**Syntax guide for imputation and analysis commands for Neighbourhood SES and BP paper (revision1 2020-04-21)**

**Commands for Imputation modified 2020-02-27**

\*\*\*\*VARIABLES TO BE IMPUTED\*\*\*\*\*

\*\*\*Obtaing number of missing values for variables

misstable summarize if include==1

misstable summarize age weight height\_cm bmi bmi\_std bmicatn4 waistcirc fastglu fast\_chol possession\_cat3 fastfood\_cat2020 phys\_act2020 if include==1

\*\*Maximum number of missing values = 152 for fasting cholesterol = approx 6% of total

\*\*\*Complete case analysis includes 2356 persons = 8% missing data

\*\*\*27th Feb 2020 - 20 imputations will be done. See Notes file for explanation.

\*\*\*\*GENERATING MISSING INDICATOR VARIABLES FOR VARIABLES TO BE IMPUTED\*\*\*\*\*\*\*\*\*\*\*\*\*

gen miss\_imputed = missing(age, bmi, height\_cm, fastglu, fast\_chol, possession\_cat3)

tab miss\_imputed if include1==1

\*\*\*\*COMPARING COMPLETE CASES VS PARTICIPANTS WITH ONE OR MORE MISSING VALUES (29/12/2017)

set more off

for var age weight height\_cm bmi mn23sbp mn23dbp fastglu fast\_chol highbp\_120\_80 bmicatn4 ///

populationdensity unemployment poverty murder\_rate averagetertiaryeducation averagesecondaryeducation ///

averageprimaryeducation of2bedroomdwellings averagetertiaryeducation\_rev pca\_comp1 pca\_comp2: ///

ttest X if include1==1 , by(miss\_imputed) unequal

for var sex bmicatn4 urban\_n pca\_comp1\_tert pca\_comp2\_tert : ///

tab X miss\_imputed if include1==1, col chi

\*\*\*SAVING MI DATA SETS\*\*\*\*2018-02-17

\*\*\*SAVING MI DATA SETS\*\*\*\*2020-02-27

 \*Test with one imputation

set more off

mi set flong

mi stset, clear

mi register imputed age bmi\_std height\_cm fastglu fast\_chol possession\_cat3 fastfood\_cat2020 phys\_act2020

mi register regular mn23sbp mn23dbp sex pca\_comp1\_std pca\_comp2\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4

mi impute chained ///

(regress) age bmi\_std height\_cm fastglu fast\_chol ///

(ologit) possession\_cat3 fastfood\_cat2020 phys\_act2020 ///

= mn23sbp mn23dbp sex pca\_comp1\_std pca\_comp2\_std if include1== 1, add(1) augment savetrace("trace\_2020\_02\_27", replace) rseed(1234)

 count

 d, short

\*\*\*Saving MI data set with 20 imputations

set more off

mi set flong

mi stset, clear

mi register imputed age bmi\_std height\_cm fastglu fast\_chol possession\_cat3 fastfood\_cat2020 phys\_act2020

mi register regular mn23sbp mn23dbp sex pca\_comp1\_std pca\_comp2\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4

mi impute chained ///

(regress) age bmi\_std height\_cm fastglu fast\_chol ///

(ologit) possession\_cat3 fastfood\_cat2020 phys\_act2020 ///

= mn23sbp mn23dbp sex pca\_comp1\_std pca\_comp2\_std if include1== 1, add(20) augment savetrace("trace\_2020\_02\_27\_2", replace) rseed(1234)

 count

 d, short

\*\*\*Checking Imputed Values\*\*\*

set more off

for var age bmi height\_cm fastglu fast\_chol: ///

tabstat X if \_mi\_m==0 & include1==1, s(n mean sd min max) \ tabstat X if miss\_X==1 & include1==1, s(n mean sd min max)

for var possession\_cat3: ///

tab X if miss\_X==0 & \_mi\_m==0 & include1==1 \ tab X if miss\_X==1 & include1==1

\*\*\*\*EXTRACTING IMPUTED DATASET M1 FOR MODEL SELECTION

mi extract 1

count

d, short

**Commands for Analyses**

\* List of variables for descriptive tables (updated 2020-03-10)

