libname dat 'H:\Personal\NHANES SES-sleep-CRP';

libname bmx\_d Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\bmx\_d.xpt';

libname bmx\_e Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\bmx\_e.xpt';

libname bmx\_f Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\bmx\_f.xpt';

libname crp\_d Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\crp\_d.xpt';

libname crp\_e Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\crp\_e.xpt';

libname crp\_f Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\crp\_f.xpt';

libname demo\_d Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\demo\_d.xpt';

libname demo\_e Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\demo\_e.xpt';

libname demo\_f Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\demo\_f.xpt';

libname slq\_d Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\slq\_d.xpt';

libname slq\_e Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\slq\_e.xpt';

libname slq\_f Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\slq\_f.xpt';

libname RHQ\_D Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\rhq\_d.xpt';

libname RHQ\_e Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\rhq\_e.xpt';

libname RHQ\_f Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\rhq\_f.xpt';

libname cot\_d Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\cot\_d.xpt';

libname cotnal\_e Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\cotnal\_e.xpt';

libname cotnal\_f Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\cotnal\_f.xpt';

libname paq\_d Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\paq\_d.xpt';

libname paq\_e Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\paq\_e.xpt';

libname paq\_f Xport 'C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\data\paq\_f.xpt';

\*vertically merge years for each dataset;

**data** bmx; set bmx\_d.bmx\_d bmx\_e.bmx\_e bmx\_f.bmx\_f; **run**;

**data** crp; set crp\_d.crp\_d crp\_e.crp\_e crp\_f.crp\_f; **run**;

**data** demo; set demo\_d.demo\_d demo\_e.demo\_e demo\_f.demo\_f; **run**;

**data** slq; set slq\_d.slq\_d slq\_e.slq\_e slq\_f.slq\_f; **run**;

**data** rhq; set rhq\_d.rhq\_d rhq\_e.rhq\_e rhq\_f.rhq\_f; **run**;

**data** cot; set cot\_d.cot\_d cotnal\_e.cotnal\_e cotnal\_f.cotnal\_f; **run**;

**data** paq; set paq\_d.paq\_d paq\_e.paq\_e paq\_f.paq\_f; **run**;

**data** dat.nhanes; \*horizontally merge datasets and create 6-year weights, save physical file;

merge bmx crp demo slq cot rhq paq;

by seqn;

WTMEC6YR = **1**/**3** \* WTMEC2YR;

label WTMEC6YR = "Full Sample 6 Year MEC Exam Weight";

WTINT6YR = **1**/**3** \* WTINT2YR;

label WTINT6YR = "Full Sample 6 Year Interview Weight";

**run**;

**proc** **contents** data=dat.nhanes;

**run**;

**proc** **format** library=dat; \* all formats;

value yesno **3**="No" **1**="Yes" **2**="Missing";

value crpbin **0**="<3" **1**="3 to 10" **2**=">10";

value sleepdur **0**="7" **1**="6" **2**="<6" **3**="8" **4**=">8";

value pir **3**="200%+" **1**="100-199%" **2**="0-100%";

value edu **1**="Less Than 9th Grade" **2**="9-11th Grade (Includes 12th grade with no diploma)"

**3**="High School Grad/GED or Equivalent" **4**="Some College or AA degree"

**5**="College Graduate or above";

value age\_5yr **0**="20-24" **1**="25-29" **2**="30-34"

**3**="35-39" **4**="40-44" **5**="45-49" **6**="50-54" **7**="55-59"

**8**="60-64" **9**="65-69" **10**="70-74" **11**="75-79" **12**="80+";

value cot **0**="<3 ng/mL" **1**="3+ ng/mL";

value gender **1**="Male" **2**="Female";

value race **1**="Mexican American" **2**="Other Hispanic" **3**="Non-Hispanic White"

**4**="Non-Hispanic Black" **5**="Other Race - Including Multi-Racial";

value hrt **1**="Yes" **0**="No" **3**="N/A (Male)" **4**="Missing";

**run**;

options fmtsearch=(dat.formats);

**data** nhanes; \* grab from physical file, coding exposures, outcomes, mediators;

set dat.nhanes;

crp\_bin = **.**;

if LBXCRP < **3** then crp\_bin = **0**;

else if **3** <= LBXCRP < **10** then crp\_bin = **1**;

else if LBXCRP >= **10** then crp\_bin = **2**;

format crp\_bin crpbin.;

crp\_log = log(LBXCRP);

sleep\_dur = **.**;

if SLD010H > **12** then sleep\_dur = **.**; \*deleting 77 and 99, these are missing;

else if SLD010H = **7** then sleep\_dur = **0**;

else if SLD010H = **6** then sleep\_dur = **1**;

else if SLD010H < **6** then sleep\_dur = **2**;

else if SLD010H = **8** then sleep\_dur = **3**;

else if SLD010H > **8** then sleep\_dur = **4**;

format sleep\_dur sleepdur.;

label sleep\_dur="How much sleep do you get (hours)?";

short\_sleep = **3**;

if sleep\_dur = **2** then short\_sleep = **1**;

else if sleep\_dur = **.** then short\_sleep = **.**;

format short\_sleep yesno.;

label short\_sleep="Short Sleep (<6 hours per night)";

poor\_sleep = **.**;

if **2** le SLQ080 le **4** then poor\_sleep = **1**;

else if **2** le SLQ090 le **4** then poor\_sleep = **1**;

else if **2** le SLQ100 le **4** then poor\_sleep = **1**;

else if **2** le SLQ110 le **4** then poor\_sleep = **1**;

else if **2** le SLQ120 le **4** then poor\_sleep = **1**;

else if SLQ080 < **2** and SLQ090 < **2** and SLQ100 < **2** and SLQ110 < **2** and SLQ120 < **2** then poor\_sleep = **3**;

format poor\_sleep yesno.;

pir\_cat = **.**;

if INDFMPIR > **2** then pir\_cat = **3**;

else if INDFMPIR > **1** then pir\_cat = **1**;

else if INDFMPIR <= **1** then pir\_cat = **2**;

format pir\_cat pir.;

label pir\_cat="Poverty income ratio";

format DMDEDUC2 edu.;

if DMDEDUC2 > **6** then DMDEDUC2 = **.**;

