## Neighborhood Deprivation and Association with Implant Complications Following Total Joint Arthroplasty: A Nationwide Analysis

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INTRODUCTION: Comprised of 17 census-based markers, the Area Deprivation Index (ADI), is a weighted index of poverty and material deprivation. The literature lacks studies on whether neighborhood deprivation is associated with implant survivorship. Therefore, the purpose was to assess whether patients who have high ADIs (greater disadvantage) undergoing primary total joint arthroplasties (TJA) were associated with differences in 2-year implant-related complications using a nationwide sample

METHODS: A retrospective query of all primary TJAs (total knee and hip arthroplasties) was performed using an insurance claims database from 2010 through 2021. ADI is reported on a scale of 0-100 with higher numbers associated with greater disadvantage. Patients with high ADI were 1:1 propensity-score matched to a comparison group by age, gender, and Elixhauser Comorbidity Index (ECI). This yielded 625,232 total patients (Total Knee Arthroplasty (TKA)=385,794, Total Hip Arthroplasty (THA)=239,438) evenly divided between each procedure. Primary endpoints were to compare 2-year implant related complications including periprosthetic joint infections (PJI), periprosthetic fractures, dislocations, aseptic loosenings, and all-cause revisions. Multivariable logistic regression models were used to calculate the odds-ratios (OR) of ADI on 2-year implant complications. P-values less than 0.001 were statistically significant RESULTS:

Patients undergoing TKAs from high ADIs experienced no difference in the incidence and odds of any implant-related complications (5.1 versus 5.0%; OR: 1.01, P = 0.532), including PJIs (1.8 versus 1.7%; OR: 1.05, P = 0.031), periprosthetic fractures (0.2 versus 0.2%; OR: 0.96, P = 0.615), dislocations (0.3 versus 0.3%; OR: 1.03, P = 0.623), aseptic loosenings (0.7 versus 0.7%; OR: 1.00, P = 0.952), or all-cause revisions (2.1 versus 2.1%; OR: 0.99, P = 0.991). Patients undergoing THAs from high ADIs experienced greater incidence and odds of developing any implant-related complications (6.6 versus 6.2%; OR: 1.07, P = 0.0004), including PJIs (1.8 versus 1.6%; OR: 1.14, P < 0.0001). DISCUSSION AND CONCLUSION:

Socioeconomically disadvantaged patients experienced similar rates and odds of 2-year implant related complications following TKA, however slight differences were found following THA.

High ADI N (%) Lower ADI N (%) OR

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	High ADI (> 90%)		Case-Matched		_		High ADI (> 90%)		Case-	Case-Matched			High ADI N (%)	Lower ADI N (%)	OR	95% CI	P-value
DEMOGRAPHICS		%		%	P-value <sup>3</sup>	DEMOGRAPHICS	n	%	п	%	P-value3	PJh	3,499 (1.8)	3,323 (1.7)	1.05	1.00-1.11	0.031
ge (Years)						Are (Verra)						Periprosthetic Fractures	328 (0.2)	341 (0.2)	0.95	0.83-1.12	0.615
15-19	55	0.0	55	0.0	0.99	15.19	188	0.2	188	0.2	0.99	Knee Dislocations	540 (0.3)	524 (0.3)	1.03	0.91-1.16	0.623
20-24	24	0.0	24	0.0		20-24	164	0.1	164	0.1		Aserbic Lorsentres	4,0274 (0.7)	1,271 (0.7)	0.00	0.95-1.08	0.932
25-29	50	0.0	50	0.0		25,29	278	0.2	278	0.2		Tetal Knee Involver	4,094 (4.1)	4////(4.1)	0.37	0.30-1.04	0.391
30-34	137	0.1	137	0.1		10-34	498	0.4	498	0.4		Complications	9,739 (5.1)	9,558 (5.0)	1.01	0.98-1.05	0.532
35-39	401	0.2	401	0.2		15.39	881	0.7	881	0.7		Table 3. Comparison of 2-1	ear Tetal Knee Arth	oplasty (TKA) Implan	at Compli-	cations for	
40-44	1,438	0.7	1,438	0.7		40-44	1.960	1.6	1.960	1.6		Patients of Higher and Low	er Area Deprivation	Indices (ADI).			
45-49	4,880	2.5	4,880	2.5		45.49	4.525	3.8	4.525	3.8							
50.54	12,527	6.5	12,527	6.5		10.11	9.612	8.0	9.612	8.0		ADI = Area Dependation Its	ex Mix Confidence h				
55-59	22,901	11.9	22,901	11.9		55.50	15.416	12.9	15416	12.9		PJI- Peri-prosthetic joint in	fection	PAL PRI			
60-64	32,684	16.9	32,684	16.9		60.64	19,418	16.2	19.418	16.2		Reference is patients of low	er deprivation				
65-69	36,987	19.2	36,987	19.2		65-69	19 578	16.4	19 578	16.4		Bold values denote statistic	d significance to the	$P \le 0.001$ level			
70-74	46,788	24.3	46,788	24.3		20.74	25 776	21.5	25 776	21.5							
75-79	28,754	14.9	28,754	14.9		75.79	12.656	14.7	12.656	14.7							
80+	5,271	2.7	5,271	2.7		804	1 769	3.1	3 769	3.1							
iex						807 Sar	2,109	5.1	3,109	3.4							
Women	119,330	61.9	119,330	61.9	0.99	Women	67.097	56.0	67.097	56.0	0.99						
Men	73.567	38.1	73,567	38.1		Mon	\$2,622	44.0	52 622	44.0	0.33						
Comorbidity Bunden						Comorbidity Burden	rayras	44.0	JEJVER	44.0							
						ECI											
(CI						0	12 571	10.5	12 571	10.5	0.99						
	15,963	8.3	15,963	8.5	0.99	ĩ	17.019	14.2	17.019	14.2							
	23,573	12.2	23,573	12.2		1	19.145	16.0	19.145	16.0							
	29,833	15.5	29,833	15.5		1	17.486	14.6	17 486	14.6							
	30,002	15.6	30,002	15.6			14 369	12.0	14 369	12.0							
	25,015	13.0	25,015	13.0			11.059	9.2	11.059	9.2							
	19,745	10.2	19,745	10.2			8 182	6.8	\$ 182	6.8							
	14,659	7.0	14,659	7.0		-	6.047	5.1	6.047	5.1							
	10,587	5.5	10,587	3.5		ŝ	4.176	3.5	4.176	3.5							
	7,609	3.9	7,609	3.9			3.088	2.6	3.088	2.6							
)	5,312	2.8	5,312	2.8		10	2,131	1.8	2.131	1.8							
0	3,687	1.9	3,687	1.9		10	1 662	1.3	1 567	1.1							
1	2,414	1.3	2,414	1.3		11	991	0.8	991	0.8							
2	1,687	0.9	1,687	0.9		12	711	0.6	711	0.6							
3	1,053	0.5	1,053	0.5		13	490	0.4	400	0.4							
4	709	0.4	709	0.4		14	190	2.4	1 691	2.4							
5+	1.049	0.5	1 049	0.5		12+	2,883	a.*	4,693								