\*Continous variables: age weight height\_cm bmi mn23sbp mn23dbp waistcirc fastglu fast\_chol pca\_comp1\_std pca\_comp2\_std

\*Categorical variables: sex possession\_cat3 phys\_act2020 fastfood\_cat2020 bmicatn4 highbp\_120\_80

\*Community variables categorical: urban\_n pca\_comp1\_tert pca\_comp2\_tert

\*Community variables: continuous: population populationdensity unemployment poverty murder\_rate ///

\*averagetertiaryeducation averagesecondaryeducation averageprimaryeducation of2bedroomdwellings dependencyratio pca\_comp1 pca\_comp1\_tert

\*\*\*Number of missing values for variables included in analyses

misstable sum age weight height\_cm bmi mn23sbp mn23dbp waistcirc fastglu fast\_chol pca\_comp1\_std pca\_comp2\_std ///

 sex possession\_cat3 phys\_act2020 fastfood\_cat2020 bmicatn4 highbp\_120\_80 ///

 if include1==1

egen num\_missing = rowmiss(age weight height\_cm bmi mn23sbp mn23dbp waistcirc fastglu fast\_chol pca\_comp1\_std pca\_comp2\_std ///

 sex possession\_cat3 phys\_act2020 fastfood\_cat2020 bmicatn4 highbp\_120\_80) ///

 if include1==1

\*\*\*\*COMMANDS FOR TABLE 1 - INDIVIDUAL PARTICIPANT and COMMUNITY CONTINUOUS DESCRIPTIVE DATA (Modified 2020-03-10)

set more off

for var age weight height\_cm bmi mn23sbp mn23dbp waistcirc fastglu fast\_chol pca\_comp1\_std pca\_comp2\_std: ///

sum X if include1==1 \ oneway X study if include1==1, tabulate \ kwallis X if include1==1, by(study)

set more off

for var sex highbp\_120\_80 possession\_cat3 phys\_act2020 fastfood\_cat2020 bmicatn4 : ///

tab X study if include1==1, col chi

\*\*\*\*COMMANDS FOR TABLE 1 SUPPLEMENT / APPENDIX - INDIVIDUAL PARTICIPANT CONTINUOUS DESCRIPTIVE DATA (Modified 2020-03-10)

set more off

for var age weight height\_cm bmi mn23sbp mn23dbp waistcirc fastglu fast\_chol pca\_comp1\_std pca\_comp2\_std: ///

bysort study: ttest X if include1==1, by(sex) unequal

set more off

for var sex highbp\_120\_80 possession\_cat3 phys\_act2020 fastfood\_cat2020 bmicatn4 : ///

bysort study: tab X sex if include1==1, col chi

\*\*\*\*COMMANDS FOR TABLE 2 - INDIVIDUAL PARTICIPANT and COMMUNITY CONTINUOUS DESCRIPTIVE DATA (Modified 2020-03-21)

set more off

for var age weight height\_cm bmi mn23sbp mn23dbp waistcirc fastglu fast\_chol pca\_comp1\_std pca\_comp2\_std: ///

ttest X if include1==1, by(highbp\_120\_80) unequal

set more off

for var sex possession\_cat3 phys\_act2020 fastfood\_cat2020 bmicatn4 : ///

tab X highbp\_120\_80 if include1==1, col chi

\*\*\*\*COMMANDS FOR TABLE 3 - MULTILEVL MIXED EFFECTS UNIVARIATE REGRESSION models (Modified 2020-04-14)

\*\*\*Robust standard errors for SBP\*\*\*\*

\*\*\*SBP

\*\*MALES

set more off

for var age bmi\_std fastglu pca\_comp1\_std pca\_comp2\_std: ///

mi estimate: mixed mn23sbp X if include1==1 & sex==1 || parish: || community\_n:, vce(robust)

set more off

for var pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4: ///

mi estimate: mixed mn23sbp X if include1==1 & sex==1 || parish: || community\_n:, vce(robust)

for var possession\_cat3 phys\_act2020 fastfood\_cat2020 : ///

mi estimate: mixed mn23sbp i.X if include1==1 & sex==1 || parish: || community\_n:, vce(robust)