**run**;

**proc** **freq** data=nhanes; \*check for correct coding of exposures, outcomes, and mediators;

tables LBXCRP\*crp\_bin SLD010H\*sleep\_dur

SLQ080\*poor\_sleep

SLQ090\*poor\_sleep

SLQ100\*poor\_sleep

SLQ110\*poor\_sleep

SLQ120\*poor\_sleep

INDFMPIR\*pir\_cat;

**run**;

**data** nhanes; \*Coding age;

set nhanes;

agecat = **.**;

if RIDAGEYR < **20** then delete;

else if RIDAGEYR <**25** then agecat = **0**;

else if RIDAGEYR <**30** then agecat = **1**;

else if RIDAGEYR <**35** then agecat = **2**;

else if RIDAGEYR <**40** then agecat = **3**;

else if RIDAGEYR <**45** then agecat = **4**;

else if RIDAGEYR <**50** then agecat = **5**;

else if RIDAGEYR <**55** then agecat = **6**;

else if RIDAGEYR <**60** then agecat = **7**;

else if RIDAGEYR <**65** then agecat = **8**;

else if RIDAGEYR <**70** then agecat = **9**;

else if RIDAGEYR <**75** then agecat = **10**;

else if RIDAGEYR <**80** then agecat = **11**;

else agecat = **12**;

format agecat age\_5yr.;

label agecat = "Age (5yr categories)";

**run**;

**proc** **freq** data=nhanes; \*check for correct coding of age;

tables RIDAGEYR\*agecat;

**run**;

**data** nhanes; \*Coding cotinine;

set nhanes;

cotinine\_cat = **.**;

if LBXCOT < **3** then cotinine\_cat = **0**;

else if LBXCOT >= **3** then cotinine\_cat = **1**;

format cotinine\_cat cot.;

label cotinine\_cat = "Cotinine level, two categories";

**run**;

**proc** **freq** data=nhanes; tables LBXCOT\*cotinine\_cat; **run**; \*Checking for correct cotinine coding;

**proc** **freq** data=nhanes; \*hrt missingness?;

tables RHQ558 RHQ566 RHQ574 RHQ584 RHQ600;

**run**;

**data** nhanes; \*coding other covariates;

set nhanes;

hrt = **4**;

if RIAGENDR = **1** then hrt = **3**;

else if RHQ540 = **2** then hrt = **0**;

else if RHQ558 = **1** or RHQ566 = **1** or RHQ574 = **1** or RHQ584 = **1** or RHQ600 = **1** then hrt = **1**;

else if RHQ558 = **2** or RHQ566 = **2** or RHQ574 = **2** or RHQ584 = **2** or RHQ600 = **2** then hrt = **0**;

format hrt hrt.;

label hrt = "Using any HRT now (y/n)";

obese = **2**;

if BMXBMI ge **30** then obese=**1**;

else if BMXBMI lt **30** then obese=**3**;

format obese yesno.;

label obese = "BMI 30+ (y/n)";

sleep\_med = **2**;

if SLQ140=**2** or SLQ140=**3** then sleep\_med = **1**;

else if SLQ140 le **2** then sleep\_med = **3**;

format sleep\_med yesno.;

label sleep\_med = "Used sleep medications 5 or more times in the last 30 days";

birth\_control = **4**;

if RIAGENDR = **1** then birth\_control = **3**;

else if RHD442 = **1** or RHQ520 = **1** then birth\_control = **1**;

else if RHQ420 = **2** or RHQ510 = **2** then birth\_control = **0**;

else if RHD442 = **2** or RHQ520 = **2** then birth\_control = **0**;

format birth\_control hrt.;

phys\_act = **3**;

if PAQ605 = **1**

OR PAQ620 = **1**

OR PAQ635 = **1**

OR PAQ650 = **1**

OR PAQ665 = **1**

then phys\_act = **1**;

else if (PAQ605 ge **7** or PAQ605 = **.** )

AND (PAQ620 ge **7** or PAQ620 = **.** )

AND (PAQ635 ge **7** or PAQ635 = **.** )

AND (PAQ650 ge **7** or PAQ650 = **.** )

AND (PAQ665 ge **7** or PAQ665 = **.** )

then phys\_act = **2**;

format phys\_act yesno.;

label phys\_act="Vigorous or moderate work, recreational, or transportation activity at least once per week.";

format RIAGENDR gender. RIDRETH1 race.;

**run**;

**proc** **freq** data=nhanes; \*check for correct coding of HRT, obese, sleepmed, birthcontrol;

tables hrt\*RHQ558 hrt\*RHQ566 hrt\*RHQ574 hrt\*RHQ584 hrt\*RHQ600

BMXBMI\*obese SLQ140\*sleep\_med RHD442\*birth\_control;

**run**;

**data** nhanes; \*dropping 22 observations due to crp >10;

set nhanes;

if crp\_bin = **2** then delete;

**run**;

**proc** **freq** data=nhanes; tables RHD143\*RIDEXPRG; **run**; \*check for pregnancies;

**data** nhanes; \*dropping 456 observations due to currently pregnant (at exam);

set nhanes;

if RIDEXPRG = **1** then delete;

**run**;

**data** nhanes; \*renaming survey design variables;

set nhanes;

weight=WTMEC6YR;

strata=SDMVSTRA;

cluster=SDMVPSU;

**run**;

\*save full dataset;

**data** dat.nhanes;

set nhanes;

**run**;

\*save final dataset with only relevant variables;

**data** dat.final (keep=SEQN weight strata cluster LBXCRP crp\_bin crp\_log sleep\_dur short\_sleep poor\_sleep pir\_cat DMDEDUC2 agecat RIDAGEYR

cotinine\_cat LBXCOT hrt obese sleep\_med birth\_control phys\_act RIAGENDR RIDRETH1 PAD200);

set nhanes;

