

Depression and CAD

Biobank analysis with sex and age

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Intake

The Biobank data was extracted in full. Demographic and angiographic data was pulled from the initial enrollment. Depression scores were also extracted from initial enrollment.

Tidy data

Sex and age categories

The ages and sex of the patients were documented as well. We chose to group patients by age, based on ≤ 60 and > 60 in age.

Table 1:

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
age	7,654	62.250	12.963	0.545	54.373	71.251	99.627

Depression scores

Depression was scored by PHQ9. The overview is below.

Table 2:

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
phq	7,674	11.175	6.742	0	9	15	36

Coronary artery disease

All angiogram data was extracted from the biobank. Each patient was analyzed for first enrollment angiography data.

Mortality and outcomes

Mortality and outcomes was also extracted, although they have not yet been adjudicated or organized by type of outcome event (e.g. MACE versus other).

Table 3: Summary descriptives table by groups of ‘gend’

	Women N=2788	Men N=4845	p.overall
age	62.1 (13.7)	62.3 (12.5)	0.509
phq	11.7 (7.21)	10.9 (6.41)	<0.001
sad:			<0.001
Undepressed	947 (34.0%)	1976 (40.8%)	
Depressed	1841 (66.0%)	2869 (59.2%)	

Table 4: Summary descriptives table

	[ALL] N=7674	N
lm	6.02 (17.5)	7674
lad	27.8 (36.6)	7674
lcx	18.8 (32.1)	7674
rca	27.4 (37.8)	7674
cass50	0.91 (1.02)	3072
cass70	0.74 (0.94)	3072
gensini	45.4 (43.9)	3072

Depression and Coronary Artery Disease

Descriptive analysis

The data is described below. We compared all patients by depression score and age first. We suspect there is an interaction between age, gender, and depression, and this is compared/visualized below.

The data also has catherization data. This is the breakdown by angiogram score for CAD severity. The table shows the major epicardial vessels with the mean percent stenosis found, along with the major angiographic scoring systems.

All the groups were compared by gender, age, sex, depression, and presence of stenoses on catherization.

Relationship of gender and depression with CAD

Amit’s JAHA paper suggested that young women with depression were more susceptible to CAD.

Table 5: Characteristics by Age Group

	Young N=2037	Middle N=2199	Old N=3418	p.overall
gend:				0.185
Women	765 (37.8%)	768 (35.1%)	1249 (36.7%)	
Men	1261 (62.2%)	1422 (64.9%)	2156 (63.3%)	
phq	11.6 (7.22)	11.2 (6.85)	11.0 (6.35)	0.004
cass50	0.57 (0.85)	0.93 (1.04)	1.09 (1.05)	<0.001
cass70	0.46 (0.76)	0.76 (0.96)	0.89 (0.99)	<0.001
gensini	35.7 (32.6)	44.0 (39.7)	52.1 (50.8)	<0.001

Table 6: Characteristics by Sex

	Women N=2788	Men N=4845	p.overall
age	62.1 (13.7)	62.3 (12.5)	0.509
phq	11.7 (7.21)	10.9 (6.41)	<0.001
cass50	0.62 (0.88)	1.06 (1.06)	<0.001
cass70	0.48 (0.77)	0.88 (0.99)	<0.001
gensini	34.8 (31.7)	51.1 (48.3)	<0.001