\*\*\*SBP

\*\*FEMALES

set more off

for var age bmi\_std fastglu pca\_comp1\_std pca\_comp2\_std: ///

mi estimate: mixed mn23sbp X if include1==1 & sex==0 || parish: || community\_n:, vce(robust)

set more off

for var pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4: ///

mi estimate: mixed mn23sbp X if include1==1 & sex==0 || parish: || community\_n:, vce(robust)

for var possession\_cat3 phys\_act2020 fastfood\_cat2020 : ///

mi estimate: mixed mn23sbp i.X if include1==1 & sex==0 || parish: || community\_n:, vce(robust)

\*\*\*DBP

\*\*MALES

set more off

for var age bmi\_std fastglu pca\_comp1\_std pca\_comp2\_std: ///

mi estimate: mixed mn23dbp X if include1==1 & sex==1 || parish: || community\_n: , vce(robust)

set more off

for var pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4: ///

mi estimate: mixed mn23dbp X if include1==1 & sex==1 || parish: || community\_n: , vce(robust)

for var possession\_cat3 phys\_act2020 fastfood\_cat2020 : ///

mi estimate: mixed mn23dbp i.X if include1==1 & sex==1 || parish: || community\_n:, vce(robust)

\*\*\*DBP

\*\*FEMALES

set more off

for var age bmi\_std fastglu pca\_comp1\_std pca\_comp2\_std: ///

mi estimate: mixed mn23dbp X if include1==1 & sex==0 || parish: || community\_n:, vce(robust)

set more off

for var pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4: ///

mi estimate: mixed mn23dbp X if include1==1 & sex==0 || parish: || community\_n:, vce(robust)

for var possession\_cat3 phys\_act2020 fastfood\_cat2020 : ///

mi estimate: mixed mn23dbp i.X if include1==1 & sex==0 || parish: || community\_n:, vce(robust)

\*\*\*\*Generating Categorical variables to use in multilevel logistic regression models\*\*\*\*\*March 26, 2020

set more off

mi passive: gen agecat = .

mi passive: replace agecat = 1 if age <18 & include1==1

mi passive: replace agecat = 2 if age >=18 & age <20 & include1==1

mi passive: replace agecat = 3 if age >=20 & age !=. & include1==1

set more off

mi passive: gen fastglu\_quin5 = .

mi passive: replace fastglu\_quin5 =0 if fastglu < 4.7924 & include1==1

mi passive: replace fastglu\_quin5 =1 if fastglu > 4.7924 & fastglu !=. & include1==1

\*\*\*\*COMMANDS FOR Appendix TABLE X - MULTILEVL Logistic regression UNIVARIATE models using categorical dependent variables (Modified 2020-03-26)

\*\*\*Do file name "Syntax\_guide\_2018\_03\_05\_1 analysis commands (revision1 2020-03-10) correct"

\*\*MALES

set more off

for var agecat bmicatn4 fastglu\_quin5 pca\_comp1\_tert pca\_comp2\_tert possession\_cat3 phys\_act2020 fastfood\_cat2020 : ///

mi estimate, or: meqrlogit highbp\_120\_80 i.X if include1==1 & sex==1 || parish: || community\_n:

\*\*FEMALES

set more off

for var agecat bmicatn4 fastglu\_quin5 pca\_comp1\_tert pca\_comp2\_tert possession\_cat3 phys\_act2020 fastfood\_cat2020 : ///

mi estimate, or: meqrlogit highbp\_120\_80 i.X if include1==1 & sex==0 || parish: || community\_n:

\*\*\*\*New FINAL MMODELS\*\*\*\*2020-04-14

\*\*\*\*\*Robust standard errors

\*\*\*Do file name "Syntax\_guide\_2018\_03\_05\_1 analysis commands (revision1 2020-04-14) correct"

\*Sex-specific sequential model

\*\*\*\*SBP

set more off

\*\*\*Males

\*\*\*Model 1

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study if include1==1 & sex==1 || parish: || community\_n: , vce(robust)

