

Exercise 2

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Example A

Estimation under stratified design

- ▶ Download ESS for Sweden and Denmark
- ▶ Import data to R and define a survey object
- ▶ Calculate the unbiased mean

Download ESS

- ▶ Download the ESS dataset for Denmark (Sampling Data and Country File) of the 5th round

Packages for data import

- ▶ Use the package `foreign`

```
library(foreign)
```

```
library(memisc)
```

Load the ESS dataset and the country file

Import portable spss-files

```
DK <- as.data.set(spss.portable.file("ESS5DK.por"))  
SE <- as.data.set(spss.portable.file("ESS5SE.por"))
```

```
DK <- as.data.frame(DK)  
SE <- as.data.frame(SE)
```

```
DK_tv <- data.frame(tvtot=DK$tvtot)  
SE_tv <- data.frame(tvtot=SE$tvtot)
```

```
NE <- rbind(DK_tv, SE_tv)
```

Define a survey object:

Example B

- ▶ Load the survey package and the api datasets.
- ▶ Estimation under SRS
- ▶ Use other allocations
- ▶ Select a StrSRS from apipop for each allocations.
- ▶ Estimate the mean of api00 from different samples (equal, proportional, optimal).

The survey library

Load survey library and dataset apistrat

```
library(survey)
```

The dataset apistrat is a sample of schools from apipop stratified by stype.

```
data(api)
```

```
head(apistrat)
```

cds	stype	name	sname
19647336097927	E	Open Magnet: Ce	Open Magnet: Center for
19647336016018	E	Belvedere Eleme	Belvedere Elementary
19648816021505	E	Altadena Elemen	Altadena Elementary
19647336019285	E	Soto Street Ele	Soto Street Elementary
56739406115430	E	Walnut Canyon E	Walnut Canyon Elementa
56726036084917	E	Atherwood Eleme	Atherwood Elementary

Stratified designs

Assuming the selection within the strata was done by SRS, define a `svydesign` object that enables you to make unbiased point and variance estimates.

- ▶ Estimate the mean of variable `api00`.

```
mean(apistrat$api00)
```

```
## [1] 652.82
```


Allocations

Now you should try different allocations.

Using `stype` as a stratification variable calculate the allocation of a sample of 60 schools from `apipop`. Use

- ▶ equal allocation
- ▶ proportional allocation (proportional to nr. of schools)
- ▶ optimal allocation (with regard to `api99` allocation)

Select a StrSRS from `apipop` for each of your allocations.

- ▶ Estimate again the mean of `api00` from your three different samples.