**run**;

**proc** **contents** data=dat.final;

**run**;

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* PAPER TABLE 1 \*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* One-way frequencies \*/

ods output OneWay=oneway\_dmdeduc2;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables DMDEDUC2; **run**;

ods output OneWay=oneway\_pir\_cat;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables pir\_cat; **run**;

ods output OneWay=oneway\_short\_sleep;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables short\_sleep; **run**;

ods output OneWay=oneway\_poor\_sleep;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables poor\_sleep; **run**;

ods output OneWay=oneway\_riagendr;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables riagendr; **run**;

ods output OneWay=oneway\_ridreth1;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables ridreth1; **run**;

ods output OneWay=oneway\_birth\_control;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables birth\_control; **run**;

ods output OneWay=oneway\_cotinine\_cat;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables cotinine\_cat; **run**;

ods output OneWay=oneway\_hrt;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables hrt; **run**;

ods output OneWay=oneway\_obese;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables obese; **run**;

ods output OneWay=oneway\_sleep\_med;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables sleep\_med; **run**;

ods output OneWay=oneway\_phys\_act;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables phys\_act; **run**;

**data** oneway\_dmdeduc2(keep=table value frequency percent); set oneway\_dmdeduc2;

value= vvalue(dmdeduc2); **run**;

**data** oneway\_pir\_cat (keep=table value frequency percent); set oneway\_pir\_cat;

value= vvalue(pir\_cat); **run**;

**data** oneway\_short\_sleep(keep=table value frequency percent); set oneway\_short\_sleep;

value= vvalue(short\_sleep); **run**;

**data** oneway\_poor\_sleep(keep=table value frequency percent); set oneway\_poor\_sleep;

value= vvalue(poor\_sleep); **run**;

**data** oneway\_RIAGENDR (keep=table value frequency percent); set oneway\_RIAGENDR ;

value= vvalue(RIAGENDR) ; **run**;

**data** oneway\_RIDRETH1 (keep=table value frequency percent); set oneway\_RIDRETH1 ;

value= vvalue(RIDRETH1) ; **run**;

**data** oneway\_birth\_control(keep=table value frequency percent); set oneway\_birth\_control;

value= vvalue(birth\_control); **run**;

**data** oneway\_cotinine\_cat(keep=table value frequency percent); set oneway\_cotinine\_cat;

value= vvalue(cotinine\_cat); **run**;

**data** oneway\_hrt(keep=table value frequency percent); set oneway\_hrt;

value= vvalue(hrt); **run**;

**data** oneway\_obese (keep=table value frequency percent); set oneway\_obese ;

value= vvalue(obese) ; **run**;

**data** oneway\_sleep\_med(keep=table value frequency percent); set oneway\_sleep\_med;

value= vvalue(sleep\_med); **run**;

**data** oneway\_phys\_act(keep=table value frequency percent); set oneway\_phys\_act;

value= vvalue(phys\_act); **run**;

**data** oneway;

set oneway\_dmdeduc2 oneway\_pir\_cat oneway\_short\_sleep oneway\_poor\_sleep

oneway\_RIAGENDR oneway\_RIDRETH1 oneway\_birth\_control oneway\_cotinine\_cat

oneway\_hrt oneway\_obese oneway\_sleep\_med oneway\_phys\_act;

where percent < **100**;

percent = percent / **100**;

table= STRIP( TRANWRD(table, "Table ", "") );

**run**;

/\* Two-way frequencies by poor sleep \*/

ods output crosstabs=ps\_DMDEDUC2;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables DMDEDUC2\*poor\_sleep; **run**;

ods output crosstabs=ps\_pir\_cat;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables pir\_cat\*poor\_sleep; **run**;

ods output crosstabs=ps\_short\_sleep;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables short\_sleep\*poor\_sleep; **run**;

ods output crosstabs=ps\_riagendr;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables riagendr\*poor\_sleep; **run**;

ods output crosstabs=ps\_ridreth1;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables ridreth1\*poor\_sleep; **run**;

ods output crosstabs=ps\_birth\_control;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables birth\_control\*poor\_sleep; **run**;

ods output crosstabs=ps\_cotinine\_cat;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables cotinine\_cat\*poor\_sleep; **run**;

ods output crosstabs=ps\_hrt;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables hrt\*poor\_sleep; **run**;

ods output crosstabs=ps\_obese;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables obese\*poor\_sleep; **run**;

ods output crosstabs=ps\_sleep\_med;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables sleep\_med\*poor\_sleep; **run**;

ods output crosstabs=ps\_phys\_act;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables phys\_act\*poor\_sleep; **run**;

**data** ps\_dmdeduc2 (keep=table value frequency percent); set ps\_dmdeduc2;

value=vvalue(dmdeduc2); table="DMDEDUC2"; where poor\_sleep=**1**; **run**;

**data** ps\_pir\_cat (keep=table value frequency percent); set ps\_pir\_cat;

value= vvalue(pir\_cat); table="pir\_cat"; where poor\_sleep = **1**; **run**;

**data** ps\_short\_sleep (keep=table value frequency percent); set ps\_short\_sleep;

value=vvalue(short\_sleep);table="short\_sleep"; where poor\_sleep=**1**; **run**;

**data** ps\_riagendr (keep=table value frequency percent); set ps\_riagendr ;

value=vvalue(riagendr ); table="RIAGENDR"; where poor\_sleep=**1**; **run**;

**data** ps\_ridreth1(keep=table value frequency percent); set ps\_ridreth1;

value=vvalue(ridreth1); table="RIDRETH1"; where poor\_sleep=**1**; **run**;

**data** ps\_birth\_control(keep=table value frequency percent); set ps\_birth\_control;

value=vvalue(birth\_control); table="birth\_control"; where poor\_sleep=**1**; **run**;