\*\*\*Model 2

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study bmi\_std if include1==1 & sex==1 || parish: || community\_n: , vce(robust)

\*\*\*\*Model 3

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 || parish: || community\_n:, vce(robust)

\*\*\*Females

set more off

\*\*\*Model 1

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study if include1==1 & sex==0 || parish: || community\_n: , vce(robust)

\*\*\*Model 2

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study bmi\_std if include1==1 & sex==0 || parish: || community\_n: , vce(robust)

\*\*\*\*Model 3

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 || parish: || community\_n:, vce(robust)

\*Sex-specific sequential model

\*\*\*\*DBP

set more off

\*\*\*Males

\*\*\*Model 1

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study if include1==1 & sex==1 || parish: || community\_n: , vce(robust)

\*\*\*Model 2

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study bmi\_std if include1==1 & sex==1 || parish: || community\_n: , vce(robust)

\*\*\*\*Model 3

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 || parish: || community\_n:, vce(robust)

\*\*\*Females

set more off

\*\*\*Model 1

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study if include1==1 & sex==0 || parish: || community\_n: , vce(robust)

\*\*\*Model 2

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study bmi\_std if include1==1 & sex==0 || parish: || community\_n: , vce(robust)

\*\*\*\*Model 3

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 || parish: || community\_n: , vce(robust)

\*Sex-specific sequential model

\*\*\*\*Elevated BP/HTN

\*agecat bmicatn4 fastglu\_quin5 highbp\_120\_80 pca\_comp1\_tert pca\_comp2\_tert agecat

set more off

\*\*\*Males

\*\*\*Model 1

mi estimate, or: meqrlogit highbp\_120\_80 i.pca\_comp1\_tert i.pca\_comp2\_tert i.agecat i.possession\_cat3 ///

 i.study if include1==1 & sex==1 || parish: || community\_n:

\*\*\*Model 2

mi estimate, or: meqrlogit highbp\_120\_80 i.pca\_comp1\_tert i.pca\_comp2\_tert i.agecat i.possession\_cat3 ///

 i.study i.bmicatn4 if include1==1 & sex==1 || parish: || community\_n:

\*\*\*\*Model 3

mi estimate, or: meqrlogit highbp\_120\_80 i.pca\_comp1\_tert i.pca\_comp2\_tert i.agecat i.possession\_cat3 ///

 i.study i.bmicatn4 i.fastglu\_quin5 i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 || parish: || community\_n:

\*\*\*Females

set more off

\*\*\*Model 1

mi estimate, or: meqrlogit highbp\_120\_80 i.pca\_comp1\_tert i.pca\_comp2\_tert i.agecat i.possession\_cat3 ///

 i.study if include1==1 & sex==0 || parish: || community\_n:

\*\*\*Model 2

mi estimate, or: meqrlogit highbp\_120\_80 i.pca\_comp1\_tert i.pca\_comp2\_tert i.agecat i.possession\_cat3 ///

 i.study i.bmicatn4 if include1==1 & sex==0 || parish: || community\_n:

\*\*\*\*Model 3

mi estimate, or: meqrlogit highbp\_120\_80 i.pca\_comp1\_tert i.pca\_comp2\_tert i.agecat i.possession\_cat3 ///

 i.study i.bmicatn4 i.fastglu\_quin5 i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 || parish: || community\_n:

\*\*\*RERUN of MODEL 3 for SBP and DBP for Individual Studies\*\*\*\*\*

\*\*\*Do file name "Syntax\_guide\_2018\_03\_05\_1 analysis commands (revision1 2020-03-10) correct"

\*\*\*MALES

\*\*\*SBP

\*\*\*\*Model 3

set more off

\*\*\*1986 Birth Cohort

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 & study ==1 || parish: || community\_n:, vce(robust)

\*\*\*Youth Risk

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 & study ==2 || parish: || community\_n:, vce(robust)

\*\*\*JHLS-II

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 & study ==3 || parish: || community\_n:, vce(robust)

 \*\*\*DBP

\*\*\*\*Model 3

set more off

\*\*\*1986 Birth Cohort

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 & study ==1 || parish: || community\_n: , vce(robust)

