Minnesota Population Center
Training and Development

IPUMS – Int.I Extraction and Analysis

Exercise 1

OBJECTIVE: Gain an understanding of how the IPUMS dataset is structured and how it can be leveraged to explore your research interests. This exercise will use the IPUMS to explore demographic and population characteristics of Mexico and Uganda.

10/24/2012

IPUMS-I Training and Development

Research Questions

What are the differences in urbanization, literacy, and occupational participation between Mexico and Uganda?

Objectives

- Create and download an IPUMS data extract
- Decompress data file and read data into SAS
- Analyze the data using sample code
- Validate data analysis work using answer key

IPUMS Variables

- URBAN: Household location
- SEX: Sex
- EMPSTAT: Employment status
- OCCISCO: Employment category
- FLOOR: Flooring material
- LIT: Literacy
- AGE: Age

SAS Code to Review

Code	Purpose
proc freq;	Begins a frequency procedure
proc means;	Begins a means procedure, returns the mean value of a variable
tables	Required syntax to display frequencies
where	Selects only specified cases to include in a procedure

Review Answer Key (page 11)

Common Mistakes to Avoid

1 Not fully decompressing the data

2 Giving the wrong filepath to indicate the dataset

3 Forget to close a procedure with "run;"

4 Forget to terminate a command with a semicolon ";"

Registering with IPUMS

Go to http://international.ipums.org, click on User Registration and Login and Apply for access. On login screen, enter email address and password and submit it!

Step 1

Make an Extract

- Go back to homepage and go to Select Data
- Click the Select Samples box and check the box for the 2000 sample for Mexico and 2002 for Uganda
- Click the Submit sample selections box
- Using the drop down menu or search feature, select the following variables:

  URBAN: Household location

  SEX: Sex

  EMPSTAT: Employment status

  OCCISCO: Employment category

  FLOOR: Flooring material

  LIT: Literacy

  AGE: Age

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Step 2

Request the Data

- Click the green VIEW CART button under your data cart
- Review variable selection
- Click the green Create Data Extract button
- Review the 'Extract Request Summary' screen, describe your extract and click Submit Extract
- You will get an email when the data is available to download
- To get to the page to download the data, follow the link in the email, or follow the Download and Revise Extracts link on the homepage

Getting the data into your statistics software

The following instructions are for SAS. If you would like to use a different stats package, see: http://cps.ipums.org/cps/extract_instructions.shtml

Step 1

Download the Data

- Go to http://international.ipums.org and click on Download or Revise Extracts
- Right-click on the data link next to extract you created
- Choose "Save Target As..." (or "Save Link As...")
- Save into "Documents" (that should pop up as the default location)
- Do the same thing for the SAS link next to the extract

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Step 2

Decompress the Data

- Find the "Documents" folder under the Start menu
- Double-click on the ".dat" file
- In the window that comes up, press the Extract button
- Double-check that the Documents folder contains three files starting "ipumsi_000..."
- Free decompression software is available at http://www.irnis.net/soft/wingzip/

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Step 3

Read in the Data

- Open the "ipumsi_000##.sas" file
- In the do file window, change the first line from "libname IPUMS '.'" to "libname IPUMS \\Documents...;" using the file directory where you saved your data files
- After "filename ASCIIDAT", enter the full file location, ending with "ipumsi_000##.dat";
- Choose Submit under the Run file menu

Analyze the Sample – Part I Variable Documentation

For each variable below, search through the tabbed sections of the variable description to answer each question.

Section 1

Analyze the Variables

A) Under "Household" and subcategory "Geography", select the URBAN variable. What constitutes an urban area:

i. In Mexico in 2000? _____

ii. In Uganda in 2002? _____

B) What are the codes for URBAN?

_____

C) Find the variable EMPSTAT (employment status). Is the reference period of work the same for these two samples?

_____

D) What is the universe for EMPSTAT:

i. In Mexico 2000? _____

ii. In Uganda 2002? _____

Analyze the Sample – Part II Frequencies

Section 1

Analyze the Data

A) Website: Find the codes page for the SAMPLE variable and write down the code values for Mexico 2000 and Uganda 2002.

