libname F "R:\envision\Data\ED Data\z Requests and Meetings\REQUESTS\Hannah Cooper - Birth and Stimulants\Acute Manuscript\Manuscript and Results Update 2024-06-07\Analytic Datasets";

libname R "R:\envision\Data\ED Data\z Requests and Meetings\REQUESTS\Hannah Cooper - Birth and Stimulants\Acute Manuscript\Manuscript and Results Update 2024-06-07\Results";

\*Bring in analytic dataset;

**data** cohort; set F.Hmother\_infoi;

AGE=round((DELMONTH-BMONTH2)/**365**, **1**);

UR=" ";

if UR1=**1** then UR="1: Large metropolitan areas with at least 1 million residents";

if UR1=**2** then UR="2: Small metropolitan areas with less than 1 million residents";

if UR1=**3** then UR="3: Micropolitan areas";

if UR1=**4** then UR="4: Not metropolitan or micropolitan";

RACE=" ";

if RACE1=**1** then RACE="1: White";

if RACE1=**2** then RACE="2: Black";

if RACE1=**3** then RACE="3: Hispanic";

if RACE1=**4** then RACE="4: Asian/Pacific Islander";

if RACE1=**5** then RACE="5: Native American";

if RACE1=**6** then RACE="6: Other";

PAYOR=" ";

if PAYOR1=**1** then PAYOR="1: Medicare";

if PAYOR1=**2** then PAYOR="2: Medicaid";

if PAYOR1=**3** then PAYOR="3: Private insurance";

if PAYOR1=**4** then PAYOR="4: Self-pay";

if PAYOR1=**5** then PAYOR="5: No charge";

if PAYOR1=**6** then PAYOR="6: Other";

AGE\_GROUP=" ";

if AVG\_AGE>=**10** and AVG\_AGE<=**19** then AGE\_GROUP="10-19";

if AVG\_AGE>=**20** and AVG\_AGE<=**24** then AGE\_GROUP="20-24";

if AVG\_AGE>=**25** and AVG\_AGE<=**29** then AGE\_GROUP="25-29";

if AVG\_AGE>=**30** and AVG\_AGE<=**34** then AGE\_GROUP="30-34";

if AVG\_AGE>=**35** and AVG\_AGE<=**39** then AGE\_GROUP="35-39";

if AVG\_AGE>=**40** and AVG\_AGE<=**44** then AGE\_GROUP="40-44";

if AVG\_AGE>=**45** and AVG\_AGE<=**49** then AGE\_GROUP="45-49";

if AVG\_AGE>=**50** then AGE\_GROUP="50+";

**run**;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Table 1 - Demographic Distributions

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

**%macro** table1(var=);

proc sql;

create table &var. as

select &var., count(\*) as count

from cohort

group by &var.

order by &var.;

quit;

proc sql;

create table &var. as

select &var. as CHARACTER label="Value" length=**200**,

put(count,comma12.0) || " " || compress("(" || strip(put(count/sum(count),percent8.1) ||")")) as TOTAL\_RAW\_COUNTS length=**50**

from &var.; quit;

**%mend**;

%***table1***(var=UR)

%***table1***(var=RACE)

%***table1***(var=PAYOR)

%***table1***(var=AGE\_GROUP)

**data** R.TABLE1;

set RACE AGE\_GROUP PAYOR UR;

**run**;

\*Total Sample;

**Proc** **sql**;

select distinct count(\*) as TOTAL\_SAMPLE format=comma12.0

from cohort;

**quit**;

\*Print Table 1 Stratifications;

**proc** **print** data=R.TABLE1 noobs; **run**;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Table 2 - Rates per 100k By Time Period

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

\*Total Ascertainment Row - Jeffreys Version Confidence Intervals ;

**%macro** table2(outcome=);

**%macro** table(outcome=, time=);

proc freq data=F.Cohort\_du\_time;

tables &outcome.\_&time. / binomial (j level=**1**);

output out=&outcome.\_&time. bin;

run;

data &outcome.\_&time.; set &outcome.\_&time. (keep = \_BIN\_ L\_J\_BIN U\_J\_BIN); rename \_BIN\_=estimate2 L\_J\_BIN=lower2 U\_J\_BIN=upper2; run;

data &outcome.\_&time. (drop = estimate2 lower2 upper2);

set &outcome.\_&time.;

estimate=round(**100000**\*(**1**-estimate2));

lower=round(**100000**\*(**1**-lower2));

upper=round(**100000**\*(**1**-upper2));

&outcome.\_&time.=estimate || " " || compress("(" || upper || "-" || lower || ")");

ORDER=\_N\_;

drop estimate lower upper;

run;

**%mend**;

%***table***(outcome=&outcome., time=ANY);

