Hard drug use and its effect on HAART

By Annie Thwing

Research question:

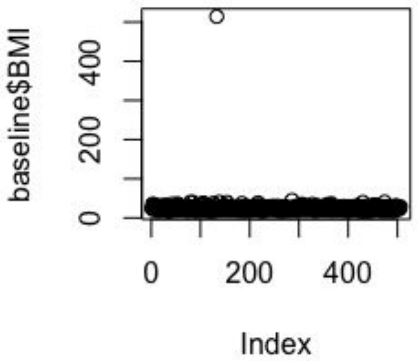
We are interested in how treatment response 2 years after initiating HAART differs between subjects who reported hard drug use at baseline and subjects who did not report hard drug use at baseline.

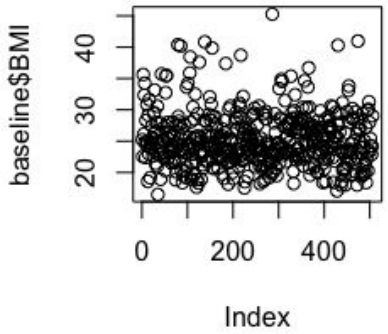
Hypothesis:

There is no difference in treatment response 2 years after initiating HAART differs between subjects who reported hard drug use at baseline and subjects who did not report hard drug use at baseline.

Data Cleanup

- Used R
- Recoded variables to groupings we are interested in
- Standardized missing values to be NA
- Transformed VLOAD
- Removed BMI outlier
- Used Text Wrangler to change every NA to a .
- Read cleaned data into SAS





Methods

1. Choosing a model
    a. Included covariates provided by investigator
    b. Used a hybrid model - difference as the outcome and included the baseline as a covariate
2. Choosing priors and initial parameter values
3. Running Diagnostics
    a. Increased number of Monte Carlo iterations and burn in iterations from SAS standard
    b. Used thinning to reduce autocorrelation (necessary for age and BMI especially)
4. Compared crude and adjusted model DIC's to choose model from which to interpret results

Model 1: Outcome LEU3N Full

The MCMC Procedure

Geweke Diagnostics		
Parameter	z	Pr > |z|
betaInt	1.3388	0.1806
betaBaseline	1.1887	0.2345
betaHASHV	0.4587	0.6465
betaincome	1.0248	0.3054
betaBMI	-0.6092	0.5424
betaSMOKE	-0.7684	0.4423
betaDKGRP	1.1467	0.2515
betaADH	-0.3436	0.7311
betaRACE	-1.0436	0.2967
betaEDUCBAS	-0.1945	0.8458
betaage	-0.0657	0.9477
betahard_drugs	1.3722	0.1700
sigma2	-0.0416	0.9669

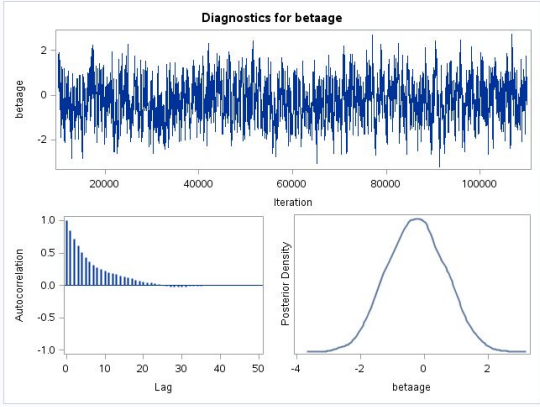


Table One

		Stratified by hard_drugs		
	level	0	1	p	test
n		467	39		
BMI (mean (sd))		25.39 (4.46)	23.62 (3.45)	0.020	
age (mean (sd))		43.16 (8.72)	44.62 (9.49)	0.321	
HASHV (%)	1	271 (58.0)	27 (69.2)	0.232	
	2	196 (42.0)	12 (30.8)		
income (%)	0	91 (19.5)	14 (35.9)	0.053	
	1	194 (41.5)	16 (41.0)		
	2	165 (35.3)	9 (23.1)		
	<NA>	17 (3.6)	0 (0.0)		
SMOKE (%)	0	301 (64.5)	9 (23.1)	<0.001	
	1	166 (35.5)	30 (76.9)		
DKGRP (%)	0	434 (92.9)	37 (94.9)	0.897	
	1	33 (7.1)	2 (5.1)		
ADH (%)	0	51 (10.9)	1 (2.6)	0.169	
	1	416 (89.1)	38 (97.4)		
RACE (%)	1	301 (64.5)	19 (48.7)	0.074	
	2	166 (35.5)	20 (51.3)		
EDUCBAS (%)	0	95 (20.3)	16 (41.0)	0.005	
	1	372 (79.7)	23 (59.0)		
hard_drugs (%)	0	467 (100.0)	0 (0.0)	<0.001	
	1	0 (0.0)	39 (100.0)		

- BMI and age evenly distributed across drug users and non drug users
- All of the NAs in income were not drug users at baseline
- Smoking and Education level look like they are highly associated with hard drug use
- Interesting to look at distribution, and possibly significant covariates
- We will still include all in our model

Results

1. LEU3N (CD4+ cell count) was significant:
   a. Mean: -83 SD: 22 HPD interval: (-124, -39)
2. AGG_PHYS was slightly significant
   a. Mean: -3.24 SD: 1.39 HPD interval: (-5.97,-0.51)
3. AGG_MENT was not significant
   a. Mean: -0.41 SD: 1.78 HPD interval (-3.87, 3.11)
4. VLOAD was not significant
   a. Mean: -0.04 SD: 0.20 HPD interval (0.42 , 0.35)

Deviance Information Criterion	
Dbar (posterior mean of deviance)	6443.918
Dmean (deviance evaluated at posterior mean)	6440.660
pD (effective number of parameters)	3.257
DIC (smaller is better)	6447.175

Deviance Information Criterion	
Dbar (posterior mean of deviance)	6019.839
Dmean (deviance evaluated at posterior mean)	6010.264
pD (effective number of parameters)	9.576
DIC (smaller is better)	6029.415

Model 1: Outcome LEU3N Full

The MCMC Procedure

Posterior Summaries and Intervals					
Parameter	N	Mean	Standard Deviation	95% HPD Interval	
betaInt	6667	14.7161	28.4412	-42.4795	69.1661
betaBaseline	6667	-0.0478	0.0408	-0.1261	0.0325
betaHASHV	6667	34.9299	14.5932	8.1596	64.8555
betaincome	6667	-20.5078	12.1020	-43.9799	3.2793
betaBMI	6667	5.2428	1.6378	2.0708	8.4726
betaSMOKE	6667	-9.9613	15.5313	-41.4855	18.6217
betaDKGRP	6667	-5.8570	22.4613	-49.5769	37.7652
betaADH	6667	37.9615	20.1764	-0.1184	77.2804
betaRACE	6667	-12.6419	15.0659	-43.0112	16.4934
betaEDUCBAS	6667	22.7270	18.2465	-13.3136	57.9402
betaage	6667	-0.2505	0.8963	-1.9274	1.5209
betahard_drugs	6667	-83.3148	21.8973	-124.4	-38.8293
sigma2	6667	30563.6	2081.1	26561.0	34572.8

Conclusions

- Hard drug use at baseline was significantly associated with change in CD4+ cell count (LEU3N)
- Hard drug use at baseline was not significantly associated with change in VLOAD
- Hard drug use at baseline was not significantly associated with change in aggregate mental quality of life (AGG_MENT)
- Hard drug use at baseline was associated with change in aggregate physical quality of life (AGG_PHYS) though only slightly