**data** ps\_cotinine\_cat(keep=table value frequency percent); set ps\_cotinine\_cat;

value=vvalue(cotinine\_cat); table="cotinine\_cat"; where poor\_sleep=**1**; **run**;

**data** ps\_hrt(keep=table value frequency percent); set ps\_hrt;

value=vvalue(hrt); table="hrt"; where poor\_sleep=**1**; **run**;

**data** ps\_obese(keep=table value frequency percent); set ps\_obese;

value=vvalue(obese); table="obese"; where poor\_sleep=**1**; **run**;

**data** ps\_sleep\_med(keep=table value frequency percent); set ps\_sleep\_med;

value=vvalue(sleep\_med); table="sleep\_med"; where poor\_sleep=**1**; **run**;

**data** ps\_phys\_act(keep=table value frequency percent); set ps\_phys\_act;

value=vvalue(phys\_act); table="phys\_act"; where poor\_sleep=**1**; **run**;

**data** ps (keep=table value ps\_freq ps\_perc);

set ps\_dmdeduc2 ps\_pir\_cat ps\_short\_sleep ps\_riagendr ps\_hrt

ps\_ridreth1 ps\_birth\_control ps\_cotinine\_cat ps\_obese ps\_sleep\_med ps\_phys\_act;

where frequency < **7310**;

ps\_freq = frequency;

ps\_perc = **1**/percent;

**run**;

/\* Two-way frequencies by short sleep \*/

ods output crosstabs=ss\_DMDEDUC2;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables DMDEDUC2\*short\_sleep; **run**;

ods output crosstabs=ss\_pir\_cat;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables pir\_cat\*short\_sleep; **run**;

ods output crosstabs=ss\_poor\_sleep;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables poor\_sleep\*short\_sleep; **run**;

ods output crosstabs=ss\_riagendr;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables riagendr\*short\_sleep; **run**;

ods output crosstabs=ss\_ridreth1;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables ridreth1\*short\_sleep; **run**;

ods output crosstabs=ss\_birth\_control;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables birth\_control\*short\_sleep; **run**;

ods output crosstabs=ss\_cotinine\_cat;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables cotinine\_cat\*short\_sleep; **run**;

ods output crosstabs=ss\_hrt;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables hrt\*short\_sleep; **run**;

ods output crosstabs=ss\_obese;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables obese\*short\_sleep; **run**;

ods output crosstabs=ss\_sleep\_med;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables sleep\_med\*short\_sleep; **run**;

ods output crosstabs=ss\_phys\_act;

**proc** **surveyfreq** data=dat.final; strata strata; cluster cluster; weight weight; tables phys\_act\*short\_sleep; **run**;

**data** ss\_dmdeduc2 (keep=table value frequency percent); set ss\_dmdeduc2;

value=vvalue(dmdeduc2); table="DMDEDUC2"; where short\_sleep=**1**; **run**;

**data** ss\_pir\_cat (keep=table value frequency percent); set ss\_pir\_cat;

value= vvalue(pir\_cat); table="pir\_cat"; where short\_sleep = **1**; **run**;

**data** ss\_poor\_sleep (keep=table value frequency percent); set ss\_poor\_sleep;

value=vvalue(poor\_sleep); table="poor\_sleep"; where short\_sleep=**1**; **run**;

**data** ss\_riagendr (keep=table value frequency percent); set ss\_riagendr ;

value=vvalue(riagendr ); table="RIAGENDR"; where short\_sleep=**1**; **run**;

**data** ss\_ridreth1(keep=table value frequency percent); set ss\_ridreth1;

value=vvalue(ridreth1); table="RIDRETH1"; where short\_sleep=**1**; **run**;

**data** ss\_birth\_control(keep=table value frequency percent); set ss\_birth\_control;

value=vvalue(birth\_control); table="birth\_control"; where short\_sleep=**1**; **run**;

**data** ss\_cotinine\_cat(keep=table value frequency percent); set ss\_cotinine\_cat;

value=vvalue(cotinine\_cat); table="cotinine\_cat"; where short\_sleep=**1**; **run**;

**data** ss\_hrt(keep=table value frequency percent); set ss\_hrt;

value=vvalue(hrt); table="hrt"; where short\_sleep=**1**; **run**;

**data** ss\_obese(keep=table value frequency percent); set ss\_obese;

value=vvalue(obese); table="obese"; where short\_sleep=**1**; **run**;

**data** ss\_sleep\_med(keep=table value frequency percent); set ss\_sleep\_med;

value=vvalue(sleep\_med); table="sleep\_med"; where short\_sleep=**1**; **run**;

**data** ss\_phys\_act(keep=table value frequency percent); set ss\_phys\_act;

value=vvalue(phys\_act); table="phys\_act"; where short\_sleep=**1**; **run**;

**data** ss (keep = table value ss\_freq ss\_perc);

set ss\_dmdeduc2 ss\_pir\_cat ss\_poor\_sleep ss\_riagendr ss\_hrt

ss\_ridreth1 ss\_birth\_control ss\_cotinine\_cat ss\_obese ss\_sleep\_med ss\_phys\_act;

where frequency < **2588**;

ss\_freq = frequency;

ss\_perc = **1**/percent;

**run**;

/\* combine all into table1 \*/

**proc** **datasets** lib=work nolist;

save oneway ss ps;

**run**;

**proc** **sort** data=oneway; by table value; **run**;

**proc** **sort** data=ss; by table value; **run**;

**proc** **sort** data=ps; by table value; **run**;

**data** table1;

merge oneway ss ps;

by table value;

**run**;

**proc** **export**

data=table1

dbms=xlsx

outfile="C:\Users\Audrey\Google Drive\CUNY SPH Coursework\EPID622 Applied Research- Data Management\NHANES SES sleep CRP\table1.xlsx"

replace;

**run**;

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* PAPER TABLE 2 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*Mean CRP (log) by each variable & f test \*/

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=edu";

strata strata; cluster cluster; weight weight;

class DMDEDUC2;

model crp\_log = DMDEDUC2 /solution noint;

