WEB APPENDIX

Nonvertebral fracture outcome definition

Unless otherwise noted, fracture date is the date of diagnosis or procedure — whichever comes first.

Note: fracture definitions were derived primarily from Ray et al. (1).

a. **Hip**
   - diagnosis during hospitalization (**ICD-9-CMv1:** 820.xx, 733.14) – PLUS –
   - procedure during same hospitalization (**ICD-9-CMv3:** 78.55, 79.05, 79.15, 79.25, 79.35, 79.65, **CPT-4:** 27230-27248)

b. **Distal forearm** --
   - Diagnosis (ICD-9: 813.4x, 813.5x, 733.12) – PLUS –
   - Procedure within +/-30 days of fracture date (**ICD-9-CMv3:** 78.53, 79.02, 79.12, 79.22, 79.32, 79.62; **CPT-4:** 24650, 24655, 24660, 24665, 24666, 25600, 25605, 25610, 25611, 25615, 25620, 25650)

   ---------- OR ----------

   - Diagnosis (ICD-9: 813.8x, 813.9x) – PLUS –
   - Procedure within +/- 30 days of fracture date (**CPT-4:** 24650, 24655, 24660, 24665, 24666, 25600, 25605, 25610, 25611, 25615, 25620, 25650)

c. **Proximal forearm**
   - Diagnosis (**ICD-9-CMv1:** 813.0x – 813.3x, 813.8x, 813.9x) – PLUS –
   - Procedure within +/-30 days of fracture date (**ICD-9-CMv3:** 78.53, 79.02, 79.12, 79.22, 79.32, 79.62; **CPT-4:** 24620, 24625, 24635, 24680, 24685, 25500, 25505, 25510, 25515, 25530, 25535, 25540, 25545, 25560, 25565, 25570, 25575)

d. **Humerus**
   - Diagnosis (**ICD-9-CMv1:** 812.xx, 733.11) – PLUS –
   - Procedure within +/-30 days of fracture date (**ICD-9-CMv3:** 78.52, 79.01, 79.11, 79.21, 79.31, 79.61, **CPT-4:** 23600, 23605, 23610, 23615, 23620, 23625, 23630, 23665, 23670, 23675, 23680, 24500, 24505, 24506, 24510, 24515, 24530, 24531, 24535, 24536, 24538, 24540, 24542, 24545, 24560, 24565, 24570, 24575-24581, 24583, 24585-24588, 24516)

e. **Pelvis**
   - Diagnosis (ICD-9: 808.xx) – PLUS –
   - Procedure within +/- 30 days of fracture date (CPT-4: 27190 – 27192, 27200 – 27228)

Composite cardiovascular outcome definition

a) Myocardial infarction:

Algorithm: Hospitalization episode lasting at least 3 days and no more than 180 days with one of the following ICD-9-CM diagnosis codes: 410.01, 410.11, 410.21, 410.31, 410.41, 410.51, 410.61, 410.71, 410.81, or 410.91. These diagnosis codes must have been listed on the discharge abstract as the principal reason for admission (principal diagnosis) or the next diagnosis (secondary diagnosis). Re-admissions for AMI (410 with a fifth digit of 2 indicating the prior hospitalization due to AMI within 8 weeks) were excluded, to identify only initial hospitalizations. The length of stay could have been less than three days if the subject died during the hospitalization.

b) Cerebrovascular events:

ICD-9 diagnostic codes:

430.x	Subarachanoid hemorrhage
431.x	Intracerebral hemorrhage
433.x1	Occlusion and stenosis of precerebral arteries
434.x (exclude 434.x0)	Occlusion of cerebral arteries
436.x	Acute but ill-defined cerebrovascular disease

Algorithm: These diagnosis codes can be in any position on the inpatient discharge

c) Acute coronary syndrome (with or without revascularization):

Any ICD-9 diagnosis code of 410.xx – 414.xx (where X can be any or no 4th / 5th digit)

d) Acute coronary syndrome with revascularization:

Any ICD-9 diagnosis code for ACS of 410.xx – 414.xx (where X can be any or no 4th / 5th digit)

-- AND --
ICD-9 and CPT-4 procedure codes for revascularization including: PTCA, any coronary stenting, CABG surgery
PTCA:
CPT-4: 92982, 92995, 92997, 92982-92984
-- OR --
ICD-9 proc: 00.66, 36.03, 36.09
-- OR --
DRG: 112, 555