\*\*\*Youth Risk

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 & study ==2 || parish: || community\_n: , vce(robust)

\*\*\*JHLS-II

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 & study ==3 || parish: || community\_n: , vce(robust)

\*\*\*FEMALES

\*\*\*SBP

\*\*\*\*Model 3

set more off

\*\*\*1986 Birth Cohort

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 & study ==1 || parish: || community\_n:, vce(robust)

\*\*\*Youth Risk

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 & study ==2 || parish: || community\_n:, vce(robust)

\*\*\*JHLS-II

mi estimate: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 & study ==3 || parish: || community\_n:, vce(robust)

 \*\*\*DBP

\*\*\*\*Model 3

set more off

\*\*\*1986 Birth Cohort

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 & study ==1 || parish: || community\_n: , vce(robust)

\*\*\*Youth Risk

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 & study ==2 || parish: || community\_n: , vce(robust)

\*\*\*JHLS-II

mi estimate: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 & study ==3 || parish: || community\_n: , vce(robust)

\*\*\*\*COMPLETE CASE ANALYSIS\*\*\*\*\*

\*\*\*\*Model 3

set more off

\*\*\*\*SBP

bysort sex: mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & \_mi\_m==0 || parish: || community\_n:, vce(robust)

\*\*\*\*DBP

bysort sex: mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & \_mi\_m==0 || parish: || community\_n: , vce(robust)

\*\*\*MODEL DIAGNOSTICS - modified 2020-04-09

\*\*\* DATA SET - IMPUTATION DATA SET, M1, USED

\*\*\*SBP

\*\*\*Males

\*\*\*\*Model 3

set more off

mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 || parish: || community\_n:

 predict stdresid\_male\_nolevel if e(sample) , rstandard

/\*mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 & stdresid\_male\_nolevel >= -2.5 & stdresid\_male\_nolevel <= 2.5 || parish: || community\_n:

\*/

mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 & stdresid\_male\_nolevel >= -3 & stdresid\_male\_nolevel <= 3 || parish: || community\_n:

qnorm stdresid\_male\_nolevel

qnorm stdresid\_male\_nolevel if stdresid\_male\_nolevel >= -3 & stdresid\_male\_nolevel <= 3

sktest stdresid\_male\_nolevel

sktest stdresid\_male\_nolevel if stdresid\_male\_nolevel >= -3 & stdresid\_male\_nolevel <= 3

dis 1100/1110 /\* Estimating the proportion within the mid-99% range\*/

br stdresid\_male\_nolevel mn23sbp if (stdresid\_male\_nolevel < -3 | stdresid\_male\_nolevel > 3 )& stdresid\_male\_nolevel != .

\*\*\*Females

set more off

\*\*\*\*Model 3

mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 || parish: || community\_n:

 predict stdresid\_female\_nolevel if e(sample) , rstandard

/\* mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 & stdresid\_female\_nolevel >= -2.5 & stdresid\_female\_nolevel <= 2.5 || parish: || community\_n:

\*/

mixed mn23sbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 & stdresid\_female\_nolevel >= -3 & stdresid\_female\_nolevel <= 3 || parish: || community\_n:

qnorm stdresid\_female\_nolevel

count if stdresid\_female\_nolevel >= -3 & stdresid\_female\_nolevel <= 3 & sex ==0

qnorm stdresid\_female\_nolevel if stdresid\_female\_nolevel >= -3 & stdresid\_female\_nolevel <= 3

br stdresid\_female\_nolevel mn23sbp if (stdresid\_female\_nolevel < -3 | stdresid\_female\_nolevel > 3 )& stdresid\_female\_nolevel != .

sktest stdresid\_female\_nolevel if stdresid\_female\_nolevel >= -3 & stdresid\_female\_nolevel <= 3

sktest stdresid\_female\_nolevel

dis 1436/1446 /\* Estimating the proportion within the mid-99% range\*/

\*\*\*DBP - reopen on m1 dataset

\*\*\*Males

\*\*\*\*Model 3

set more off

mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 || parish: || community\_n:

 predict stdresid\_male\_nolevel if e(sample) , rstandard

/\*mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 & stdresid\_male\_nolevel >= -2.5 & stdresid\_male\_nolevel <= 2.5 || parish: || community\_n:

\*/

mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==1 & stdresid\_male\_nolevel >= -3 & stdresid\_male\_nolevel <= 3 || parish: || community\_n:

qnorm stdresid\_male\_nolevel

qnorm stdresid\_male\_nolevel if stdresid\_male\_nolevel >= -3 & stdresid\_male\_nolevel <= 3

sktest stdresid\_male\_nolevel

sktest stdresid\_male\_nolevel if stdresid\_male\_nolevel >= -3 & stdresid\_male\_nolevel <= 3

dis ... /\* Estimating the proportion within the mid-99% range\*/

br stdresid\_male\_nolevel mn23dbp if (stdresid\_male\_nolevel < -3 | stdresid\_male\_nolevel > 3 )& stdresid\_male\_nolevel != .

\*\*\*Females

set more off

\*\*\*\*Model 3

mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 || parish: || community\_n:

 predict stdresid\_female\_nolevel if e(sample) , rstandard

/\* mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 & stdresid\_female\_nolevel >= -2.5 & stdresid\_female\_nolevel <= 2.5 || parish: || community\_n:

\*/

mixed mn23dbp pca\_comp1\_std pca\_comp2\_stdm1 pca\_comp2\_std0 pca\_comp2\_std1 pca\_comp2\_std4 age i.possession\_cat3 ///

 i.study fastglu bmi\_std i.phys\_act2020 i.fastfood\_cat2020 if include1==1 & sex==0 & stdresid\_female\_nolevel >= -3 & stdresid\_female\_nolevel <= 3 || parish: || community\_n:

qnorm stdresid\_female\_nolevel

count if stdresid\_female\_nolevel >= -3 & stdresid\_female\_nolevel <= 3 & sex ==0

qnorm stdresid\_female\_nolevel if stdresid\_female\_nolevel >= -3 & stdresid\_female\_nolevel <= 3

br stdresid\_female\_nolevel mn23dbp if (stdresid\_female\_nolevel < -3 | stdresid\_female\_nolevel > 3 )& stdresid\_female\_nolevel != .

sktest stdresid\_female\_nolevel if stdresid\_female\_nolevel >= -3 & stdresid\_female\_nolevel <= 3

sktest stdresid\_female\_nolevel

dis ... /\* Estimating the proportion within the mid-99% range\*/

**Sample Size Calculations**

\*Syntax for initial simple random sample size estimation

 dis "Sample size calculation for males"

 power onecorrelation 0 -0.1363, power(0.8)

 \*n = 421

 dis "Sample size calculation for females"

 power onecorrelation 0 -0.1516 , power(0.8)

 \*n = 340

 \*Commands below provided sex-specific estimates for ICC

 \*\*\*Relationship between SBP and pca\_comp1\_std

 \*\*MALES

mixed mn23sbp pca\_comp1\_std if include1==1 & sex==1 || parish: || community\_n:

estat icc

\*icc = 0.086831

\*\*FEMALES

 mixed mn23sbp pca\_comp1\_std if include1==1 & sex== 0 || parish: || community\_n:

estat icc

\*icc = 0.1342401

\* In order to obtain the average number (m) of persons per cluster (community) we used

bysort sex: xtsum mn23sbp if include1 == 1 , i( community\_n)

\*Males , m = 5

\*Females, m= 6

\*After Lohr (1999) (page 240) we estimated the sex-specific design effect values as follows:

dis "Design effect for males = " 1+(5-1)\*0.086831

dis "Design effect for females = " 1+(6-1)\*0.1342401

\* Lohr S. Sampling: Design and Analysis. Pacific Grove: Brooks / Cole Publishing Company; 1999 1999. - Design Effect reference

\*The adjusted sample size that will anticipate the effect of clustering in comunities on variance parameter estimates

dis "Sample size adjusted to accommodate effect of clustering - for males = " (1+(5-1)\*0.086831)\*421

dis "Sample size adjusted to accommodate effect of clustering - for females = " (1+(6-1)\*0.1342401)\*340