**run**;

**data** p; set p; effect='DMDEDUC2'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** edu (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=pir\_cat";

strata strata; cluster cluster; weight weight;

class pir\_cat;

model crp\_log = pir\_cat /solution noint;

**run**;

**data** p; set p; effect='pir\_cat'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** pir (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=activity";

strata strata; cluster cluster; weight weight;

class phys\_act;

model crp\_log = phys\_act/solution noint;

lsmeans phys\_act;

**run**;

**data** p; set p; effect='phys\_act'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** phys (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=gender";

strata strata; cluster cluster; weight weight;

class RIAGENDR;

model crp\_log = RIAGENDR /solution noint;

**run**;

**data** p; set p; effect='RIAGENDR'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** gender (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=race";

strata strata; cluster cluster; weight weight;

class RIDRETH1;

model crp\_log = RIDRETH1 /solution noint;

**run**;

**data** p; set p; effect='RIDRETH1'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** race(keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=age";

strata strata; cluster cluster; weight weight;

class agecat;

model crp\_log = agecat /solution noint;

**run**;

**data** p; set p; effect='agecat'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** age (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=birth control";

strata strata; cluster cluster; weight weight;

class birth\_control;

model crp\_log = birth\_control /solution noint;

**run**;

**data** p; set p; effect='birth\_control'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** birth (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=cotinine";

strata strata; cluster cluster; weight weight;

class cotinine\_cat;

model crp\_log = cotinine\_cat /solution noint;

**run**;

**data** p; set p; effect='cotinine\_cat'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** cotinine (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=hrt";

strata strata; cluster cluster; weight weight;

class hrt;

model crp\_log = hrt /solution noint;

**run**;

**data** p; set p; effect='hrt'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** hrt (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=obese";

strata strata; cluster cluster; weight weight;

class obese;

model crp\_log = obese /solution noint;

**run**;

**data** p; set p; effect='obese'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** obese (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=poor sleep";

strata strata; cluster cluster; weight weight;

class poor\_sleep;

model crp\_log = poor\_sleep /solution noint;

**run**;

**data** p; set p; effect='poor\_sleep'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** poor (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=sleep duration";

strata strata; cluster cluster; weight weight;

class short\_sleep;

model crp\_log = short\_sleep /solution noint;

**run**;

**data** p; set p; effect='short\_sleep'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** short (keep=effect parameter estimate probF); merge e p; by effect; **run**;

ods output parameterestimates=p effects=e;

**proc** **surveyreg** data=dat.final; title "univariable crp=sleep meds";

strata strata; cluster cluster; weight weight;

class sleep\_med;

model crp\_log = sleep\_med /solution noint;

**run**;

**data** p; set p; effect='sleep\_med'; **run**; **data** e; set e; where not(effect='Model'); **run**;

**data** sleep\_med (keep=effect parameter estimate probF); merge e p; by effect; **run**;

/\* combine into table 2 \*/

**data** table2 (keep=effect parameter estimate exp\_estimate pval);

set edu pir phys gender race age birth cotinine hrt obese poor short sleep\_med;

if probF < **0.0001** then pval = "<0.0001";

else pval = input(probF, **1.4**);

parameter = STRIP( TRANWRD(parameter, effect, "") );

exp\_estimate = exp(estimate);

**run**;

\*get total geometric mean crp;

ods output statistics=mean\_crp\_log;

**proc** **surveymeans** data=dat.final;

strata strata; cluster cluster; weight weight;

var crp\_log;

**run**;

**data** geom\_mean\_crp (keep=geom\_mean); set mean\_crp\_log;

geom\_mean = exp(mean);

**run**;

**proc** **print** data=geom\_mean\_crp; title 'Geometric mean CRP (total)'; **run**;

**proc** **export**

data=table2

dbms=xlsx

outfile="h:\personal\NHANES SES sleep CRP\table2.xlsx"

replace;

**run**;

/\* Checking residuals

ods graphics on;

proc glm data=dat.final order=INTERNAL PLOTS=DIAGNOSTICS;

class DMDEDUC2 phys\_act poor\_sleep

RIAGENDR RIDRETH1 agecat

birth\_control cotinine\_cat hrt

obese sleep\_med;

model crp\_log = DMDEDUC2 poor\_sleep phys\_act RIAGENDR RIDRETH1 agecat birth\_control

cotinine\_cat hrt obese sleep\_med;

run; quit;

\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* Supplemental Table 1 \*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* CHECKING IF EXPOSURE->MEDIATOR, MEDIATOR->OUTCOME \*/

/\* EXPOSURE->MEDIATOR \*/

/\* edu->short\_sleep YES \*/

ods output type3=edu\_ss;

**proc** **surveylogistic** data=dat.final order=INTERNAL;

strata strata; cluster cluster; weight weight;

class sleep\_med DMDEDUC2 RIAGENDR RIDRETH1 birth\_control cotinine\_cat hrt obese;

model short\_sleep = DMDEDUC2 RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med;

**run**;

/\* edu->poor\_sleep NO \*/

ods output type3=edu\_ps;

**proc** **surveylogistic** data=dat.final order=INTERNAL;

strata strata; cluster cluster; weight weight;

class sleep\_med DMDEDUC2 RIAGENDR RIDRETH1 birth\_control cotinine\_cat hrt obese;

model poor\_sleep = DMDEDUC2 RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med;

**run**;

/\* inc->short\_sleep YES \*/

ods output type3=inc\_ss;

**proc** **surveylogistic** data=dat.final order=INTERNAL;

strata strata; cluster cluster; weight weight;

class sleep\_med pir\_cat RIAGENDR RIDRETH1 birth\_control cotinine\_cat hrt obese;

model short\_sleep = pir\_cat RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med;

**run**;

/\* inc->poor\_sleep YES \*/

ods output type3=inc\_ps;

