

Racial/Ethnic Disparities in Second Breast Lesions after DCIS

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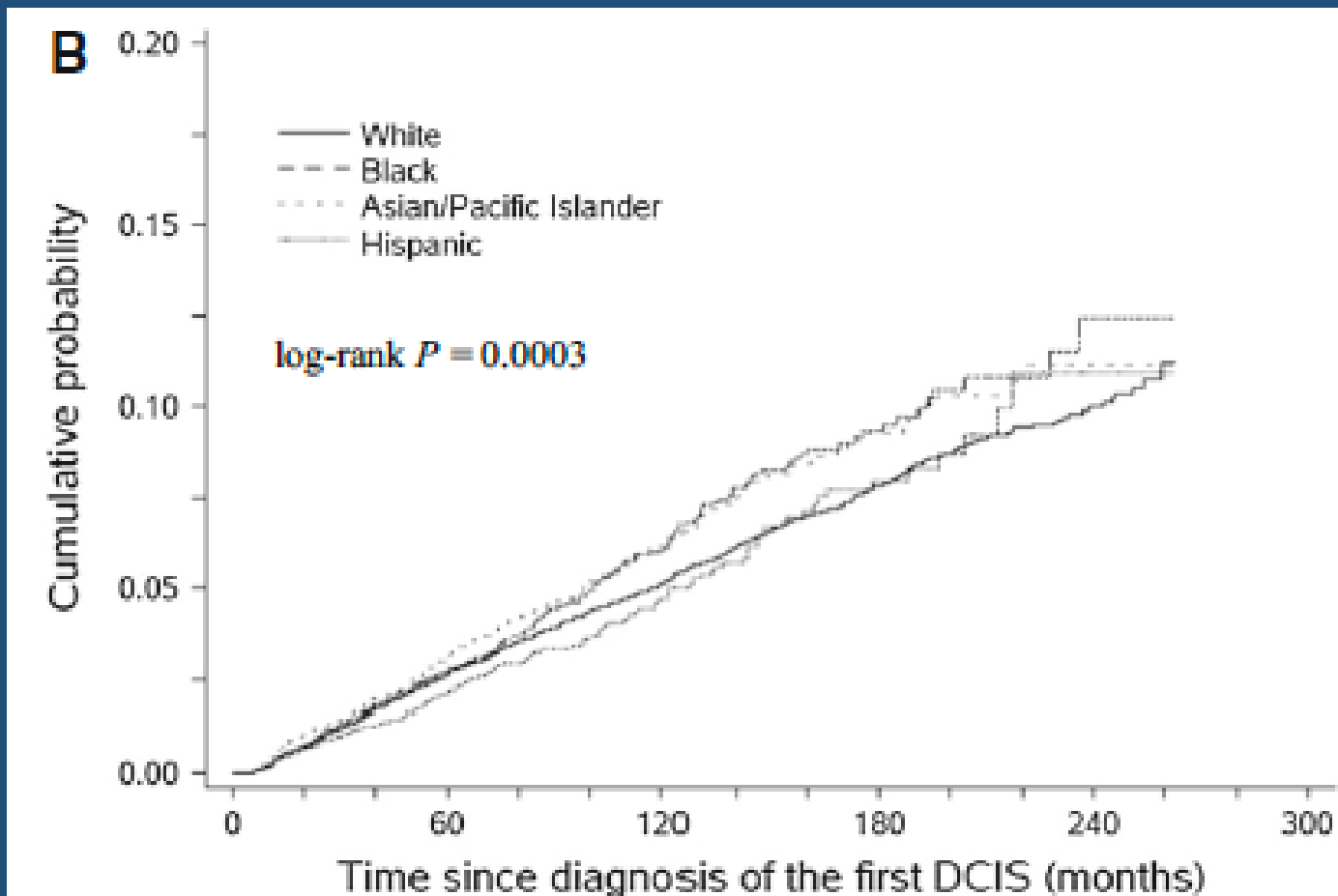
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Why DCIS?

- DCIS over 45,000 cases per year
- SEER 18 Cancer Registries
 - Cases from January 1988 through June 2009
 - 102,000 Cases
- Significant excess second breast lesions
 - Ipsilateral DCIS and invasive breast cancer (contralateral)
 - African American and Hispanic women at increased risk

Second breast tumor - contralateral



No. at risk

White	75431	44557	16256	5806	985
Black	9921	5122	1588	471	81
Asian/PI	9246	5203	1893	570	95
Hispanic	7891	3898	1167	351	43