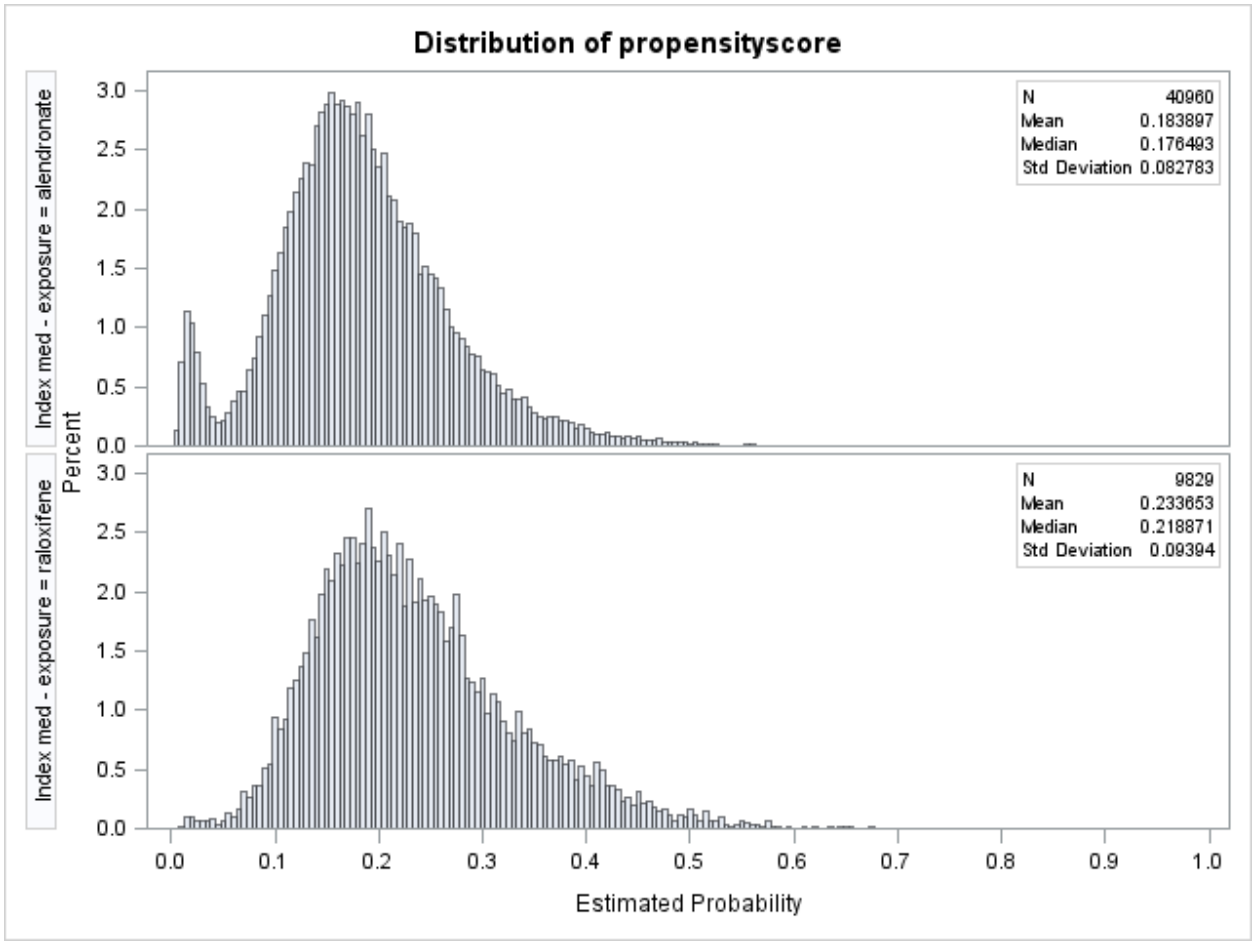
Stenting:
CPT-4 92980, 92981
-- OR --
ICD-9 procedure: 36.06, 36.07
-- OR --

DRG: 556, 557,558

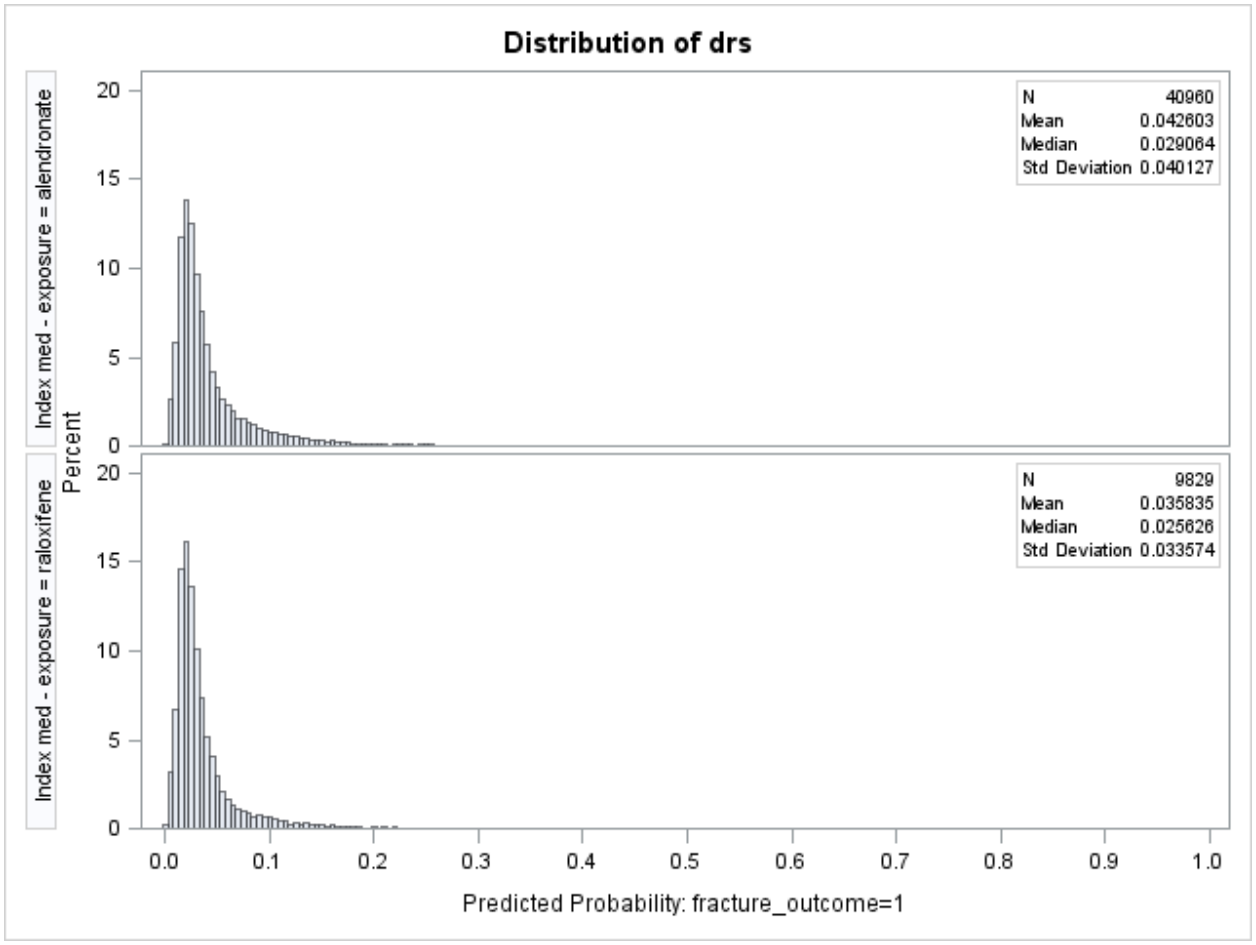
CABG:
CPT-4: 33510 – 33545
--OR --
ICD-9 procedure: 36.1x, 36.2x
-- OR --
DRG: 106, 107, 109, 547, 548, 549, 550

