	$23,651	125	135	$3,374,065	$24,993	-18%	-19%	-24%	-5%
Shoulder	44	49	$356,937	$7,284	59	60	$533,347	$8,889	-25%	-18%	-33%	-18%
General	31	35	$2,324,959	$66,427	26	28	$1,106,061	$39,502	19%	25%	110%	68%
Lower Leg/Ankle	24	28	$457,453	$16,338	26	28	$372,710	$13,311	-8%	0%	23%	23%
Foot/Toes	16	19	$140,329	$7,386	11	13	$196,282	$15,099	45%	46%	-29%	-51%
Neck/Thorax	8	8	$175,425	$21,928	7	7	$112,727	$16,104	14%	14%	56%	36%
Head	5	7	$2,021,899	$288,843	3	3	$50,335	$16,778	67%	133%	3917%	1622%
Upper Arm/Elbow	4	4	$39,068	$9,767	6	6	$56,922	$9,487	-33%	-33%	-31%	3%
Hand/Fingers	2	2	$19,819	$9,910	4	4	$18,468	$4,617	-50%	-50%	7%	115%
Forearm/Wrist	1	1	$13,735	$13,735	1	1	$16,430	$16,430	0%	0%	-16%	-16%
Abdomen	-	-	-	-	4	4	$7,030	$1,757	NA	NA	NA	NA
Back/Flank	-	-	-	-	1	1	$45,725	$45,725	NA	NA	NA	NA

✴ Segal

Spotlight On: Musculoskeletal (Medically Underserved Areas)
All Members

January 2019 – December 2019												
	Fully Underserved[1] ("Full")				Partially Underserved[1] ("Partial")				Variance (Full vs Partial)			
Type of Surgery	Patients	Surgeries	Total Cost	Cost per Surgery	Patients	Surgeries	Total Cost	Cost per Surgery	Patients	Surgeries	Total Cost	Cost per Surgery
Hip Replacement/Revision	83	91	$809,962	$8,901	140	149	$1,422,282	$9,546	-41%	-39%	-43%	-7%
Knee Arthroscopy	-	-	-	-	2	2	$22,717	$11,359	NA	NA	NA	NA
Knee Replacement/Revision	149	160	$1,402,412	$8,765	242	261	$2,523,152	$9,667	-38%	-39%	-44%	-9%
Spine Fusion	52	54	$1,544,434	$28,601	65	66	$1,738,188	$26,336	-20%	-18%	-11%	9%

