Table S1. Baseline characteristics of study population by site**

	MMHS		NHS		NHSII		MCMAM		SFMR	
	Cases	Controls	Cases	Controls	Cases	Controls	Cases	Controls	Cases	Controls
N	62	112	412	454	351	492	242	395	104	206
Mean age at mammogram (SD)	55.8 (9.3)	53.3 (7.2)	58.6 (7.7)	58.3 (7.7)	45.5 (4.3)	45.9 (4.3)	64.1 (10.1)	64.1 (10.1)	55.5 (11.3)	55.5 (11.3)
Mean age at diagnosis (SD)	58.3 (9.3)	--	66 (6.9)	--	49.7 (4.3)	--	67.8 (10.1)	--	59.8 (11.3)	--
Mean BMI (SD)	29.7 (6.7)	29.9 (7.9)	26.1 (4.9)	25.8 (5.4)	24.3 (5.8)	25.2 (7.7)	26.6 (7.6)	26.8 (6.8)	24.2 (5.6)	23.5 (4.7)
Body mass index categories, kg/m^2										
<25	16 (26%)	36 (32%)	186 (45%)	230 (51%)	**206 (59%)**	**270 (54.9%)**	80 (33%)	163 (41%)	63 (61%)	155 (75%)
25-29	17 (27%)	27 (24%)	139 (34%)	136 (30%)	**99 (28%)**	**111 (22.6%)**	86 (35%)	128 (32%)	28 (27%)	41 (20%)
30-34	16 (26%)	25 (22%)	63 (15%)	55 (12%)	**25 (7%)**	**47 (9.6%)**	44 (18%)	62 (16%)	7 (7%)	7 (3%)
35+	13 (21%)	24 (21%)	22 (5%)	29 (6%)	**13 (4%)**	**48 (9.8%)**	21 (9%)	32 (8%)	4 (4%)	3 (2%)
Unknown	0 (0%)	0 (0%)	2 (1%)	4 (1%)	**8 (2%)**	**16 (3.3%)**	11 (5%)	10 (3%)	2 (2%)	0 (0%)
Menopausal Status										
Premenopausal	18 (29%)	42 (37%)	75 (18%)	99 (22%)	266 (76%)	361 (73.4%)	38 (16%)	67 (17%)	33 (32%)	63 (31%)
Postmenopausal	44 (71%)	69 (62%)	336 (82%)	355 (78%)	55 (16%)	89 (18.1%)	202 (83%)	324 (82%)	60 (58%)	125 (61%)
Unknown	0 (0%)	1 (1%)	1 (0.2%)	0 (0%)	30 (8%)	42 (8.5%)	2 (1%)	4 (1%)	11 (11%)	18 (9%)
Parity										
Nulliparous	5 (8%)	18 (16%)	**34 (8%)**	**15 (3%)**	64 (18%)	86 (17.5%)	33 (14%)	48 (12%)	33 (32%)	51 (25%)
Parous	57 (92%)	87 (78%)	**371 (90%)**	**435 (96%)**	285 (81%)	405 (82.3%)	209 (86%)	346 (88%)	55 (53%)	135 (65%)
Unknown	0 (0%)	7 (6%)	**7 (2%)**	**4 (1%)**	2 (1%)	1 (0.2%)	0 (0%)	1 (0.3%)	16 (15%)	20 (10%)
Postmenopausal hormone therapy*										
Not current	38 (86%)	52 (75%)	161 (48%)	192 (54%)	**11 (20%)**	**28 (31.5%)**	--	--	45 (75%)	95 (76%)
Current, estrogen	3 (7%)	8 (12%)	91 (27%)	95 (27%)	**18 (33%)**	**45 (50.6%)**	--	--	4 (7%)	8 (6%)
Current, estrogen + progestin	3 (7%)	9 (13%)	84 (25%)	68 (19%)	**26 (47%)**	**16 (18%)**	--	--	11 (18%)	22 (18%)
Family History										
No	44 (71%)	90 (80%)	347 (84%)	400 (88%)	**298 (85%)**	**443 (90%)**	200 (83%)	338 (86%)	84 (81%)	182 (88%)
Yes	18 (29%)	22 (20%)	65 (16%)	54 (12%)	**53 (15%)**	**49 (10%)**	42 (17%)	57 (14%)	18 (17%)	24 (12%)
Unknown	0 (0%)	0 (0%)	0 (0%)	0 (0%)	**0 (0%)**	**0 (0%)**	0 (0%)	0 (0%)	2 (2%)	0 (0%)
Standardized Mean % mammographic density (SD)	32.5 (19.0)	28.8 (17.9)	**29.1 (16)**	**24.8 (15.4)**	39.6 (19.3)	33.6 (20.2)	**30 (18.2)**	**24.5 (17.9)**	**32.3 (21.2)**	**26.7 (17.6)**
Standardized Mean Dense Area cm^2 (SD)	54.7 (38.2)	45.8 (28.2)	**71.4 (45.5)**	**60.8 (38.6)**	**58.5 (34.2)**	**48.3 (32.6)**	**51.8 (36.2)**	**42.2 (32.4)**	**80.9 (62.3)**	**65.2 (51.5)**
Standardized Mean Nondense Area cm^2 (SD)	149.6 (113.1)	152.1 (122.0)	**187.8 (87.1)**	**207.5 (96.0)**	**98.7 (63.0)**	**111.6 (73.3)**	138.3 (91.3)	145.3 (85.7)	194.4 (151.0)	194.6 (129.1)

