U.S. Department of Health and Human Services

Agency for Healthcare Research and Quality
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MEPS Programming Overview

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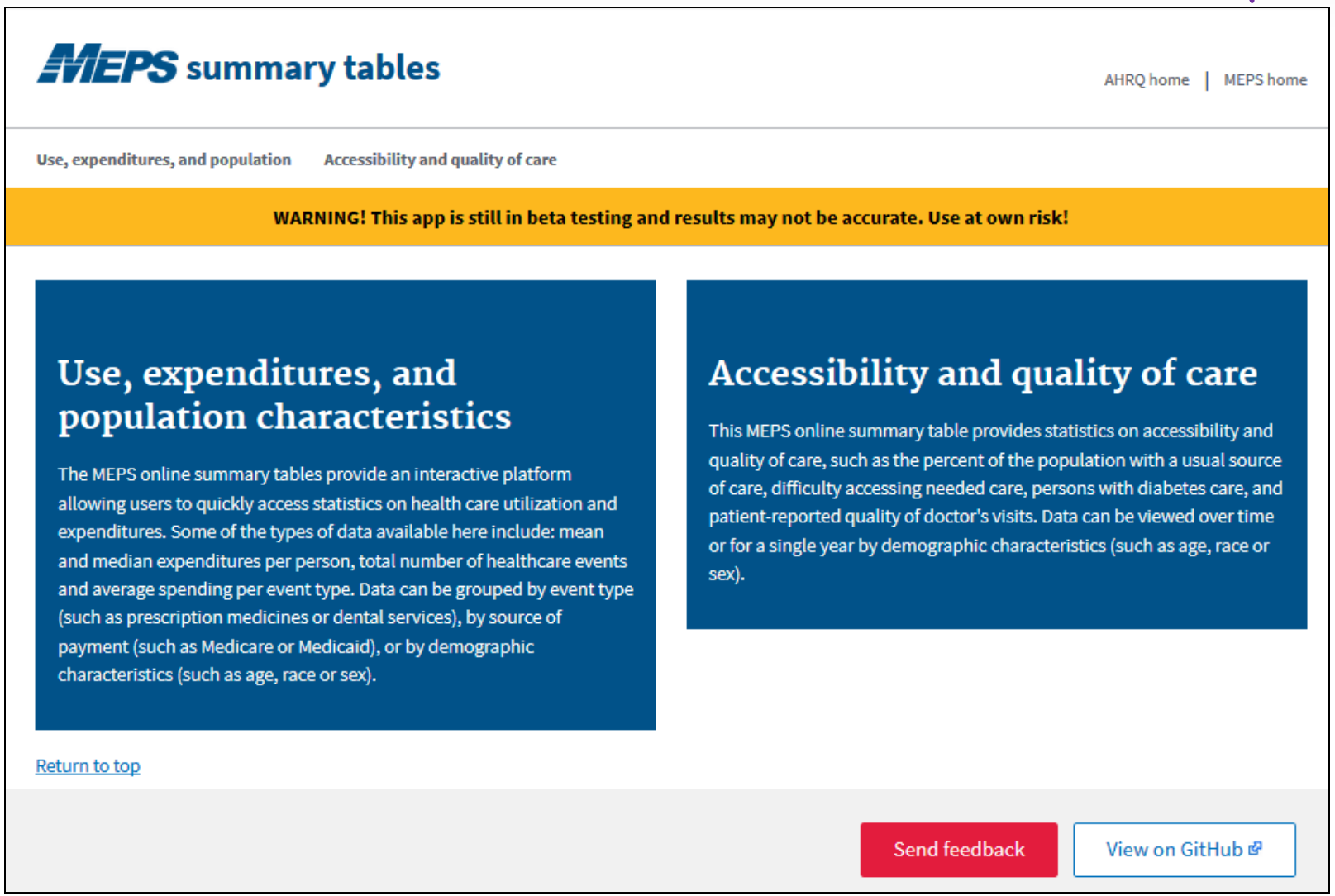
MEPS summary tables

new



MEPS Public Use Files

www.meps.ahrq.gov

MEPS Public Use Files

Data files and related documentation are available for downloading from the MEPS Web site: www.meps.ahrq.gov/mepsweb

