STATISTICAL ANALYSIS ON STATA PROGRAM

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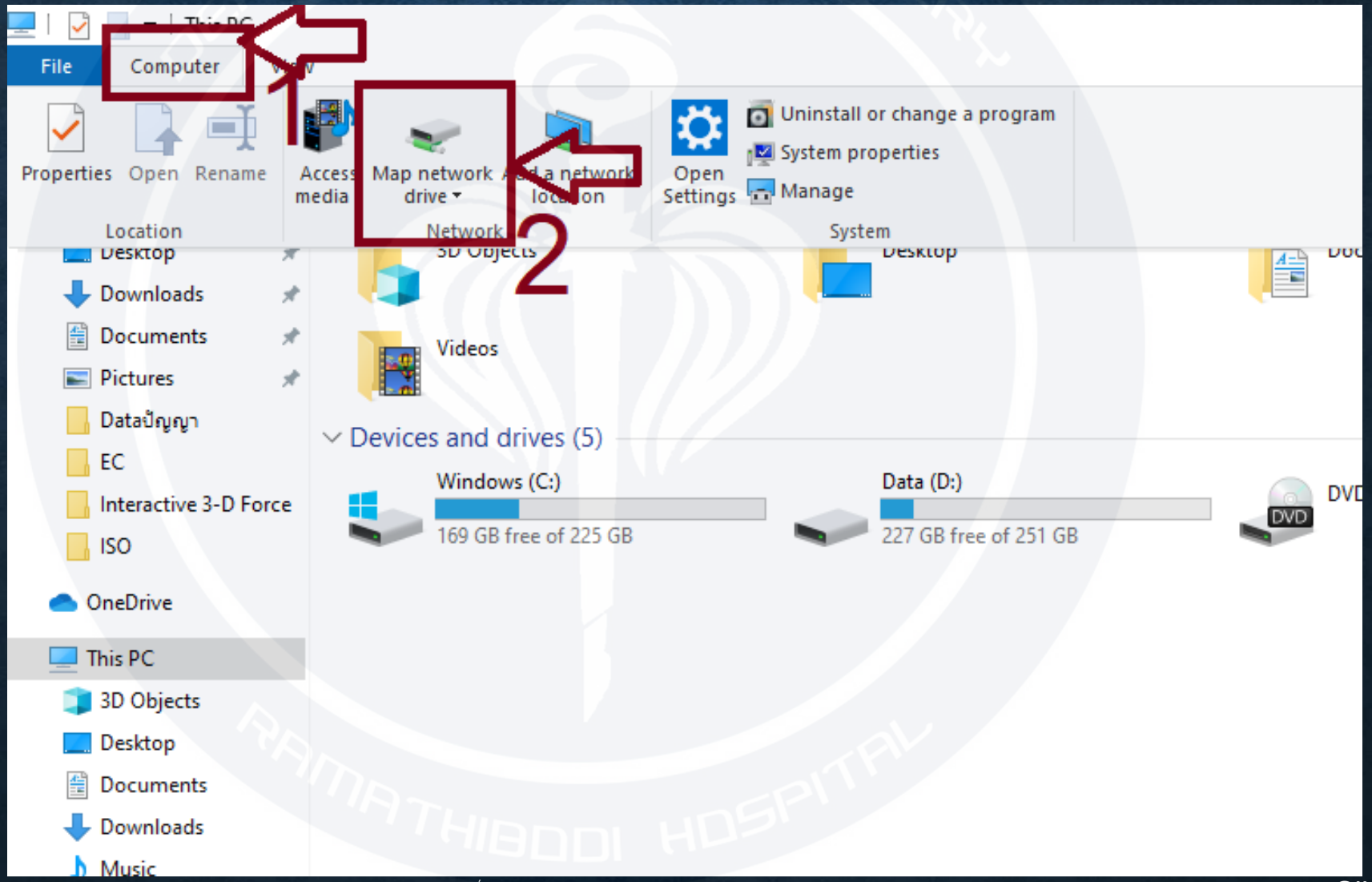
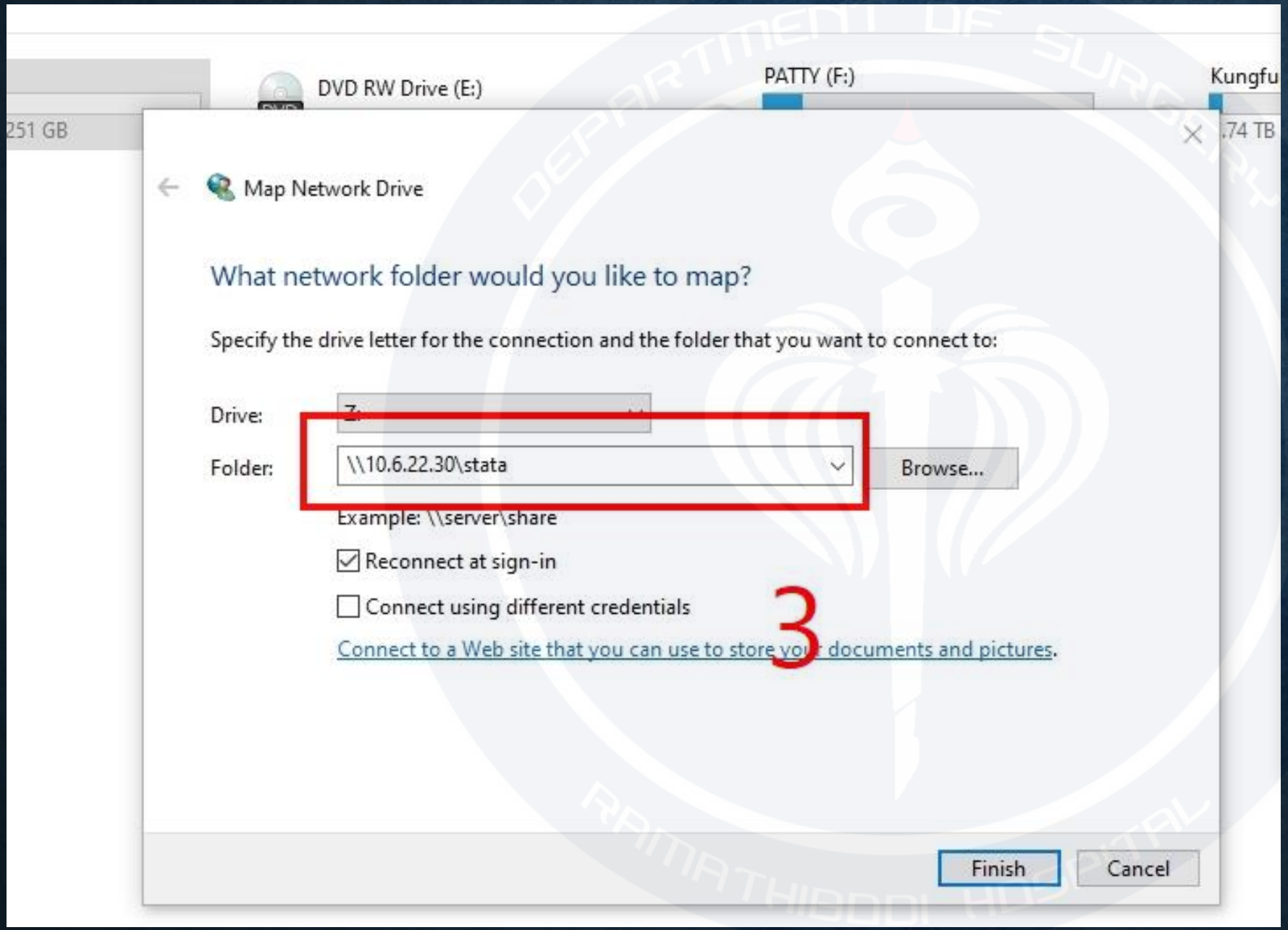
Ramathibodi Hospital, Mahidol University