Summary score distributions for raloxifene and nonvertebral fracture example

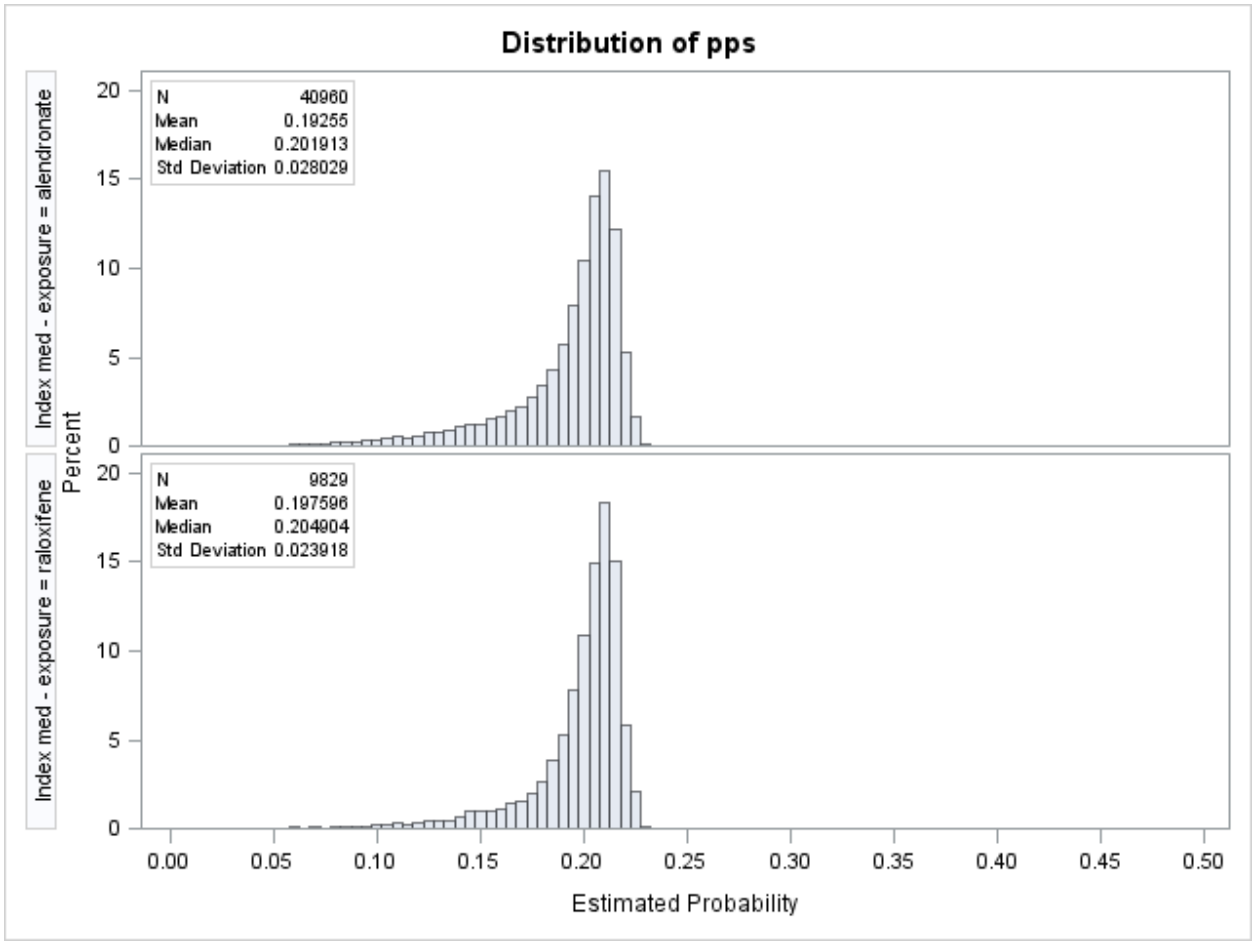
Web Figure 1. Propensity score distributions



Web Figure 2. Disease risk score distributions



Web Figure 3. Prognostic propensity score distributions



Web Table 1. 1:1 Matching Results in Raloxifene vs. Alendronate and Nonvertebral Fracture Example

Caliper Width	Odds Ratio for Fracture Raloxifene vs. Alendronate[a]		# Patients Matched	# Raloxifene Matched	% Raloxifene Matched	# Alendronate Matched	% Alendronate Matched	# Events	% Events	# Events Raloxifene	# Events Alendronate
	OR	95% CI									
PS											
0.3*SD logit(PS)[b]	1.00	0.86, 1.16	19,612	9,806	99.77	9,806	23.94	708	33.73	354	354
0.2*SD logit(PS)	1.00	0.86, 1.16	19,604	9,802	99.73	9,802	23.93	708	33.73	354	354
0.1*SD logit(PS)	1.00	0.86, 1.16	19,594	9,797	99.67	9,797	23.92	708	33.73	354	354
0.05	1.00	0.86, 1.16	19,612	9,806	99.77	9,806	23.94	708	33.73	354	354
0.025	1.00	0.86, 1.16	19,596	9,798	99.68	9,798	23.92	708	33.73	354	354
0.01	1.00	0.86, 1.16	19,588	9,794	99.64	9,794	23.91	708	33.73	354	354
0.001	1.00	0.86, 1.16	19,442	9,721	98.90	9,721	23.73	705	33.59	352	353
0.0001	0.99	0.85, 1.15	18,766	9,383	95.46	9,383	22.91	691	32.92	344	347
DRS											
0.3*SD logit(DRS)[b]	0.96	0.83, 1.11	19,656	9,828	99.99	9,828	23.99	722	34.40	354	368
0.2*SD logit(DRS)	0.96	0.83, 1.11	19,654	9,827	99.98	9,827	23.99	722	34.40	354	368
0.1*SD logit(DRS)	0.96	0.83, 1.11	19,650	9,825	99.96	9,825	23.99	722	34.40	354	368
0.05	0.96	0.83, 1.11	19,658	9,829	100	9,829	24.00	722	34.40	354	368
0.025	0.96	0.83, 1.11	19,658	9,829	100	9,829	24.00	722	34.40	354	368
0.01	0.96	0.83, 1.11	19,658	9,829	100	9,829	24.00	722	34.40	354	368
0.001	0.96	0.83, 1.11	19,656	9,828	99.99	9,828	23.99	722	34.40	354	368
0.0001	0.96	0.83, 1.12	19,598	9,799	99.69	9,799	23.92	711	33.87	349	362
PPS											
0.3*SD logit(PPS)[b]	0.96	0.83, 1.11	19,658	9,829	100	9,829	24.00	722	34.40	354	368
0.2*SD logit(PPS)	0.96	0.83, 1.11	19,658	9,829	100	9,829	24.00	722	34.40	354	368
0.1*SD logit(PPS)	0.96	0.83, 1.11	19,658	9,829	100	9,829	24.00	722	34.40	354	368
0.05	0.96	0.83, 1.11	19,658	9,829	100	9,829	24.00	722	34.40	354	368
0.025	0.96	0.83, 1.11	19,658	9,829	100	9,829	24.00	722	34.40	354	368
0.01	0.96	0.83, 1.11	19,658	9,829	100	9,829	24.00	722	34.40	354	368
0.001	0.96	0.83, 1.11	19,658	9,829	100	9,829	24.00	722	34.40	354	368
0.0001	0.96	0.83, 1.12	19,630	9,815	99.86	9,815	23.96	717	34.16	352	365

