

Supplemental Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Associations of family history of breast cancer with dense volume and non-dense volume (N=375).					
Characteristics	N	Dense Volume (cm³)^a	p value^b	Non-dense Volume (cm³)^a	
		exp^β (95% CI)		exp^β (95% CI)	p value^b
FHBC					
<i>Model 1^c</i>					
No	275	Reference		Reference	
Yes	87	1.16 (1.05 – 1.29)	0.006	0.91 (0.81 – 1.03)	0.12
Unknown	13	0.79 (0.62 – 1.01)	0.06	0.79 (0.60 – 1.03)	0.09
<i>Model 2^d</i>					
No	275	Reference		Reference	
Yes	87	1.16 (1.04 – 1.29)	0.007	0.91 (0.81 – 1.03)	0.13
Unknown	13	0.74 (0.58 – 0.95)	0.02	0.74 (0.56 – 0.98)	0.04
FHBC in mothers alone					
<i>Model 1^c</i>					
No	301	Reference		Reference	
Yes	67	1.21 (1.08 – 1.36)	0.001	0.91 (0.80 – 1.04)	0.15
Unknown	7	0.91 (0.66 – 1.27)	0.59	0.88 (0.61 – 1.28)	0.49
<i>Model 2^d</i>					
No	301	Reference		Reference	
Yes	67	1.21 (1.07 – 1.36)	0.002	0.91 (0.79 – 1.04)	0.15
Unknown	7	0.88 (0.63 – 1.22)	0.44	0.84 (0.58 – 1.22)	0.36
FHBC in sisters alone					
<i>Model 1^c</i>					
No	339	Reference		Reference	
Yes	26	1.07 (0.90 – 1.28)	0.45	0.98 (0.80 – 1.19)	0.82
Unknown	10	0.75 (0.57 – 0.99)	0.04	0.72 (0.53 – 0.98)	0.04
<i>Model 2^d</i>					
No	339	Reference		Reference	
Yes	26	1.08 (0.91 – 1.29)	0.38	0.99 (0.81 – 1.21)	0.95
Unknown	10	0.71 (0.53 – 0.93)	0.01	0.68 (0.50 – 0.93)	0.02
Number of affected relatives with FHBC					
<i>Model 1^c</i>					
0	275	Reference		Reference	
1	81	1.16 (1.04 – 1.29)	0.01	0.99 (0.81 – 1.21)	0.95
≥2	6	1.25 (0.87 – 1.78)	0.23	0.68 (0.50 – 0.93)	0.02
Unknown	13	0.79 (0.62 – 1.01)	0.06	0.99 (0.81 – 1.21)	0.95
<i>Model 2^d</i>					
0	275	Reference		Reference	
1	81	1.15 (1.03 – 1.28)	0.01	0.91 (0.80 – 1.03)	0.14
≥2	6	1.32 (0.92 – 1.89)	0.13	0.91 (0.61 – 1.37)	0.66
Unknown	13	0.74 (0.58 – 0.95)	0.02	0.74 (0.56 – 0.98)	0.037

Abbreviations: CI, confidence interval, exp, Exponentiated; FHBC, Family history of breast cancer; N, Number.

^a Continuous mammographic measurements were log transformed in the analysis. The beta coefficients were back transformed and exponentiated for easier interpretation. Effect measures represent proportion for percentage difference.

^b p value derived from linear regression.

^c Model 1 was adjusted for current age and body mass index (BMI)

^d Model 2 was adjusted for current age, BMI, parity, race, age at menarche, and alcohol use.

eTable 2. Associations of family history of breast cancer with BI-RADS breast density categories^a in validation set, stratified by race.

Characteristics	Non-Hispanic White (N = 8,010)				Black/African American (N = 5,292)			
	Dense breast (N)	Total (N)	Dense breast vs. non-dense breast		Dense breast (N)	Total (N)	Dense breast vs. non-dense breast	
			OR (95% CI)	p value ^b			OR (95% CI)	p value ^b
FHBC								
<i>Model 1^c</i>								
No	3464	6632	Reference	<0.001	1578	4572	Reference	0.03
Yes	787	1378	1.30 (1.13 – 1.49)		279	720	1.23 (1.02 – 1.49)	
<i>Model 2^d</i>								
No	3464	6632	Reference	<0.001	1578	4572	Reference	0.03
Yes	787	1378	1.29 (1.13 – 1.49)		279	720	1.23 (1.02 – 1.49)	
FHBC in mothers alone								
<i>Model 1^c</i>								
No	3129	6059	Reference	<0.001	1371	4065	Reference	0.003
Yes	572	998	1.27 (1.09 – 1.49)		173	448	1.25 (0.99 – 1.58)	
Unknown	550	953	1.36 (1.16 – 1.59)		313	779	1.32 (1.10 – 1.57)	
<i>Model 2^d</i>								
No	3129	6059	Reference	<0.001	1371	4065	Reference	0.003
Yes	572	998	1.27 (1.08 – 1.49)		173	448	1.25 (0.99 – 1.58)	
Unknown	550	953	1.32 (1.12 – 1.55)		313	779	1.34 (1.11 – 1.60)	
FHBC in sisters alone								
<i>Model 1^c</i>								
No	3126	6054	Reference	<0.001	1371	4064	Reference	0.003
Yes	150	284	1.36 (1.03 – 1.79)		85	234	1.18 (0.87 – 1.62)	
Unknown	975	1672	1.31(1.15 – 1.49)		401	994	1.32 (1.12 – 1.56)	
<i>Model 2^d</i>								
No	3126	6054	Reference	0.002	1371	4064	Reference	0.003
Yes	150	284	1.37 (1.04 – 1.80)		85	234	1.21 (0.88 – 1.66)	
Unknown	975	1672	1.28 (1.13 – 1.46)		401	994	1.33 (1.13 – 1.57)	
Number of affected relatives with FHBC								
<i>Model 1^c</i>								
0	3125	6053	Reference	0.001	1369	4061	Reference	0.006
1	660	1168	1.30 (1.12 – 1.50)		236	620	1.20 (0.98 – 1.47)	
≥2	31	57	1.27 (0.70 – 2.31)		11	31	1.54 (0.68 – 3.49)	
Unknown	435	732	1.35 (1.13 – 1.62)		241	580	1.38 (1.13 – 1.69)	
<i>Model 2^d</i>								
0	3125	6053	Reference	0.006	1369	4061	Reference	0.005
1	660	1168	1.30 (1.12 – 1.50)		236	620	1.21 (0.98 – 1.48)	
≥2	31	57	1.24 (0.68 – 2.26)		11	31	1.56 (0.69 – 3.52)	
Unknown	435	732	1.30 (1.08 – 1.56)		241	580	1.40 (1.14 – 1.73)	