วิธีเข้าโปรแกรม STATA ผ่านระบบ RAN





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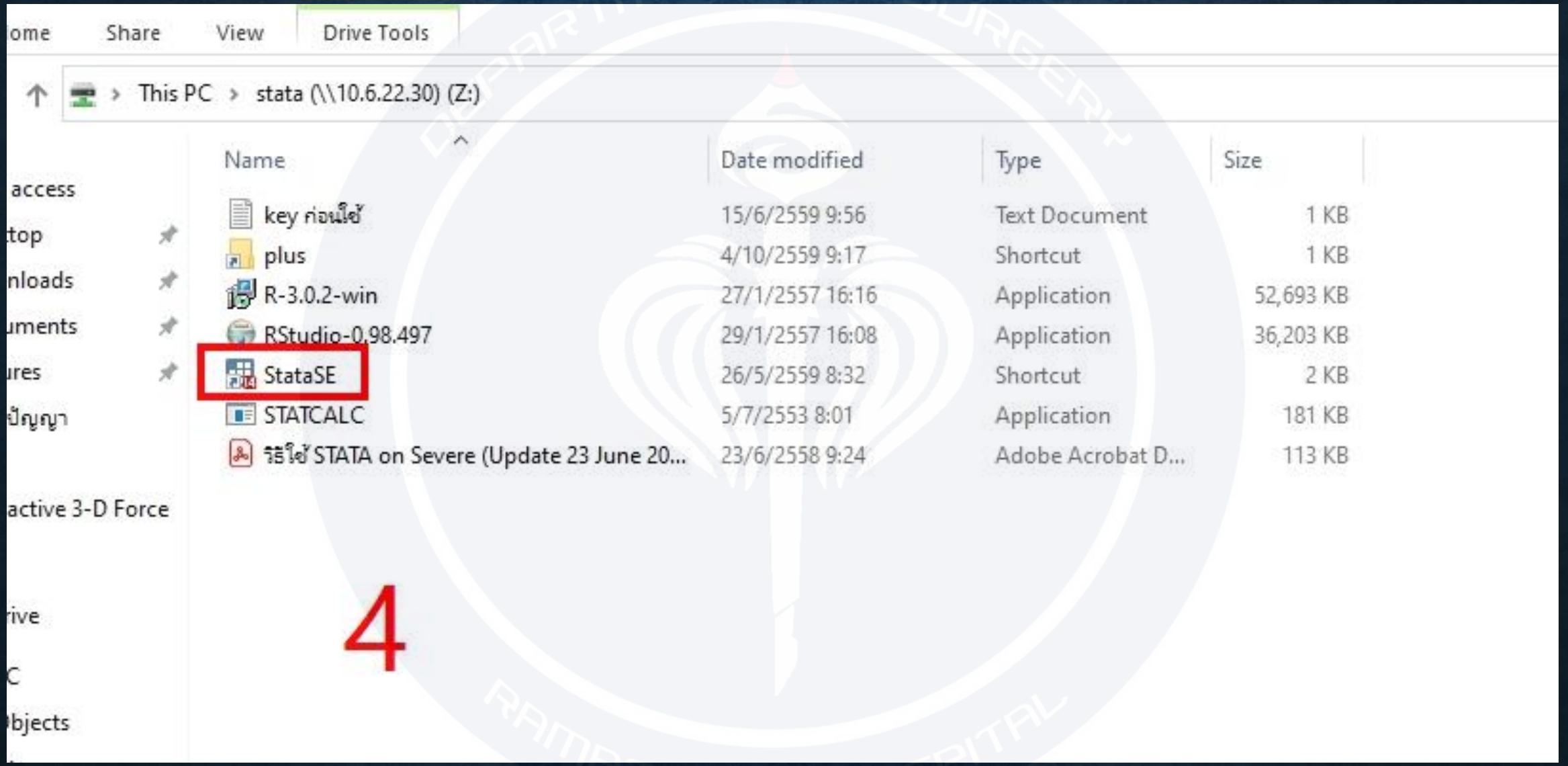
User: stata

PW: stata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stata (\\10.6.22.30) (Z:)
Name
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key ก่อนใช้
15/6/2559 9:56
Text Document
1 KB
plus
4/10/2559 9:17
Shortcut
1 KB
R-3.0.2-win
27/1/2557 16:16
Application
52,693 KB
RStudio-0.98.497
29/1/2557 16:08
Application
36,203 KB
StataSE
26/5/2559 8:32
Shortcut
2 KB
STATCALC
5/7/2553 8:01
Application
181 KB
วิธีใช้ STATA on Severe (Update 23 June 20...
23/6/2558 9:24
Adobe Acrobat D...
113 KB
access
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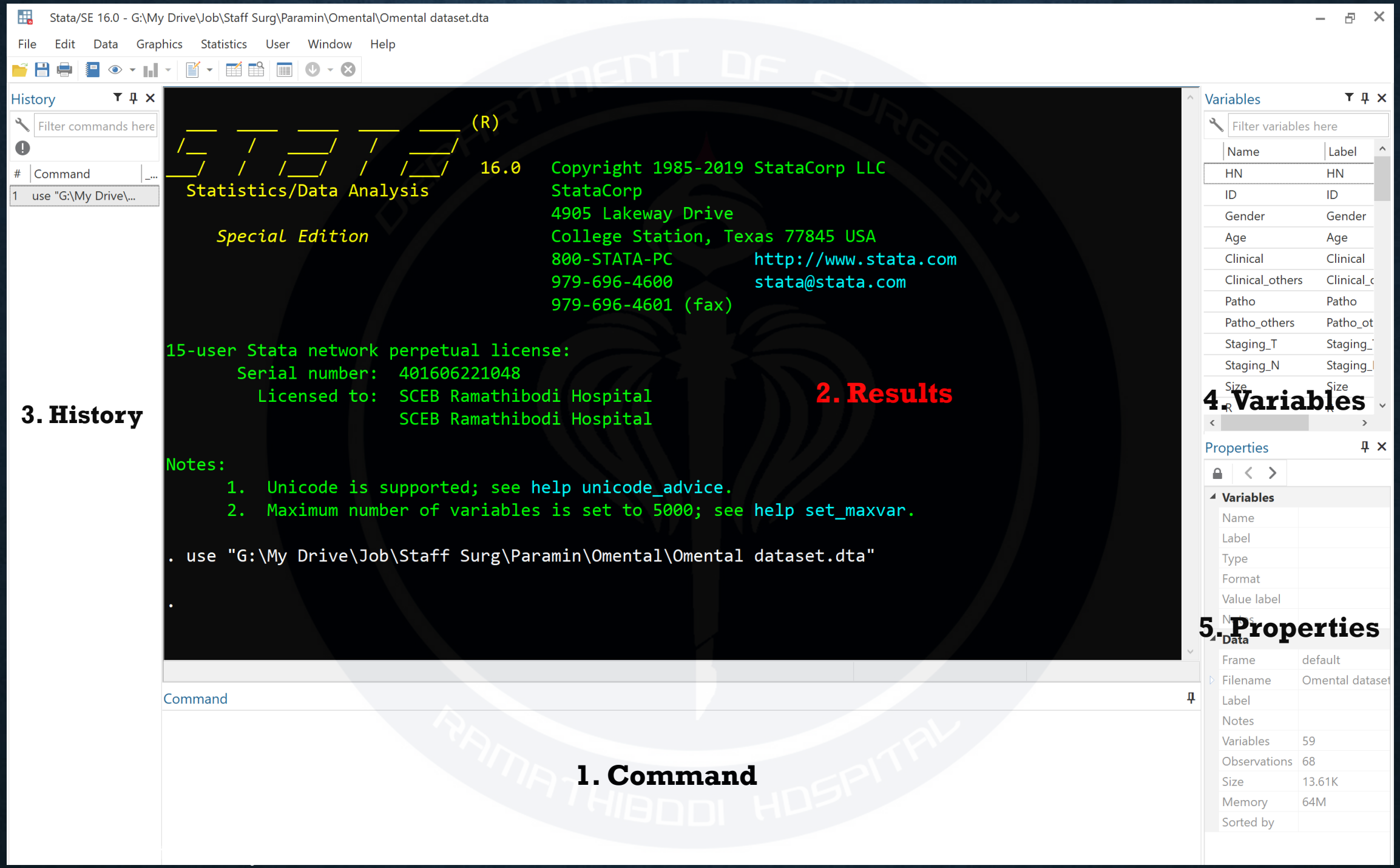
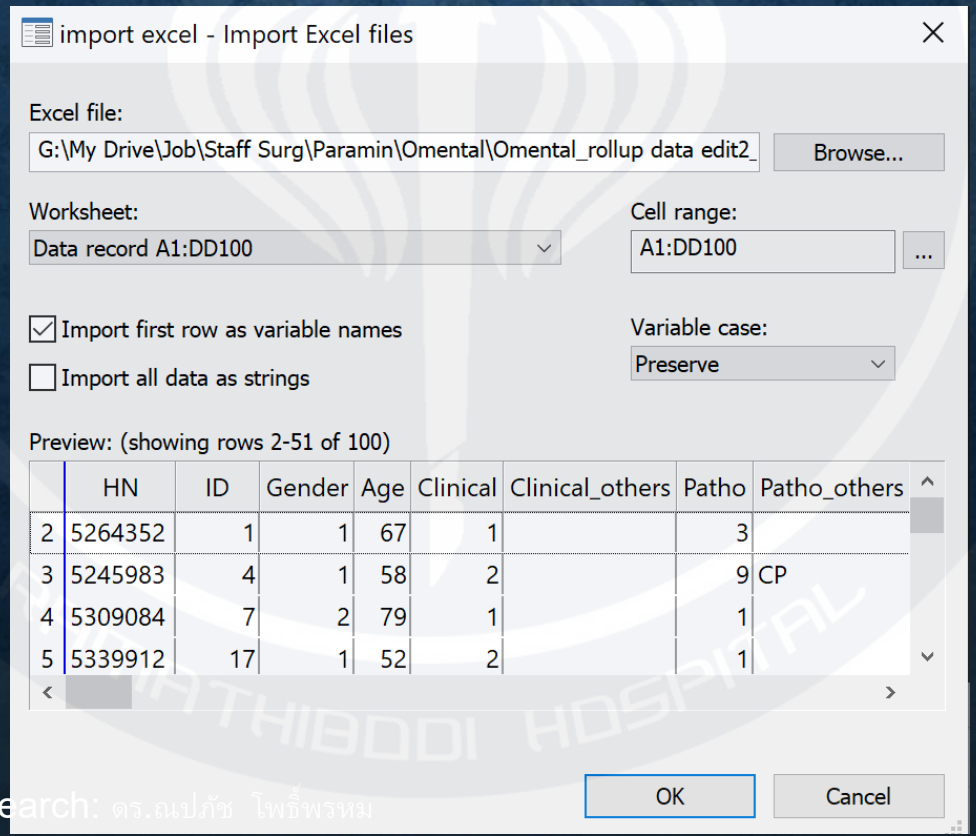
4

