

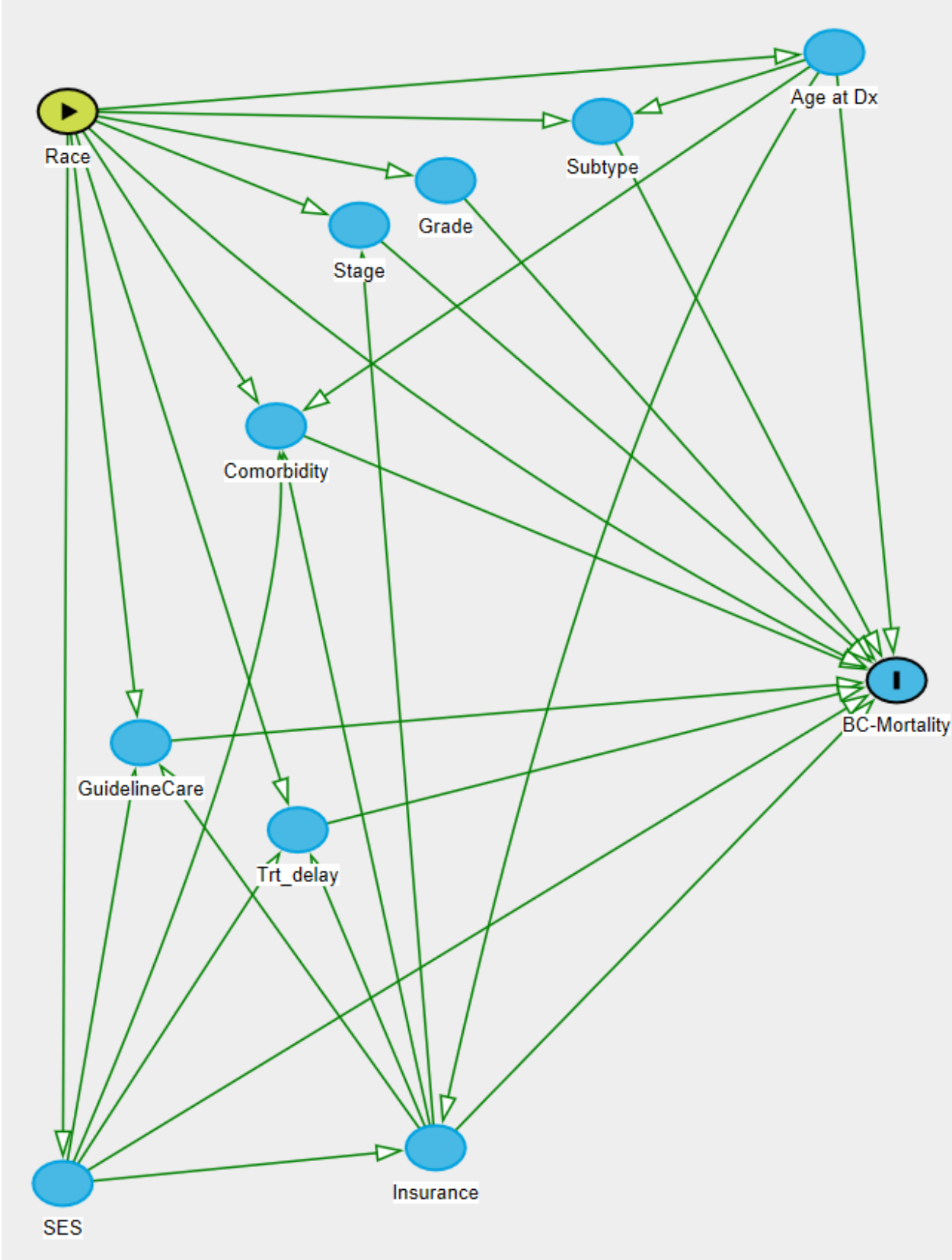
Racial disparities in breast cancer outcomes in the metropolitan Atlanta area: new insights and approaches for health equity

Lindsay J. Collin,¹ Renjian Jiang,¹ Kevin C. Ward,¹ Keerthi Gogineni,² Preeti D. Subhedar,² Mark E. Sherman,³

Mia M. Gaudet,⁴ Carmen Radecki Breitkopf,⁵ Olivia D'Angelo,² Sheryl GA Garbram-Mendola,² Ritu Aneja,⁶

Anne H. Gaglioti,⁷ Lauren E. McCullough¹

Supplemental Figure 1: Directed Acyclic Graph (DAG) for the relationship between race, breast cancer-specific mortality, and patient, tumor, and treatment characteristics.