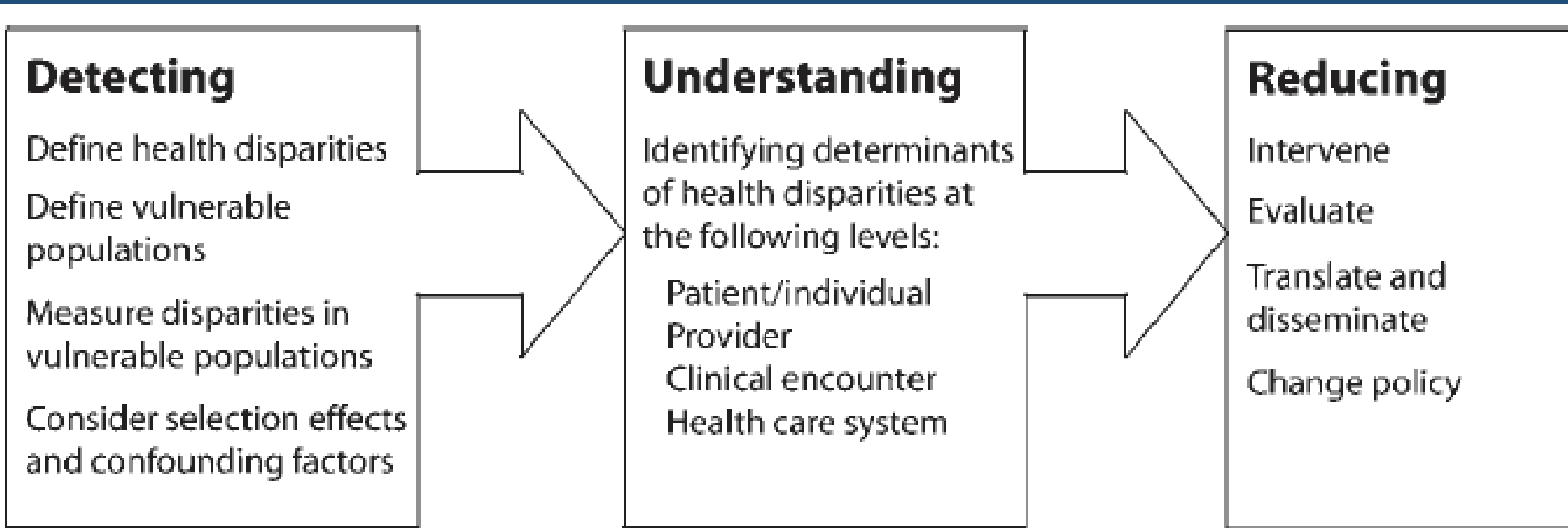
Risk of ipsilateral breast tumors

	Person-years	Ipsilateral breast tumors			Ipsilateral DCIS		
		Cases	RR ^c	95 % CI ^c	Cases	RR ^c	95 % CI ^c
White	355,850	2,104	1.00	Referent	595	1.00	Referent
Black	39,822	3,30	1.46	1.29–1.65	98	1.48	1.18–1.86
Asian/PI	39,132	255	1.11	0.96–1.29	62	0.94	0.70–1.27
Hispanic	32,118	236	1.18	1.03–1.36	69	1.33	1.02–1.72

$P_{\text{heterogeneity}} = 0.25$

RR relative risk, 95 % CI 95 % confidence interval

Phases of disparities research



Evaluating DCIS Disparities

- Screening- access
- Treatment
 - Rates of different treatment options
 - Delay of treatment
 - Completion of treatment course
- Outcome
 - Relapse or development of secondary breast tumors
 - Breast-Cancer Specific Survival

Data Sources

- **SEER 17 Cancer Registries**
 - Cases from January 1992 through June 2013
 - 138,874 Cases
- **Missouri Cancer Registry**
 - Cases from January 1996 through December 2012
 - 4,531 Cases

SEER Study Population

- Women aged 20-84 diagnosed with primary, unilateral DCIS
 - Followed at least 6 months
 - No prior cancer history
 - Excluded women with BL mastectomy

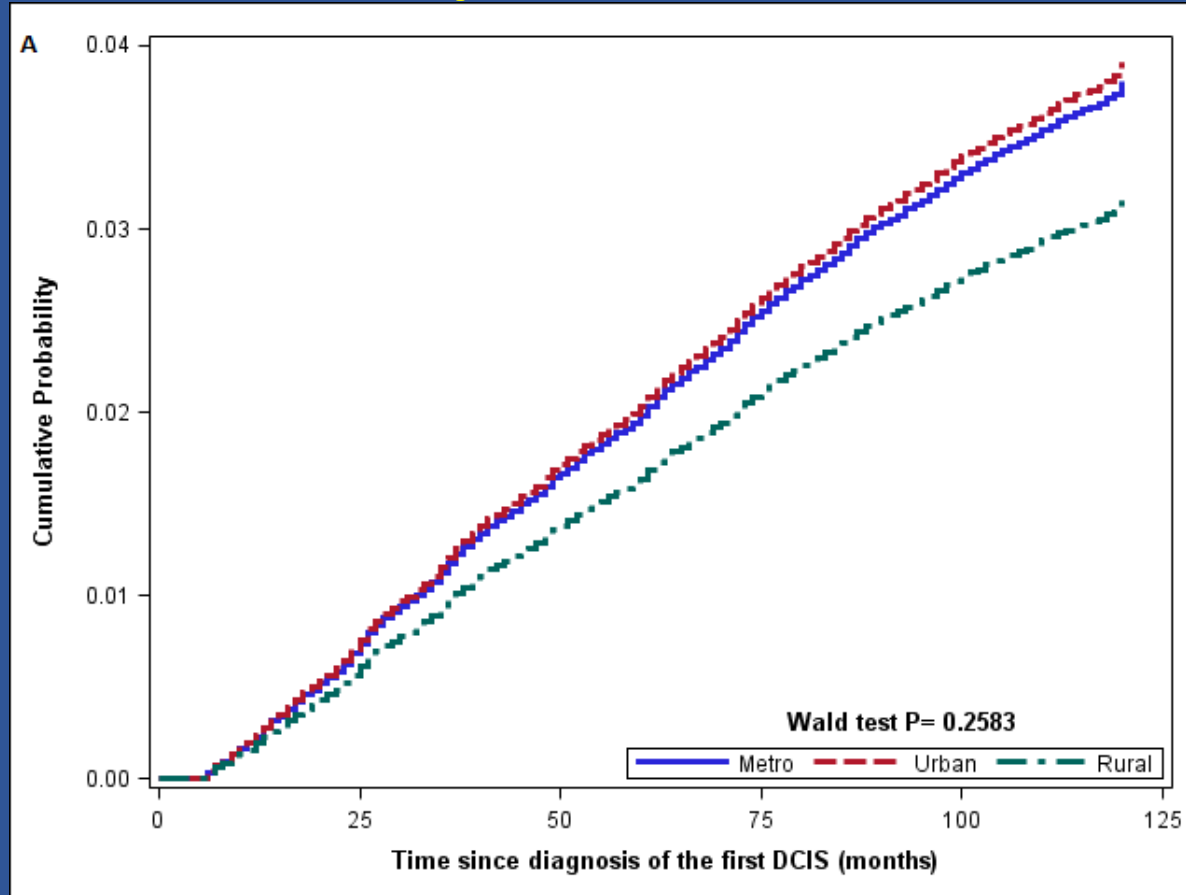
SEER Limitations

- No variable information relating to socioeconomic status
- No variable information encoding distance traveled for screening or treatment