**proc** **surveylogistic** data=dat.final order=INTERNAL;

strata strata; cluster cluster; weight weight;

class sleep\_med pir\_cat RIAGENDR RIDRETH1 birth\_control cotinine\_cat hrt obese;

model poor\_sleep = pir\_cat RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med;

**run**;

/\* MEDIATOR->OUTCOME \*/

/\* short\_sleep->CRP YES \*/

ods output effects=ss\_crp;

**proc** **surveyreg** data=dat.final order=INTERNAL;

strata strata; cluster cluster; weight weight;

class short\_sleep sleep\_med RIAGENDR RIDRETH1 birth\_control cotinine\_cat hrt obese;

model crp\_log = short\_sleep RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med /solution CLPARM;

**run**;

/\* poor\_sleep->CRP \*/

ods output effects=ps\_crp;

**proc** **surveyreg** data=dat.final order=INTERNAL;

strata strata; cluster cluster; weight weight;

class sleep\_med poor\_sleep RIAGENDR RIDRETH1 birth\_control cotinine\_cat hrt obese;

model crp\_log = poor\_sleep RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med /solution CLPARM;

**run**;

**data** edu\_ps (keep=effect ps\_x2 ps\_df ps\_p); set edu\_ps;

ps\_x2 = waldchisq; ps\_df=df; ps\_p=probchisq;

where effect="DMDEDUC2";

**run**;

**data** edu\_ss (keep=effect ss\_x2 ss\_df ss\_p); set edu\_ss;

ss\_x2 = waldchisq; ss\_df=df; ss\_p=probchisq;

where effect="DMDEDUC2";

**run**;

**data** inc\_ps (keep=effect ps\_x2 ps\_df ps\_p); set inc\_ps;

ps\_x2 = waldchisq; ps\_df=df; ps\_p=probchisq;

where effect="pir\_cat";

**run**;

**data** inc\_ss (keep=effect ss\_x2 ss\_df ss\_p); set inc\_ss;

ss\_x2 = waldchisq; ss\_df=df; ss\_p=probchisq;

where effect="pir\_cat";

**run**;

**data** ss\_crp (keep=effect ss\_x2 ss\_df ss\_p); set ss\_crp;

where effect="short\_sleep";

ss\_x2=fvalue; ss\_df=numdf; ss\_p=probf;

**run**;

**data** ps\_crp(keep=effect ps\_x2 ps\_df ps\_p); set ps\_crp;

where effect="poor\_sleep";

ps\_x2=fvalue; ps\_df=numdf; ps\_p=probf;

**run**;

**data** ps\_crp; set ps\_crp; effect="crp"; **run**;

**data** ss\_crp; set ss\_crp; effect="crp"; **run**;

**data** ss; set edu\_ss inc\_ss ss\_crp; **run**;

**data** ps; set edu\_ps inc\_ps ps\_crp; **run**;

**proc** **sort** data=ss; by effect; **run**;

**proc** **sort** data=ps; by effect; **run**;

**data** suppl\_table1; merge ss ps; by effect; **run**;

**proc** **export**

data=suppl\_table1

dbms=xlsx

outfile="c:\users\audrey\documents\nhanes\_ses\_sleep\_crp\suppl\_table1.xlsx"

replace;

**run**; **quit**;

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* PAPER TABLE 3 \*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* creating a bootstrap sample of 1000 replicates \*/

%let reps=1000;

**proc** **surveyselect** data=dat.final out=outboot

seed=**1**

method=urs

samprate=**1**

outhits

rep=&reps;

**run**;

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* 0. CRUDE TOTAL EFFECTS \*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* income \*/

ods output parameterestimates=te\_crude\_pir;

**proc** **surveyreg** data=dat.final;

strata strata; cluster cluster; weight weight;

class pir\_cat;

model crp\_log = pir\_cat /solution CLPARM;

**run**;

/\* education \*/

ods output parameterestimates=te\_crude\_edu;

**proc** **surveyreg** data=dat.final;

strata strata; cluster cluster; weight weight;

class DMDEDUC2;

model crp\_log = DMDEDUC2 /solution CLPARM;

**run**;

**data** te\_crude (keep=param est\_TE\_crude lwr\_TE\_crude upr\_TE\_crude); set te\_crude\_edu te\_crude\_pir;

param=parameter; est\_TE\_crude=estimate; lwr\_TE\_crude=LowerCL; upr\_TE\_crude=UpperCL;

**run**;

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* 1. EXPOSURE=INCOME, MEDIATOR=POOR SLEEP (with interaction) \*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*total effect\*/

ods output parameterestimates=p;

**proc** **surveyreg** data=dat.final;

strata strata; cluster cluster; weight weight;

class sleep\_med pir\_cat RIAGENDR RIDRETH1 birth\_control cotinine\_cat hrt obese;

model crp\_log = pir\_cat RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med /solution CLPARM;

**run**;

**data** total\_effect\_pir (keep=parameter estimate probt lowercl uppercl);

set p (firstobs=**2** obs=**4**);

**run**;

/\*outcome regression\*/

**proc** **surveyreg** data=outboot order=INTERNAL;\* 1. outcome model;

by replicate;

strata strata; cluster cluster; weight weight;

class poor\_sleep sleep\_med pir\_cat

RIAGENDR RIDRETH1

birth\_control cotinine\_cat hrt obese;

model crp\_log = pir\_cat poor\_sleep pir\_cat\*poor\_sleep RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med /solution;

ods select none;

ods output ParameterEstimates = outcome\_model;

**run**;

**data** poorsleep (keep = replicate poorsleep); set outcome\_model;

where parameter = 'poor\_sleep Yes';

poorsleep = estimate;

**run**;

**data** poorsleep\_pir0100 (keep = replicate poorsleep\_pir0100); set outcome\_model;

where parameter = 'poor\_sleep\*pir\_cat Yes 0-100%';

poorsleep\_pir0100 = estimate;

**run**;

**data** poorsleep\_pir199 (keep = replicate poorsleep\_pir199); set outcome\_model;

where parameter = 'poor\_sleep\*pir\_cat Yes 100-199%';

poorsleep\_pir199 = estimate;

