Applied Epidemiology I: Data clearance
A review of using Stata

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November 20, 2020

Acknowledgements

This course material in data clearance is based on my learning from Anastasia Lam's teachings in last year's Applied Epidemiology I lab sessions, and readings from *A First Course in Probability and Statistics* by Goldsman and Goldsman [1], *Principles of Biostatistics* by Pagano and Gauvreau [2], and *Biostatistics I* by Gabriel and Frumento [3].

Outline (also learning outcomes)

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Set up working directory

- Working directory is the folder where all your files are stored, and should be set each time you start.
- Where is it?

```
. cd
/Users/Desktop
. pwd
/Users/Desktop
```

- Change working directory

  -
    ```
    // Change working directory to Download
    . cd "/Users/Download"
    ```
  - Click File - Change Working Directory

Import and save data: Import

- **Excel (.xls or .xlsx)**

  ```
  import excel filename, clear firstrow
  ```

- **Delimited (.csv) or text (.txt)**

  ```
  import delimited filename, clear
  infile filename, clear
  ```

- **Stata (.dta)**

  ```
  use filename, clear
  ```

- **SAS (.xpt)**

  ```
  fdause filename, clear
  ```

Import and save data: Save

- Save your dataset as a Stata file:

  ```
  save "filename", replace
  ```

- The `replace` option lets you overwrite the existing dataset.

  ```
  save "filename", replace
  ```

Manage datasets: Merge

merge adds new variables from a second dataset to your existing dataset. (Make the dataset wider)

```
. sysuse cancer, clear
(Patient Survival in Drug Trial)

. gen id = _n

. keep id

. merge 1:1 id using cancer

    Result                           # of obs.
    -----------------------------------------
    not matched                             0
    matched                                48  (_merge==3)
    -----------------------------------------
```

Manage datasets: Append

`append` adds new observations to existing variables in your current dataset. (Make the dataset longer)

```
. use cancer_drug12, clear
(Patient Survival in Drug Trial)

. append using cancer_drug3.dta // append patients using drug 3
```

Get to know the data: Summarize

`summarize` gives summaries for all your variables, such as number of observations, mean, standard deviation, etc.

```
. sysuse cancer, clear
(Patient Survival in Drug Trial)

. keep if drug ==1 | drug == 2
(14 observations deleted)

. summarize age  // One variable only (age)

    Variable |        Obs        Mean    Std. Dev.       Min
-------------+-----------------------------------------------------
         age |         34    56.41176    6.010686         47
```

Get to know the data: Describe

`describe` gives descriptions for all your variables, such as storage type and labels.

```
. describe  age

              storage   display value
variable name   type    format  label variable label
--------------------------------------------------------------------
age             byte    %8.0g         Patient's age at start of exp
```

Get to know the data: Codebook

`codebook` is a combination of summarize and describe and will give a detailed summary of all your variables, including mean, sd, range, percentiles, missing, frequency, etc.

```
. codebook  age

----------------------------------------------------------------------------------------------------------------
age                                                                       Patient's age at start of exp.
----------------------------------------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [47,67]                      units:  1
         unique values:  15                       missing .:  0/34

                  mean:   56.4118
              std. dev:   6.01069

           percentiles:        10%       25%       50%       75%       90%
                                49        51        56        61        65
```

Get to know the data: List

`list` lists the observations of specified variables.

```
. list      age if age < 50

     +-----+
     | age |
     |-----|
 12. |  49 |
 15. |  49 |
 18. |  49 |
 25. |  49 |
 33. |  47 |
     +-----+
```

Manage variables: Numeric and string

Numeric: byte, integer, long, float, double – all types of numeric variables that just differ based on min and max length
String: character variables with a certain length (*str*#)

Manage variables: Drop/Keep

- drop is used to delete variables or observations.
- keep is used to keep variables or observations.

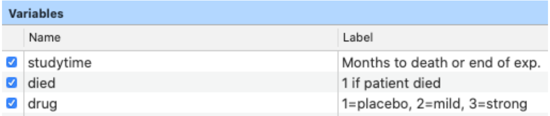
```
. sysuse cancer, clear
(Patient Survival in Drug Trial)
. drop if drug ==1 | drug == 2
(34 observations deleted)

. sysuse cancer, clear
(Patient Survival in Drug Trial)
. keep if drug ==1 | drug == 2 // So drug == 3 will be dropped
(14 observations deleted)
```

Manage variables: Label

- `label` helps you keep track of your dataset and variables, and helps others understand your data.
- `label define` to a variable (usually the one you defined)
- `label values` attaches the labels defined using.

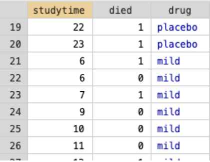
```
. label variable drug "1=placebo, 2=mild, 3=strong"
```



Variables

	Name	Label
☑	studytime	Months to death or end of exp.
☑	died	1 if patient died
☑	drug	1=placebo, 2=mild, 3=strong

```
. label define drug 1 "placebo" 2 "mild" 3 "strong"
. label values drug drug
```



	studytime	died	drug
19	22	1	placebo
20	23	1	placebo
21	6	1	mild
22	6	0	mild
23	7	1	mild
24	9	0	mild
25	10	0	mild
26	11	0	mild

Manage variables: Rename, recode, generate, replace

- `rename` changes the name of a variable.

```
. rename died death
```

- `recode` changes variable values.

```
. recode drug (3=4)
```

- `generate` creates a new variable.

```
. generate placebo = 1 if drug == 1
```

- `replace` replaces existing variables (or variable values).

```
. replace placebo = 0 if drug != 1
```

Manage variables: Sort, by, if, in

- sort orders observations in ascending order.

```
. sort death
```

- by executes a command within a specified variable (e.g. by age group), but data should be sorted first.

```
. by death: summarize
```

- bysort combines the by and sort commands into one.

```
. bysort death: summarize // by death, sort: summarize
```

- if is used to select by a condition.

```
. list age if death == 1
```

- in is used to select by observations.

```
. gen id = _n
. list id 1/10
```

Manage variables: Operators

Operator	Purpose	Example
==	Evaluates if true/false	summarize if sex==1
~= or !=	Indicates 'not equal'	summarize if sex!=0
<, <= >, >=	Less than (equal to) or greater than (equal to)	summarize if age<35
&	Indicates 'and'	summarize outcome if sex==1 & age>=60
|	Indicates 'or'	gen x=1 if a==1 & (b==1 | c==1)

References

1. David Goldsman PG. *A First Course in Probability and Statistics*. Georgia Institute of Technology, 2020.
2. Marcello Pagano KG. *Principles of Biostatistics*. Cengage Learning, Inc, 2000. ISBN 0534229026.
3. Erin Gabriel PF. Epidemiology PhD program, Karolinska Institutet, 2020.