

Homework #4 Review

Question #1

What is the average baseline SBP (basesbp) for someone with a measured SBP at year one (`miss_mar==0`)?
What is the average baseline SBP for someone with a missing SBP (`miss_mar==1`)?

Baseline BP

```
ttest basesbp if visit==1, by(miss_mar)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]
0	1389	122.2513	.3163558	11.79036	121.6307 122.8718
1	1231	149.1958	.4263561	14.95896	148.3593 150.0322
combined	2620	134.9111	.3705146	18.96513	134.1845 135.6376
diff		-26.94452	.5234744		-27.97098 -25.91805

diff = mean(0) - mean(1)
Ho: diff = 0
Ha: diff < 0

t = -51.4725
degrees of freedom = 2618
Ha: diff != 0
Ha: diff > 0

What is the average baseline SBP (basesbp) for someone with a measured SBP at year one (miss_mar==0)?
What is the average baseline SBP for someone with a missing SBP (miss_mar==1)?

Baseline BP

```
ttest basesbp if visit==1, by(miss_mar)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	1389	122.2513	.3163558	11.79036	121.6307	122.8718
1	1231	149.1958	.4263561	14.95896	148.3593	150.0322
combined	2620	134.9111	.3705146	18.96513	134.1845	135.6376
diff		-26.94452	.5234744		-27.97098	-25.91805

```
diff = mean(0) - mean(1)          t = -51.4725
Ho: diff = 0                      degrees of freedom = 2618
```

$$H_a: \text{diff} < 0$$

```
Ha: diff != 0
```

Ha: $\text{diff} > 0$

Year 1 BP

What is the average baseline SBP (basesbp) for someone with a measured SBP at year one (miss_mar==0)?
What is the average baseline SBP for someone with a missing SBP (miss_mar==1)?

```
. ttest sbp if visit==1, by(miss_mar)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	1389	127.5464	.4395215	16.38065	126.6842	128.4086
1	1231	143.9058	.526809	18.48342	142.8722	144.9393
combined	2620	135.2328	.3754603	19.21829	134.4966	135.9691
diff		-16.35933	.6811241		-17.69493	-15.02374

diff = mean(0) - mean(1) t = -24.0181
Ho: diff = 0 degrees of freedom = 2618

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

Question #2

GEE complete data

```
xtgee sbp i.visit, i(pptid) corr(indep) robust
```

(Std. Err. adjusted for clustering on pptid)

sbp	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
visit	.3217557	.3394217	0.95	0.343	-.3434986	.9870101
_cons	134.9111	.3705146	364.12	0.000	134.1849	135.6373

GEE available data

```
xtgee sbp i.visit if miss_mar==0, i(pptid) corr(indep) robust
```

(Std. Err. adjusted for clustering on pptid)

sbp	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
1.visit	-7.364632	.5146309	-14.31	0.000	-8.37329	-6.355974
_cons	134.9111	.3705146	364.12	0.000	134.1849	135.6373

Question #3

Question 3: How do the values for SBP which have been imputed compared to the observed values?

```
m=1 data:
-----
2
miss_mar | mean(sbp1)
-----+-----
0 | 127.546
1 | 143.573
-----

m=2 data:
-----
2
miss_mar | mean(sbp1)
-----+-----
0 | 127.546
1 | 146.387
-----

m=3 data:
-----
2
miss_mar | mean(sbp1)
-----+-----
0 | 127.546
1 | 143.114
-----

m=4 data:
-----
2
miss_mar | mean(sbp1)
-----+-----
0 | 127.546
1 | 145.246
-----
```

Question #4: MI for GEE

```
Multiple-imputation estimates      Imputations      =      100
GEE population-averaged model     Number of obs     =     5240

Group variable:                    pptid      Number of groups =     2620
Link:                              identity     Obs per group: min =      2
Family:                            Gaussian      avg =      2.0
Correlation:                       independent  max =      2
Scale parameter:                   x2

Average RVI      =     1.8255
DF adjustment:   Large sample      DF:      min      =     178.50
                                           avg      =    8.17e+54
                                           max      =    1.63e+55
Model F test:      Equal FMI      F( 1, 178.5) =     0.30
Within VCE type:   Semirobust     Prob > F      =     0.5851
```

(Within VCE adjusted for clustering on pptid)

```
-----
sbp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
1.visit | .3480427   .6362825     0.55  0.585   - .9075608   1.603646
 _cons | 134.9111   .3705146    364.12  0.000   134.1849   135.6373
-----
```

Question #5: Mixed Model

```
. mi estimate, dots: xtmixed sbp i.visit || ppid:
```

Multiple-imputation estimates	Imputations	=	100
Mixed-effects REML regression	Number of obs	=	5240
Group variable: ppid	Number of groups	=	2620
	Obs per group: min	=	2
	avg	=	2.0
	max	=	2
DF adjustment: Large sample	Average RVI	=	1.9112
	DF: min	=	178.50
	avg	=	1.22e+45
	max	=	4.86e+45
Model F test: Equal FMI	F(1, 178.5)	=	0.30
	Prob > F	=	0.5851

sbp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
1.visit	.3480427	.6362825	0.55	0.585	-.9075607	1.603646
_cons	134.9111	.3681854	366.42	0.000	134.1894	135.6327

Random-effects Parameters		Estimate	Std. Err.	[95% Conf. Interval]	
ppid: Identity					
	sd(_cons)	14.81318	.50474	13.85062	15.84265
	sd(Residual)	11.63035	.2987951	11.05576	12.2348