5A Results

WLS Regression Results

Dep. Variable:	dbrwt	R-squared (uncentered):	0.981
Model:	WLS	Adj. R-squared (uncentered):	0.981
Method:	Least Squares	F-statistic:	7.849e+04
Date:	Mon, 02 Oct 2023	Prob (F-statistic):	0.00
Time:	12:06:02	Log-Likelihood:	-8.8421e+05
No. Observations:	114610	AIC:	1.769e+06
Df Residuals:	114535	BIC:	1.769e+06
Df Model:	75		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
tobacco	-207.0869	2.748	-75.359	0.000	-212.473	-201.701
alcohol	-41.5574	20.688	-2.009	0.045	-82.107	-1.008
mrace3_2	-204.0742	13.971	-14.608	0.000	-231.456	-176.692
mrace3_3	-149.2114	6.744	-22.125	0.000	-162.430	-135.993
ormothhis	-106.5629	10.719	-9.941	0.000	-127.573	-85.553
adeq_2.0	-40.6024	4.976	-8.159	0.000	-50.356	-30.849
adeq_3.0	-83.0863	9.988	-8.319	0.000	-102.663	-63.510
cardiac	-25.1019	23.434	-1.071	0.284	-71.033	20.829
pre4000	396.3394	16.386	24.188	0.000	364.223	428.455
phyper	-102.1755	11.280	-9.058	0.000	-124.284	-80.067
diabetes	140.5443	12.034	11.679	0.000	116.958	164.130
anemia	18.2216	19.477	0.936	0.350	-19.952	56.396