**run**;

/\*mediator regression \*/

**proc** **surveyreg** data=outboot order=INTERNAL;

by replicate;

strata strata; cluster cluster; weight weight;

class poor\_sleep sleep\_med pir\_cat

RIAGENDR RIDRETH1

birth\_control cotinine\_cat hrt obese;

model poor\_sleep = pir\_cat RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med /solution;

ods select none;

ods output ParameterEstimates = mediator\_model;

**run**;

**data** pir0100 (keep = replicate pir0100); set mediator\_model;

where parameter = 'pir\_cat 0-100%';

pir0100 = estimate;

**run**;

**data** pir199 (keep = replicate pir199); set mediator\_model;

where parameter = 'pir\_cat 100-199%';

pir199 = estimate;

**run**;

/\* combine and calculate the indirect effect \*/

**data** combine;

merge poorsleep poorsleep\_pir0100 pir0100 poorsleep\_pir199 pir199;

by replicate;

indirect\_pir0100 = (pir0100\*poorsleep) + (pir0100\*poorsleep\_pir0100);

indirect\_pir199 = (pir199\*poorsleep) + (pir199\*poorsleep\_pir199);

**run**;

/\* get confidence intervals from percentiles of the bootstrap estimates \*/

**proc** **univariate** data=combine noprint;

var indirect\_pir199 indirect\_pir0100;

output out=result\_income\_poorsleep mean=estimate199 estimate100 pctlpre=P\_199\_ p\_100\_ pctlpts= **2.5**, **97.5**;

**run**;

**data** dat.result\_income\_poorsleep; set result\_income\_poorsleep; **run**;

**proc** **print** data=result\_income\_poorsleep;

title "Indirect Effect Estimates for Income Mediated by Poor Sleep.";

ods select all;

**run**;

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* 2. EXPOSURE=INCOME, MEDIATOR=SHORT SLEEP (no interaction) \*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*outcome regression\*/

**proc** **surveyreg** data=outboot order=INTERNAL;\* 1. outcome model;

by replicate;

strata strata; cluster cluster; weight weight;

class short\_sleep sleep\_med pir\_cat

RIAGENDR RIDRETH1

birth\_control cotinine\_cat hrt obese;

model crp\_log = pir\_cat short\_sleep RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med /solution;

ods select none;

ods output ParameterEstimates = outcome\_model;

**run**;

**data** short\_sleep (keep = replicate short\_sleep); set outcome\_model;

where parameter = 'short\_sleep Yes';

short\_sleep = estimate;

**run**;

/\*mediator regression \*/

**proc** **surveyreg** data=outboot order=INTERNAL;

by replicate;

strata strata; cluster cluster; weight weight;

class short\_sleep sleep\_med pir\_cat

RIAGENDR RIDRETH1

birth\_control cotinine\_cat hrt obese;

model short\_sleep = pir\_cat RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med /solution;

ods select none;

ods output ParameterEstimates = mediator\_model;

**run**;

**data** pir0100 (keep = replicate pir0100); set mediator\_model;

where parameter = 'pir\_cat 0-100%';

pir0100 = estimate;

**run**;

**data** pir199 (keep = replicate pir199); set mediator\_model;

where parameter = 'pir\_cat 100-199%';

pir199 = estimate;

**run**;

/\* combine and calculate the indirect effect \*/

**data** combine;

merge short\_sleep pir0100 pir199;

by replicate;

indirect\_pir0100 = (pir0100\*short\_sleep);

indirect\_pir199 = (pir199\*short\_sleep) ;

**run**;

/\* get confidence intervals from percentiles of the bootstrap estimates \*/

**proc** **univariate** data=combine noprint;

var indirect\_pir199 indirect\_pir0100;

output out=result\_income\_shortsleep mean=estimate199 estimate100 pctlpre=P\_199\_ p\_100\_ pctlpts= **2.5**, **97.5**;

**run**;

**data** dat.result\_income\_shortsleep; set result\_income\_shortsleep; **run**;

**proc** **print** data=result\_income\_shortsleep;

title "Indirect Effect Estimates for Income Mediated by Short Sleep.";

ods select all;

**run**;

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* 3. EXPOSURE=EDUCATION, MEDIATOR=SHORT SLEEP (no interaction) \*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\*total effect of education \*/

ods output parameterestimates=p;

**proc** **surveyreg** data=dat.final order=INTERNAL;

strata strata; cluster cluster; weight weight;

class sleep\_med DMDEDUC2 RIAGENDR RIDRETH1 birth\_control cotinine\_cat hrt obese;

model crp\_log = DMDEDUC2 RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med /solution CLPARM;

**run**;

**data** total\_effect (keep=parameter estimate probt lowercl uppercl est\_exp lwr\_exp upr\_exp);

set total\_effect\_pir p (firstobs=**2** obs=**6**);

est\_exp = exp(estimate);

lwr\_exp = exp(lowercl);

upr\_exp = exp(uppercl);

**run**;

**proc** **print** data=total\_effect; **run**;

/\*outcome regression\*/

**proc** **surveyreg** data=outboot order=INTERNAL;\* 1. outcome model;

by replicate;

strata strata; cluster cluster; weight weight;

class short\_sleep sleep\_med DMDEDUC2

RIAGENDR RIDRETH1

birth\_control cotinine\_cat hrt obese;

model crp\_log = DMDEDUC2 short\_sleep RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med /solution;

ods select none;

ods output ParameterEstimates = outcome\_model;

**run**;

**data** short\_sleep (keep = replicate short\_sleep); set outcome\_model;

where parameter = 'short\_sleep Yes';

short\_sleep = estimate;

**run**;

/\*mediator regression \*/

**proc** **surveyreg** data=outboot order=INTERNAL;\* 1. outcome model;

by replicate;

strata strata; cluster cluster; weight weight;

class short\_sleep sleep\_med DMDEDUC2

RIAGENDR RIDRETH1

birth\_control cotinine\_cat hrt obese;

model short\_sleep = DMDEDUC2 RIAGENDR RIDRETH1 RIDAGEYR birth\_control

cotinine\_cat hrt obese sleep\_med /solution;

ods select none;

ods output ParameterEstimates = mediator\_model;