_____

B) How many individuals are in the Mexico 2000 sample extract?

_____

C) How many individuals are in the Uganda 2002 sample extract?

_____

```
proc freq;
        tables sample;
run;
```

D) How many individuals in the sample lived in urban areas?

Mexico 2000 _____ Uganda 2002 _____

E) What proportion of individuals in the sample lived in urban areas? Mexico 2000 _____ Uganda 2002 _____

```
proc freq;
        tables sample*urban;
run;
```

Section Continues Below…

Analyze the Sample - Part II Frequencies (WTPER)

To get a more accurate estimation for the actual proportion of individuals living in urban areas, you will have to use the person weight.

Section 2

Weighting the Data

F) Using weights, what is the total population of each country?

Mexico 2000 _____ Uganda 2002 _____

G) Using weights, how many individuals lived in urban areas?

Mexico 2000 _____ Uganda 2002 _____

H) Using weights, what proportion of individuals lived in urban areas? Mexico 2000 _____ Uganda 2002 _____

```
proc freq;
        tables sample*urban;
        weight wtper;
run;
```

• • •

Section 3

Weighting Explanation

When to use the household weights (WTHH)

Suppose you were interested not in the number of people living in urban areas, but in the number of households. To get this statistic you would need to use the household weight.

In order to use household weight, you should be careful to select only one person from each household to represent that household's characteristics. You will need to apply the household weight (WTHH). To identify only one person from each household, use the "where" statement to select only cases where the PERNUM equals 1.

Section 1

Analyze the Data

Analyze the Sample – Part III Trends in the Data

A) Using weights, which occupational category has the highest percentage of workers from each country?

```
proc freq;
        tables occisco*sample;
        weight wtper;
run;
```

Mexico 2000 _____ Uganda 2002 _____

B) Which occupational category has the highest percentage of female workers in each country?

```
proc freq;
        where sex = 2;
        tables occisco*sample;
        weight wtper;
run;
```

Mexico 2000 _____ Uganda 2002 _____

Section Continues Below…

Compare the distribution of occupational activity among people in the labor force

Section 2

Compare the Variables

In order to do your analysis, you must decide whether you are analyzing the total population or the people participating in the labor force. The previous commands yielded totals and percentages of people within an occupation among all people in the population. If you want to know how women's work is distributed among women in the labor force, you have to limit your analysis to people who are employed. To find out who is working, look at employment status category 1, "employed."

A) What is the labor force participation distribution by gender in each country? Mexico 2000 %:_____ Uganda 2002 %:_____

```
proc freq;
        tables empstat*sample;
        by sex;
        weight wtper;
run;
```

B) What percentage of women *within the labor force* is working:

i. In Agriculture; Mexico 2000:_____ In Uganda 2002:_____

ii. In Service; Mexico 2000:_____ Uganda 2002:_____

```
proc freq;
        tables occisco*sample;
        where empstat = 1;
        by sex;
        weight wtper;
run;
```

Analyze the Sample – Part IV Graphical Analysis

Section 1

Graph the Data

A) What percent of the population is literate in each sample?

_____

B) How are universe differences seen on the graph?

_____

```
proc gchart;
        vbar lit / discrete type = percent;
        where cntry = 484;
run;
proc gchart;
        vbar lit / discrete type = percent;
        where cntry = 800;
run;
```

Note: SAS graph procedures do not allow for WEIGHT options, so graph analyses are at the sample level.

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Section 2

Recode the Data

Recode literacy to look at literacy rates across age

```
data ipums.ipumsi_000##;
        set ipums.ipumsi_000##;
        literate = _null_;
        if lit = 1 then literate = 0;
        if lit = 2 then literate = 1;
run;
proc freq;
        tables lit*literate;
run;
proc sgplot data=ipums.ipumsi_000##;
        vline age /
        response=literate
        stat=mean
        markers;
        by sample;
xaxis values = (0 to 100 by 5) integer;
        xaxis fitpolicy = staggerthin;
run;
```

Analyze the Sample – Part IV Graphical Analysis, Age/Literacy

Section 3

Analyze Recoded Data

A) Which country has higher overall literacy?