Data presentation: mean (standard deviation) or number (%).
 *Among postmenopausal women in MMHS, NHS, NHSII , and SFMR
**Sites generally matched cases and controls on age and date of mammogram
Bold denotes statistically significant difference between cases and controls within study (p-value < 0.05)

Table S2. Pearson correlation coefficient for top 15 significant features. Correlations calculated using case subjects. Gray and gray with line pattern highlight strength of positive and negative associations respectively.

	Homogeneity	Energy	FD_TH_75	FD_TH_70	FD_TH_80	FD_TH_65	FD_TH_85	FD_TH_60	Kurtosis	Minkowski FD	FD_TH_15	FD_TH_10	Busyness	PD	Entropy	Dissimilarity
Homogeneity	1	0.37	0.02	-0.01	0.01	-0.01	0.02	-0.01	0.03	-0.26	-0.22	-0.2	-0.04	-0.05	-0.46	-0.98
Energy	0.37	1	0.2	0.18	0.23	0.15	0.25	0.11	0.13	-0.19	-0.17	-0.2	-0.09	-0.01	-0.82	-0.33
FD_TH_75	0.02	0.2	1	0.94	0.95	0.89	0.88	0.82	0.37	0.43	-0.06	-0.11	-0.42	-0.32	-0.41	-0.04
FD_TH_70	-0.01	0.18	0.94	1	0.88	0.96	0.79	0.91	0.42	0.5	-0.04	-0.09	-0.39	-0.39	-0.42	-0.02
FD_TH_80	0.01	0.23	0.95	0.88	1	0.81	0.95	0.73	0.29	0.35	-0.07	-0.11	-0.43	-0.24	-0.4	-0.02
FD_TH_65	-0.01	0.15	0.89	0.96	0.81	1	0.7	0.96	0.48	0.55	-0.03	-0.09	-0.36	-0.46	-0.42	-0.02
FD_TH_85	0.02	0.25	0.88	0.79	0.95	0.7	1	0.62	0.21	0.26	-0.07	-0.11	-0.41	-0.14	-0.37	-0.02
FD_TH_60	-0.01	0.11	0.82	0.91	0.73	0.96	0.62	1	0.52	0.58	-0.03	-0.08	-0.34	-0.52	-0.4	-0.03
Kurtosis	0.03	0.13	0.37	0.42	0.29	0.48	0.21	0.52	1	0.38	-0.3	-0.5	-0.27	-0.34	-0.53	-0.06
FD_Minkowski	-0.26	-0.19	0.43	0.5	0.35	0.55	0.26	0.58	0.38	1	0.44	0.34	0.18	-0.55	-0.11	0.21
FD_TH_15	-0.22	-0.17	-0.06	-0.04	-0.07	-0.03	-0.07	-0.03	-0.3	0.44	1	0.85	0.62	-0.15	0.19	0.25
FD_TH_10	-0.2	-0.2	-0.11	-0.09	-0.11	-0.09	-0.11	-0.08	-0.5	0.34	0.85	1	0.56	-0.1	0.3	0.22
Busyness	-0.04	-0.09	-0.42	-0.39	-0.43	-0.36	-0.41	-0.34	-0.27	0.18	0.62	0.56	1	-0.03	0.2	0.09
PD	-0.05	-0.01	-0.32	-0.39	-0.24	-0.46	-0.14	-0.52	-0.34	-0.55	-0.15	-0.1	-0.03	1	0.23	0.09
Entropy	-0.46	-0.82	-0.41	-0.42	-0.4	-0.42	-0.37	-0.4	-0.53	-0.11	0.19	0.3	0.2	0.23	1	0.44
Dissimilarity	-0.98	-0.33	-0.04	-0.02	-0.02	-0.02	-0.02	-0.03	-0.06	0.21	0.25	0.22	0.09	0.09	0.44	1