BASIC FUNCTIONS AND COMMANDS IN STATA


Stata/SE 16.0 - G:\My Drive\Job\Staff Surg\Paramin\Omental\Omental dataset.dta
File Edit Data Graphics Statistics User Window Help
History
Filter commands here
Command
1 use "G:\My Drive\...
3. History
(R)
16.0
Copyright 1985-2019 StataCorp LLC
Statistics/Data Analysis
StataCorp
4905 Lakeway Drive
Special Edition
College Station, Texas 77845 USA
800-STATA-PC http://www.stata.com
979-696-4600 stata@stata.com
979-696-4601 (fax)
15-user Stata network perpetual license:
Serial number: 401606221048
Licensed to: SCEB Ramathibodi Hospital
SCEB Ramathibodi Hospital
2. Results
Notes:
1. Unicode is supported; see help unicode_advice.
2. Maximum number of variables is set to 5000; see help set_maxvar.
. use "G:\My Drive\Job\Staff Surg\Paramin\Omental\Omental dataset.dta"
.
Command
1. Command
Variables
Filter variables here
Name Label
HN HN
ID ID
Gender Gender
Age Age
Clinical Clinical
Clinical_others
Patho Patho
Patho_others
Staging_T
Staging_N
Size
4. Variables
Properties
Variables
Name
Label
Type
Format
Value label
Data
Frame default
Filename Omental dataset
Label
Notes
Variables 59
Observations 68
Size 13.61K
Memory 64M
Sorted by
5. Properties

IMPORTING DATA FROM EXCEL

- Menu > File > Import
- Select "Import first row as variable names"
- A range of Excel cells to import can also be specified



GENERAL STRUCTURE

- bysort Gender: sum Age if Operation==1, detail

Prefix | **Command Variables** | **Data condition** | **Option**

Example

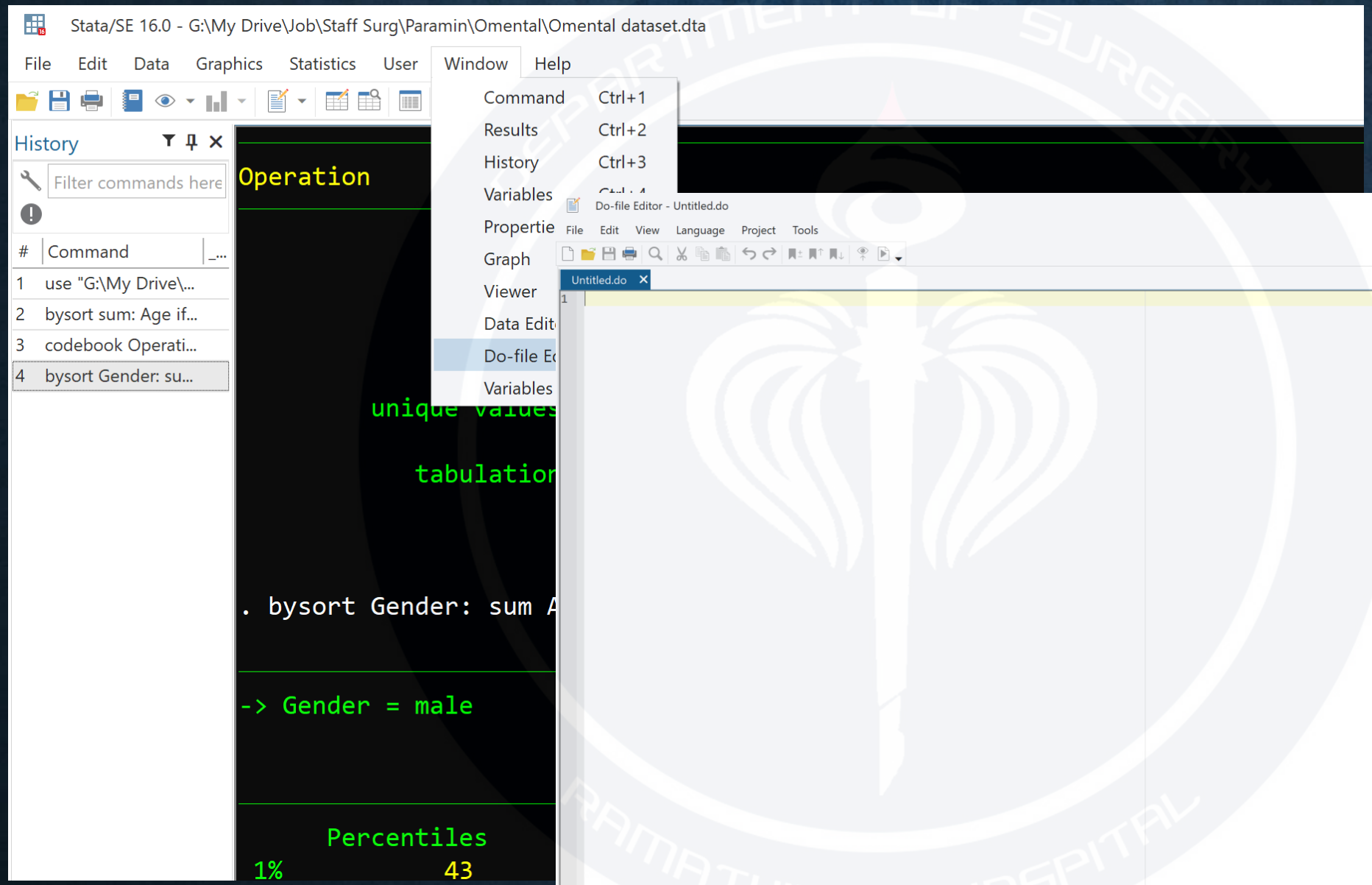
- list id age education if school==1 in 1/5, nolabel

STATA'S .DO FILE

- Do-file: a file containing list of Stata commands
- Useful when you are doing large projects that may require repeated analysis

Starting a new empty do-file:

- Window > Do-file Editor > New Do-file Editor (or through the "Do-file" icon)



Basic statistical analysis for clinical resea

Data Editor (Edit) - [data overall]