_____

B) At (approximately) which ages are literacy rates highest?

Mexico 2000 _____ Uganda 2002 _____

C) How are universe differences seen on the graph?

_____

D) In which country are literacy rates nearly equal for men and women? _____

```
proc sgpanel data=ipums.ipumsi_000##;
        panelby sample;
        vbar sex /
        response=literate
        stat=mean;
run;
```

E) What type of floor material is most common in Uganda 2002?

_____

```
proc freq;
        tables floor*sample;
        weight wtper;
run;
```

• • •

Complete! Validate Your Answers

ANSWERS: Analyze the Sample – Part I Variable Documentation

For each variable below, search through the tabbed sections of the variable description to answer each question.

Section 1

Analyze the Variables

A) Under "Household" and subcategory "Geography", select the URBAN variable. What constitutes an urban area:

i. In Mexico in 2000? 2,500+ people

ii. In Uganda in 2002? 2,000+ people

B) What are the codes for URBAN? 1 Rural 2 Urban

C) Find the variable EMPSTAT (employment status). Is the reference period of work the same for these two samples?
Both samples use a reference week.

D) What is the universe for EMPSTAT:

i. In Mexico 2000? Persons age 12+

ii. In Uganda 2002? Persons age 5+

ANSWERS: Analyze the Sample – Part II Frequencies

Section 1

Analyze the Data

A) Website: Find the codes page for the SAMPLE variable and write down the code values for Mexico 2000 and Uganda 2002.
Mexico 2000: 4845; Uganda 2002: 8002

B) How many individuals are in the Mexico 2000 sample extract?
Mexico 2000 10,099,182 persons

C) How many individuals are in the Uganda 2002 sample extract?
Uganda 2002 2,497,449 persons

```
proc freq;
        tables sample;
run;
```

D) How many individuals in the sample lived in urban areas?

Mexico 2000 5,976,764 Uganda 2002 306,054

E) What proportion of individuals in the sample lived in urban areas? Mexico 2000 59.2% Uganda 2002 12.3%

```
proc freq;
        tables sample*urban;
run;
```

Section Continues Below…

ANSWERS: Analyze the Sample - Part II Frequencies (WTPER)

To get a more accurate estimation for the actual proportion of individuals living in urban areas, you will have to use the person weight.

Section 2

Weighting the Data

F) Using weights, what is the total population of each country?

Mexico 2000 97,014,867 Uganda 2002 24,974,490

G) Using weights, how many individuals lived in urban areas?

Mexico 2000 72,409,464 Uganda 2002 3,060,540

H) Using weights, what proportion of individuals lived in urban areas? Mexico 2000 74.6% Uganda 2002 12.3%

Comparing frequencies and proportions, you can see that unweighted sample data from Mexico grossly misrepresent the population. The Mexico data was designed specifically to oversample rural areas. Weighting corrects the proportional representation of individuals or households.

```
proc freq;
        tables sample*urban;
        weight wtper;
run;
```

• • •

Section 3

Weighting Explanation

Note: When to use the household weights (WTHH)

Suppose you were interested not in the number of people living in urban areas, but in the number of households. To get this statistic you would need to use the household weight.

In order to use household weight, you should be careful to select only one person from each household to represent that household's characteristics. You will need to apply the household weight (WTHH). To identify only one person from each household, use the "where" statement to select only cases where the PERNUM equals 1.

ANSWERS: Analyze the Sample – Part III Trends in the Data

Section 1

Analyze the Data

A) Using weights, which occupational category has the highest percentage of workers from each country?

Mexico 2000 6.5% Crafts and Related Trades

Uganda 2002 21.5% of people work in Agriculture

```
proc freq;
        tables occisco*sample;
        weight wtper;
run;
```

B) Which occupational category has the highest percentage of female workers in each country?