Code generated from online resource Daggity (<http://www.dagitty.net/dags.html#>) for the above causal diagram.

Code:

Age%20at%20Dx 1 @0.943,-0.017

BC-Mortality O @1.018,0.546

Comorbidity 1 @0.271,0.318

Grade 1 @0.475,0.098

GuidelineCare 1 @0.108,0.602

Insurance 1 @0.463,0.965

Race E @0.020,0.036

SES 1 @0.014,0.997

Stage 1 @0.371,0.138

Subtype 1 @0.664,0.045

Trt_delay 1 @0.297,0.680

Age%20at%20Dx BC-Mortality Comorbidity Insurance @0.665,0.288 Race Subtype

Comorbidity BC-Mortality

Grade BC-Mortality

GuidelineCare BC-Mortality

Insurance BC-Mortality Comorbidity GuidelineCare Stage Trt_delay

Race BC-Mortality @0.467,0.342 Comorbidity Grade GuidelineCare SES Stage Subtype
Trt_delay

SES BC-Mortality Comorbidity @0.297,0.509 GuidelineCare Insurance Trt_delay

Stage BC-Mortality

Subtype BC-Mortality

Trt_delay BC-Mortality

Supplemental Table 1. Multivariable adjusted* hazard ratios (HR) and 95% confidence intervals (95% CI) for breast cancer-specific death according to race and tumor characteristics among non-Hispanic White (NHW) and non-Hispanic Black (NHB) women diagnosed with breast cancer in the metropolitan Atlanta area 2010–2014 and registered with the Georgia Cancer Registry.

Characteristics	No. Deaths		Common Referent HR (95% CI)		RERI (95% CI)
	NHW	NHB	NHW	NHB	
	N	N	HR (95% CI)		
Stage					
I	31	29	Reference	1.64 (0.98, 2.72)	--
II	80	118	4.03 (2.63, 6.17)	5.51 (3.64, 8.35)	0.85 (−0.67, 2.37)
III	85	126	13.97 (8.96, 21.78)	17.47 (11.36, 26.88)	2.87 (−1.77, 7.50)
IV	123	215	32.89 (21.02, 51.46)	54.59 (35.35, 84.31)	21.06 (7.44, 34.69)
Grade					
1	20	14	Reference	1.86 (0.93, 3.75)	--
2	97	119	1.62 (0.99, 2.64)	2.68 (1.65, 4.37)	0.20 (−1.03, 1.44)
3+	154	286	3.09 (1.90, 5.01)	3.50 (2.17, 5.65)	−0.45 (−1.82, 0.93)
ER Status					
ER+	209	282	Reference	1.59 (1.31, 1.93)	--
ER-	90	189	3.16 (1.75, 5.71)	3.79 (2.15, 6.66)	0.04 (−0.91, 0.99)
Molecular Subtype					
Luminal A	171	221	Reference	1.64 (1.33, 2.01)	--
Luminal B	31	56	1.12 (0.72, 1.76)	1.48 (1.02, 2.16)	−0.28 (−0.91, 0.35)
HER2 Overexpressing	16	40	1.12 (0.63, 1.99)	2.01 (1.32, 3.07)	0.25 (−0.64, 1.14)
TNBC	65	137	3.11 (2.25, 4.29)	3.44 (2.62, 4.51)	−0.31 (−1.31, 0.69)

*Adjusted for age; stage; subtype; receipt of surgery, chemotherapy, radiation, hormone therapy, and trastuzumab; insurance status

Supplemental Table 2. Multivariable adjusted* hazard ratios (HR) and 95% confidence intervals (95% CI) for breast cancer-specific death according to race and treatment parameters among non-Hispanic White (NHW) and non-Hispanic Black (NHB) women diagnosed with breast cancer in the metropolitan Atlanta area 2010–2014 and registered with the Georgia Cancer Registry.