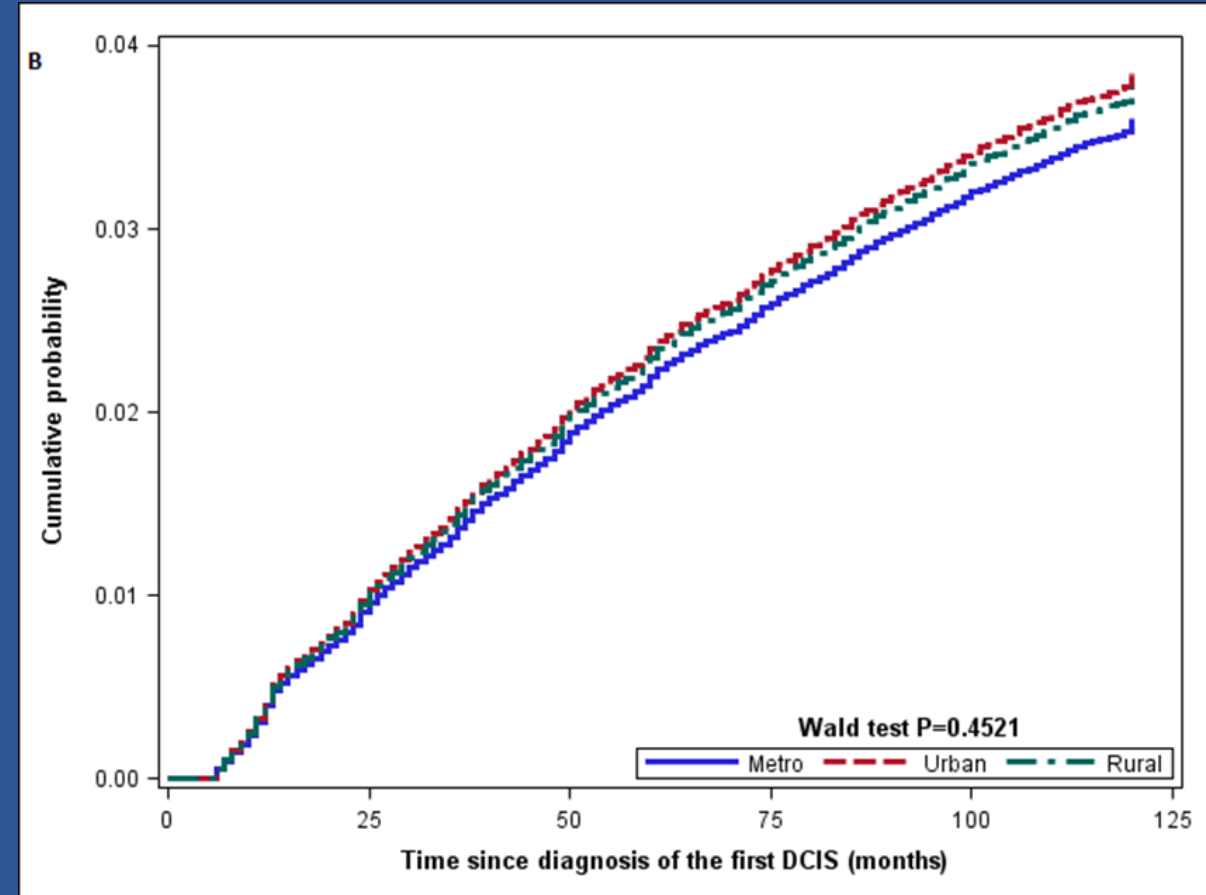
	<u>No. of patients (%)</u>		
	<u>Metro</u>	<u>Urban</u>	<u>Rural P</u>
<u>Total</u>	122,865(91.1)	8,439(6.2)	3,570(2.7) -
<u>Age at diagnosis, y</u>			
Mean(SD)	58.2(11.9)	60.0(11.7)	61.0(11.6) <.0001
<u>Race</u>			
NH-White	85,397(70.2)	7,066(85)	3,231(91) <.0001
NH-Black	13,053(10.7)	646(7.8)	209(5.9)
NH-Asian	12,007(9.9)	351(4.2)	8(0.2)
His	11,159(9.2)	255(3.1)	104(2.9)
Others/missing	1,249	121	18
<u>Histological subtype</u>			
comedo	15,813(12.9)	1,415(16.8)	642(18) <.0001
<u>Grade</u>			
poor diff	43,893(45.3)	2,888(46.5)	1,138(43.9) <.0001
<u>Tumor size, cm</u>			
<2cm	63,917(74.1)	4,346(78.3)	1,791(78.8) <.0001
<u>Estrogen receptor</u>			
negative	10,809(15.6)	828(17.8)	340(17.4)
positive	58,470(84.4)	3,822(82.2)	1,608(82.6) <.0001
<u>Surgery for first DCIS</u>			
None	2,956(2.4)	229(2.7)	76(2.1)
BCS	87,563(71.5)	5,770(68.8)	2,311(65.1) <.0001
MAS	31,961(26.1)	2,391(28.5)	1,165(32.8)
<u>Radiation therapy for first DCIS</u>			
No	63,643(52.8)	4,458(54.3)	1,920(56.7)
Yes	56,979(47.2)	3,747(45.7)	1,464(43.3) <.0001
<u>Surgery and radiation therapy for first DCIS</u>			
No surgery	2,956(2.4)	229(2.7)	76(2.1)
BCS alone	31,913(26.1)	2,139(25.5)	871(24.5)
BCS and radiation	55,650(45.4)	3,631(43.3)	1,440(40.5)