Mexico 2000 Service, shop and market sales 5.5%

Uganda 2002 Agricultural work 21.1%

```
proc freq;
        where sex = 2;
        tables occisco*sample;
        weight wtper;
run;
```

Section Continues Below…

ANSWERS: Compare the distribution of occupational activity among people in the labor force

Section 2

Compare the Variables

In order to do your analysis, you must decide whether you are analyzing the total population or the people participating in the labor force. The previous commands yielded totals and percentages of people within an occupation among all people in the population. If you want to know how women's work is distributed among women in the labor force, you have to limit your analysis to people who are employed. To find out who is working, look at employment status category 1, "employed."

A) What is the labor force participation distribution by gender in each country?

Mexico 2000 %: M 50.3%; F 22.9%

Uganda 2002 %: M 33.7%; F 26.5%

```
proc freq;
        tables empstat*sample;
        by sex;
        weight wtper;
run;
```

B) What percentage of women *within the labor force* is working:

i. In Agriculture; Mexico 2000: 4.7% Uganda 2002: 79.7%

ii. In Service; Mexico 2000: 23.9% Uganda 2002: 9.0%

```
proc freq;
        tables occisco*sample;
        where empstat = 1;
        by sex;
        weight wtper;
run;
```

ANSWERS: Analyze the Sample – Part IV Graphical Analysis

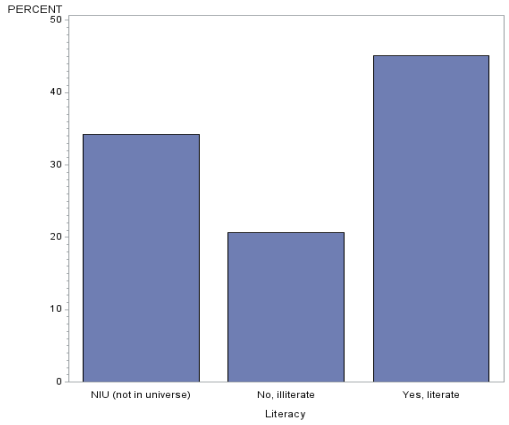
Section 1

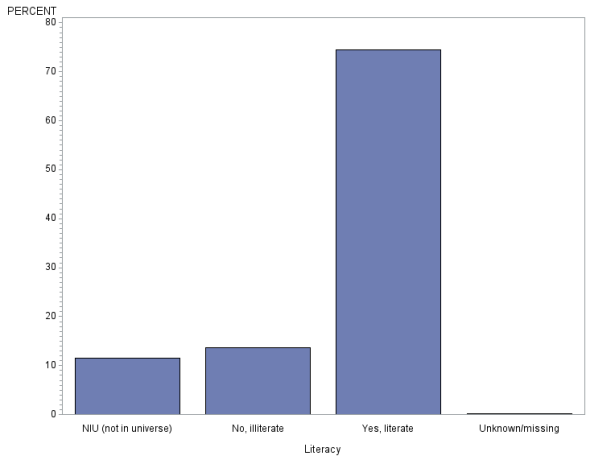
Graph the Data

A) What percent of the population is literate in each sample? Mexico 2000 ~84%; Uganda 2002 ~68%

B) How are universe differences seen on the graph? NIU is included as a separate category; within universe % would be higher.

```
proc gchart;
        vbar lit / discrete type = percent;
        where cntry = 484;
run;
proc gchart;
        vbar lit / discrete type = percent;
        where cntry = 800;
run;
```





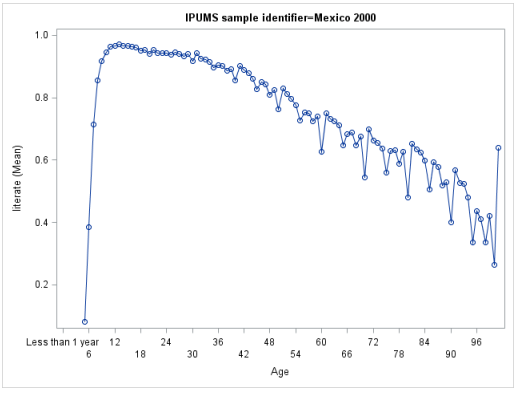
ANSWERS: Analyze the Sample – Part IV Graphical Analysis