- Data files in SAS transport and ASCII formats
- Documentation files
- Codebooks
- SAS, SPSS, and Stata users notes
  - Sample code to read SAS transport and ASCII files, including variable positions
  - Variable labels
  - Variable formats
- Questionnaires

MEPS Reserve Codes

-1	Inapplicable	Question was not asked due to skip pattern
-7	Refused	Question was asked and respondent refused to answer question
-8	Don’t Know	Question was asked and respondent did not know answer
-9	Not Ascertained	Interviewer did not record the data
-10	Top-Coded	Variable was top-coded for confidentiality

MEPS Reserve Codes

-1 Inapplicable

-7 Refused

-8 Don't Know

-9 Not Ascertained

-10 Top-Coded ⟵ Jobs file

EXAMPLES

FYC file: Pregnant

Event file: Phone Calls and Expenditures

Jobs file: Hourly Wage

Variable Naming Conventions

Edited Variables end in an “X”

RACE**X**

Year-specific variables use last two digits of year

TOTEXP**14**
PERWT**14**F

Round-specific variables, use two-digit round

- Certain questions or instrument sections are only asked in certain rounds, e.g. the Self-Administered Questionnaire in rounds 2 and 4

AGE**31**X
AGE**42**X
AGE**53**X

Record-Level and Identifiers

Person-level

- Full-year consolidated file
- Longitudinal files

Event-level

- Event files: RX, DN, OM, IP, ER, OP, OB, HH

Condition-level

- Medical conditions file

Job-level

- Jobs file

Record-Level and Identifiers

Person-level

DUID	PID	DUPERSID
20004	101	20004101
20004	102	20004102
20004	103	20004103
20005	101	20005101

Event-level

DUPERSID	EVNTIDX
20004101	200041010011
20004101	200041010021
20005101	200051010151
20005101	200051010201

Conditions-level

DUPERSID	CONDN	CONDIDX
20004103	11	200041030011
20005101	11	200051010011
20005101	21	200051010021
20005101	51	200051010051

Jobs-level

DUPERSID	RN	JOBSN	JOBSIDX
20004101	3	1	2000410130 1
20004101	4	1	20004101401
20004101	5	1	20004101501
20004102	3	1	20004102301

Record-Level and Identifiers

Person-level

DUID	PID	DUPERSID
20004	101	20004101
20004	102	20004102
20004	103	20004103
20005	101	20005101

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DUPERSID	EVNTIDX
20004101	200041010011
20004101	200041010021
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Conditions-level

DUPERSID	CONDN	CONDIDX
20004103	11	200041030011
20005101	11	200051010011
20005101	21	200051010021
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Jobs-level

DUPERSID	RN	JOBSN	JOBSIDX
20004101	3	1	20004101301
20004101	4	1	20004101401
20004101	5	1	20004101501
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Record-Level and Identifiers

Person-level

DUID	PID	DUPERSID
20004	101	20004101
20004	102	20004102
20004	103	20004103
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Event-level

DUPERSID	EVNTIDX
20004101	200041010011
20004101	200041010021
20005101	200051010151
20005101	200051010201

Conditions-level

DUPERSID	CONDN	CONDIDX
20004103	11	200041030011
20005101	11	200051010011
20005101	21	200051010021
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Jobs-level

DUPERSID	RN	JOBSN	JOBSIDX
20004101	3	1	20004101301
20004101	4	1	20004101401
20004101	5	1	20004101501
20004102	3	1	20004102301

Estimation Variables

Weight Variables – which one?

- Person-level (e.g. PERWT14F, DIABW14F, SAQWT14F)
- Family-level (e.g. FAMWT14F, FAMWT14C)
- Longitudinal (e.g. LONGWT)

Variance-Estimation Variables:

- After 2002 FY data: VARSTR, VARPSU
- 1996-2001 FY data: VARSTRyy, VARPSUyy
  - When calculating variances with ***pooled data***, use STRA9614, PSU9614 in HC-036

Common Mistakes

Mistakes	Solutions
Not reading documentation or checking results	Read the documentation! Check your results!
Ignoring reserve codes: -1, -9, -7, -8, etc.	Check summary statistics of all variables
Sub-setting to specific populations	Use survey-specific subsetting procedures (e.g. 'domain' analysis)
Using default analysis methods (e.g. proc means)	Using complex survey methods (e.g. proc surveymeans)
Using incorrect weights (e.g. using PERWT for family-level analysis)	Verify weights correspond to analysis
Incorrect merging - can end up double-counting expenditures	Check dataset at every step

Common Mistakes

Not thinking about what statistic is desired, e.g.