Surgeries Comparison
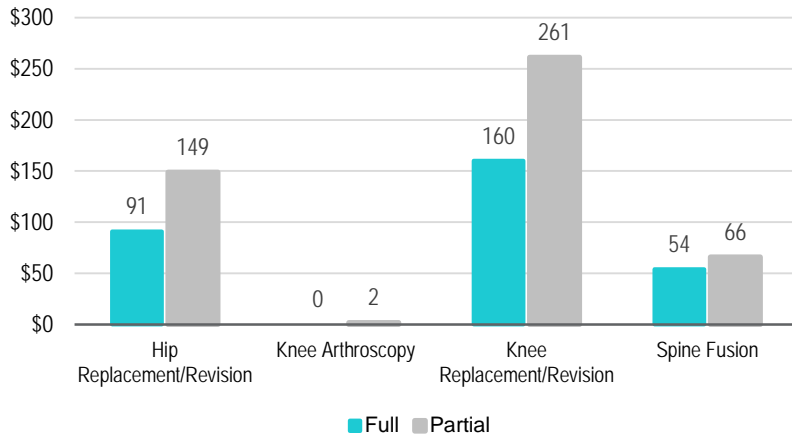
Cost per Surgery Comparison
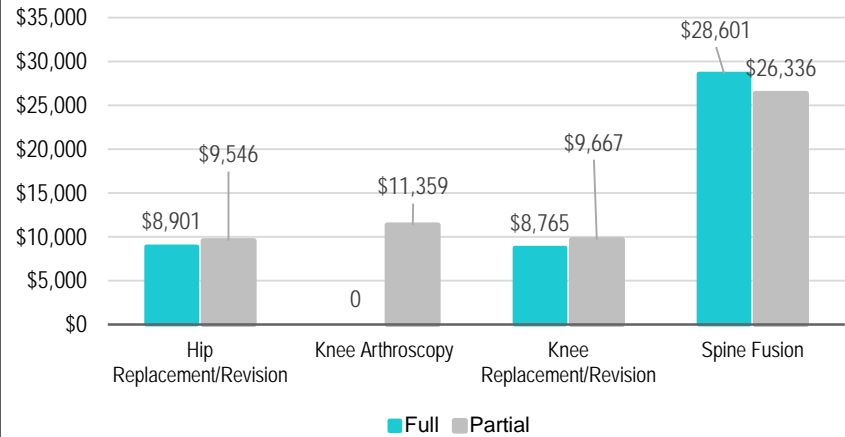
Key Takeaways From Musculoskeletal Review
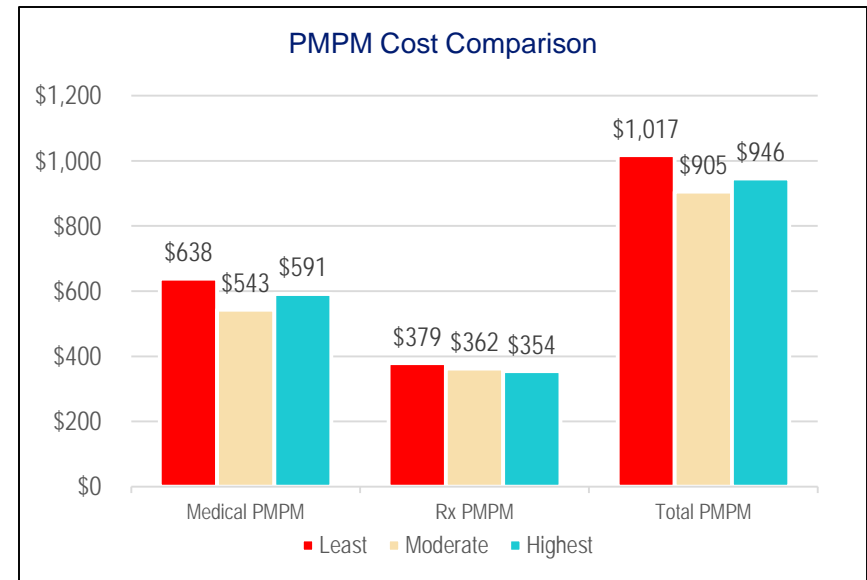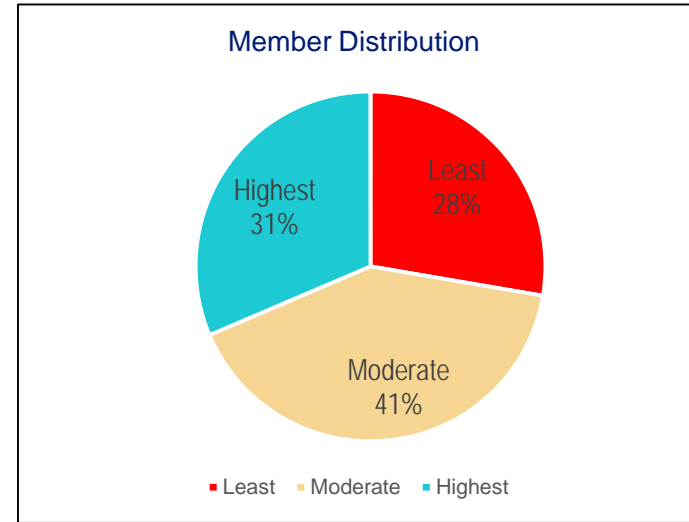
1. Consider a prevention program related to early interventions for physical therapy and weight loss

2. Direct contracting through bundled payments can be established independent of a carriers network for high volume high cost procedures

3. Established vendor partnerships exist within different carriers and independent vendors can offer virtual physical therapy or a separate network

Spotlight On: Diabetes (Area Deprivation Index)
All Members

Area Deprivation Index (ADI) Levels[1]			
Categories	Least Disadvantaged ("Least")	Moderately Disadvantaged ("Moderate")	Most Disadvantaged ("Highest")
Membership			
Members	4,497	6,641	5,101
% of Total	28%	41%	31%
Claim Experience			
Medical PMPM	$638	$543	$591
Rx PMPM	$379	$362	$354
Total PMPM	$1,017	$905	$946
Relative PMPM[2]	1.07	0.95	1.00
Total Risk Score	19.62	19.76	19.72
Key Utilization Metrics (per 1,000)			
Hospital Inpatient	158	174	162
Emergency Room	237	247	284
Urgent Care	36	25	32
Preventive Visits	282	255	245
Scripts	41,826	43,572	46,608

Member Distribution

- Least · Moderate · Highest

PMPM Cost Comparison

- Least · Moderate · Highest

[1] Refer to appendix for more details on Area Deprivation Index (ADI).Scores 1-3 are assigned to least disadvantaged category, 4-7 are assigned to moderately disadvantaged; 9-10 are assigned to most disadvantaged.
[2] Reflects the ratio of PMPM costs of members with the specific level to the overall PMPM of diabetic members.