Incidence of Second Breast Tumors by Location Group

Ipsilateral*



Contralateral



* Women who received mastectomies excluded from analysis

Locational Differences in Risk of Contralateral Breast Tumors

	Cases	Person-years	RR ^a	95 % CI ^a
Breast-conserving surgery alone				
Metro	1,305	87,968	1.00	Referent
Urban	80	4,526	0.95	0.74–1.23
Rural	29	2,137	0.84	0.56–1.26
Breast-conserving surgery and radiation therapy				
Metro	2,148	140,443	1.00	Referent
Urban	141	9,385	0.98	0.81–1.18
Rural	58	3,818	1.01	0.76–1.35
Mastectomy				
Metro	1,426	101,506	1.00	Referent
Urban	126	7,913	1.32	1.08-1.62
Rural	61	5,194	1.34	1.0-1.79
P_{interaction} = 0.13				

Missouri Cancer Registry: Disparities in DCIS Treatment

Missouri Cancer Registry Study Population

- Women diagnosed with primary DCIS and treated with breast conserving surgery (BCS) and radiation therapy (RT)
 - Aged 20-84 years
 - Diagnosed between 1998-2012
- Excluded cases where RT was not initiated within 12 months postdiagnosis

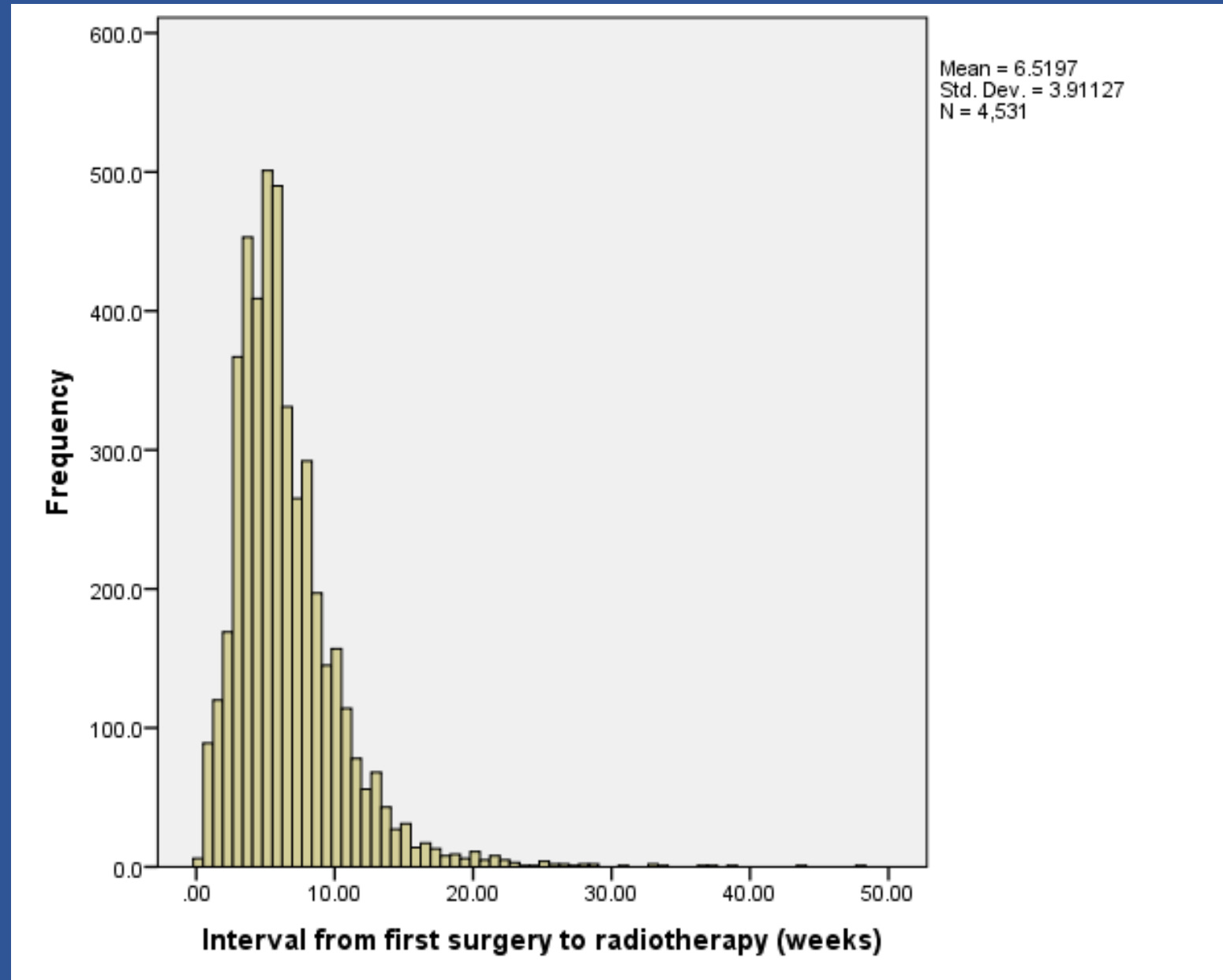
Missouri Cancer Registry Limitations

- **Awaiting localization data**
 - Information regarding socioeconomic status
- **Population fairly small (N=4531)**
 - Insufficient power for analysis of subsequent breast event or cumulative mortality
 - **Focus on treatment disparities**
- **No variable information for duration of chemotherapy in MCR**
 - Excluded cases involving chemotherapy