- Expenditures for persons who reported being diabetic

  Conditions file + FYC file

- Expenditures for persons who were treated with at least one diabetes-associated event

  Event file + FYC file

- Expenditures for events associated with diabetes

  Event file

Programming Example

How do 2014 medical expenses for the elderly (age 65 and over) compare to those for persons under 65?*

* Not including people that have $0 in expenses

Process

1. Download / load datasets
2. Create Analytic File
3. Quality checks on new variables
4. Run a survey procedure
5. Examine results

Process

1. **Download / load datasets**
2. Create Analytic File
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Download datasets

FYC 2014 (h171)

Documentation	File type
Documentation	PDF (982 KB) / HTML
Codebook	PDF (1.6 MB) / HTML*
SAS Programming Statements	TXT (500 KB)
SPSS Programming Statements	TXT (342 KB)
STATA Programming Statements	TXT (416 KB)
2007 Industry Codes File	PDF (229 KB) / HTML
2010 Occupation Codes File	PDF (225 KB) / HTML

Data	File type**
Data File, ASCII format	ZIP (9.3 MB) / EXE (6.3 MB)
Data File, SAS transport format	ZIP (12 MB) / EXE (7.5 MB)

Download datasets

FYC 2014 (h171)

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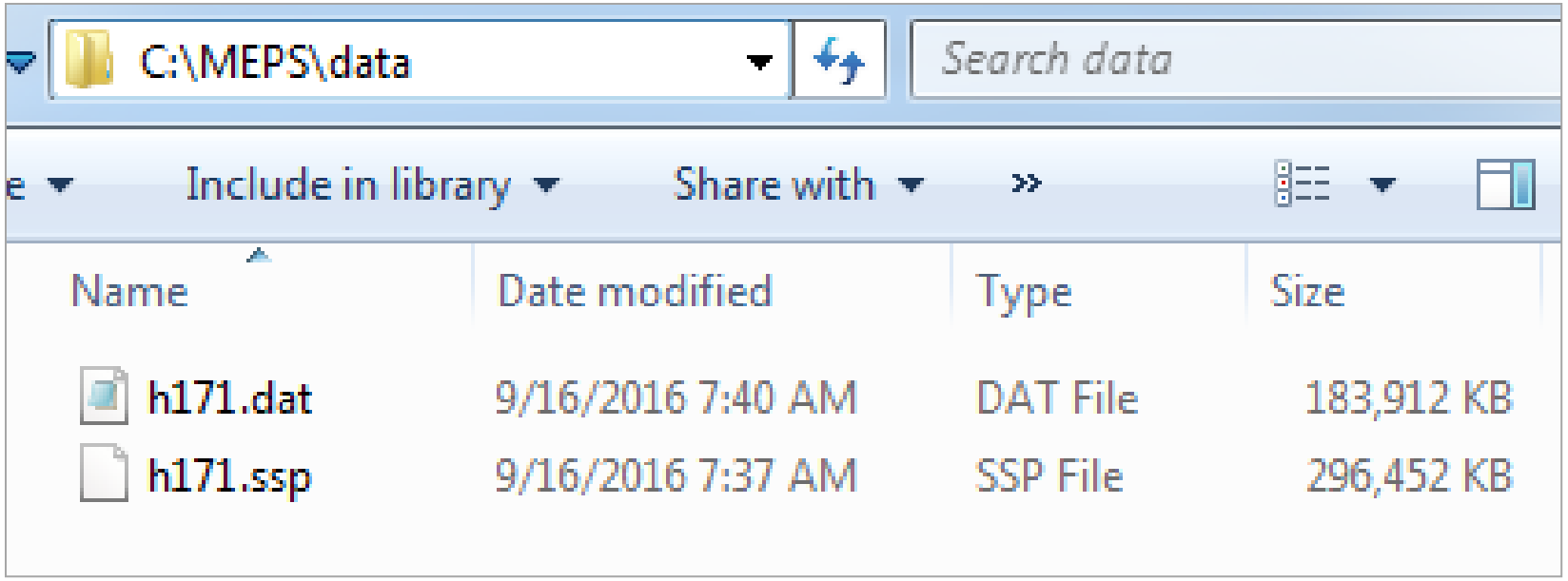
Data	File type**
Data File, ASCII format	ZIP (9.3 MB) / EXE (6.3 MB)
Data File, SAS transport format	ZIP (12 MB) / EXE (7.5 MB)

