

# A Clinical Risk Stratification Tool for Predicting Treatment Resistance in Major Depressive Disorder

## *Supplemental Information*

Figure S1. Consort diagram of sample derivation and analysis

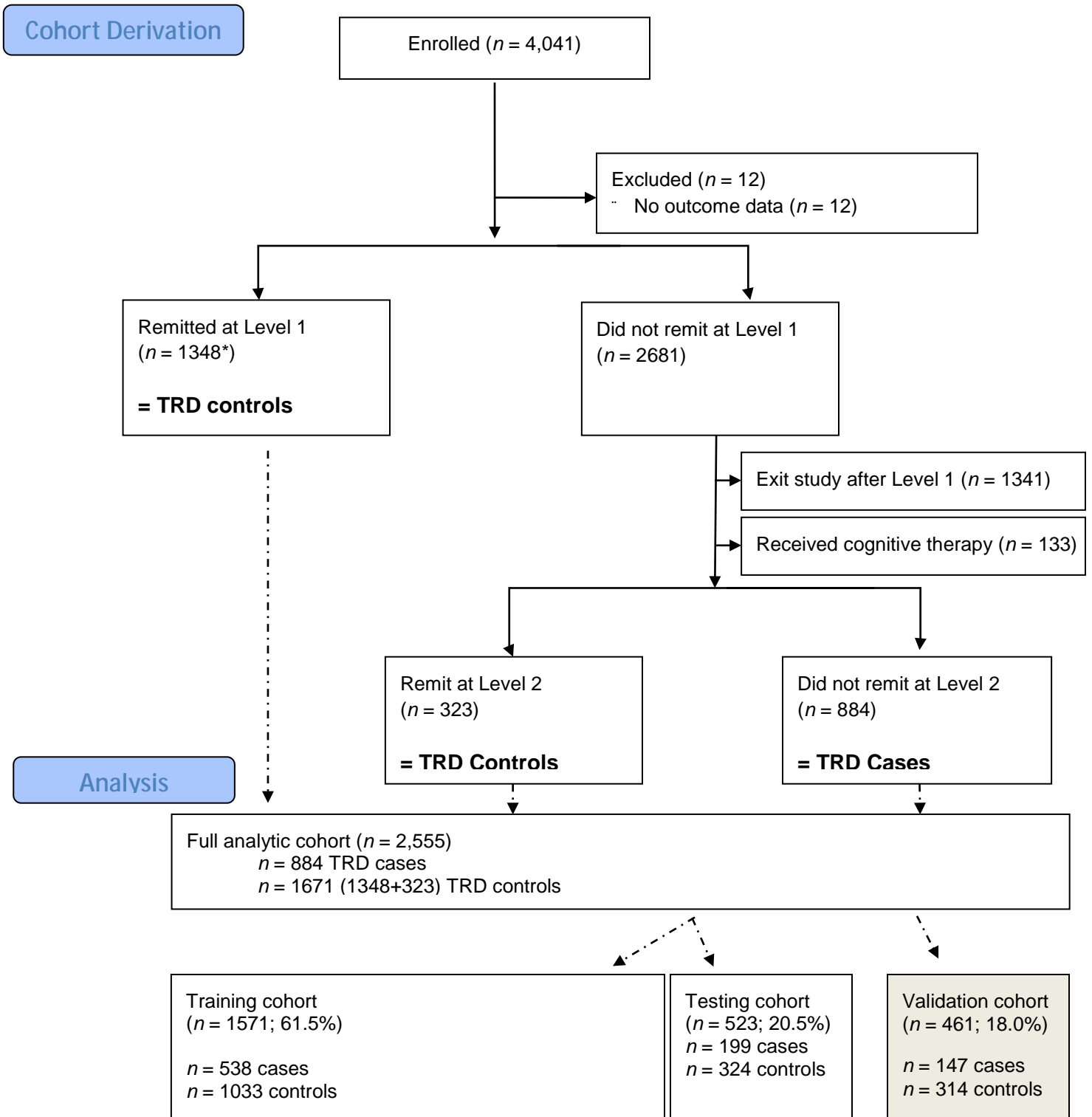
Figure S2. Diagram of model development and testing

Table S1. List of variables considered for model inclusion

Table S2. Comparison of subjects included in modeling analysis with those censored from analysis

Table S3. Comparison of subjects between 3 modeling cohorts

Table S4. Additional model performance measures



**Figure S1.** CONSORT diagram of sample derivation and analysis. \*includes subjects who remit but enter Level 2 ( $n = 97$ ). TRD, treatment-resistant depression.