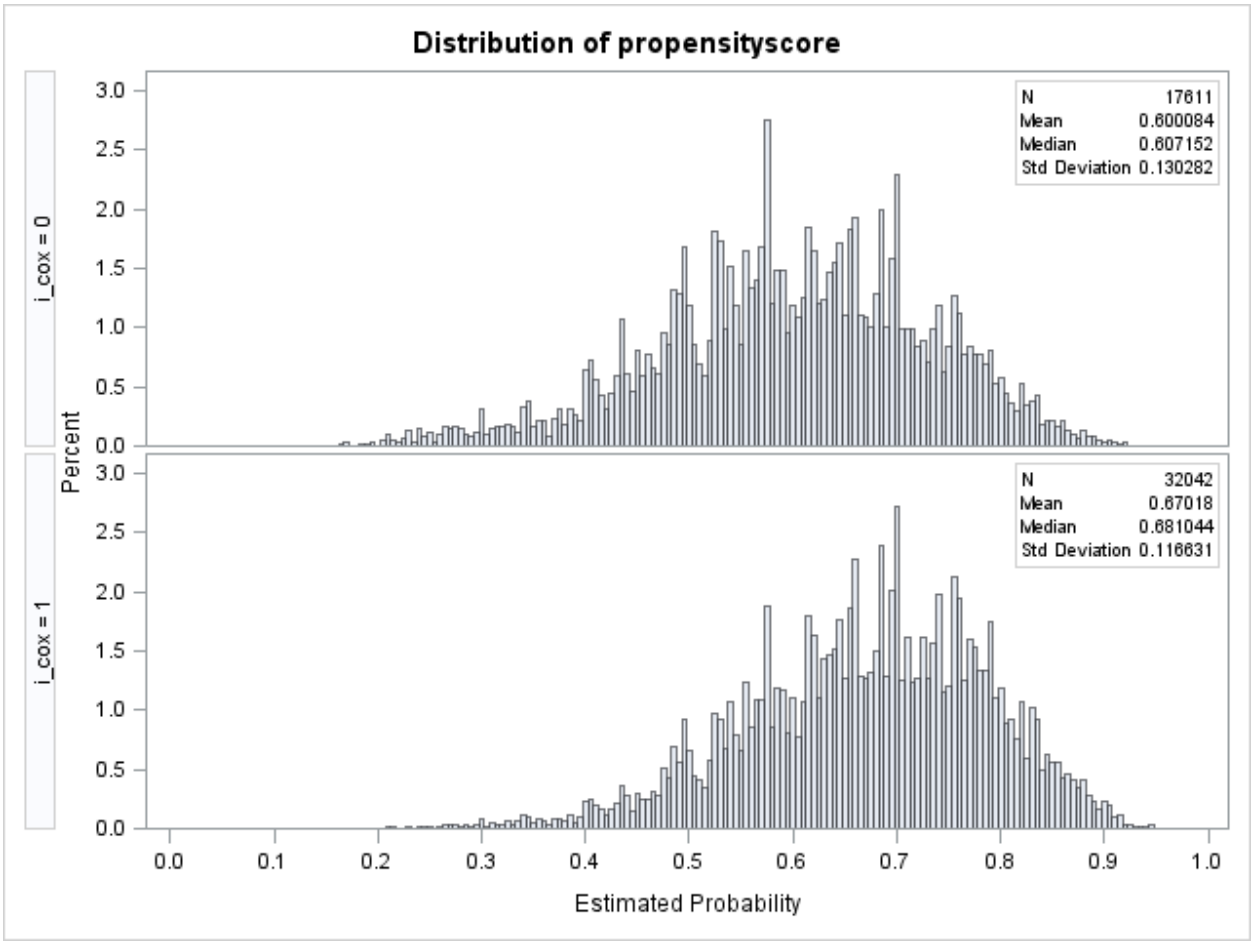
CI, confidence interval; DRS, disease risk score; OR, odds ratio; PPS, prognostic propensity score; PS, propensity score; SD, standard deviation.

[a] Unadjusted odds ratio: 0.84 (95% CI: 0.75, 0.94).