Spotlight On: Obesity (Area Deprivation Index)
All Members

Area Deprivation Index (ADI) Levels[1]			
Categories	Least Disadvantaged ("Least")	Moderately Disadvantaged ("Moderate")	Most Disadvantaged ("Highest")
Membership			
Members	7,304	9,532	7,054
% of Total	31%	40%	30%
Claim Experience			
Medical PMPM	$529	$503	$585
Rx PMPM	$218	$210	$209
Total PMPM	**$746**	**$713**	**$793**
Relative PMPM[2]	1.00	0.95	1.06
Total Risk Score	15.73	15.89	16.19
Key Utilization Metrics (per 1,000)			
Hospital Inpatient	125	138	149
Emergency Room	234	256	297
Urgent Care	47	36	46
Preventive Visits	350	320	299
Scripts	27,778	29,655	30,836

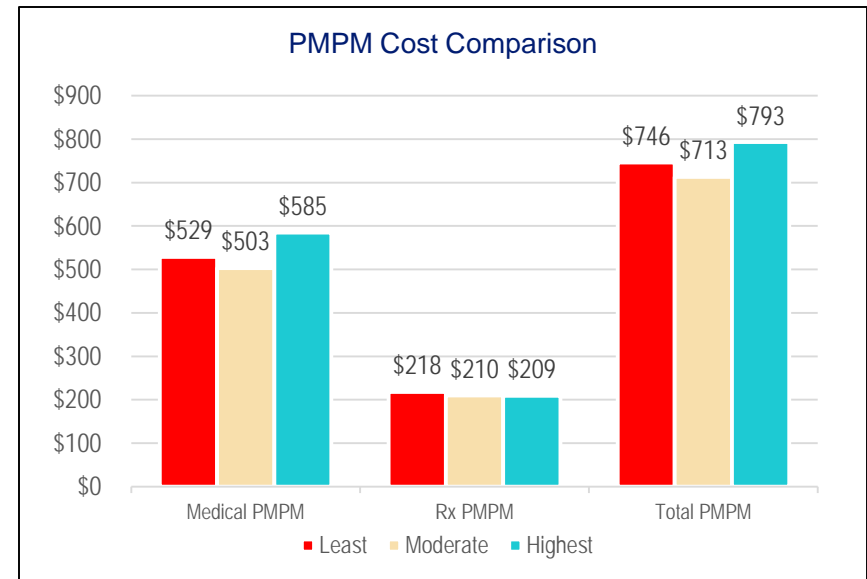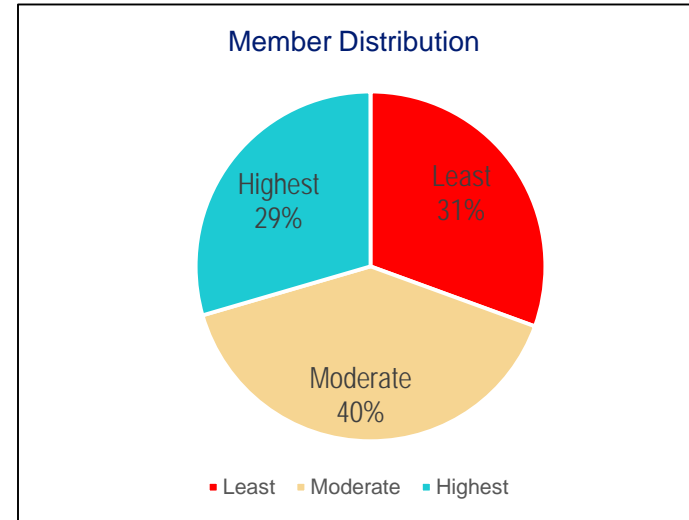### Member Distribution

PMPM Cost Comparison

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[1] Refer to appendix for more details on Area Deprivation Index (ADI).Scores 1-3 are assigned to least disadvantaged category, 4-7 are assigned to moderately disadvantaged; 9-10 are assigned to most disadvantaged.
[2] Reflects the ratio of PMPM costs of members with the specific level to the overall PMPM of diabetic members.