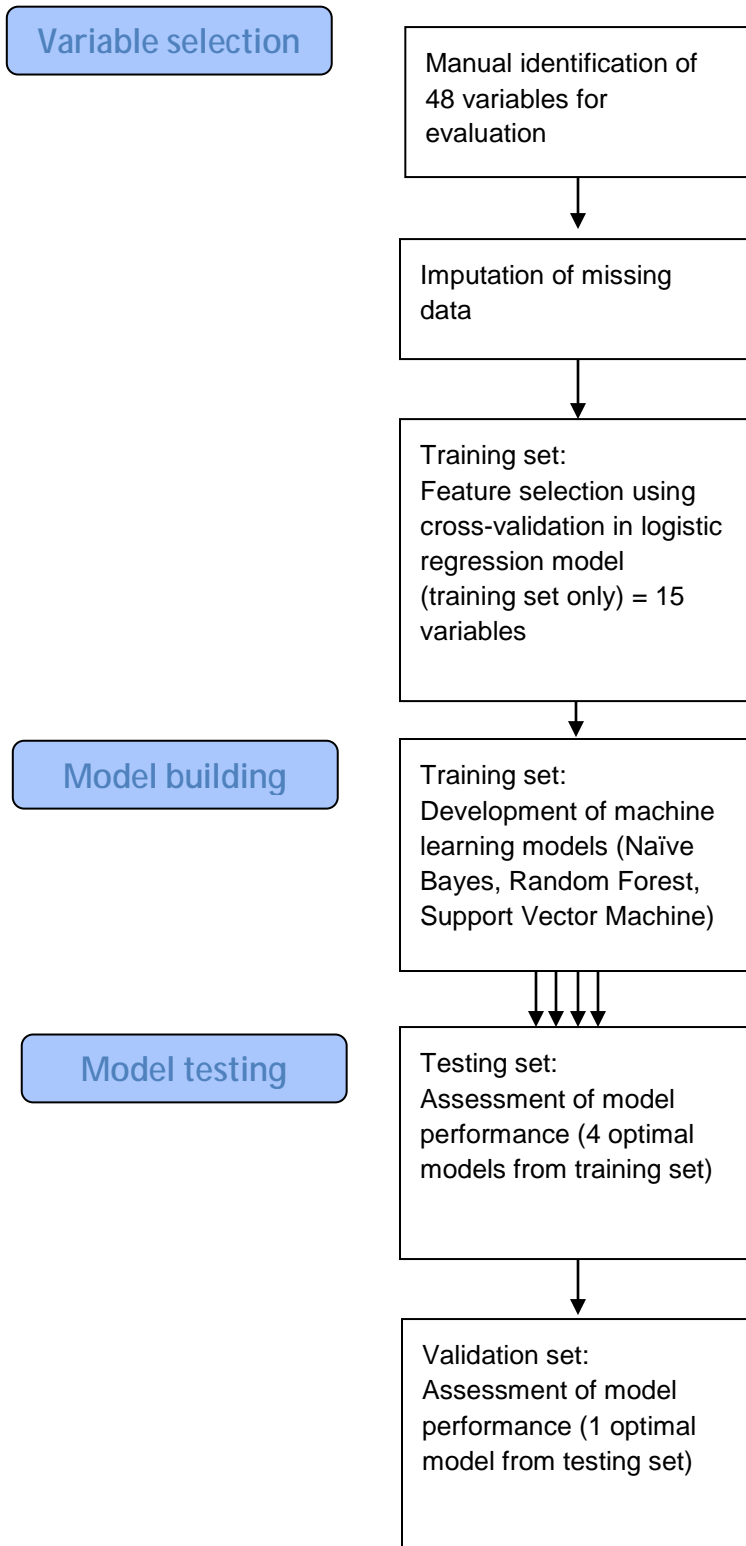


Figure S2. Diagram of model development and testing

**Table S1.** List of variables considered for model inclusion

<b>Category</b>	<b>Variables</b>	<b>Source</b>
Depression symptoms	QIDS-SR items, QIDS-SR total score, perimenstrual worsening	QIDS-SR, psychiatric history form*
Sociodemographic features	Age, sex, years of education, marital status (current, lifetime), ethnicity (white vs other, black vs other), race, home ownership	Enrollment demographic form*
Psychiatric comorbidity	Individual DSM-IV axis I diagnoses, total axis I diagnoses, 1+ psychotic symptom from PDSQ, 1+ manic symptom from PDSQ	PDSQ
Illness course features and stressors	Recurrence, duration of current episode, onset age, witnessed trauma (lifetime), experienced trauma (lifetime), family impact (current)	Psychiatric history form*, PDSQ, enrollment demographic form*

QIDS-SR, Quick Inventory of Depressive Symptoms; PDSQ, Psychiatric Diagnostic Symptom Questionnaire.