Delay of Radiation Therapy for DCIS

- NCI recommends RT to be initiated within 8 weeks of surgery or 4 weeks of after chemotherapy completion
 - National Cancer Institute. Breast Cancer (PDQ): Treatment, Ductal Carcinoma In Situ. July 8, 2016. http://www.cancer.gov/types/breast/hp/breast-treatment-pdq#link/_1576_toc. Accessed July 11, 2016.
- **Delay increases risk of recurrence**
 - Ying Liu, Shumei Yun, Min Lian, Graham Colditz. Washington University School of Medicine in St. Louis, St. Louis, MO; Office of Epidemiology, Missouri Department of Health and Senior Services, Jefferson City, MO "Radiation therapy delay and risk of ipsilateral breast tumors in women with ductal carcinoma in situ" [Abstract] In: American Association for Cancer Research Annual Meeting; 2016 Apr 16-20. New Orleans, LA. AACR, 2016.
 - R.S. Punglia, A.M. Saito, B.A. Neville, et al. Impact of interval from breast conserving surgery to radiotherapy on local recurrence in older women with breast cancer: Retrospective cohort analysis. *BMJ*, 340 (2010), p. c845

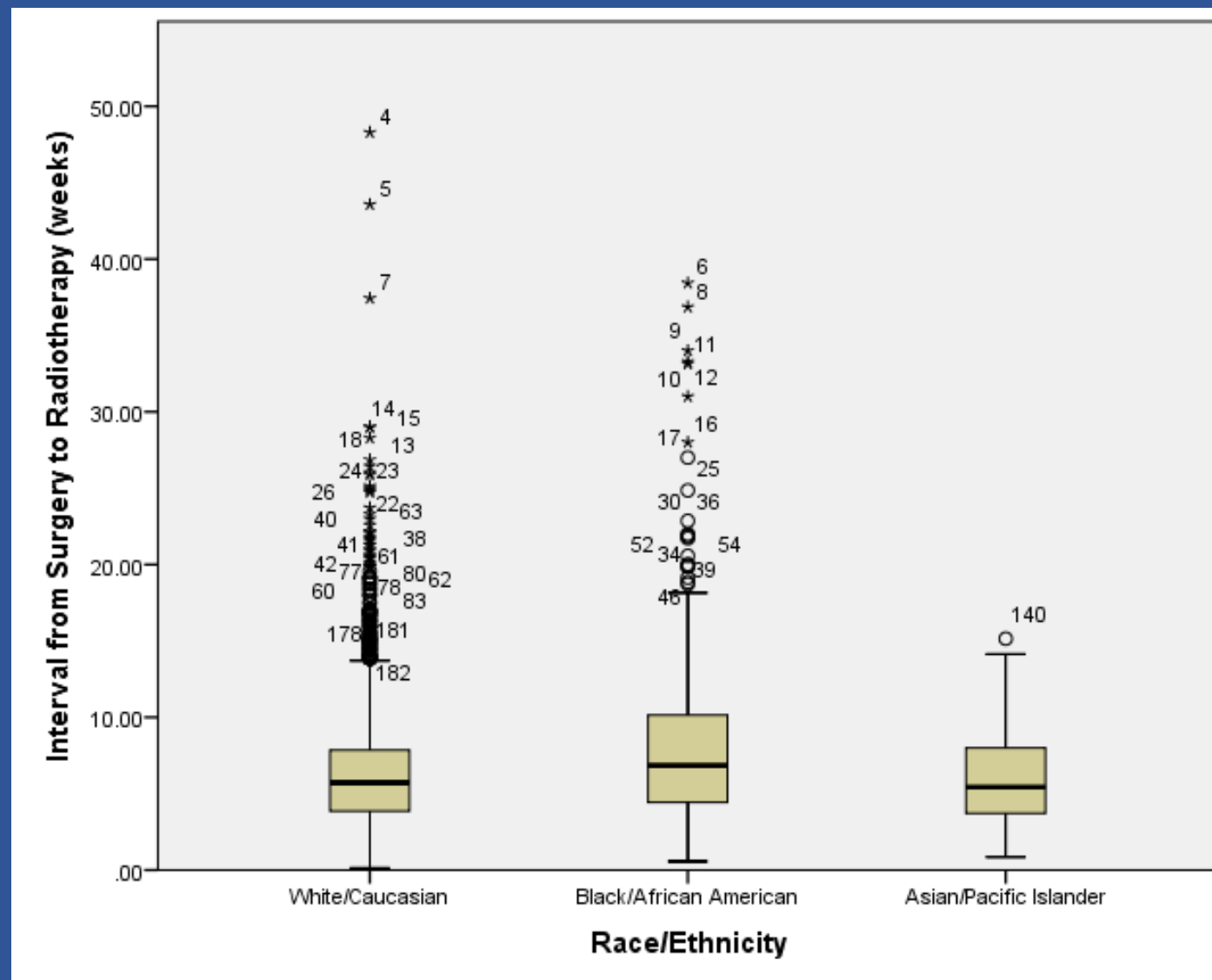
Surgery to RT Interval in Subjects with DCIS