Abbreviations: BI-RADS, The Breast Imaging, Reporting and Data System; CI, confidence interval, FHBC, Family history of breast cancer; N, Number; OR, Odds ratio.

¹ Dense breast defined as BI-RADS 3 and 4. Non-dense breast (referent) defined as BI-RADS 1 and 2. Logistic regression examines odds of having dense breast.

² Type III chi-square p values derived from logistic regression.

³ Model 1 was adjusted for current age and BMI

⁴ Model 2 was adjusted for current age, BMI, parity, age at menarche, and alcohol use.

eTable 3. Associations of family history of breast cancer with BI-RADS breast density categories, pre- and post-5th edition of BIRADS.						
Characteristics	Visited Before December 31, 2012 (N = 6,900)			Visited After January 1, 2013 (N = 7,140)		
	Dense Breast (BI-RADS) ^a					
	N ^b	Odds Ratio (95% CI)	p value ^c	N ^b	Odds Ratio (95% CI)	p value ^c
FHBC						
<i>Model 1^d</i>						
No	2717	Reference	0.02	2806	Reference	<0.001
Yes	469	1.22 (1.03 – 1.43)		643	1.52 (1.16 – 1.55)	
<i>Model 2^e</i>						
No	2717	Reference	0.01	2806	Reference	<0.001
Yes	469	1.23 (1.04 – 1.45)		643	1.36 (1.17 – 1.58)	
FHBC in mothers alone		6				
<i>Model 1^d</i>						
No	2446	Reference	0.01	2476	Reference	<0.001
Yes	327	1.23 (1.02 – 1.50)		441	1.30 (1.10 – 1.55)	
Unknown	413	1.25 (1.05 – 1.48)		532	1.40 (1.19 – 1.63)	
<i>Model 2^e</i>						
No	2446	Reference	0.01	2476	Reference	<0.001
Yes	327	1.24 (1.02 – 1.51)		441	1.31 (1.10 – 1.56)	
Unknown	413	1.24 (1.04 – 1.47)		532	1.39 (1.18 – 1.63)	
FHBC in sisters alone						
<i>Model 1^d</i>						
No	2442	Reference	<0.01	2477	Reference	<0.001
Yes	102	1.10 (0.82 – 1.48)		154	1.55 (1.18 – 2.03)	
Unknown	642	1.28 (1.11 – 1.48)		818	1.31 (1.15 – 1.50)	
<i>Model 2^e</i>						
No	2442	Reference	<0.01	2477	Reference	<0.001
Yes	102	1.12 (0.83 – 1.52)		154	1.58 (1.20 – 2.09)	
Unknown	642	1.27 (1.10 – 1.48)		818	1.31 (1.14 – 1.50)	
Number of affected relatives with FHBC						
<i>Model 1^d</i>						
0	2442	Reference	0.01	2474	Reference	<0.001
1	403	1.22 (1.03 – 1.46)		533	1.32 (1.13 – 1.55)	
≥2	13	0.91 (0.42 – 1.97)		31	1.89 (0.99 – 3.60)	
Unknown	328	1.29 (1.07 – 1.57)		411	1.36 (1.14 – 1.63)	
<i>Model 2^e</i>						
0	2442	Reference	0.02	2474	Reference	<0.001
1	403	1.23 (1.03 – 1.47)		533	1.34 (1.14 – 1.57)	
≥2	13	0.95 (0.44 – 2.06)		31	1.83 (0.96 – 3.51)	
Unknown	328	1.27 (1.04 – 1.55)		411	1.34 (1.12 – 1.61)	

Abbreviations: BI-RADS, The Breast Imaging, Reporting and Data System; CI, confidence interval; exp, Exponentiated; FHBC, Family history of breast cancer; N, Number.

^a Dense breast defined as BI-RADS 3 and 4. Non-dense breast (reference) defined as BI-RADS 1 and 2. Logistic regression examines odds of having dense breast.

^b Represents the proportion of patients with dense breast within the exposure strata (i.e., among those with or without a family history of breast cancer).

^c Type III chi-square p values derived from logistic regression.

^d Model 1 was adjusted for current age (continuous, years) and BMI (continuous, kg/m²).

^e Model 2 was adjusted for current age (continuous, years), BMI (continuous, kg/m²), parity (0, 1, 2, ≥3), race (non-Hispanic white/African American/others), age at menarche (continuous, years), and alcohol consumption (yes/no).