**run**;

**data** LessThan9th (keep = replicate LessThan9th); set mediator\_model; where parameter = 'DMDEDUC2 Less Than 9th Grade';

LessThan9th = estimate; **run**;

**data** From9to11 (keep = replicate From9to11); set mediator\_model; where parameter = 'DMDEDUC2 9-11th Grade (Includes 12th grade with no diploma)';

From9to11 = estimate; **run**;

**data** HighSchool (keep = replicate HighSchool); set mediator\_model; where parameter = 'DMDEDUC2 High School Grad/GED or Equivalent';

HighSchool = estimate; **run**;

**data** SomeCollege (keep = replicate SomeCollege); set mediator\_model; where parameter = 'DMDEDUC2 Some College or AA degree';

SomeCollege = estimate; **run**;

/\* combine and calculate the indirect effect \*/

**data** combine;

merge short\_sleep LessThan9th From9to11 HighSchool SomeCollege;

by replicate;

indirect\_LessThan9th = (LessThan9th\*short\_sleep);

indirect\_From9to11 = (From9to11\*short\_sleep);

indirect\_HighSchool = (HighSchool\*short\_sleep);

indirect\_SomeCollege = (SomeCollege\*short\_sleep);

**run**;

/\* get confidence intervals from percentiles of the bootstrap estimates \*/

**proc** **univariate** data=combine noprint;

var indirect\_LessThan9th indirect\_From9to11 indirect\_HighSchool indirect\_SomeCollege;

output

out=result\_edu\_shortsleep

mean=est\_LessThan9th est\_From9to11 est\_HighSchool est\_SomeCollege

pctlpre=LessThan9th\_ From9to11\_ HighSchool\_ SomeCollege\_

pctlpts= **2.5**, **97.5**;

**run**;

**data** dat.result\_edu\_shortsleep; set result\_edu\_shortsleep; **run**;

**proc** **print** data=result\_edu\_shortsleep;

title "Indirect Effect Estimates for Education Mediated by Short Sleep.";

ods select all;

**run**;

/\* COMBINING ALL THE RESULTS INTO TABLE 3 \*/

/\* edu / ss \*/

**data** edu\_9to11 (keep=param est\_ss lwr\_ss upr\_ss); set dat.result\_edu\_shortsleep ;

param="DMDEDUC2 9-11th Grade (Includes 12th grade w"; est\_ss=est\_from9to11; lwr\_ss=from9to11\_2\_5; upr\_ss=from9to11\_97\_5;

**run**;

**data** edu\_hs (keep=param est\_ss lwr\_ss upr\_ss); set dat.result\_edu\_shortsleep ;

param="DMDEDUC2 High School Grad/GED or Equivalent"; est\_ss=est\_highschool; lwr\_ss=highschool\_2\_5; upr\_ss=highschool\_97\_5;

**run**;

**data** edu\_les9 (keep=param est\_ss lwr\_ss upr\_ss); set dat.result\_edu\_shortsleep ;

param="DMDEDUC2 Less Than 9th Grade"; est\_ss=est\_lessthan9th; lwr\_ss=lessthan9th\_2\_5; upr\_ss=lessthan9th\_97\_5;

**run**;

**data** edu\_some (keep=param est\_ss lwr\_ss upr\_ss); set dat.result\_edu\_shortsleep ;

param="DMDEDUC2 Some College or AA degree"; est\_ss=est\_SomeCollege; lwr\_ss=SomeCollege\_2\_5; upr\_ss=SomeCollege\_97\_5;

**run**;

**data** table3; set edu\_9to11 edu\_hs edu\_les9 edu\_some; **run**;

/\* income / ss \*/

**data** pir100 (keep=param est\_ss lwr\_ss upr\_ss); set dat.result\_income\_shortsleep;

param="pir\_cat 0-100%"; est\_ss=estimate100; lwr\_ss=p\_100\_2\_5; upr\_ss=p\_100\_97\_5;

**run**;

**data** pir199 (keep=param est\_ss lwr\_ss upr\_ss); set dat.result\_income\_shortsleep;

param="pir\_cat 100-199%"; est\_ss=estimate199; lwr\_ss=p\_199\_2\_5; upr\_ss=p\_199\_97\_5;

**run**;

**data** table3; set table3 pir100 pir199; **run**;

/\* income / ps \*/

**data** pir100\_ps (keep=param est\_ps lwr\_ps upr\_ps ); set dat.result\_income\_poorsleep;

param="pir\_cat 0-100%"; est\_ps =estimate100; lwr\_ps =p\_100\_2\_5; upr\_ps =p\_100\_97\_5;

**run**;

**data** pir199\_ps (keep=param est\_ps lwr\_ps upr\_ps ); set dat.result\_income\_poorsleep;

param="pir\_cat 100-199%"; est\_ps =estimate199; lwr\_ps =p\_199\_2\_5; upr\_ps =p\_199\_97\_5;

**run**;

**data** ps; set pir199\_ps pir100\_ps ; **run**;

**proc** **sort** data=ps; by param; **run**;

**proc** **sort** data=table3; by param; **run**;

**data** te (keep=param est\_TE lwr\_TE upr\_TE); set total\_effect;

param=parameter; est\_TE=estimate; lwr\_TE=LowerCL; upr\_TE=UpperCL;

**run**;

**proc** **sort** data=te; by param; **run**;

**data** table3; merge te table3 ps; by param; **run**;

**proc** **sort** data=te\_crude; by param; **run**;

**data** table3; merge table3 te\_crude; by param; if not(param="Intercept"); **run**;

**proc** **export**

data=table3

dbms=xlsx

outfile="H:\Personal\NHANES SES sleep CRP\table3.xlsx"

replace;

**run**;