Key Takeaways From Obesity/Diabetes Review

1. Diabetes Prevention
   a. Add a CDC approved Diabetes Prevention Program (DPP) through a digital platform
   b. Incentive enrollment and key millstones

2. Diabetes Management
   a. Add a digital management program that reduces the out of pocket cost to the member and increases compliance with prescribed treatment

3. Risk Reduction
   a. Add a digital diabetes program that focuses on does optimization with lifestyle changes reducing independence on high cost injectable insulin

4. Establish quantifiable performance guarantees tied to individual health outcomes
   a. A pilot can be focused on the highest cost diabetics

Appendix

Preventive Screening Metrics

The table below illustrates the restrictions applied when defining population that is applicable for each disease condition.

Disease Condition	Age/Gender Restrictions	Notes
Skin cancer	Not Applicable	The U.S. Preventive Services Task Force (USPSTF) has concluded there is not enough evidence to recommend for or against routine screening (total body examination by a doctor) to find skin cancers early (https://www.cdc.gov/cancer/skin/basic_info/screening.htm).
Breast cancer	Female, age 40-69	
Colon cancer	All genders, age 50-75	
Prostate cancer	Male, age 50-75	
Lung cancer	Not Available	Unable to compute preventive screening metrics due to lack of smoking members identifier and tobacco consumption volume.

About the Area Deprivation Index (ADI)

The Area Deprivation Index (ADI) is based on a measure created by the Health Resources & Services Administration (HRSA) over three decades ago, and has since been refined, adapted, and validated to the Census Block Group neighborhood level by Amy Kind, MD, PhD and her research team at the University of Wisconsin-Madison. It allows for rankings of neighborhoods by socioeconomic disadvantage in a region of interest (e.g. at the state or national level). It includes factors for the theoretical domains of income, education, employment, and housing quality. It can be used to inform health delivery and policy, especially for the most disadvantaged neighborhood groups.

https://www.neighborhoodatlas.medicine.wisc.edu/

What do the ADI values mean?

The ADIs on this website are provided in national percentile rankings at the block group level from 1 to 100. The percentiles are constructed by ranking the ADI from low to high for the nation and grouping the block groups/neighborhoods into bins corresponding to each 1% range of the ADI. Group 1 is the lowest ADI and group 100 is the highest ADI. A block group with a ranking of 1 indicates the lowest level of "disadvantage" within the nation and an ADI with a ranking of 100 indicates the highest level of "disadvantage".

Similarly, ADIs are also available in deciles from 1 to 10 for each individual state. The state deciles are constructed by ranking the ADI from low to high for each state alone without consideration of national ADIs. Again, group 1 is the lowest ADI (least disadvantaged) and 10 is the highest ADI (most disadvantaged).

Appendix

What methodology was used to create these ADI datasets?

The following two articles explain the methodology that was used to create these ADI datasets:

- Singh GK. Am J Public Health 2003;93(7):1137-43.Area deprivation and widening inequalities in US mortality, 1969-1998

- Kind AJH, Jencks S, Brock J, et al. Ann Intern Med 2014;161(11):765-74. Neighborhood socioeconomic disadvantage and 30-day rehospitalizations: an analysis of Medicare data

Data Assumptions

The analysis using ADI is dependent on having enrollment data that shows member data down to the granular census block zip code (9-digit zip code). The State's enrollment data received only included 5-digit zip code and therefore assumption on ADI scores had to be made.

In the cases where more than one ADI score was available when grouping the census blocks into a single 5-digit zip code, a weighted average ADI score was assigned based on the number of census blocks present within the group (see example below)

Examples below are for illustration only and not actual values

Example 1: all census blocks within the 5-digit zip code with identical score

5-digit Zip Code	Census Block	ADI Score
12345	G123450030	8
12345	G123450031	8
Average ADI		8

Example 2: Census blocks within the 5-digit zip code with different scores

5-digit Zip Code	Census Block	ADI Score
12345	G123450030	8
12345	G123450031	7
12345	G123450031	1
Average ADI		5