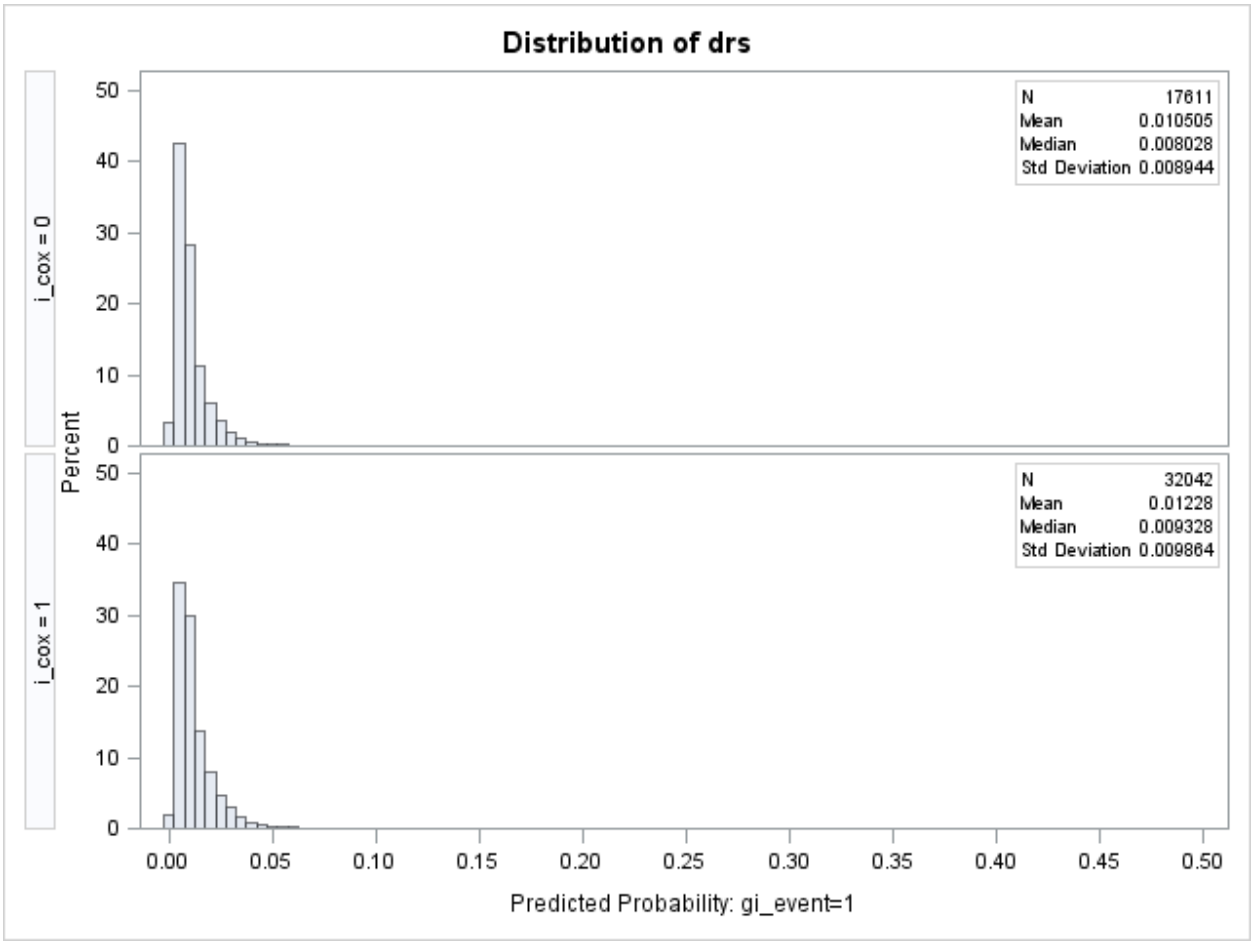
[b] SD logit(DRS) = 0.8507; SD logit(PPS) = 0.2096; SD logit(PS) = 0.7049.

Summary score distributions for cyclooxygenase 2 inhibitors and gastrointestinal toxicity example:

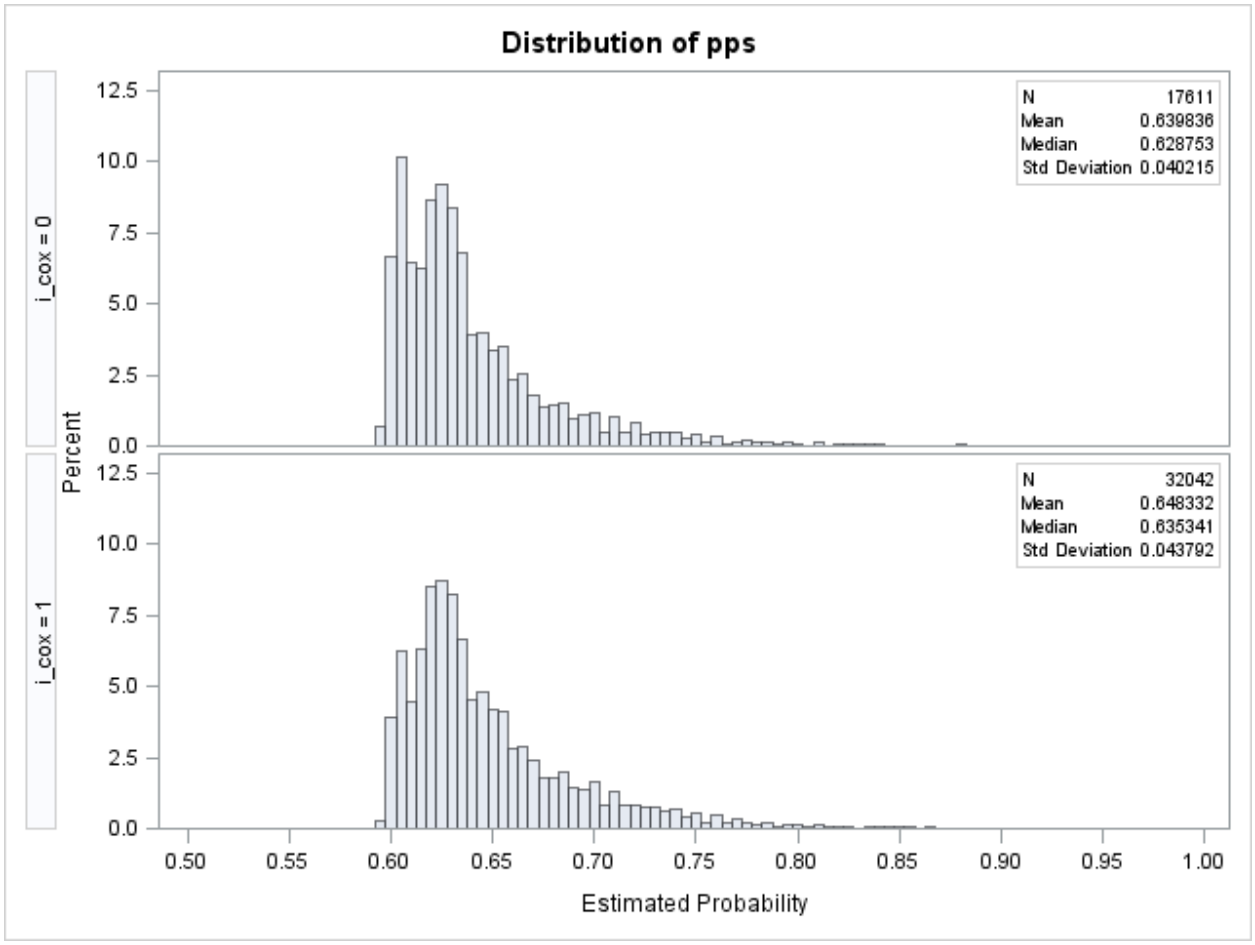
Web Figure 4. Propensity score distributions