File Edit View Data Tools

prov[37] นครราชสีมา

	collec3	age	gender	weight	height	edu	occ
1	Napaphat	35	1. Male	76.0	171.0	9. Postgraduate	10. Soldiers police
2	Napaphat	35	1. Male	76.0	171.0	9. Postgraduate	10. Soldiers police
3	Napaphat	35	1. Male	76.0	171.0	9. Postgraduate	10. Soldiers police
4	Napaphat	35	1. Male	76.0	171.0	9. Postgraduate	10. Soldiers police
5	napaphat	47	2. Female	59.1	155.3	5. Bachelor's degree	4. Technical staff
6	napaphat	47	2. Female	59.1	155.3	5. Bachelor's degree	4. Technical staff
7	napaphat	47	2. Female	59.1	155.3	5. Bachelor's degree	4. Technical staff
8	napaphat	47	2. Female	59.1	155.3	5. Bachelor's degree	4. Technical staff
9	napaphat	23	1. Male	50.0	175.0	5. Bachelor's degree	1. Student
10	napaphat	23	1. Male	50.0	175.0	5. Bachelor's degree	1. Student
11	napaphat	23	1. Male	50.0	175.0	5. Bachelor's degree	1. Student
12	napaphat	23	1. Male	50.0	175.0	5. Bachelor's degree	1. Student
13	napaphat	42	1. Male	60.0	163.0	5. Bachelor's degree	4. Technical staff
14	napaphat	42	1. Male	60.0	163.0	5. Bachelor's degree	4. Technical staff
15	napaphat	42	1. Male	60.0	163.0	5. Bachelor's degree	4. Technical staff
16	napaphat	42	1. Male	60.0	163.0	5. Bachelor's degree	4. Technical staff
17	napaphat	33	1. Male	65.0	175.0	5. Bachelor's degree	4. Technical staff
18	napaphat	33	1. Male	65.0	175.0	5. Bachelor's degree	4. Technical staff
19	napaphat	33	1. Male	65.0	175.0	5. Bachelor's degree	4. Technical staff
20	napaphat	33	1. Male	65.0	175.0	5. Bachelor's degree	4. Technical staff
21	napaphat	30	2. Female	54.7	154.0	5. Bachelor's degree	4. Technical staff
22	napaphat	30	2. Female	54.7	154.0	5. Bachelor's degree	4. Technical staff
23	napaphat	30	2. Female	54.7	154.0	5. Bachelor's degree	4. Technical staff
24	napaphat	30	2. Female	54.7	154.0	5. Bachelor's degree	4. Technical staff
25	napaphat	60	2. Female	64.0	155.0	2. Elementary school	12. Other
26	napaphat	60	2. Female	64.0	155.0	2. Elementary school	12. Other
27	napaphat	60	2. Female	64.0	155.0	2. Elementary school	12. Other
28	napaphat	60	2. Female	64.0	155.0	2. Elementary school	12. Other
29	napaphat	53	2. Female	93.0	160.0	5. Bachelor's degree	2. Senior executive
30	napaphat	53	2. Female	93.0	160.0	5. Bachelor's degree	2. Senior executive
31	napaphat	53	2. Female	93.0	160.0	5. Bachelor's degree	2. Senior executive
32	napaphat	53	2. Female	93.0	160.0	5. Bachelor's degree	2. Senior executive
33	napaphat	31	2. Female	46.0	155.0	3. High school	11. Worker using basic
34	napaphat	31	2. Female	46.0	155.0	3. High school	11. Worker using basic
35	napaphat	31	2. Female	46.0	155.0	3. High school	11. Worker using basic
36	napaphat	31	2. Female	46.0	155.0	3. High school	11. Worker using basic
37	napaphat	52	1. Male	77.0	175.0	2. Elementary school	11. Worker using basic

Variables

Filter variables here

Name	Label	T
dcoll	Date of collection @	lc
namecoll	Name of collector @	st
site	Site of Study @	b
diagsc	Diagnosed as uncompli...	b
agesc	Age more than 18 and l...	b
pregsc	Non pregnancy. @	b
thaisc	Understanding Thai lan...	b
immunsc	Did not receive immun...	b
autosc	Non-autoimmune disea...	b
renalsc	Non history of end stag...	b
severesc	Non severe underlying ...	b
id	Participants ID @	ir

Variables Snapshots

Properties

Variables

Name	prov
Label	Province @
Type	str51
Format	%51s
Value label	
Notes	

Data

Frame	default
Filename	data overall.dta
Label	form 1
Notes	
Variables	487
Observations	904
Size	5.96M
Memory	64M
Sorted by	id

35		บางบัวทอง	กรุงเทพ
36		บางบัวทอง	กรุงเทพ
37		สีคิ้ว	นครราชสีมา

34 06may2562
35 06may2562
36 06may2562
37 06mar2562

```
. tab gender

2. Gender @ |      Freq.     Percent        Cum.
------------+-----------------------------------
     1. Male |        356       39.38       39.38
   2. Female |        548       60.62      100.00
------------+-----------------------------------
       Total |        904      100.00

. codebook nausea


-------------------------------------------------------------------------------
nausea                                                          1. Nausea  @
-------------------------------------------------------------------------------

                  type:  numeric (byte)
                 label:  LABEL_ADMIS

                 range:  [1,2]                        units:  1
         unique values:  2                    missing .:  0/904

            tabulation:  Freq.   Numeric  Label
                           388         1  1. yes
                           516         2  2. no
```

ANALYSIS OF CATEGORICAL DATA

Data Editor (Edit) - [dataset APP 14-10-21]

File Edit View Data Tools

Index100[1] 100

	abtright	nausea	vomit	anorex	fever	urine	feval	dm	ht	otdisease	allergy
1	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
2	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
3	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
4	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
5	24	1. yes	1. yes	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
6	24	1. yes	1. yes	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
7	24	1. yes	1. yes	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
8	24	1. yes	1. yes	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
9	5	1. yes	1. yes	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
10	5	1. yes	1. yes	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
11	5	1. yes	1. yes	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
12	5	1. yes	1. yes	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
13	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
14	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
15	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
16	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
17	12	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
18	12	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
19	12	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
20	12	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
21	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	1. yes
22	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	1. yes
23	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	1. yes
24	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	1. yes
25	24	1. yes	1. yes	2. no	1. yes	1. normal	1. normal	2. no	2. no	1. yes	2. no
26	24	1. yes	1. yes	2. no	1. yes	1. normal	1. normal	2. no	2. no	1. yes	2. no
27	24	1. yes	1. yes	2. no	1. yes	1. normal	1. normal	2. no	2. no	1. yes	2. no
28	24	1. yes	1. yes	2. no	1. yes	1. normal	1. normal	2. no	2. no	1. yes	2. no
29	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
30	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
31	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
32	24	2. no	2. no	2. no	2. no	1. normal	1. normal	2. no	2. no	2. no	2. no
33	8	2. no	2. no	2. no	1. yes	1. normal	1. normal	2. no	2. no	2. no	2. no
34	8	2. no	2. no	2. no	1. yes	1. normal	1. normal	2. no	2. no	2. no	2. no
35	8	2. no	2. no	2. no	1. yes	1. normal	1. normal	2. no	2. no	2. no	2. no
36	8	2. no	2. no	2. no	1. yes	1. normal	1. normal	2. no	2. no	2. no	2. no
37	9	1. yes	1. yes	2. no	1. yes	1. normal	1. normal	2. no	2. no	2. no	2. no

ข้อตกลงเบื้องต้นในการใช้ CHI-SQUARE TEST

- ประชากร 2 กลุ่มหรือมากกว่า และเป็นอิสระต่อกัน
- ข้อมูลเป็น **categorical data**
- ค่าคาดหวัง (**expected frequency**) น้อยกว่า 5 ไม่เกิน 20% ของจำนวน **cell** ทั้งหมด

*****ถ้าไม่เป็นไปตามข้อตกลงนี้ให้ใช้ **Fisher's exact test*****

CHI-SQUARE TEST

In assessing association between types of intervention and recurrence of appendicitis.

H0: Incidence of recurrence of appendicitis between those who received each intervention is not different.

Ha: Incidence of recurrence of appendicitis between those who received each intervention is different.