Download datasets

Store .dat and .ssp files in a local directory:



Load datasets

SAS 9.4

```
FILENAME in_h171 'C:\MEPS\data\h171.ssp';

proc xcopy in = in_h171 out = WORK IMPORT;
run;
```

Stata

```
import sasxport "C:\MEPS\data\h171.ssp"
```

R

```
install.packages("foreign")
library(foreign)

h171 = read.xport("C:/MEPS/data/h171.ssp")
```

Process

1. Download / load datasets
2. **Create Analytic File**
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Create Analytic File

SAS 9.4

```
data h171;
  set h171; /*keep= is optional*/

  if 0 <= AGELAST <= 64 then agecat ='0-64';
  else if AGELAST > 64 then agecat = '65+';

  if TOTEXP14>0 then has_exp = 1;
  else if TOTEXP14=0 then has_exp = 0;
run;
```

Stata

```
gen agecat = 1
replace agecat = 2 if agelast > 64

gen has_exp = 1
replace has_exp = 0 if (totexp14 <= 0)
```

R

```
install.packages("dplyr")
library(dplyr)

h171 = h171 %>%
  mutate(
    agecat = ifelse(AGELAST > 64, '0-64', '65+'),
    has_exp = ifelse(TOTEXP14 <= 0, 1, 0)
  )
```

(optional) Add formats

SAS 9.4

```
proc format;
   value AGECAT
              1 = '0-64'
              2 = '65+';
run;
```

Stata

```
label define agecat 1 “0-64” 2 “65+”
label value agecat agecat
```

R

```
h171 = h171 %>%
  mutate(
    AGECAT = recode_factor(agecat,
                           '1'='0-64',
                           '2'='65+')
  )
```

Process

1. Download / load datasets
2. Create Analytic File
3. **Quality checks on new variables**
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5. Examine results

QC Checks on New Variables

SAS 9.4

```
proc means data = h171;
    format agecat agecat. ;
    class agecat;
    var agelast;
run;

proc means data = h171;
    class has_exp;
    var totexp14;
run;
```

Stata

```
bys agecat:    sum agelast
bys has_exp: sum totexp14
```

R

```
h171 %>% group_by(AGECAT) %>%
  summarise(min=min(AGELAST),
            max=max(AGELAST))

h171 %>% group_by(has_exp) %>%
  summarise(min=min(TOTEXP14),
            max=max(TOTEXP14))
```

QC Checks on New Variables

SAS 9.4

Analysis Variable : AGELAST PERSON'S AGE LAST TIME ELIGIBLE						
AGECAT	N Obs	N	Mean	Std Dev	Minimum	Maximum
0-64	30770	30770	29.8894053	18.4666760	0	64.0000000
65+	4105	4105	73.8068210	6.6630803	65.0000000	85.0000000

Analysis Variable : TOTEXP14 TOTAL HEALTH CARE EXP 14						
HAS_EXP	N Obs	N	Mean	Std Dev	Minimum	Maximum
1	27650	27650	4938.68	14269.34	1.0000000	491858.00
2	7225	7225	0	0	0	0

QC Checks on New Variables

Stata

```
. bys agecat:     sum agelast

-------------------------------------------------------------------------------
-> agecat = 0-64

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
     agelast |     30,770    29.88941    18.46668         0         64

-------------------------------------------------------------------------------
-> agecat = 65+

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
     agelast |      4,105    73.80682     6.66308        65         85
```

QC Checks on New Variables

R

AGECAT	min	max
<fctr>	<dbl>	<dbl>
0-64	0	64
65+	65	85

has_exp	min	max
<dbl>	<dbl>	<dbl>
1	1	491858
2	0	0

Process

1. Download / load datasets
2. Create Analytic File
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4. **Run a survey procedure**
5. Examine results