Table 7: Characteristics by Depression status

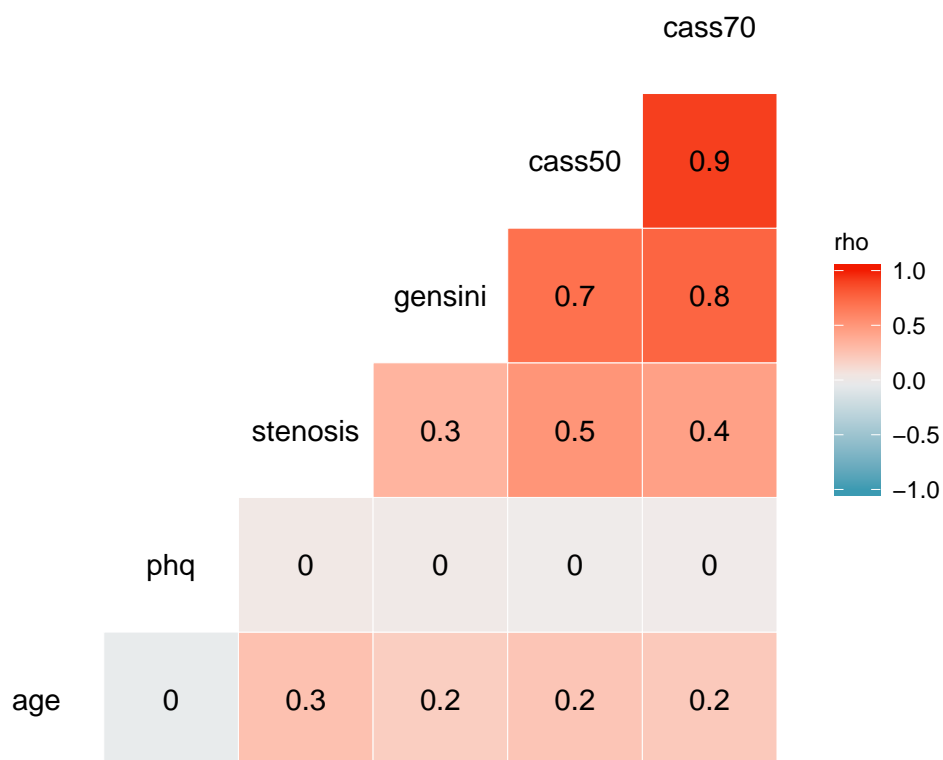
	Undepressed N=2946	Depressed N=4710	p.overall
age	62.4 (12.5)	62.2 (13.2)	0.582
gend:			<0.001
Women	947 (32.4%)	1841 (39.1%)	
Men	1976 (67.6%)	2869 (60.9%)	
cass50	0.88 (1.02)	0.92 (1.02)	0.330
cass70	0.71 (0.93)	0.75 (0.94)	0.169
gensini	44.1 (42.5)	46.1 (44.7)	0.214