STATA COMMAND

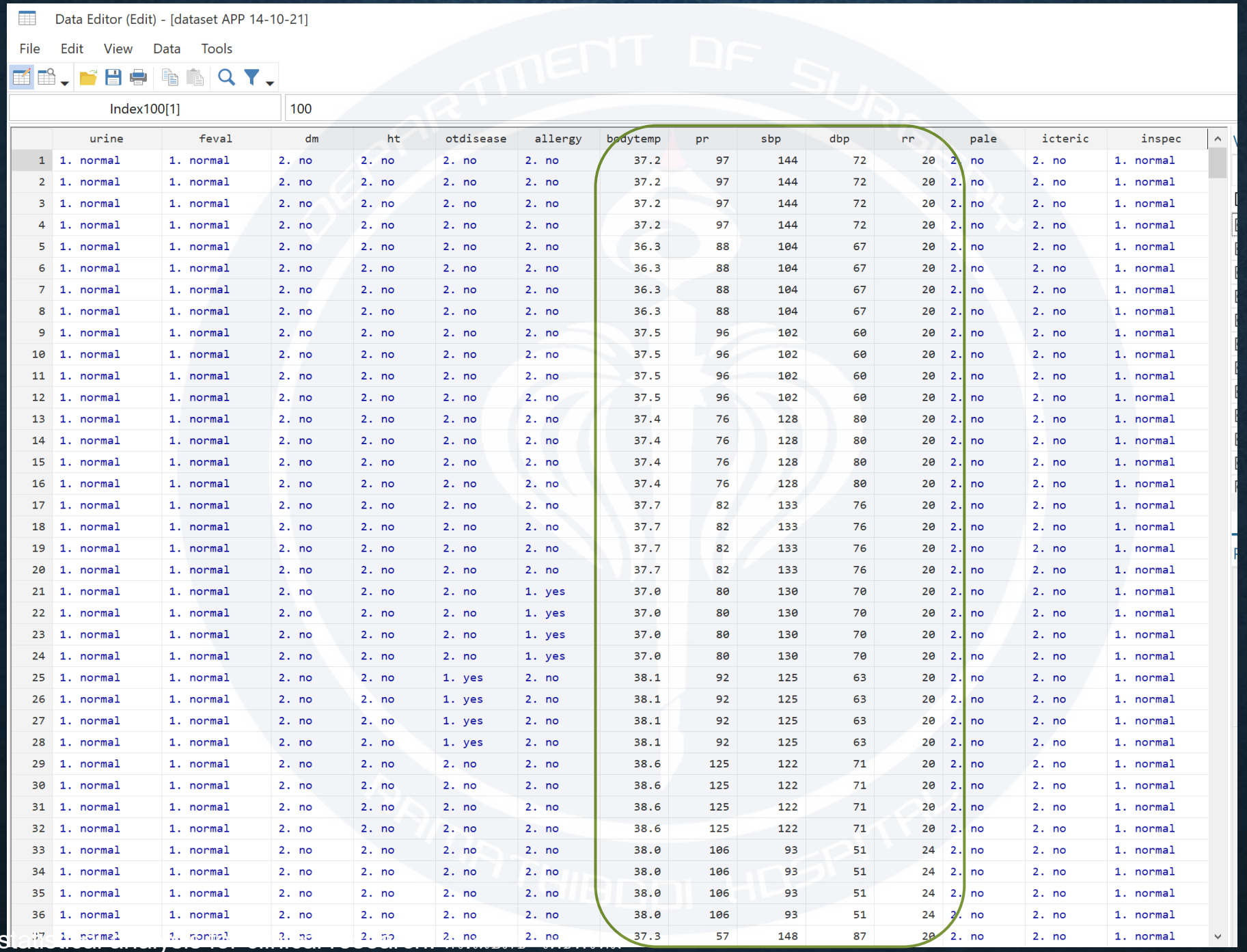
- tab intervention recurrence, col chi2 exact expect

intervention	recurrence 0. no	1. yes	Total
Open	552	0	552
	536.7	15.3	552.0
	62.80	0.00	61.06
Laparoscopic	32	0	32
	31.1	0.9	32.0
	3.64	0.00	3.54
Betalactamase	67	5	72
	70.0	2.0	72.0
	7.62	20.00	7.96
Quinolone	46	6	52
	50.6	1.4	52.0
	5.23	24.00	5.75
Cef_Metro	182	14	196
	190.6	5.4	196.0
	20.71	56.00	21.68
Total	879	25	904
	879.0	25.0	904.0

CONCLUSIONS

- The p value is <0.001 which is less than the level of significance (0.05).
- We can reject the null hypothesis and conclude that types of intervention is associated with recurrence of appendicitis.
- In other words, the incidence of recurrence of appendicitis among those interventions are different.

ANALYSIS OF CONTINUOUS DATA



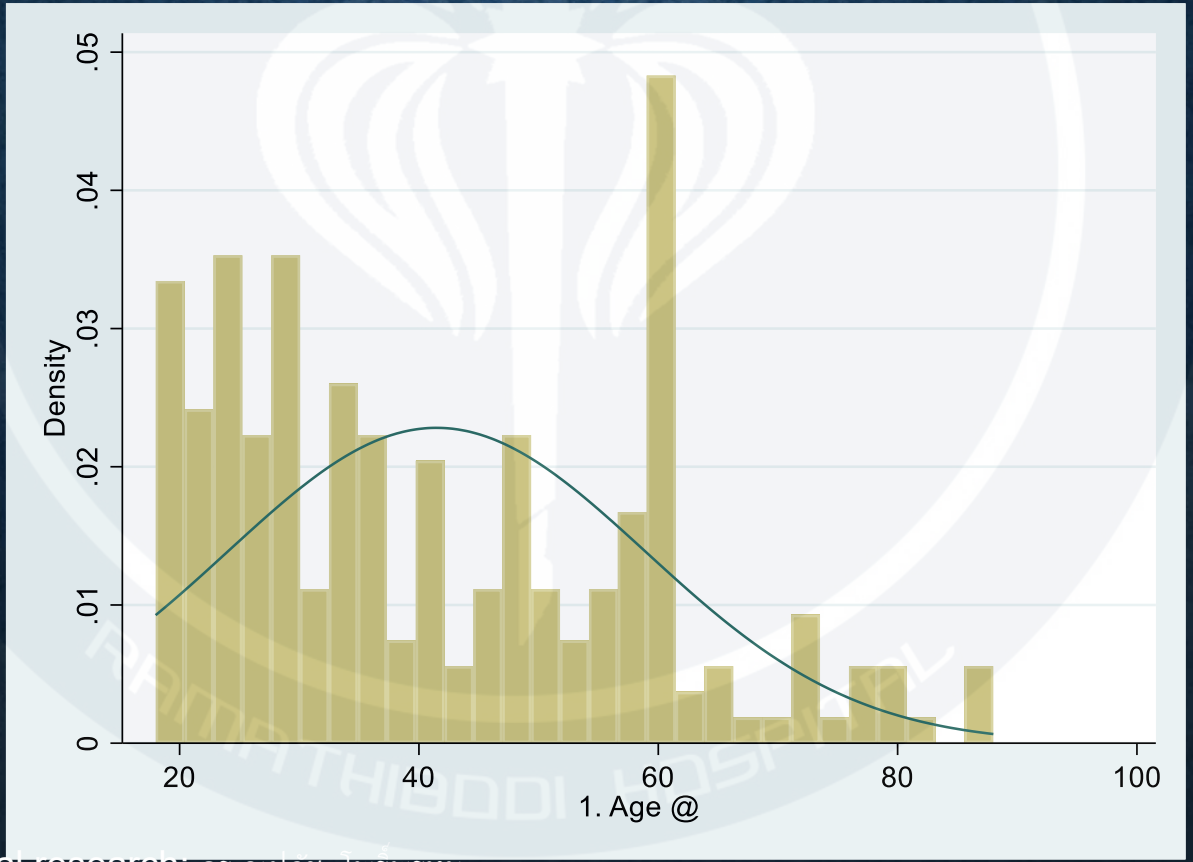
	urine	feval	dm	ht	otdisease	allergy	bodytemp	pr	sbp	dbp	rr	pale	icteric	inspec
1	1. normal	1. normal	2. no	2. no	2. no	2. no	37.2	97	144	72	20	2. no	2. no	1. normal
2	1. normal	1. normal	2. no	2. no	2. no	2. no	37.2	97	144	72	20	2. no	2. no	1. normal
3	1. normal	1. normal	2. no	2. no	2. no	2. no	37.2	97	144	72	20	2. no	2. no	1. normal
4	1. normal	1. normal	2. no	2. no	2. no	2. no	37.2	97	144	72	20	2. no	2. no	1. normal
5	1. normal	1. normal	2. no	2. no	2. no	2. no	36.3	88	104	67	20	2. no	2. no	1. normal
6	1. normal	1. normal	2. no	2. no	2. no	2. no	36.3	88	104	67	20	2. no	2. no	1. normal
7	1. normal	1. normal	2. no	2. no	2. no	2. no	36.3	88	104	67	20	2. no	2. no	1. normal
8	1. normal	1. normal	2. no	2. no	2. no	2. no	36.3	88	104	67	20	2. no	2. no	1. normal
9	1. normal	1. normal	2. no	2. no	2. no	2. no	37.5	96	102	60	20	2. no	2. no	1. normal
10	1. normal	1. normal	2. no	2. no	2. no	2. no	37.5	96	102	60	20	2. no	2. no	1. normal
11	1. normal	1. normal	2. no	2. no	2. no	2. no	37.5	96	102	60	20	2. no	2. no	1. normal
12	1. normal	1. normal	2. no	2. no	2. no	2. no	37.5	96	102	60	20	2. no	2. no	1. normal
13	1. normal	1. normal	2. no	2. no	2. no	2. no	37.4	76	128	80	20	2. no	2. no	1. normal
14	1. normal	1. normal	2. no	2. no	2. no	2. no	37.4	76	128	80	20	2. no	2. no	1. normal
15	1. normal	1. normal	2. no	2. no	2. no	2. no	37.4	76	128	80	20	2. no	2. no	1. normal
16	1. normal	1. normal	2. no	2. no	2. no	2. no	37.4	76	128	80	20	2. no	2. no	1. normal
17	1. normal	1. normal	2. no	2. no	2. no	2. no	37.7	82	133	76	20	2. no	2. no	1. normal
18	1. normal	1. normal	2. no	2. no	2. no	2. no	37.7	82	133	76	20	2. no	2. no	1. normal
19	1. normal	1. normal	2. no	2. no	2. no	2. no	37.7	82	133	76	20	2. no	2. no	1. normal
20	1. normal	1. normal	2. no	2. no	2. no	2. no	37.7	82	133	76	20	2. no	2. no	1. normal
21	1. normal	1. normal	2. no	2. no	2. no	1. yes	37.0	80	130	70	20	2. no	2. no	1. normal
22	1. normal	1. normal	2. no	2. no	2. no	1. yes	37.0	80	130	70	20	2. no	2. no	1. normal
23	1. normal	1. normal	2. no	2. no	2. no	1. yes	37.0	80	130	70	20	2. no	2. no	1. normal
24	1. normal	1. normal	2. no	2. no	2. no	1. yes	37.0	80	130	70	20	2. no	2. no	1. normal
25	1. normal	1. normal	2. no	2. no	1. yes	2. no	38.1	92	125	63	20	2. no	2. no	1. normal
26	1. normal	1. normal	2. no	2. no	1. yes	2. no	38.1	92	125	63	20	2. no	2. no	1. normal
27	1. normal	1. normal	2. no	2. no	1. yes	2. no	38.1	92	125	63	20	2. no	2. no	1. normal
28	1. normal	1. normal	2. no	2. no	1. yes	2. no	38.1	92	125	63	20	2. no	2. no	1. normal
29	1. normal	1. normal	2. no	2. no	2. no	2. no	38.6	125	122	71	20	2. no	2. no	1. normal
30	1. normal	1. normal	2. no	2. no	2. no	2. no	38.6	125	122	71	20	2. no	2. no	1. normal
31	1. normal	1. normal	2. no	2. no	2. no	2. no	38.6	125	122	71	20	2. no	2. no	1. normal
32	1. normal	1. normal	2. no	2. no	2. no	2. no	38.6	125	122	71	20	2. no	2. no	1. normal
33	1. normal	1. normal	2. no	2. no	2. no	2. no	38.0	106	93	51	24	2. no	2. no	1. normal
34	1. normal	1. normal	2. no	2. no	2. no	2. no	38.0	106	93	51	24	2. no	2. no	1. normal
35	1. normal	1. normal	2. no	2. no	2. no	2. no	38.0	106	93	51	24	2. no	2. no	1. normal
36	1. normal	1. normal	2. no	2. no	2. no	2. no	38.0	106	93	51	24	2. no	2. no	1. normal
37	1. normal	1. normal	2. no	2. no	2. no	2. no	37.3	57	148	87	20	2. no	2. no	1. normal

