Using SHADAC Health Insurance Unit (HIU) and Federal Poverty Guideline (FPG) Microdata Variables

November 2013

Introduction

SHADAC researchers have developed Health Insurance Unit (HIU) and Federal Poverty Guideline (FPG) variables for analyzing health insurance coverage in federal population surveys. These variables are available through the Minnesota Population Center's Integrated Public Use Microdata Series (IPUMS) for the American Community Survey (ACS) and the Current Population Survey Annual Social and Economic Supplement (CPS).[1]

The HIU defines family based on who is likely considered a "family unit" in determining eligibility for either private or public coverage.[2] This is a narrower definition compared with the Census Bureau's general family definition that groups all related members of a household into a family.

The FPG are issued by the Department of Health and Human Services for administrative purposes, such as determining financial eligibility for federal programs. The FPG are different from the Census Bureau's federal poverty thresholds (FPT) that are used for statistical purposes, such as determining the official number in poverty.[3]

This technical document provides information and example STATA and SAS code for using the SHADAC HIU and FPG microdata variables that are available through IPUMS for the ACS and CPS. This code will also allow analysts to replicate estimates available from SHADAC's Data Center.[4]

Variables

Table 1 lists the HIU and FPG variables available from IPUMS, as well as additional variables that are needed to match the universes used in SHADAC's Data Center tables. All of the component variables are provided so data users have the flexibility to define family, poverty levels, and universe based on their analysis. In this brief we provide code for calculating estimates by HIU and FPG. To match the SHADAC Data Center, estimates are restricted to the poverty universe as defined by the Census Bureau and for the ACS to the non-institutionalized population.

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[1] IPUMS ACS is available at https://usa.ipums.org/usa/ and IPUMS CPS is available at https://cps.ipums.org/cps/.

[2] A complete description of the HIU is available in SHADAC Brief #27 "Defining 'Family' for Studies of Health Insurance Coverage" along with the SAS and STATA code to create the HIU at http://www.shadac.org/publications/defining-family-studies-health-insurance-coverage.

[3] A description of FPG and FPT is available in SHADAC Blog "FPG vs. FPL: What's the Difference" at http://shadac.org/blog/fpg-vs-fpl-whats-difference. FPT are often referred to as federal poverty levels (FPL).

[4] SHADAC's Data Center is an easy to use on-line table generator providing health insurance coverage estimates by many characteristics from the ACS, CPS, and SHADAC-Enhanced CPS (a harmonized version of the CPS) available at http://shadac.org/datacenter.

Table 1. ACS and CPS IPUMS variables for SHADAC HIU, FPG, and Data Center universe

Variable Name	Description
To calculate estimates by HIU	
HIUID	Identification of HIU
HIUNPERS	Number of persons in HIU
HIURULE	Pointer rule for HIU creation (not needed for analysis)
To calculate estimates by FPG	
HIUFPGBASE	Federal poverty guidelines base
HIUFPGINC	Federal poverty guidelines increment
INCTOT	Total personal income
ADJUST	Income adjustment factor (ACS only)
To match SHADAC Data Center	
AGE	Age
GQTYPE	Group quarters type (ACS only)
POVERTY	Poverty status (only needed for ACS to calculate poverty universe)
FTYPE	Family type (CPS only)

General Steps

This section provides the general steps to tabulate estimates by HIU and FPG. Detailed STATA and SAS code follows. The steps are the same for the ACS and CPS except where noted.

1. Determine poverty guidelines based on FPG and HIU family size.

    HIU_HHSPOV_GUIDE = HIUFPGBASE + HIUFPGINC*(HIUNPERS-1)

2. Sum personal income by HIU family. For the ACS, multiply INCTOT by the income adjustment factor ADJUST. Note that the Census Bureau uses ADJUST and IPUMS also uses this to calculate the variable POVERTY, but in general IPUMS does not recommend the use of this factor.[5]

    ACS: HIU_TOTVAL = sum(INCTOT*ADJUST) by HIUID
    CPS: HIU_TOTVAL= sum(INCTOT) by HIUID

3. Calculate the poverty cutoff based on HIU family income and FPG poverty guidelines.

    HIU_HHSPOV = 100*(HIU_TOTVAL/HIU_HHSPOV_GUIDE)

4. Calculate the HIU poverty universe. This is based on the Census Bureau definition of poverty universe and is needed to match SHADAC Data Center tabulations by income and poverty.