Run a Survey Procedure

SAS 9.4

```
proc surveymeans data = h171 mean ;
        stratum VARSTR;
        cluster VARPSU;
        weight PERWT14F;
        var TOTEXP14;
        domain has_exp * AGECAT;
        format agecat agecat.;
run;
```

R

```
library(survey); options(survey.lonely.psu='adjust');

mepsdsgn = svydesign(
   id = ~VARPSU,
   strata = ~VARSTR,
   weights = ~PERWT14F,
   data = h171,
   nest = TRUE)

svyby(~TOTEXP14,
      by = ~AGECAT,
      FUN = svymean,
      design = subset(mepsdsgn,has_exp==1))
```

Stata

```
svyset [pweight=perwt14f], strata(varstr) psu(varpsu) vce(linearized) singleunit(missing)

svy, subpop(if has_exp==1): mean totexp14, over(agecat)
```

Run a Survey Procedure

SAS 9.4

```
proc surveymeans data = h171 mean ;
        stratum VARSTR;
        cluster VARPSU;
        weight PERWT14F;
        var TOTEXP14;
        domain has_exp * AGECAT;
        format agecat agecat.;
run;
```

WARNING

- Must use DOMAIN, not WHERE, so all observations stay in analysis
- If using alternate weight (DIABW14F, SAQWT14), SAS will drop zero-weights.

SOLUTION

```
data h171; set h171;

  if DIABW14F = 0 then do;
     poswt = 0;
     altwt = 0.0001;
  end;
  else do;
     poswt = 1;
     altwt = DIABW14F;
  end;
run;
```

Run a Survey Procedure

SAS

Domain Statistics in HAS_EXP*AGECAT					
HAS_EXP	AGECAT	Variable	Label	Mean	Std Error of Mean
1	0-64	TOTEXP14	TOTAL HEALTH CARE EXP 14	4429.921466	149.960906
	65+	TOTEXP14	TOTAL HEALTH CARE EXP 14	10890	302.614176
2	0-64	TOTEXP14	TOTAL HEALTH CARE EXP 14	0	0
	65+	TOTEXP14	TOTAL HEALTH CARE EXP 14	0	0

Stata

```
_subpop_1: agecat = 0-64
_subpop_2: agecat = 65+
```

Over	Linearized Mean	Std. Err.	[95% Conf.	Interval]
totexp14				
_subpop_1	4429.921	149.9609	4134.223	4725.62
_subpop_2	10890	302.6142	10293.29	11486.7

Run a Survey Procedure

SAS

Domain Statistics in HAS_EXP*AGECAT					
HAS_EXP	AGECAT	Variable	Label	Mean	Std Error of Mean
1	0-64	TOTEXP14	TOTAL HEALTH CARE EXP 14	4429.921466	149.960906
	65+	TOTEXP14	TOTAL HEALTH CARE EXP 14	10890	302.614176
2	0-64	TOTEXP14	TOTAL HEALTH CARE EXP 14	0	0
	65+	TOTEXP14	TOTAL HEALTH CARE EXP 14	0	0

R

```
      AGECAT  TOTEXP14       se
0-64   0-64  4429.921 149.9609
65+     65+ 10889.997 302.6142
```

Process

1. Download / load datasets
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5. **Examine results**

Examine the Results

Table 1: Total Health Services-Median and Mean Expenses per Person With Expense and Distribution of Expenses by Source of Payment: United States, 2014

Population Characteristic	Population (in thousands)	Percent with expense	Per person with an expense	
			Median	Mean
Total	318,440	85.1	1,373	5,531
Age in years				
Under 65	270,479	83.1	1,040	4,430
Under 5	19,912	90.7	599	2,588
5-17	53,888	86.1	632	2,294
18-44	112,965	76.4	893	3,522
45-64	83,714	88.5	2,165	7,274
65 and over	47,961	96.4	4,875	10,890

Exercises (★ difficulty level)

SAS / Stata

1. National health care expenses by type of service ★
2. Expenditures and utilization of antipsychotics (from SB #275) ★★
3. Constructing family-level estimates ★★
4. Use and expenditures for persons with diabetes ★★
5. Expenditures for all events associated with diabetes ★★★★★
6. Pooling multiple years of MEPS data ★★★
7. Constructing insurance status variables from monthly insurance variables ★★★★★
8. Pooling longitudinal files ★★★