CHECKING FOR NORMAL DISTRIBUTION

- Construct the histogram
- Construct the normal probability plot
- Compare mean and median
- Compare mean and standard deviation

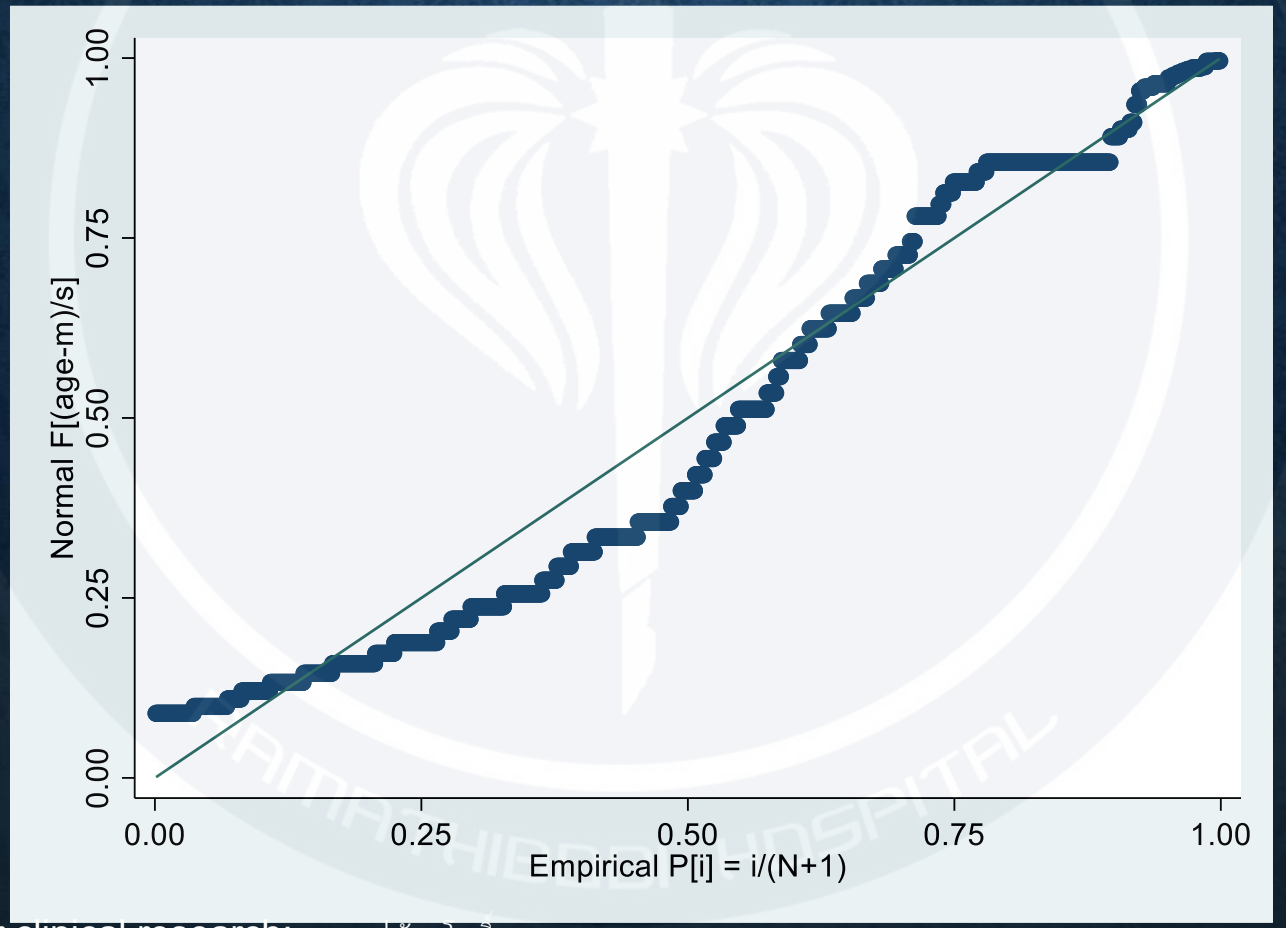
CONSTRUCT THE HISTOGRAM

- histogram age, norm



CONSTRUCT THE NORMAL PROBABILITY PLOT

- pnorm age



COMPARE MEAN WITH MEDIAN & COMPARE MEAN WITH STANDARD DEVIATION

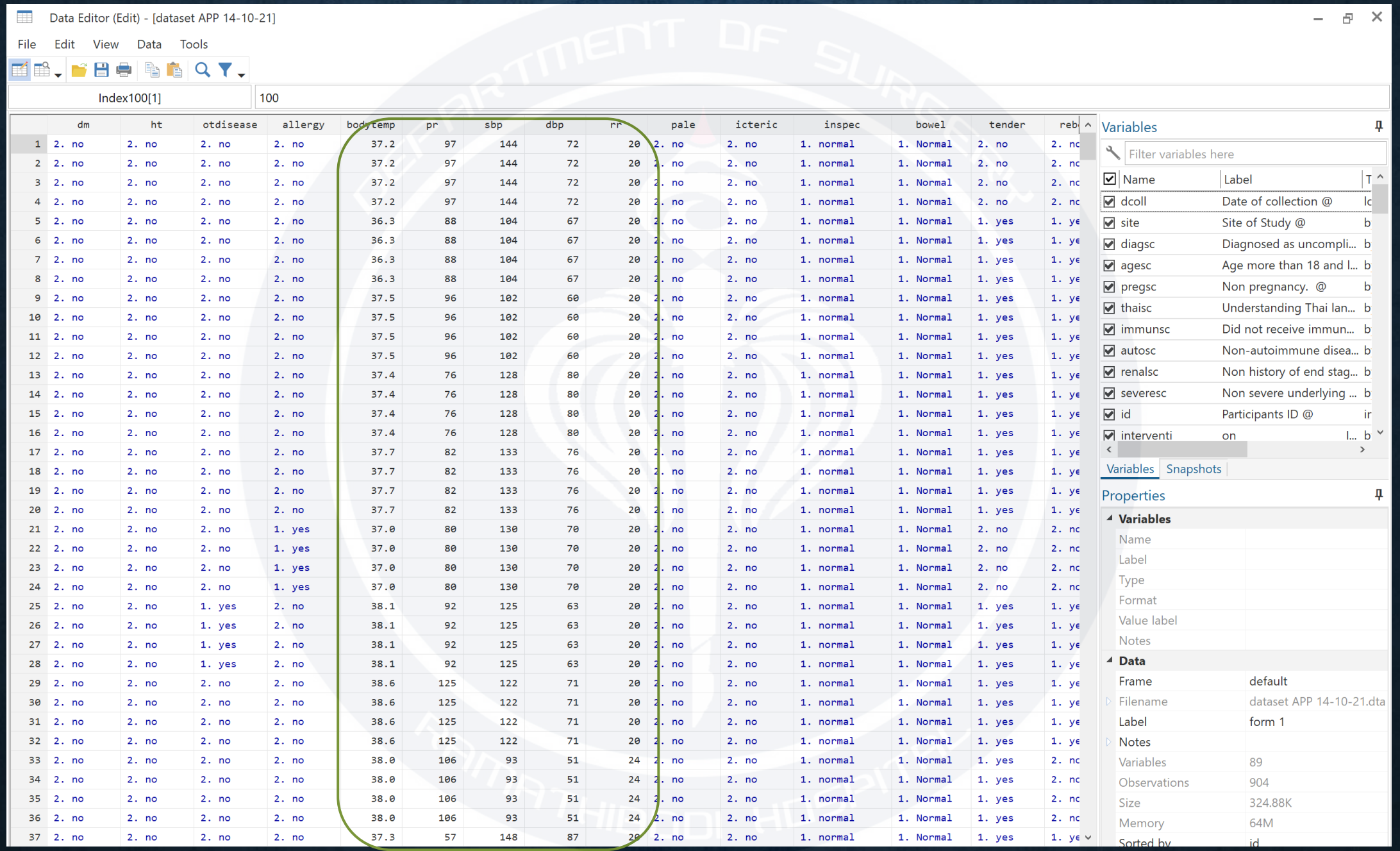
- sum age, details

```
. sum age, det

                          1. Age @
-------------------------------------------------------------
      Percentiles      Smallest
 1%           18              18
 5%           19              18
10%           21              18       Obs                 892
25%           26              18       Sum of Wgt.         892

50%           37                       Mean           41.47534
                      Largest          Std. Dev.      17.48466
75%           58              88
90%           63              88       Variance       305.7132
95%           73              88       Skewness       .5576089
99%           87              88       Kurtosis       2.375658
```

INDEPENDENT OR STUDENT T-TEST



	dm	ht	otdisease	allergy	bodytemp	pr	sbp	dbp	rr	pale	icteric	inspec	bowel	tender	reb
1	2. no	2. no	2. no	2. no	37.2	97	144	72	20	2. no	2. no	1. normal	1. Normal	2. no	2. nc
2	2. no	2. no	2. no	2. no	37.2	97	144	72	20	2. no	2. no	1. normal	1. Normal	2. no	2. nc
3	2. no	2. no	2. no	2. no	37.2	97	144	72	20	2. no	2. no	1. normal	1. Normal	2. no	2. nc
4	2. no	2. no	2. no	2. no	37.2	97	144	72	20	2. no	2. no	1. normal	1. Normal	2. no	2. nc
5	2. no	2. no	2. no	2. no	36.3	88	104	67	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
6	2. no	2. no	2. no	2. no	36.3	88	104	67	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
7	2. no	2. no	2. no	2. no	36.3	88	104	67	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
8	2. no	2. no	2. no	2. no	36.3	88	104	67	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
9	2. no	2. no	2. no	2. no	37.5	96	102	60	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
10	2. no	2. no	2. no	2. no	37.5	96	102	60	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
11	2. no	2. no	2. no	2. no	37.5	96	102	60	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
12	2. no	2. no	2. no	2. no	37.5	96	102	60	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
13	2. no	2. no	2. no	2. no	37.4	76	128	80	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
14	2. no	2. no	2. no	2. no	37.4	76	128	80	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
15	2. no	2. no	2. no	2. no	37.4	76	128	80	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
16	2. no	2. no	2. no	2. no	37.4	76	128	80	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
17	2. no	2. no	2. no	2. no	37.7	82	133	76	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
18	2. no	2. no	2. no	2. no	37.7	82	133	76	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
19	2. no	2. no	2. no	2. no	37.7	82	133	76	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
20	2. no	2. no	2. no	2. no	37.7	82	133	76	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
21	2. no	2. no	2. no	1. yes	37.0	80	130	70	20	2. no	2. no	1. normal	1. Normal	2. no	2. nc
22	2. no	2. no	2. no	1. yes	37.0	80	130	70	20	2. no	2. no	1. normal	1. Normal	2. no	2. nc
23	2. no	2. no	2. no	1. yes	37.0	80	130	70	20	2. no	2. no	1. normal	1. Normal	2. no	2. nc
24	2. no	2. no	2. no	1. yes	37.0	80	130	70	20	2. no	2. no	1. normal	1. Normal	2. no	2. nc
25	2. no	2. no	1. yes	2. no	38.1	92	125	63	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