Web Figure 5. Disease risk score distributions



Web Figure 6. Prognostic propensity score distributions



Web Table 2. 1:1 Matching Results in Coxibs vs. Nonselective Nonsteroidal Anti-inflammatory Drugs and GI Toxicity Example

Caliper Width	Odds Ratio for GI Toxicity for Coxibs vs. ns-NSAIDs[a]		# Patients Matched	# Coxib Matched	% Coxib Matched	# ns-NSAID Matched	% ns-NSAID Matched	# Events	% Events	# Events Coxib	# Events ns-NSAID
	OR	95% CI									
PS											
0.3*SD logit(PS)[b]	0.87	0.70, 1.08	32,886	16,443	51.32	16,443	93.37	335	60.69	156	179
0.2*SD logit(PS)	0.87	0.70, 1.07	32,854	16,427	51.27	16,427	93.28	334	60.51	155	179
0.1*SD logit(PS)	0.87	0.70, 1.08	32,786	16,393	51.16	16,393	93.08	333	60.33	155	178
0.05	0.88	0.71, 1.09	32,842	16,421	51.25	16,421	93.24	333	60.33	155	178
0.025	0.88	0.71, 1.09	32,756	16,378	51.11	16,378	93.00	331	59.96	155	176
0.01	0.88	0.71, 1.09	32,744	16,372	51.10	16,372	92.96	331	59.96	155	176
0.001	0.88	0.71, 1.09	32,512	16,256	50.73	16,256	92.31	331	59.96	155	176
0.0001	0.90	0.72, 1.12	30,966	15,483	48.32	15,483	87.92	311	56.34	147	164
DRS											
0.3*SD logit(DRS)[b]	0.96	0.78, 1.19	33,630	16,815	52.48	16,815	95.48	349	63.22	171	178
0.2*SD logit(DRS)	0.96	0.78, 1.19	33,630	16,815	52.48	16,815	95.48	349	63.22	171	178
0.1*SD logit(DRS)	0.96	0.78, 1.19	33,626	16,813	52.47	16,813	95.47	349	63.22	171	178
0.05	0.97	0.79, 1.19	35,220	17,610	54.96	17,610	99.99	364	65.94	179	185
0.025	0.97	0.79, 1.19	35,220	17,610	54.96	17,610	99.99	364	65.94	179	185
0.01	0.97	0.79, 1.19	35,220	17,610	54.96	17,610	99.99	364	65.94	179	185
0.001	0.97	0.79, 1.19	35,206	17,603	54.94	17,603	99.95	364	65.94	179	185
0.0001	0.98	0.80, 1.21	34,992	17,496	54.60	17,496	99.35	359	65.04	178	181
PPS											
0.3*SD logit(PPS)[b]	0.97	0.79, 1.19	35,058	17,529	54.71	17,529	99.53	360	65.22	177	183
0.2*SD logit(PPS)	0.97	0.79, 1.19	35,056	17,528	54.70	17,528	99.53	360	65.22	177	183
0.1*SD logit(PPS)	0.97	0.79, 1.19	35,036	17,518	54.67	17,518	99.47	360	65.22	177	183
0.05	0.97	0.79, 1.19	35,024	17,512	54.65	17,512	99.44	360	65.22	177	183
0.025	0.97	0.79, 1.19	35,024	17,512	54.65	17,512	99.44	360	65.22	177	183
0.01	0.97	0.79, 1.19	35,024	17,512	54.65	17,512	99.44	360	65.22	177	183
0.001	0.98	0.80, 1.20	34,940	17,470	54.52	17,470	99.20	358	64.86	177	181
0.0001	0.99	0.81, 1.23	34,176	17,088	53.33	17,088	97.03	345	62.50	172	173

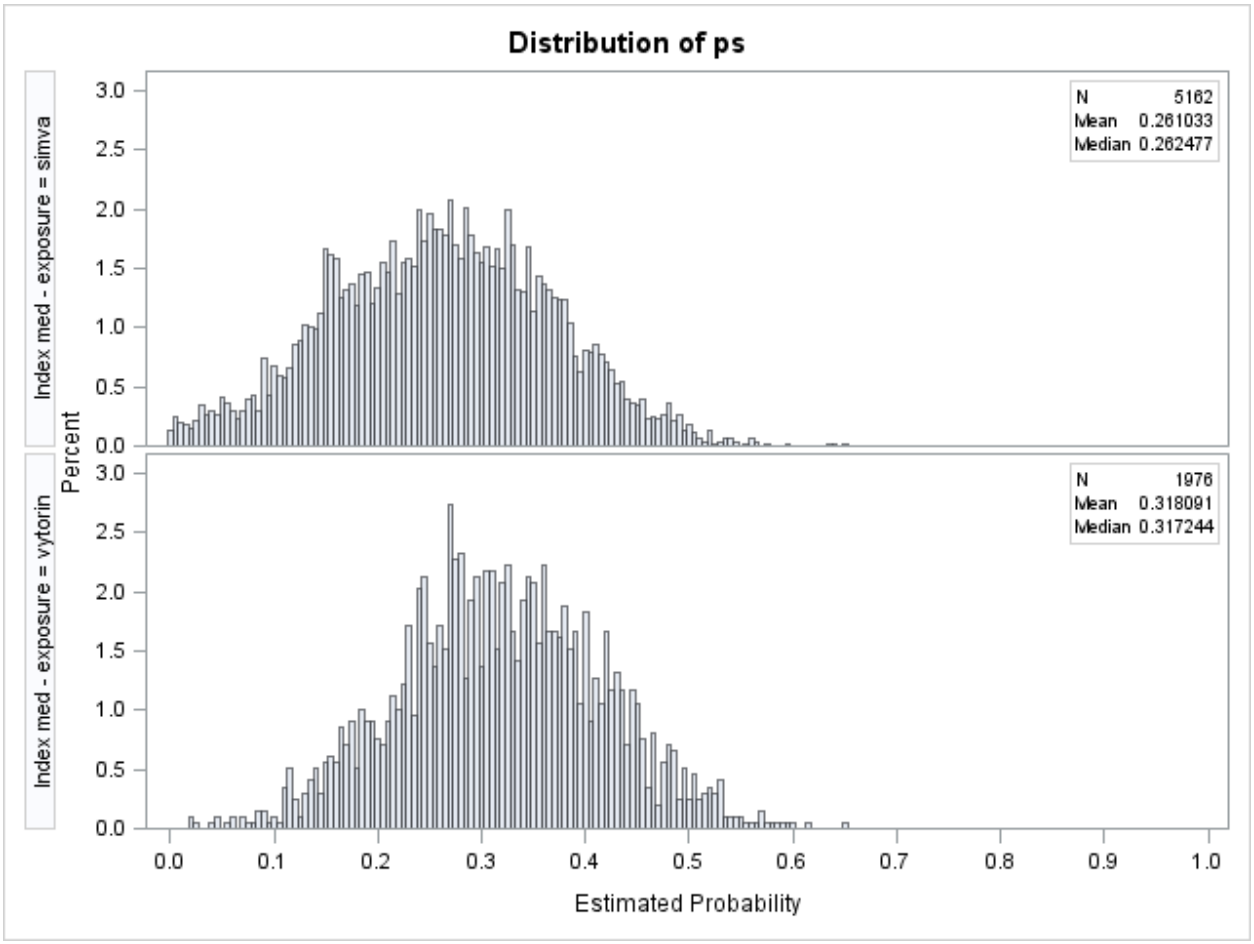
CI, confidence interval; Coxib, cyclooxygenase 2 inhibitor; DRS, disease risk score; GI, gastrointestinal; OR, odds ratio; PPS, prognostic propensity score; PS, propensity score; SD, standard deviation.