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lung                -24.6099     22.895     -1.075      0.282
-69.483      20.263
dlivord              25.6253      3.833      6.685      0.000
18.112      33.138
educ_0.0          -1796.3814     36.128    -49.722      0.000
-1867.192   -1725.571
educ_1.0          -1811.8247     33.714    -53.741      0.000
-1877.904   -1745.746
educ_2.0          -1781.7508     34.195    -52.106      0.000
-1848.773   -1714.729
dmage                0.6116      0.468      1.308      0.191
-0.305       1.528
dmar                47.1455      5.822      8.098      0.000
35.735      58.556
tot_2.0              9.3572      7.222      1.296      0.195
-4.799      23.513
tot_3.0             12.6628      8.451      1.498      0.134
-3.902      29.228
tot_4.0              6.5467     10.192      0.642      0.521
-13.430      26.523
tot_5.0             -1.1581     12.878     -0.090      0.928
-26.400      24.084
tot_6.0             -3.1801     16.848     -0.189      0.850
-36.203      29.843
tot_7.0            -19.5192     23.196     -0.841      0.400
-64.983      25.944
tot_8.0            -60.7137     26.372     -2.302      0.021
-112.401      -9.026
live_1.0           -45.1496     26.527     -1.702      0.089
-97.142       6.842
live_2.0           -58.9853     23.476     -2.513      0.012
-104.997     -12.974
live_3.0            48.8769     11.649      4.196      0.000
26.046      71.708
live_4.0            97.5948     10.632      9.179      0.000
76.756     118.434
live_5.0            99.3359      9.437     10.526      0.000
80.839     117.833
live_6.0            91.3998      9.968      9.169      0.000
71.862     110.937
live_7.0            87.3696     11.276      7.748      0.000
65.269     109.470
live_8.0            67.4998     12.922      5.224      0.000
42.172      92.827
live_9.0            56.7232     10.326      5.493      0.000
36.484      76.962
dgestat            114.1369      0.793    143.878      0.000
112.582     115.692
csex               136.2566      3.873     35.177      0.000
128.665     143.849
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plur_1              557.5086     14.856     37.527      0.000
528.390     586.627
tobacco*alcohol     -37.3553     28.791     -1.297      0.194
-93.786      19.075
tobacco*mrace3_2    168.2630     22.360      7.525      0.000
124.437     212.089
tobacco*mrace3_3     29.6416      9.041      3.279      0.001
11.922      47.362
tobacco*ormothhis    63.4667     15.281      4.153      0.000
33.516      93.418
tobacco*adeq_2.0    -10.4440      6.998     -1.492      0.136
-24.160       3.271
tobacco*adeq_3.0     22.6642     14.154      1.601      0.109
-5.077      50.406
tobacco*cardiac      40.0408     33.516      1.195      0.232
-25.650     105.732
tobacco*pre4000     -81.6769     23.570     -3.465      0.001
-127.873     -35.481
tobacco*phyper       75.7938     15.443      4.908      0.000
45.525     106.063
tobacco*diabetes    108.0879     16.720      6.465      0.000
75.317     140.859
tobacco*anemia      -23.6157     27.305     -0.865      0.387
-77.133      29.902
tobacco*lung         -9.3122     31.899     -0.292      0.770
-71.835      53.210
tobacco*dlivord     -20.9630      5.476     -3.828      0.000
-31.696     -10.230
tobacco*educ_0.0   2020.1929    272.059      7.426      0.000
1486.961    2553.425
tobacco*educ_1.0   2127.1110    271.418      7.837      0.000
1595.135    2659.087
tobacco*educ_2.0   2141.9475    271.497      7.889      0.000
1609.817    2674.078
tobacco*dgestat      -7.9029      1.117     -7.074      0.000
-10.093      -5.713
tobacco*dmage        -2.7492      0.634     -4.336      0.000
-3.992      -1.507
tobacco*dmar         -9.1091      7.804     -1.167      0.243
-24.405       6.187
tobacco*csex          2.9970      5.484      0.547      0.585
-7.751      13.745
tobacco*tot_2.0      11.7438     10.104      1.162      0.245
-8.060      31.548
tobacco*tot_3.0     -10.5362     11.869     -0.888      0.375
-33.800      12.727
tobacco*tot_4.0      41.4315     14.421      2.873      0.004
13.166      69.697
tobacco*tot_5.0       1.9828     18.193      0.109      0.913
-33.675      37.641
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tobacco*tot_6.0      14.1269     23.973      0.589      0.556
-32.860      61.114
tobacco*tot_7.0      50.9727     32.542      1.566      0.117
-12.808     114.754
tobacco*tot_8.0     116.8844     36.859      3.171      0.002
44.642     189.127
tobacco*live_1.0     17.4014     37.752      0.461      0.645
-56.592      91.395
tobacco*live_2.0      2.8189     32.850      0.086      0.932
-61.567      67.205
tobacco*live_3.0      8.9817     16.619      0.540      0.589
-23.591      41.554
tobacco*live_4.0     -0.7810     15.188     -0.051      0.959
-30.549      28.987
tobacco*live_5.0    -23.2035     13.411     -1.730      0.084
-49.490       3.082
tobacco*live_6.0      0.2856     14.108      0.020      0.984
-27.366      27.937
tobacco*live_7.0     27.2467     16.057      1.697      0.090
-4.225      58.719
tobacco*live_8.0     -0.0112     18.250     -0.001      1.000
-35.782      35.759
tobacco*live_9.0      5.3072     14.470      0.367      0.714
-23.053      33.668
tobacco*plur_1        0.4043     21.088      0.019      0.985
-40.927      41.736
==============================================================================
Omnibus:                    19873.048   Durbin-Watson:
1.963
Prob(Omnibus):                  0.000   Jarque-Bera (JB):
451672.410
Skew:                           0.126   Prob(JB):
0.00
Kurtosis:                      12.722   Cond. No.
1.66e+04
==============================================================================

Notes:
[1] R² is computed without centering (uncentered) since the model does
not contain a constant.
[2] Standard Errors assume that the covariance matrix of the errors is
correctly specified.
[3] The condition number is large, 1.66e+04. This might indicate that
there are
strong multicollinearity or other numerical problems.
How many covars once we include interaction terms?
(114610, 741)
5B Results Long Covars
```

OLS Regression Results

Dep. Variable:	dbrwt	R-squared:	0.363
Model:	OLS	Adj. R-squared:	0.363
Method:	Least Squares	F-statistic:	3441.
Date:	Mon, 02 Oct 2023	Prob (F-statistic):	0.00
Time:	12:06:08	Log-Likelihood:	-8.6704e+05
No. Observations:	114610	AIC:	1.734e+06
Df Residuals:	114590	BIC:	1.734e+06
Df Model:	19		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
intercept	-2713.6686	86.874	-31.237	0.000	-2883.940	-2543.397
tobacco	-186.0027	3.976	-46.781	0.000	-193.796	-178.210
8	187.5849	37.700	4.976	0.000	113.694	261.476
18	58.6302	6.553	8.947	0.000	45.786	71.475
35	129.7421	2.722	47.664	0.000	124.407	135.077
36	133.0145	13.795	9.642	0.000	105.977	160.052
37	1634.6725	97.614	16.746	0.000	1443.351	1825.994
276	187.5849	37.700	4.976	0.000	113.694	261.476
305	35.8496	76.290	0.470	0.638	-113.678	185.378
419	26.4134	2.352	11.228	0.000	21.803	31.024
421	24.2949	2.090	11.622	0.000	20.198	28.392
439	11.0031	2.326	4.730	0.000	6.443	15.563
528	0.2995	0.040	7.436	0.000	0.221	