Exercises (difficulty level)

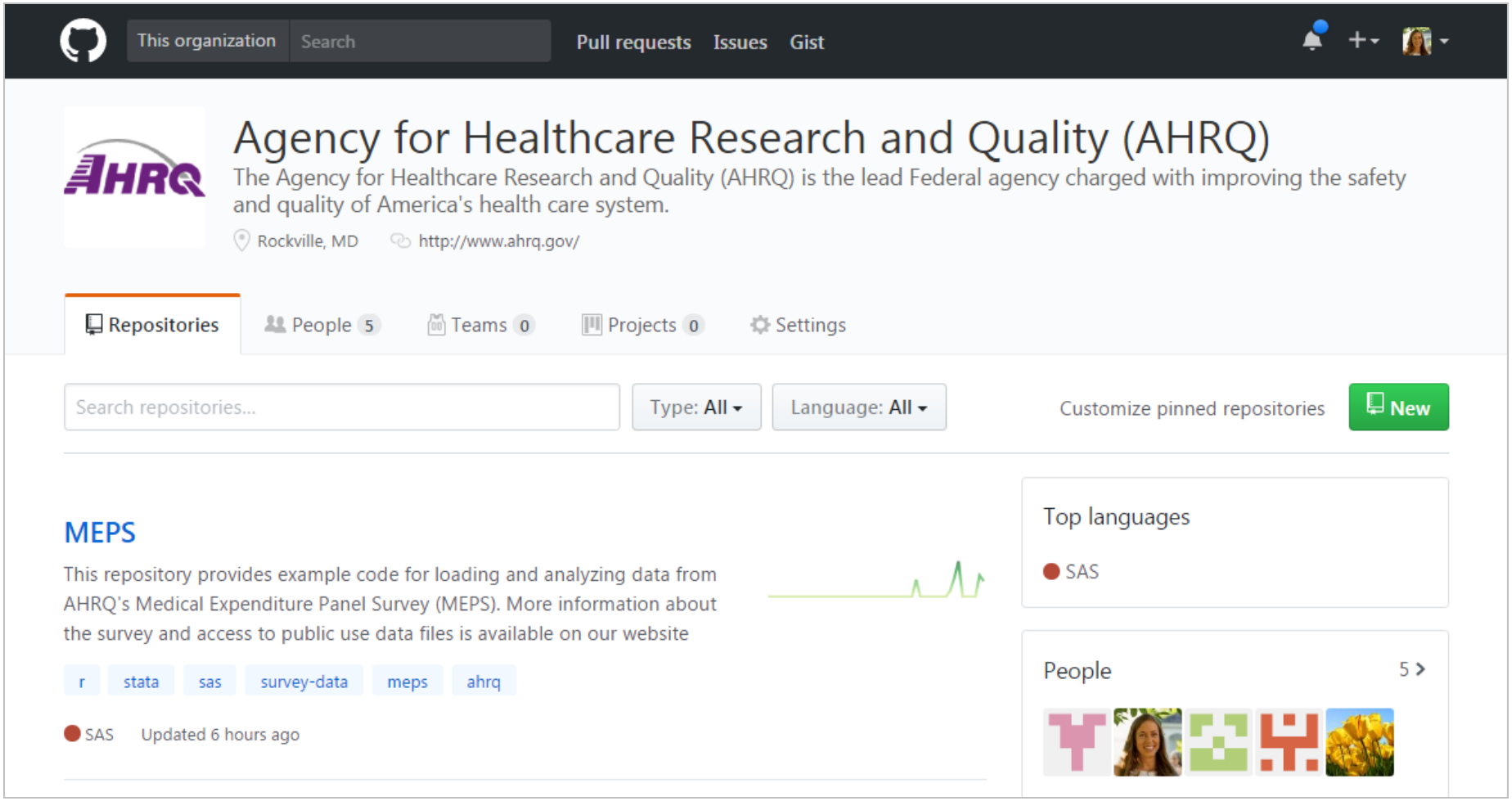
R

1. Estimates from MEPS summary table 2013, Table 1.

2. National health care expenses in 2013 (tables and Figure 1 from Stat brief #491)

=> ** Includes ggplot example **

MEPS GitHub page



https://github.com/HHS-AHRQ/MEPS

Questions?

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