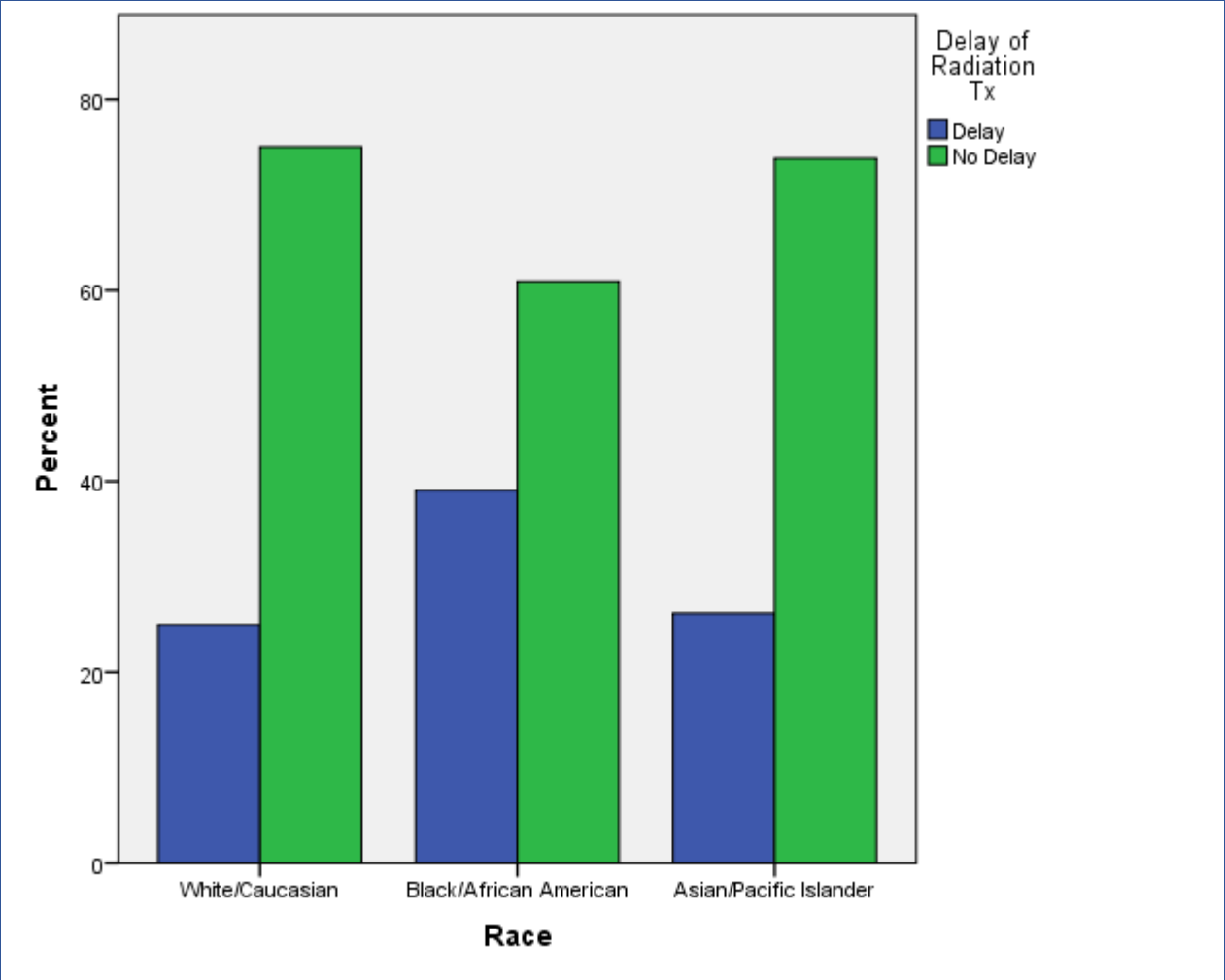
Frequency of RT Delay in Sample, MO 1998-12

<u>Delay of Radiation Treatment</u>				
		Frequency	Percent	Cumulative Percent
Valid	Delay	1198	26.4	26.4
	No Delay	3333	73.6	100.0
	Total	4531	100.0	