```
0.378
529           -0.6387      0.576     -1.109      0.267      -1.768
0.490
530           -8.3132      1.566     -5.308      0.000     -11.383
-5.244
549            3.0272      7.270      0.416      0.677     -11.223
17.277
737          -22.2441      2.485     -8.951      0.000     -27.115
-17.373
1            -15.9317     11.266     -1.414      0.157     -38.014
6.150
15            11.4969      5.607      2.050      0.040       0.507
22.487
38           -15.9317     11.266     -1.414      0.157     -38.014
6.150
52           -80.0723     28.908     -2.770      0.006    -136.731
-23.414
418            7.4802      2.205      3.392      0.001       3.158
11.803
==============================================================================
========
Omnibus:                     1369.369   Durbin-Watson:
1.958
Prob(Omnibus):                  0.000   Jarque-Bera (JB):
2417.017
Skew:                           0.042   Prob(JB):
0.00
Kurtosis:                       3.706   Cond. No.
3.67e+20
==============================================================================
========

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is
correctly specified.
[2] The smallest eigenvalue is 1.05e-30. This might indicate that
there are
strong multicollinearity problems or that the design matrix is
singular.
5B Results Short Covars (just x_a_tilde)
                            OLS Regression Results
==============================================================================
========
Dep. Variable:                  dbrwt   R-squared:
0.363
Model:                            OLS   Adj. R-squared:
0.363
Method:                 Least Squares   F-statistic:
4352.
Date:                Mon, 02 Oct 2023   Prob (F-statistic):
```

```
0.00
Time:                        12:06:08   Log-Likelihood:
-8.6707e+05
No. Observations:              114610   AIC:
1.734e+06
Df Residuals:                  114594   BIC:
1.734e+06
Df Model:                          15
Covariance Type:            nonrobust
==============================================================================
========
                 coef    std err          t      P>|t|      [0.025
0.975]
------------------------------------------------------------------------------
--------
intercept  -2690.5768     86.765    -31.010      0.000   -2860.635
-2520.519
tobacco     -185.7886      3.922    -47.373      0.000    -193.475
-178.102
8            189.9596     37.708      5.038      0.000     116.052
263.867
18            46.7309      6.117      7.640      0.000      34.742
58.719
35           129.7277      2.722     47.653      0.000     124.392
135.063
36           133.0668     13.798      9.644      0.000     106.023
160.110
37          1628.1265     97.627     16.677      0.000    1436.780
1819.473
276          189.9596     37.708      5.038      0.000     116.052
263.867
305           30.5322     76.307      0.400      0.689    -119.028
180.092
419           16.0783      1.345     11.956      0.000      13.443
18.714
421           29.9770      1.825     16.429      0.000      26.401
33.553
439           13.8809      2.176      6.379      0.000       9.616
18.146
528            0.2998      0.040      7.446      0.000       0.221
0.379
529           -0.8663      0.573     -1.512      0.131      -1.989
0.257
530           -8.1475      1.566     -5.203      0.000     -11.217
-5.078
549            3.7922      7.269      0.522      0.602     -10.455
18.040
737          -22.2142      2.486     -8.936      0.000     -27.086
-17.342
==============================================================================
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========
Omnibus:                     1374.488   Durbin-Watson:
1.958
Prob(Omnibus):                  0.000   Jarque-Bera (JB):
2427.597
Skew:                           0.043   Prob(JB):
0.00
Kurtosis:                       3.708   Cond. No.
3.08e+19
================================================================================
========

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is
correctly specified.
[2] The smallest eigenvalue is 1.49e-28. This might indicate that
there are
strong multicollinearity problems or that the design matrix is
singular.
How many x_a_tilde elements?
Int64Index([8, 18, 35, 36, 37, 276, 305, 419, 421, 439, 528, 529, 530,
549,
            737],
           dtype='int64')
How many x_b_tilde elements?
Int64Index([1, 15, 38, 52, 418], dtype='int64')
How many overlapping elements?
[]
```