[a] Unadjusted odds ratio: 1.09 (95% CI: 0.91, 1.30).

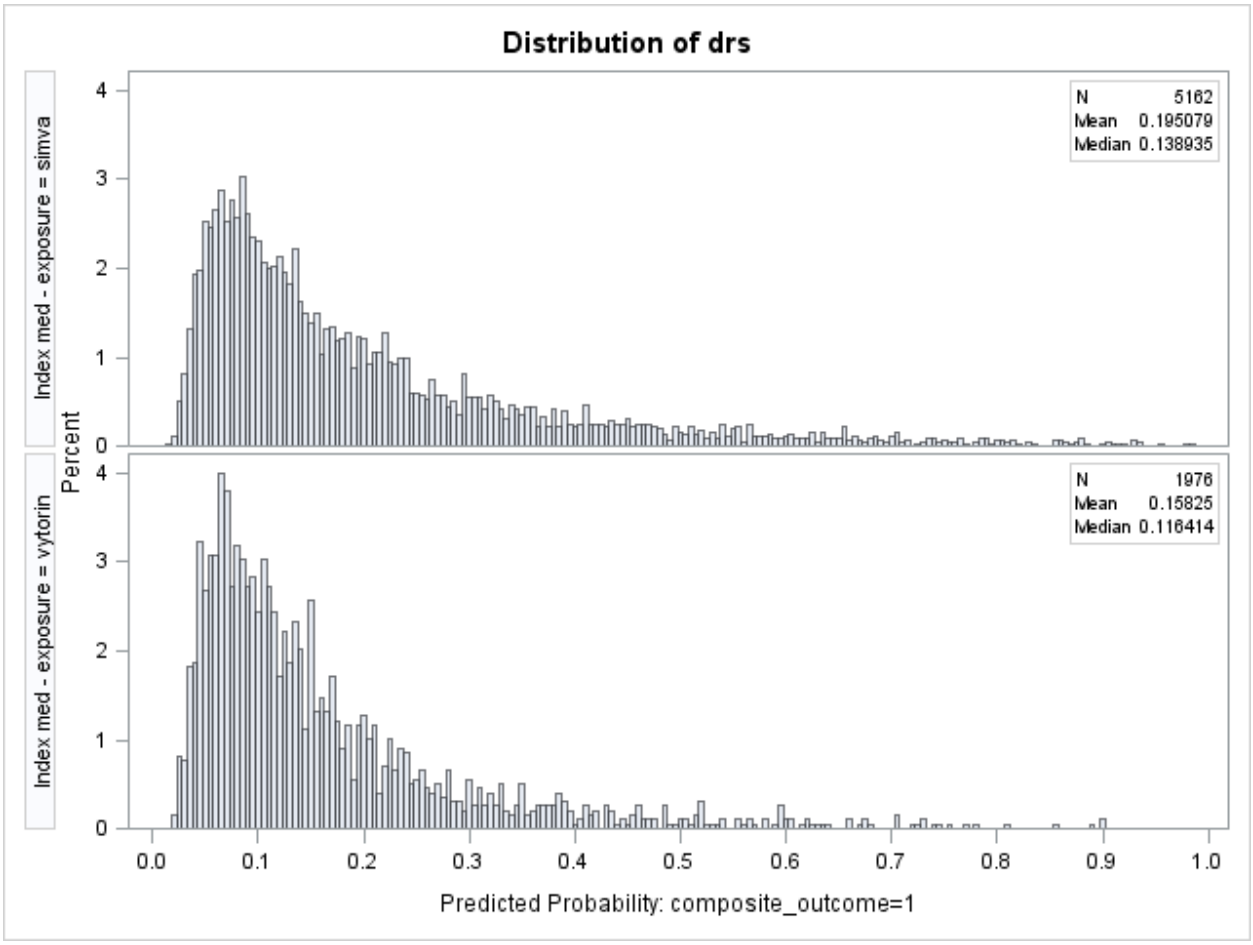
[b] SD logit(DRS) = 0.7053; SD logit(PPS) = 0.2090; SD logit(PS) = 0.5896.