26	2. no	2. no	1. yes	2. no	38.1	92	125	63	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
27	2. no	2. no	1. yes	2. no	38.1	92	125	63	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
28	2. no	2. no	1. yes	2. no	38.1	92	125	63	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
29	2. no	2. no	2. no	2. no	38.6	125	122	71	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
30	2. no	2. no	2. no	2. no	38.6	125	122	71	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
31	2. no	2. no	2. no	2. no	38.6	125	122	71	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
32	2. no	2. no	2. no	2. no	38.6	125	122	71	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye
33	2. no	2. no	2. no	2. no	38.0	106	93	51	24	2. no	2. no	1. normal	1. Normal	1. yes	2. nc
34	2. no	2. no	2. no	2. no	38.0	106	93	51	24	2. no	2. no	1. normal	1. Normal	1. yes	2. nc
35	2. no	2. no	2. no	2. no	38.0	106	93	51	24	2. no	2. no	1. normal	1. Normal	1. yes	2. nc
36	2. no	2. no	2. no	2. no	38.0	106	93	51	24	2. no	2. no	1. normal	1. Normal	1. yes	2. nc
37	2. no	2. no	2. no	2. no	37.3	57	148	87	20	2. no	2. no	1. normal	1. Normal	1. yes	1. ye

ข้อตกลงเบื้องต้น

- ประชากร 2 กลุ่ม ที่เป็นอิสระต่อกัน
- ข้อมูลเป็นแบบ **continuous data**
- การกระจายเป็นแบบ **normal distribution**

หากไม่เป็นไปตามข้อตกลงเบื้องต้นให้ใช้ **Mann Whitney U test, Wilcoxon Rank sum test**

EXAMPLE

- Researchers wanted to test if the mean/median age of these patients is different among recurrence appendicitis patients

H0: The mean/median age between the patients who have recurrence of appendicitis and who did not is not different.
Ha: The mean/median age between the patients who have recurrence of appendicitis and who did not is different.

STATA COMMAND

i) Variance ratio test

- sdtest age, by(recurrence)

```
Variance ratio test

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
   0. no |     867    41.49942    .5975564    17.59497    40.3266    42.67225
  1. yes |      25       40.64    2.668882    13.34441    35.1317     46.1483
---------+--------------------------------------------------------------------
combined |     892    41.47534    .5854296    17.48466   40.32635    42.62432

    ratio = sd(0. no) / sd(1. yes)                 f =    1.7385
Ho: ratio = 1                     degrees of freedom =  866, 24

    Ha: ratio < 1               Ha: ratio != 1                 Ha: ratio > 1
  Pr(F < f) = 0.9495         2*Pr(F > f) = 0.1009         Pr(F > f) = 0.0505
```

STATA COMMAND

ii) Student t-test

- ttest age, by(recurrence)

```
Two-sample t test with equal variances

   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
   0. no |     867    41.49942    .5975564    17.59497    40.32660    42.67225
  1. yes |      25       40.64    2.668882    13.34441    35.13170     46.1483
---------+--------------------------------------------------------------------
combined |     892    41.47534    .5854296    17.48466    40.32635    42.62432
---------+--------------------------------------------------------------------
    diff |            .8594233    3.548865               -6.105697    7.824543
------------------------------------------------------------------------------
    diff = mean(0. no) - mean(1. yes)                             t =   0.2422
Ho: diff = 0                                     degrees of freedom =      890

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.5956         Pr(|T| > |t|) = 0.8087          Pr(T > t) = 0.4044
```

CONCLUSION

- The p value is 0.8087 which is greater than the level of significance.
- Therefore, we cannot reject the null hypothesis and conclude that the mean age of among recurrence of appendicitis is not different.