Characteristics	No. Deaths		Common Referent HR (95% CI)		RERI (95% CI)
	NHW	NHB	NHW	NHB	
	N	N	HR (95% CI)		
Surgery					
No	139	241	Reference	1.47 (1.16, 1.86)	--
Breast Conserving Surgery	59	76	0.32 (0.22, 0.46)	0.44 (0.31, 0.62)	−0.35 (−0.70, 0.06)

Mastectomy	121	171	0.42 (0.31, 0.57)	0.64 (0.48, 0.85)	-0.25 (-0.59, 0.09)
Chemotherapy					
No	103	124	0.83 (0.62, 1.11)	1.63 (1.23, 2.15)	0.47 (0.06, 0.88)
Yes	171	317	Reference	1.33 (1.09, 1.63)	--
Radiation					
No	164	238	1.13 (0.87, 1.47)	1.63 (1.28, 2.09)	-0.03 (-0.44, 0.38)
Yes	130	205	Reference	1.54 (1.22, 1.94)	--
Receipt of Hormone Therapy (ER+ tumors only)					
No	161	267	1.66 (1.23, 2.24)	2.50 (1.88, 3.32)	0.03 (-0.71, 0.77)
Yes	158	221	Reference	1.81 (1.44, 2.28)	--
Receipt of Trastuzumab (HER2+ tumors only)					
No	283	414	2.09 (1.16, 3.77)	2.73 (1.61, 4.61)	-0.24 (-1.75, 1.28)
Yes	36	74	Reference	1.88 (1.17, 3.00)	--

*Adjusted for age; stage; subtype; receipt of surgery, chemotherapy, radiation, hormone therapy, and trastuzumab; insurance status

Supplemental Table 3. Multivariable adjusted* hazard ratios (HR) and 95% confidence intervals (95% CI) for breast cancer-specific death according to race and patient characteristics among non-Hispanic White (NHW) and non-Hispanic Black (NHB) women diagnosed with breast cancer in the metropolitan Atlanta area 2010–2014 and registered with the Georgia Cancer Registry.

Characteristics	No. Deaths		Common Referent HR (95% CI)		RERI (95% CI)
	NHW N	NHB N	NHW HR (95% CI)	NHB	
Insurance Type[†]					
Uninsured	8	36	1.56 (0.78, 3.28)	2.00 (1.34, 2.99)	-0.20 (-1.56, 1.16)
Private Insurance	147	212	Reference	1.60 (1.28, 2.00)	--

	Medicaid	18	93	1.56 (0.94, 2.59)	1.84 (1.40, 2.43)	-0.32 (-1.22, 0.58)
	Medicare	133	131	1.17 (0.88, 1.57)	1.72 (1.31, 2.25)	-0.060 (-0.53, 0.41)
Age Group						
	<40	15	49	0.44 (0.24, 0.79)	0.80 (0.53, 1.19)	0.01 (-0.43, 0.46)
	40-49	39	102	0.53 (0.35, 0.81)	0.90 (0.64, 1.27)	0.02 (-0.37, 0.42)
	50-65	124	210	0.77 (0.56, 1.06)	1.05 (0.78, 1.42)	-0.06 (-0.44, 0.31)
	>65	141	127	Reference	1.35 (1.04, 1.74)	--
Marital Status						
	Married	139	144	Reference	1.76 (1.37, 2.25)	--
	Single	47	170	1.20 (0.84, 1.71)	1.76 (1.37, 2.25)	-0.20 (0.79, 0.39)
	Divorced/Widowed/Separated	116	143	1.53 (1.16, 2.01)	1.68 (1.30, 2.16)	-0.20 (0.79, 0.39)
SES Index						
	0% - <5% poverty	71	25	Reference	2.05 (1.25, 3.35)	--
	5% - <10% poverty	96	57	1.50 (1.08, 2.09)	1.86 (1.28, 2.70)	-0.69 (-1.82, 0.44)
	10% - <20% poverty	99	167	1.59 (1.14, 2.20)	2.06 (1.52, 2.79)	-0.57 (-1.62, 0.48)
	20% - 100% poverty	53	239	1.51 (1.03, 2.21)	2.01 (1.51, 2.69)	-0.54 (-1.62, 0.53)

*Adjusted for age; stage; subtype; receipt of surgery, chemotherapy, radiation, hormone therapy, and trastuzumab; insurance status

‡ Military/other not estimated due to small cell size