%***table***(outcome=&outcome., time=DEL);

%***table***(outcome=&outcome., time=TM1);

%***table***(outcome=&outcome., time=TM2);

%***table***(outcome=&outcome., time=TM3);

%***table***(outcome=&outcome., time=DMO);

%***table***(outcome=&outcome., time=PP1);

%***table***(outcome=&outcome., time=PP2);

%***table***(outcome=&outcome., time=PP3);

%***table***(outcome=&outcome., time=PP4);

data &outcome.(rename=(

&outcome.\_ANY=ANY

&outcome.\_TM1=TM1

&outcome.\_TM2=TM2

&outcome.\_TM3=TM3

&outcome.\_DMO=DMO

&outcome.\_DEL=DEL

&outcome.\_PP1=PP1

&outcome.\_PP2=PP2

&outcome.\_PP3=PP3

&outcome.\_PP4=PP4));

LENGTH Outcome $**50**;

merge &outcome.\_ANY &outcome.\_DEL &outcome.\_TM1 &outcome.\_TM2 &outcome.\_TM3 &outcome.\_DMO &outcome.\_PP1 &outcome.\_PP2 &outcome.\_PP3 &outcome.\_PP4; by ORDER; OUTCOME="&outcome."; run;

**%mend**;

%***table2***(outcome=OD)

%***table2***(outcome=ENDO)

%***table2***(outcome=ABSCELL)

**data** Table2; set OD ENDO ABSCELL; **run**;

**proc** **sql**;

create table R.TABLE2 as

select outcome, ANY, TM1, TM2, TM3, DMO, DEL, PP1, PP2, PP3, PP4

from TABLE2;

**quit**;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Table 3 - Rates per 100k - Stratified by Demographics

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

\*Total Ascertainment Row - Jeffreys Version Confidence Intervals ;

**%macro** table(outcome=);

proc freq data=cohort;

tables &outcome. / binomial (j level=**1**);

output out=&outcome. bin;

run;

data &outcome.; set &outcome. (keep = \_BIN\_ L\_J\_BIN U\_J\_BIN); rename \_BIN\_=estimate2 L\_J\_BIN=lower2 U\_J\_BIN=upper2; run;

data &outcome. (drop = estimate2 lower2 upper2);

set &outcome.;

estimate=round(**100000**\*(**1**-estimate2));

lower=round(**100000**\*(**1**-lower2));

upper=round(**100000**\*(**1**-upper2));

&outcome.=estimate || " " || compress("(" || upper || "-" || lower || ")");

ORDER=\_N\_;

drop estimate lower upper;

run;

**%mend**;

%***table***(outcome=OD\_ANY);

%***table***(outcome=ENDO\_ANY);

%***table***(outcome=ABSCELL\_ANY);

**data** total\_rates; length CATEGORY $ **50**; merge OD\_ANY ENDO\_ANY ABSCELL\_ANY; by ORDER; CATEGORY="Total Sample"; Order=**0**; **run**;

**%macro** table3(outcome=);

**%macro** jeff(cat=);

proc sort data=cohort; by &cat.; run;

proc freq data=cohort;

by &cat.;

tables &outcome. / binomial (j level=**1**);

where &cat ne " ";

output out=&cat. bin;

\*weight weight /zeros;

run;

data &cat.; set &cat. (keep = &cat. \_BIN\_ L\_J\_BIN U\_J\_BIN); Category="&cat."; rename &cat.=STRATA \_BIN\_=estimate2 L\_J\_BIN=lower2 U\_J\_BIN=upper2; run;

**%mend**;

%***jeff***(cat=RACE);

%***jeff***(cat=AGE\_GROUP);

%***jeff***(cat=PAYOR);

%***jeff***(cat=UR);

data &outcome. (drop = estimate2 lower2 upper2);

length CATEGORY STRATA $ **50**;

set race AGE\_GROUP payor ur;

where strata ne " ";

estimate=round(**100000**\*(**1**-estimate2));

lower=round(**100000**\*(**1**-lower2));

upper=round(**100000**\*(**1**-upper2));

&outcome.=estimate || " " || compress("(" || upper || "-" || lower || ")");

ORDER=\_N\_;

drop estimate lower upper;

run;

**%mend**;

\*Run each table outcome/column seperately;

%***table3***(outcome=OD\_ANY);

%***table3***(outcome=ENDO\_ANY);

%***table3***(outcome=ABSCELL\_ANY);

\*Merge results from each outcome;

**data** rates; merge OD\_ANY ENDO\_ANY ABSCELL\_ANY; by ORDER; **run**;

**data** Table3; set total\_rates rates; **run**;

\*Print Tables;