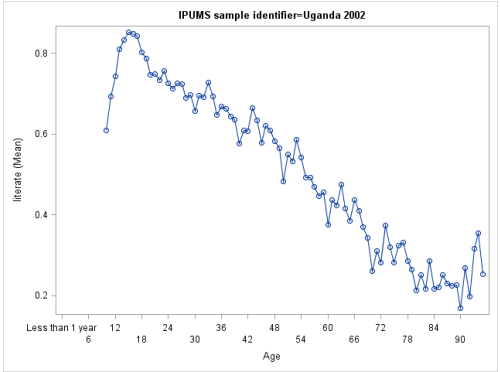
Recode literacy to look at literacy rates across age

Section 2

Recode the Data

```
data ipums.ipumsi_000##;
        set ipums.ipumsi_000##;
        literate = _null_;
        if lit = 1 then literate = 0;
        if lit = 2 then literate = 1;
run;
proc sgplot data=ipums.ipumsi_000##;
        vline age /
        response=literate
        stat=mean
        markers;
        by sample;
xaxis values = (0 to 100 by 5) integer;
        xaxis fitpolicy = staggerthin;
```





ANSWERS: Analyze the Sample – Part IV Graphical Analysis

Section 3

Analyze Recoded Data

A) Which country has higher overall literacy? Mexico 2000

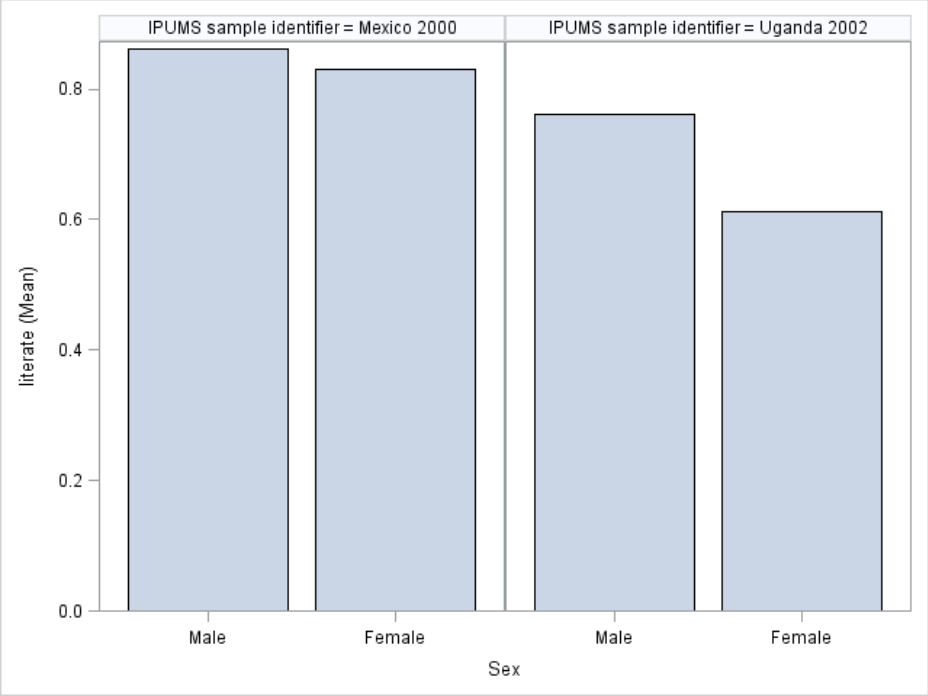
B) At (approximately) which ages are literacy rates highest?

Mexico 2000 ~12-16 Uganda 2002 ~14-18

C) How are universe differences seen on the graph? Lines begin at different ages (5 in Mexico, 10 in Uganda). Apart from universe, Mexico records higher ages which are included with corresponding literacy rates in the graph.

D) In which country are literacy rates nearly equal for men and women? Mexico 2000

```
proc sgpanel data=ipums.ipumsi_000##;
        panelby sample;
        vbar sex /
        response=literate
        stat=mean;
run;
```



Section 3

Analyze Data

E) What type of floor material is most common in Uganda 2002?
None (earth floor)

```
proc freq;
        tables floor*sample;
        weight wtper;
run;
```