Surgery to RT Interval by Race, MO



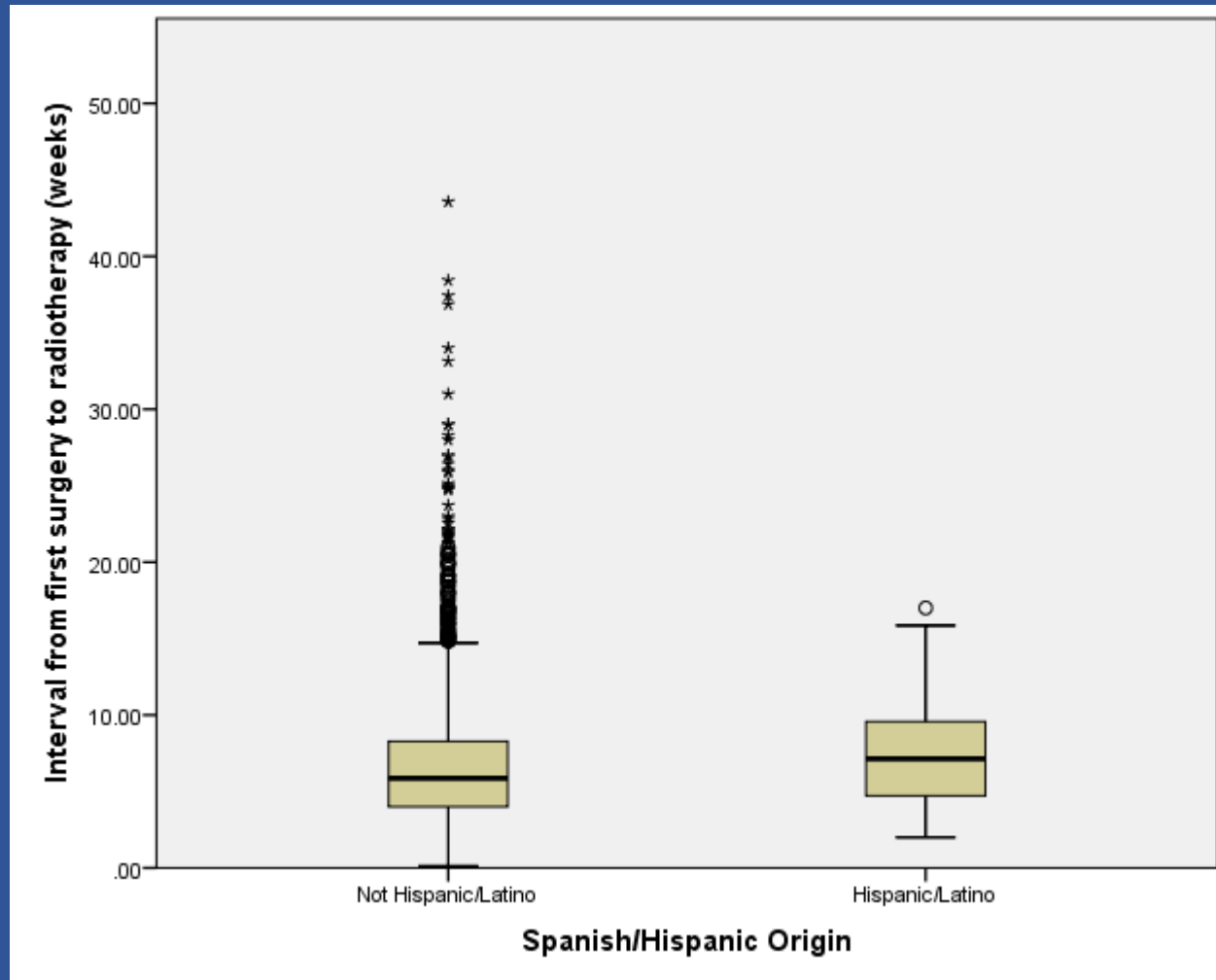
RT Delay by Race



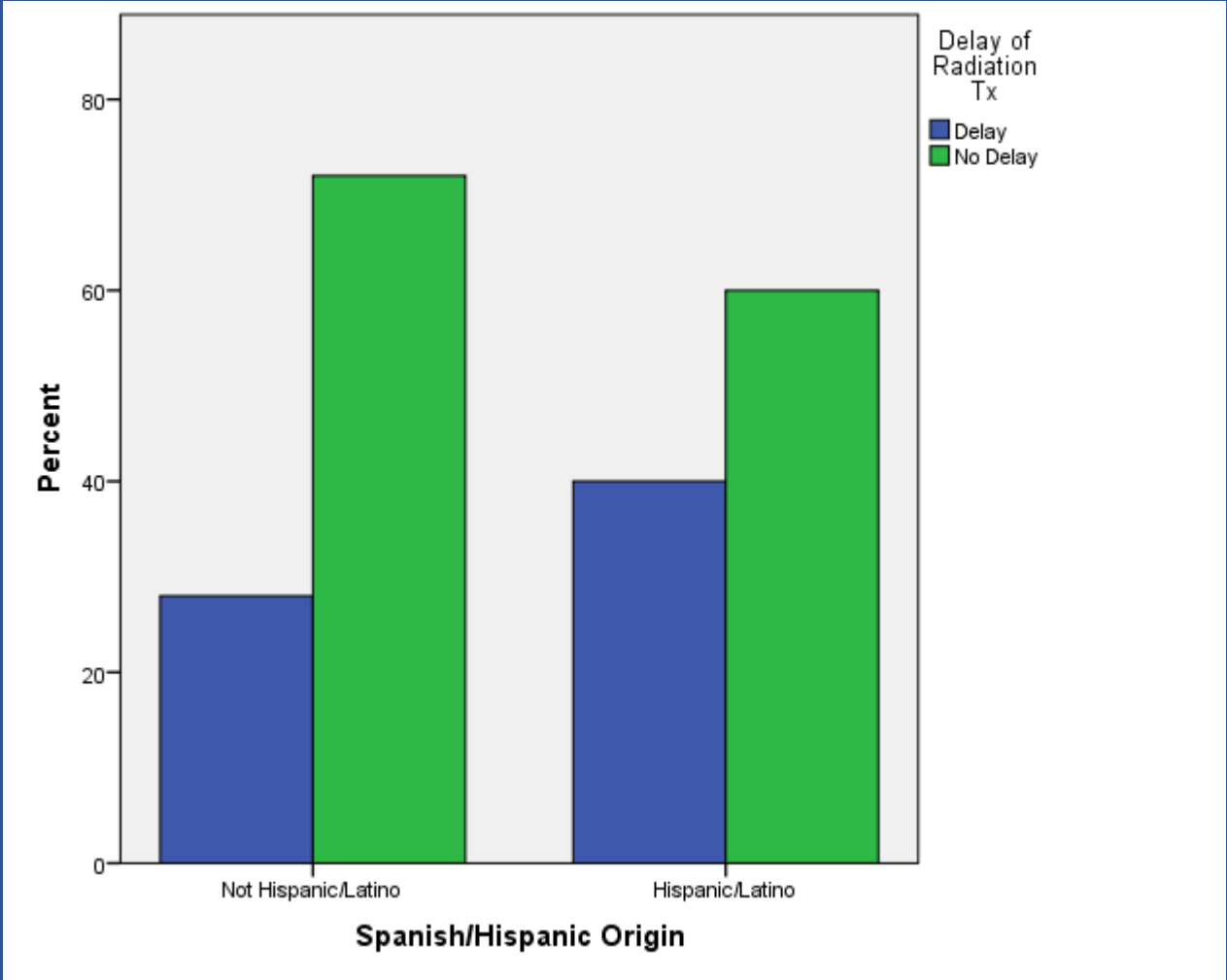
RT Delay by Race, MO 1998-2012

	Delay of Radiation Tx		Odds Ratio	CI	
	Delay	No Delay		Lower	Upper
White/Caucasian	1001 (25%)	3011 (75%)	1	-	-
Black/African-American	182 (39.1%)	284 (60.9%)	1.928	1.579	2.353
Asian/Pacific Islander	11 (26.2%)	31 (73.8%)	1.067	0.535	2.131