**proc** **print** data=Table3 noobs; **run**;

**proc** **sql**;

create table R.Table3 as

select distinct CATEGORY, STRATA, OD\_ANY, ENDO\_ANY, ABSCELL\_ANY

from TABLE3

order by order;

**quit**;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Table 4 - Disparities - Ratio of Rates

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Relative Risks and CIs- Comparing inequities using a reference category

Must run the %nlmeans macro first! https://support.sas.com/kb/62/addl/fusion\_62362\_7\_nlmeans.sas.txt

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

**%macro** table(outcome=);

**%macro** RR(cat=, ref=);

proc genmod data = cohort descending;

class &cat.;

model &outcome. = &cat./ dist = binomial link = log;

estimate 'Beta' &cat. **1** -**1**/ exp;

run;

proc logistic data=cohort;

\*freq count;

class &cat.(ref="&ref.") / param=glm;

model &outcome.(event="1")=&cat.;

lsmeans &cat. / e ilink;

ods output coef=coeffs;

store out=ques;

run;

%***nlmeans***(instore=ques, coef=coeffs, link=logit, options=ratio, null=**1**, title=Relative Risk)

data &cat.; set est (keep = label estimate lower upper); where substr(compress(label), length(compress(label))-**1**, **2**)="/1";

CATEGORY="&cat.";

&outcome.\_RR=round(estimate,**.01**) || " " || compress("(" || round(lower,**.01**) || "-" || round(upper,**.01**) || ")");

RENAME estimate=&outcome.\_est lower=&outcome.\_L upper=&outcome.\_U;

run;

**%mend**;

%***RR***(cat=RACE, ref=**2**: Black);

%***RR***(cat=AGE\_GROUP, ref=**30**-**34**);

%***RR***(cat=PAYOR, ref=**3**: Private insurance);

%***RR***(cat=UR, ref=**1**: Large metropolitan areas with at least **1** million residents);

data &outcome.; length label CATEGORY $ **50**; set RACE AGE\_GROUP PAYOR UR; ORDER=\_N\_; run;

**%mend**;

\*Run each table outcome/column seperately;

%***table***(outcome=OD\_ANY);

%***table***(outcome=ENDO\_ANY);

%***table***(outcome=ABSCELL\_ANY);

\*Merge results from each outcome;

**data** R.RR; merge OD\_ANY ENDO\_ANY ABSCELL\_ANY; by ORDER; **run**;

**proc** **print** data=RR noobs; **run**;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Risk Differences and CIs- Comparing inequities using a reference category

Must run the %nlmeans macro first! https://support.sas.com/kb/62/addl/fusion\_62362\_7\_nlmeans.sas.txt

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*;

**%macro** table(outcome=);

**%macro** diff(cat=, ref=);

proc genmod data=cohort;

class &cat.(ref="&ref.");

model &outcome.=&cat. / dist=poisson /\*offset=ln\*/;

estimate '&cat. ratio' &cat. **1** -**1**;

lsmeans &cat. / e diff exp cl;

ods output coef=coeffs;

store out=insmodel;

run;

%***NLMeans***(instore=insmodel, coef=coeffs, link=log, title=Difference of Rates)

\*Convert rates to per 100k?;

data &cat.; set est;

&outcome.\_estimate2=round(**100000**\*estimate);

&outcome.\_lower2=round(**100000**\*lower);

&outcome.\_upper2=round(**100000**\*upper);

where substr(compress(label), length(compress(label))-**1**, **2**)="-1";

CATEGORY="&cat.";

diff\_&outcome.=round(&outcome.\_estimate2) || " " || compress("(" || round(&outcome.\_lower2) || "-" || round(&outcome.\_upper2) || ")");

run;

**%mend**;

%***diff***(cat=RACE, ref=**2**: Black);

%***diff***(cat=AGE\_GROUP, ref=**30**-**34**);

%***diff***(cat=PAYOR, ref=**3**: Private insurance);

%***diff***(cat=UR, ref=**1**: Large metropolitan areas with at least **1** million residents);

data &outcome.; length label CATEGORY $ **50**; set RACE AGE\_GROUP PAYOR UR; ORDER=\_N\_; run;

**%mend**;

\*Run each table outcome/column seperately;

%***table***(outcome=OD\_ANY);

%***table***(outcome=ENDO\_ANY);

%***table***(outcome=ABSCELL\_ANY);

\*Merge results from each outcome;

**data** R.DIFF; merge OD\_ANY ENDO\_ANY ABSCELL\_ANY; by ORDER; **run**;

**proc** **print** data=R.table1 noobs; **run**;

**proc** **print** data=R.table2 noobs; **run**;

**proc** **print** data=R.table3 noobs; **run**;

**proc** **print** data=R.RR noobs; **run**;

**proc** **print** data=R.DIFF noobs; **run**;