Table 8: Characteristics by obstructive CAD

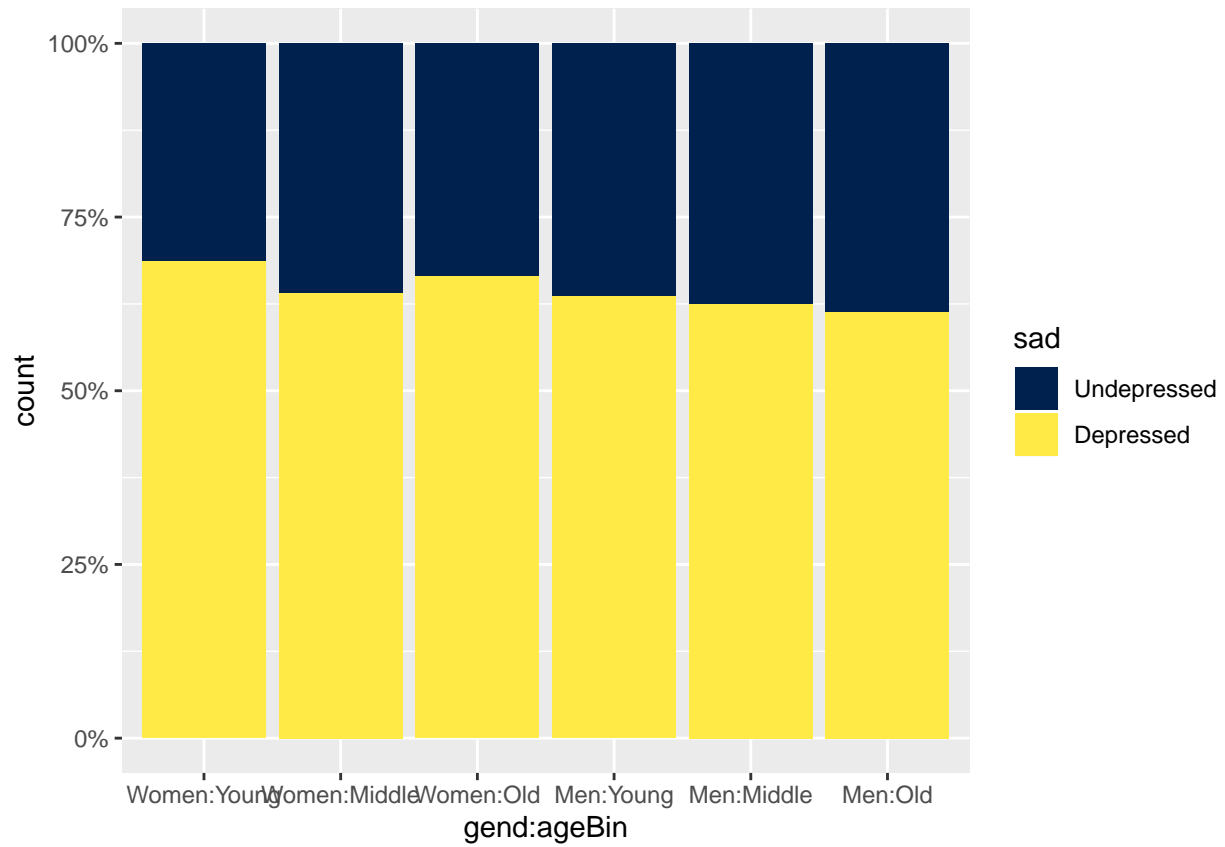
	0 N=768	1 N=2304	p.overall
age	56.8 (13.2)	64.1 (11.4)	<0.001
gend:			<0.001
Women	356 (47.3%)	707 (30.9%)	
Men	397 (52.7%)	1581 (69.1%)	
phq	10.9 (6.54)	11.4 (6.68)	0.047
cass50	0.01 (0.19)	1.21 (1.01)	0.000
cass70	0.01 (0.17)	0.98 (0.97)	0.000
gensini	20.0 (7.76)	53.8 (47.6)	<0.001

“After multivariable adjustment for CAD risk factors, depressive symptoms predicted CAD presence in women aged 55 years (odds ratio=1.07 95% confidence interval [CI] 1.02 to 1.13 per 1 point increase in PHQ-9 score), but not in men aged 55 years or women aged >55 years.” ~ Shah et al 2014