\* Variable recorded by clinician but readily assessed by patient self-report.

**Table S2.** Comparison of subjects included in modeling analysis with those censored from analysis

Feature	Included ( <i>n</i> = 2555)		Censored ( <i>n</i> = 1486)		Comparison	
	pct	<i>n</i>	pct	<i>n</i>	$\chi^2$	<i>p</i> value
Sex (male)	39.4%	1006	33.8%	503	12.26	<0.001
Race (White)	82.1%	2097	72.7%	1080	49.35	<0.001
Race (African-American)	15.7%	402	24.0%	357	42.33	<0.001
Ethnicity (Hispanic)	12.0%	306	13.5%	201	2.06	0.152
Primary care setting	37.8%	965	41.0%	610	4.25	0.039
Currently married	35.1%	897	29.3%	435	14.47	<0.001
	mean	SD	mean	SD	<i>t</i> -statistic	<i>p</i> value
Age (years)	41.32	13.04	40.34	13.65	2.26	0.024
Baseline QIDS-SR	15.12	4.39	15.93	4.24	-5.74	<.001
Education (years)	13.66	3.21	13.08	3.19	5.53	<.001
Episode duration (months)	25.05	53.39	25.21	51.00	-0.09	0.925
Comorbid axis 1 diagnoses	1.28	1.60	1.68	1.78	-7.28	<.001

pct, percent; QIDS-SR: Inventory of Depressive Symptomatology Self-Report (16-item).

**Table S3.** Comparison of subjects between 3 modeling cohorts

Feature	Training ( <i>n</i> = 1571)		Testing ( <i>n</i> = 523)		Validation ( <i>n</i> = 461)		Comparison	
	pct	<i>n</i>	pct	<i>n</i>	pct	<i>n</i>	$\chi^2$	<i>p</i> value
Sex (male)	38.9%	611	39.6%	207	40.8%	188	0.54	0.76
Race (White)	81.9%	1286	83.0%	434	81.8%	377	0.37	0.83
Race (African-American)	15.8%	248	15.9%	83	15.4%	71	0.05	0.98
Ethnicity (Hispanic)	10.8%	169	11.7%	61	16.5%	76	11.16	0.004
Primary care setting	38.8%	610	42.3%	221	29.1%	134	20.08	<.001
Currently married	36.3%	571	36.3%	190	29.5%	136	7.76	0.02
	mean	SD	mean	SD	mean	SD	ANOVA	<i>p</i> value
Age (years)	41.52	12.99	41.88	12.79	40.01	13.43	2.97	0.05
Baseline QIDS-SR	15.15	4.34	15.18	4.38	14.94	4.57	0.48	0.62
Education (years)	13.58	3.23	13.61	3.12	13.96	3.24	2.58	0.08
Episode duration (months)	22.46	44.81	23.49	50.85	35.66	76.82	11.26	<.001
Comorbid axis 1 diagnoses	1.32	1.64	1.28	1.56	1.14	1.52	2.19	0.11

pct, percent; QIDS-SR: Inventory of Depressive Symptomatology Self-Report (16-item).

**Table S4.** Additional model performance measures

	Logistic Regression		Naïve Bayes		Random Forest		Support Vector	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
<b>Training set (cross-validation)</b>								
Accuracy	69.058	2.765	69.218	2.865	69.765	2.424	67.734	2.692
Kappa	0.242	0.069	0.306	0.066	0.248	0.061	0.157	0.071
RMSE	0.445	0.012	0.464	0.021	0.445	0.011	0.453	0.011
Relative absolute error	86.758	2.390	79.077	4.221	88.391	2.226	91.991	2.465
Root relative squared error	93.759	2.526	97.812	4.395	93.861	2.254	95.462	2.241
SF entropy gain	14.366	5.821	-3.191	14.601	13.800	5.060	10.234	4.853
SF mean entropy gain	0.091	0.037	-0.020	0.093	0.088	0.032	0.065	0.031
<b>Testing set</b>								
Accuracy	66.539		67.113		67.878		66.157	
Kappa	0.222		0.282		0.249		0.183	
RMSE	0.455		0.476		0.460		0.462	
RAE	87.117		80.783		89.184		89.876	
RRSE	93.375		97.837		94.391		94.959	
SF entropy gain	50.077		-12.115		42.721		39.071	
SF mean entropy gain	0.096		-0.023		0.082		0.075	
<b>Validation set</b>								
Accuracy	70.282							
Kappa	0.198							
RMSE	0.438							
RAE	86.099							
RRSE	93.870							
SF entropy gain	42.884							
SF mean entropy gain	0.093							

RAE, relative absolute error; RMSE, root mean squared error; RRSE, root relative squared error.