    ACS: HIU_POVUNIV excludes unrelated children under 15, institutional group quarters, and some non-institutional group quarters (college dormitories and military barracks)
    CPS: HIU_POVUNIV excludes unrelated children under 15; the CPS surveys the civilian non-institutionalized population, so institutional group quarters are not included

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[5] For more information on the IPUMS variable POVERTY and the income adjustment factor ADJUST see https://usa.ipums.org/usa-action/variables/POVERTY#description_section and https://usa.ipums.org/usa/acsincadj.shtml.

5. For the ACS only, calculate the non-institutionalized universe. This universe is needed to match all SHADAC Data Center tabulations for the ACS.

> NONINST excludes institutionalized group quarters

STATA Code

```
/* 1. Create HIU_HHSPOV_GUIDE */
        gen  hiu_hhspov_guide = hiufpgbase + hiufpginc*(hiunpers-1)

/* 2. Sum personal income by HIU */
        /* For ACS use adjusted income and remove N/A */
        replace inctot=. if inctot==9999999
        gen  adj_inc = inctot*adjust

        /* For CPS use income and remove not in universe and missing */
        replace inctot=. if inctot==99999999|inctot==99999998
        gen  adj_inc = inctot

        egen hiu_totval = sum(adj_inc), by(hiuid)

/* 3. Create HIU_HHSPOV */
        gen hiu_hhspov = 100*(hiu_totval/hiu_hhspov_guide)

/* 4. Create HIU_POVUNIV */
        /* For ACS */
        gen hiu_povuniv = 1
        replace hiu_povuniv = 0 if gqtype==0 & age<15 & hiunpers==1
        replace hiu_povuniv = 0 if gqtype>=1 & gqtype<=4
        replace hiu_povuniv = 0 if gqtype>=5 & gqtype<=9 & poverty==0

        /* For CPS */
        gen hiu_povuniv = 1
        replace hiu_povuniv = 0 if  age<15 & hiunpers==1 & ftype==5

/* 5. Identify non-institutionalized population for the ACS */
        gen noninst = .
        replace noninst = 0 if gqtype>=1 & gqtype<=4
        replace noninst = 1 if gqtype==0 | (gqtype>=5 & gqtype<=9)
```

SAS Code

```
data ipums ;
    set ipums ;
/* 1. Create HIU_HHSPOV_GUIDE */
```

```
            hiu_hhspov_guide = hiufpgbase + hiufpginc*(hiunpers-1) ;

/* For ACS use adjusted income */
            adj_inc = inctot*adjust ;

/* For CPS use income */
            adj_inc = inctot ;
run ;

proc sort data=ipums out=ipums_sorted  ;
    by hiuid;
run;

/* 2. Sum personal income by HIU */
/* For ACS, remove N/A income */
proc means data=ipums_sorted (where=(inctot ne 9999999)) noprint sum ;
    var adj_inc ;
    by hiuid ;
    output out=hiu_sum sum= ;
run;

/* For CPS, remove not in universe and missing income */
proc means data=ipums_sorted (where=(inctot ne 99999999 and inctot ne 99999998)) noprint sum ;
    var adj_inc ;
    by hiuid ;
    output out=hiu_sum sum= ;
run;

data ipums2 ;
  merge ipums_sorted
      hiu_sum (rename=(adj_inc=hiu_totval));
  by hiuid ;

 /* 3. Create HIU_HHSPOV */
 hiu_hhspov = 100*(hiu_totval/hiu_hhspov_guide) ;

 /* 4. Create HIU_POVUNIV */
/* For ACS */
  if (gqtype = 0 and age < 15 and hiunpers = 1) OR
    gqtype in(1,2,3,4) OR
    (gqtype in(5,6,7,8,9) and poverty=0 ) then hiu_povuniv=0 ;
  else hiu_povuniv = 1 ;

/* For CPS */
```

```
if (age < 15 and hiunpers = 1 and ftype=5) then hiu_povuniv=0 ;
else hiu_povuniv=1 ;

/* 5. Identify non-institutionalized population for the ACS */
  if gqtype in (0, 5, 6, 7, 8, 9) then noninst=1 ;
    else noninst=0 ;
run ;
```