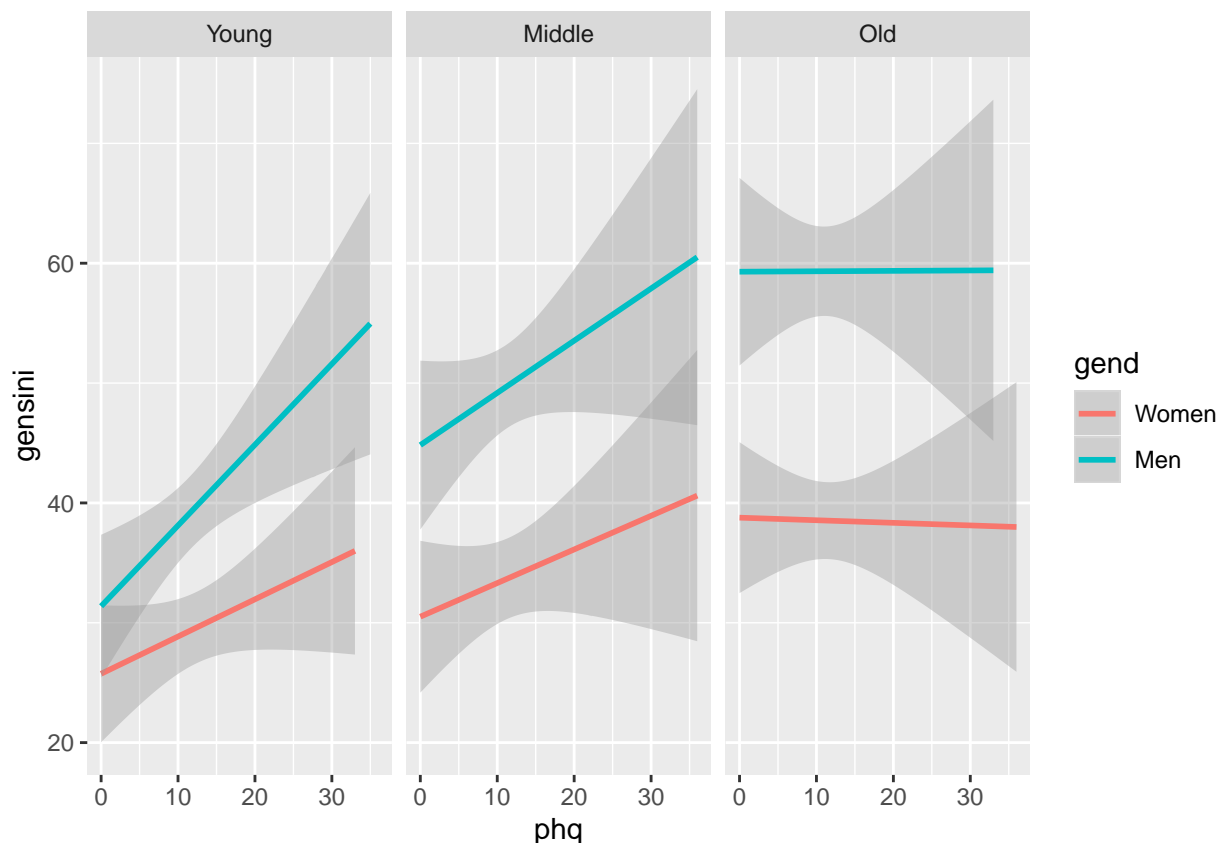
TO re-establish this relationship with roughly ~7000 patients, double that of the group in 2014, we first have to check the association of depression with CAD. Per this plot, no obvious correlation by comparing two variables exists.



However, the relationship of depression and CAD may be modified by age and sex. We can explore sex and age effects on depression first.



Although it seems like younger women have more depression, its not a huge difference like in the 2014 data set. Lets look at the visual differences as it depression predicts CAD.



This pattern shows the largest difference in slopes with younger women compared to younger men. The pattern in old age does not show an interaction at all. There may be some pattern with middle age, but its hard to tell. With young age, men versus women, likely shows an effect modification. So, we should do the regression analyses here.

Table 9:

	Dependent variable:			
	gensini			
	(1)	(2)	(3)	(4)
phq	0.188 (0.119)	0.238** (0.119)	0.275** (0.117)	0.270** (0.117)
gendMen		16.440*** (1.643)	16.584*** (1.626)	9.773*** (3.195)
ageBinMiddle			8.520*** (2.080)	4.379 (3.523)
ageBinOld			16.492*** (1.913)	9.189*** (3.255)
gendMen:ageBinMiddle				6.276 (4.361)
gendMen:ageBinOld				11.146*** (4.019)
Constant	43.253*** (1.557)	32.017*** (1.914)	21.711*** (2.337)	26.242*** (2.970)
Observations	3,072	3,041	3,036	3,036
R ²	0.001	0.033	0.056	0.059
Adjusted R ²	0.0005	0.032	0.055	0.057
Residual Std. Error	43.866 (df = 3070)	43.174 (df = 3038)	42.686 (df = 3031)	42.646 (df = 3029)
F Statistic	2.484 (df = 1; 3070)	51.464*** (df = 2; 3038)	45.263*** (df = 4; 3031)	31.522*** (df = 6; 3029)

Note:

* p<0.1; ** p<0.05; *** p<0.01