Summary score distributions for simvastatin + ezetimibe and composite cardiovascular outcome example

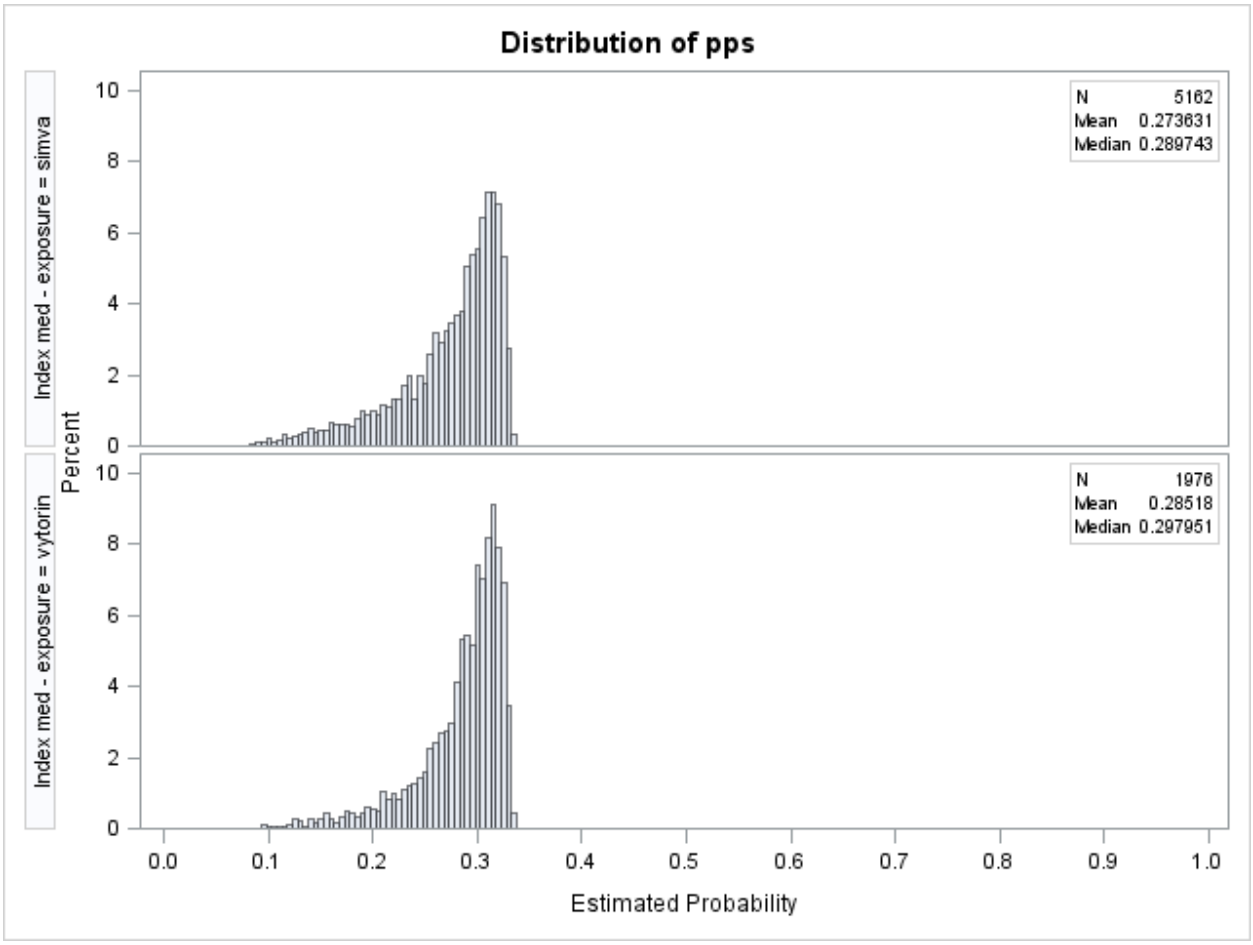
Web Figure 7. Propensity score distributions



Web Figure 8. Disease risk score distributions



Web Figure 9. Prognostic propensity score distributions



Web Table 3. 1:1 Matching Results in Simvastatin + Ezetimibe vs. Simvastatin and Composite Cardiovascular Outcome Example

Caliper Width	Odds Ratio For Composite Simvastatin + Ezetimibe vs. Simvastatin[a]		# Patients Matched	# Simvastatin + Ezetimibe Matched	% Simvastatin + Ezetimibe Matched	# Simvastatin Matched	% Simvastatin Matched	# Events	% Events	# Events Simvastatin + Ezetimibe	# Events Simvastatin
	OR	95% CI									
DRS											
0.3*SD logit(DRS)[b]	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.2*SD logit(DRS)	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.1*SD logit(DRS)	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.05	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.025	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.01	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.001	0.77	0.65, 0.91	3,908	1,954	98.89	1,954	37.85	544	43.45	236	308
0.0001	0.84	0.71, 1.06	3,206	1,603	81.12	1,603	31.05	384	30.67	178	206
PPS											
0.3*SD logit(PPS)[b]	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.2*SD logit(PPS)	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.1*SD logit(PPS)	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321

0.05	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.025	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.01	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.001	0.76	0.65, 0.90	3,952	1,976	100.00	1,976	38.28	566	45.21	245	321
0.0001	0.79	0.66, 0.94	3,740	1,870	94.64	1,870	36.23	497	39.70	219	278
PS											
0.3*SD logit(PS)[b]	0.78	0.66, 0.92	3,934	1,967	99.54	1,967	38.11	558	44.57	244	314
0.2*SD logit(PS)	0.78	0.66, 0.92	3,922	1,961	99.24	1,961	37.99	555	44.33	243	312
0.1*SD logit(PS)	0.78	0.66, 0.92	3,912	1,956	98.99	1,956	37.89	555	44.33	243	312
0.05	0.78	0.66, 0.92	3,934	1,967	99.54	1,967	38.11	558	44.57	244	314
0.025	0.78	0.66, 0.92	3,918	1,959	99.14	1,959	37.95	555	44.33	243	312
0.01	0.78	0.66, 0.92	3,908	1,954	98.89	1,954	37.85	554	44.25	243	311
0.001	0.78	0.66, 0.93	3,802	1,901	96.20	1,901	36.83	547	43.69	240	307
0.0001	0.83	0.69, 1.00	2,988	1,494	75.61	1,494	28.94	435	34.74	197	238

CI, confidence interval; DRS, disease risk score; OR, odds ratio; PPS, prognostic propensity score; PS, propensity score; SD, standard deviation.

[a] Unadjusted odds ratio: 0.58 (95% CI: 0.50, 0.68).

[b] SD logit(DRS) = 0.9901; SD logit(PPS) = 0.2724; SD logit(PS) = 0.6917.

Web Reference

1. Ray WA, Griffin MR, Fought RL, Adams ML. Identification of fractures from computerized Medicare files. *J Clin Epidemiol.* 1992;45(7): 703–714.