Surgery to RT Interval by Hispanic Origin



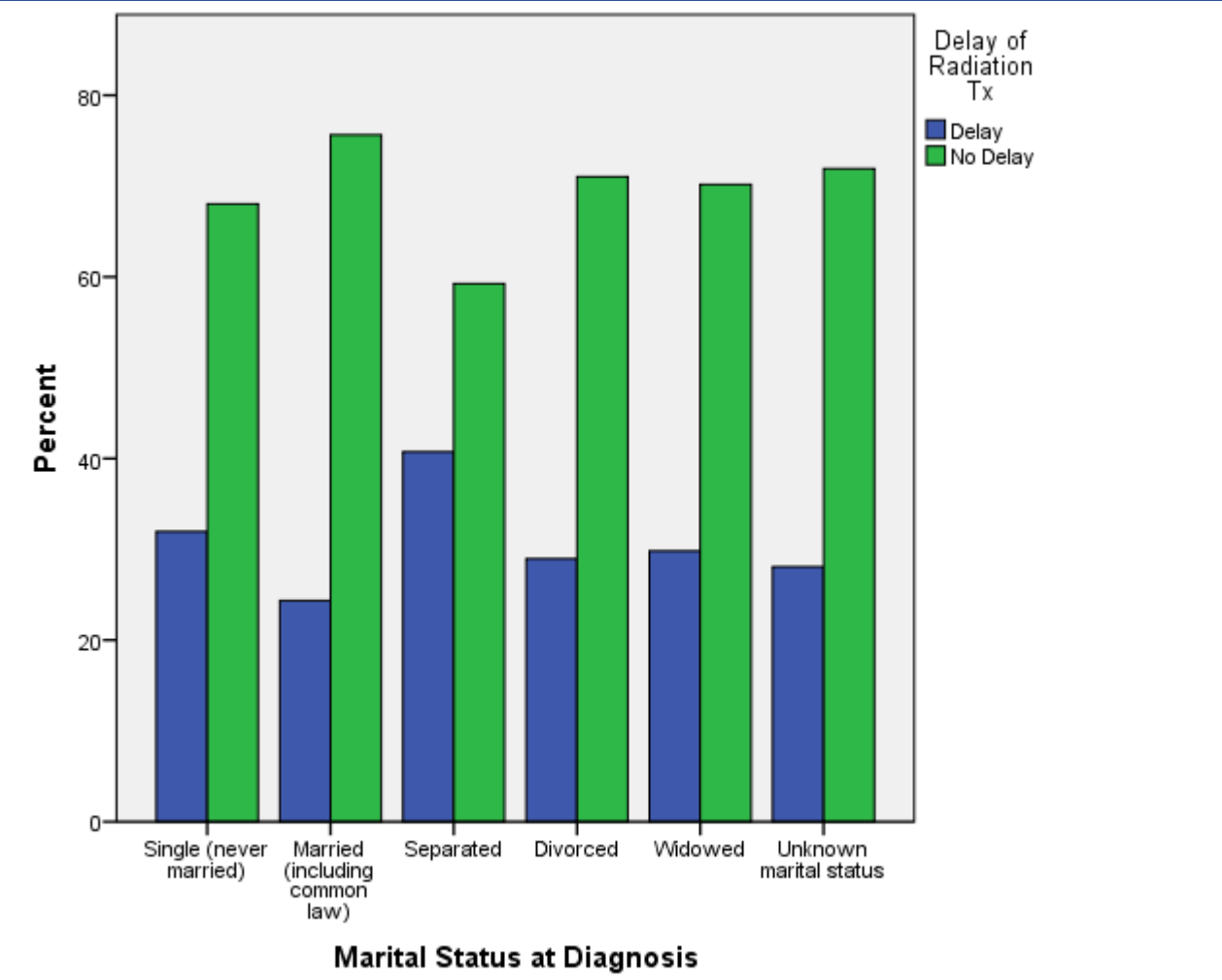
RT Delay by Hispanic Origin



RT Delay by Hispanic Origin, MO 1998-2012

	Delay of Radiation Tx		Odds Ratio	95% Confidence Interval	
	<u>Delay</u>	<u>No Delay</u>		<u>Lower</u>	<u>Upper</u>
Not Hispanic/Latino	999 (28%)	2571 (72%)	1	-	-
Hispanic/Latino	18 (40%)	27 (60%)	1.716	.941	3.129

RT Delay by Marital Status



RT Delay by Marital Status

Marital Status	Odds Ratio	Confidence Interval	
		Lower	Upper
Married	1	-	-
Single	1.458	1.172	1.814
Separated	2.135	0.986	4.621
Divorced	1.266	1.026	1.526
Widowed	1.319	1.083	1.606

Explanations for RT Delay

- Coordination between oncology, surgery, and interventional radiology
- Increased risk for unmarried patients suggests social networks/support play an important role
 - Could this be addressed/attenuated with case managers?
- Localization data likely to reveal contributing factors

Questions?