PAIRED T-TEST

ข้อตกลงเบื้องต้น

- ประชากร 2 กลุ่ม ที่เป็นไม่อิสระต่อกัน
- ข้อมูลเป็นแบบ **continuous data**
- การกระจายเป็นแบบ **normal distribution**

****หากไม่เป็นไปตามข้อตกลงเบื้องต้นให้ใช้ **Wilcoxon matched signed ranks test*****

EXAMPLE

- Researchers wanted to test if the mean utility score of appendicitis patients before and after 7 days of received treatment are different.

H0: The mean of utility score before and after 7 days of reived treatment in the appendicitis patients are not different.
Ha: The mean of utility score before and after 7 days of reived treatment in the appendicitis patients are different.

STATA COMMAND

- ttest base_Utility== after_Utility

```
Paired t test
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
base_U~y |     904    .4218142    .0062965    .1893128    .4094568    .4341715
after_~y |     904    .6341018    .0125648     .377781    .6094421    .6587614
---------+--------------------------------------------------------------------
    diff |     904   -.2122876    .0132227    .3975608   -.2382384   -.1863369
------------------------------------------------------------------------------
    mean(diff) = mean(base_Utility - after_Utility)               t = -16.0548
Ho: mean(diff) = 0                               degrees of freedom =      903

 Ha: mean(diff) < 0           Ha: mean(diff) != 0           Ha: mean(diff) > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000
```

CONCLUSION

- The p value is less than 0.001 which is less than the level of significance.
- So, we reject the null hypothesis and conclude that the mean difference of utility score is not equal to zero.
- Alternatively, the mean utility score of appendicitis patients before and after receiving treatment are different.

ANALYSIS OF VARIANCE (ANOVA)

ข้อตกลงเบื้องต้น

- ประชากรมากกว่า 2 กลุ่ม ที่เป็นอิสระต่อกัน
- ข้อมูลเป็นแบบ **continuous data**
- การกระจายเป็นแบบ **normal distribution**

หากไม่เป็นไปตามข้อตกลงเบื้องต้นให้ใช้ **Kruskal Wallis test**

EXAMPLE

- Researchers wanted to test if the mean weights of appendicitis patients among the treatment (i.e., open, LAP, beta-lactamase, quinolone and cephalosporin) are different.

H0 : $\mu_{open}=\mu_{LAP}=\mu_{beta}=\mu_{qui}=\mu_{cep}$

HA: Not all μ's are identical

STATA COMMAND

- oneway weight intervention, tabulate

intervention	Summary of 3. Weight @ Mean	Std. Dev.	Freq.
Open	61.1	12.2	552
Laparosco	66.6	13.7	32
Betalacta	61.1	11.8	72
Quinolone	61.0	11.4	52
Cef_Metro	62.6	12.9	196
Total	61.6	12.4	904

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	1153.23427	4	288.308566	1.89	0.1107
Within groups	137396.545	899	152.832642		
Total	138549.779	903	153.432757		

Bartlett's test for equal variances: chi2(4) = 2.3822 Prob>chi2 = 0.666

CONCLUSION

- The p value from Bartlett's test is 0.666, which is greater than significance level, so we fail to reject the null hypothesis.
- We conclude that the variances of the patients weights among five different treatment groups are not different.
- The p value from ANOVA is 0.1107 which is less than the level of significance.
- Conclusion, we can not reject the null hypothesis and conclude that the mean weight of appendicitis patients is no different.

LOGISTIC REGRESSION

LOGISTIC REGRESSION ANALYSIS VS CORRELATION

Correlation

- Strength of Association
- NOT for cause-effect analysis
- NOT for Predictive purpose

Regression

- Strength of Association
- Cause-effect analysis
- Predictive model

EXAMPLE

- Determine the risk factors which associated with overall morbidity!!

Outcome: having morbidity and non-having morbidity

Predictors:

- Gender
- Age
- WBC
- Intervention

SAMPLE SIZE ESTIMATION

TWO RTIONS

β-Lactam vs Non-β-Lactam Antibiotics and Surgical Site Infection in Colectomy Patients

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BACKGROUND: Surgical site infections (SSIs) represent a significant preventable source of morbidity, mortality, and cost. Prophylactic antibiotics have been shown to decrease SSI rates, and β-lactam antibiotics are recommended by national guidelines. It is currently unclear whether recommended β-lactam and recommended non-β-lactam antibiotic regimens are equivalent with respect to SSI risk reduction in colectomy patients.

STUDY DESIGN: We conducted a retrospective cohort study of SSI rates between prophylactic intravenously administered recommended β-lactam and non-β-lactam in colectomy patients (25 CPT codes) collected by the Michigan Surgical Quality Collaborative from January 2013 to February 2018. Surgical site infection rates were compared as a dichotomous variable (no SSI vs SSI). Mixed-effects regression was used to compare the association between receiving a β-lactam or non-β-lactam antibiotic and likelihood of having an SSI.

RESULTS: Of 9,949 patients, 9,411 (94.6%) received β-lactam antibiotics and 538 (5.4%) received non-β-lactam antibiotics. Overall, there were 622 (6.3%) patients with SSIs. Of the patients receiving β-lactam antibiotics, SSIs developed in 571 (6.1%) compared with 51 (9.5%) patients in the non-β-lactam group. After applying mixed-effects logistic regression, prophylactic treatment with a non-β-lactam regimen was associated with significantly higher odds of surgical site infection (odds ratio 1.65, 95% CI 1.20 to 2.26, $p < 0.01$).

CONCLUSIONS: Colectomy patients receiving β-lactam antibiotics had a lower likelihood of SSI compared with those receiving non-β-lactam antibiotics, even when antibiotics were compliant with national recommendations. Our findings suggest that surgeons should prescribe β-lactam antibiotics for prophylaxis whenever possible, reserving alternatives for those rare patients with true allergies or clinical indications for non-β-lactam antibiotic prophylaxis. (J Am Coll Surg 2019;229: 487–496. © 2019 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)

P1= 6.1%
P2= 9.5%

Surgical site infection (SSI) represents a significant preventable source of morbidity, mortality, and cost.[1-3] With estimates of 1 million additional hospital days and $1.5 billion in added costs,[3] reducing SSIs is an imperative patient safety and quality improvement opportunity. For patients undergoing operations, the rate of SSI is approximately

CME questions for this article available at http://jacscme.facs.org

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Randomised Controlled Trial

A randomized controlled trial on irrigation of open appendectomy wound with gentamicin- saline solution versus saline solution for prevention of surgical site infection

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ARTICLE INFO

Keywords:
Mesh terms): therapeutic irrigation
Surgical wound infection
Appendectomy
Gentamicins
Saline solution
Randomized controlled trial

ABSTRACT

Background: Surgical site infection (SSI) is one of the most common complications after abdominal surgery. The present trial examined the efficacy of saline irrigation of open appendectomy wound with or without topical antibiotics in prevention of SSI.

Methods: This was a double blind randomized trial on patients with acute appendicitis who underwent open appendectomy. Patients were randomly allocated to one of three equal groups; group I had layer-by-layer wound irrigation with gentamicin-saline solution, group II had wound irrigation with saline solution, and group III received no irrigation (Control group). The main outcome measures were the incidence of incisional SSI, surgical site occurrence (SSO), other complications, operation time, postoperative pain, and patients' satisfaction.

Results: 205 patients (113 female) of a mean age of 27.9 years were included. The average hospital stay and pain scores were similar in the three groups. Groups I and II had significantly lower rates of incisional SSI (4.3% Vs 2.9%; Vs 17.4%, p = 0.005) and SSO (24.6% Vs 13.4% Vs 43.5%; p = 0.0003) as compared to group III. Groups I and II had comparable rates of SSI and SSO. The three groups had similar rates of wound seroma, hematoma, and dehiscence. Groups I and II had significantly higher satisfaction with the procedure than group III.

Conclusions: Layer-by-layer irrigation of open appendectomy wound decreased the rates of incisional SSI and SSO significantly compared to the no-irrigation group. Adding gentamicin to saline solution was useless to improve the outcome and did not decrease rates of SSI or other complications.

PROPORTIONS

International Journal of Surgery 81 (2020) 140–146

- Group I had layer by layer irrigation of the surgical wound with gentamicin-saline solution.
- Group II had layer by layer wound irrigation with normal saline 0.9% solution.
- Group III (Control group) did not receive wound irrigation.

Gr1 =4.3%
Gr2 =2.9%
Gr3 =17.4%

Surgical Endoscopy (2019) 33:2072–2082
https://doi.org/10.1007/s00464-019-06746-6

REVIEW ARTICLE

Laparoscopic appendicectomy is superior to open sur for complicated appendicitis

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Received: 19 July 2018 / Accepted: 6 March 2019 / Published online: 13 March 2019

Abstract

Background Over the last three decades, laparoscopic appendicectomy (LA) has bec plicated acute appendicitis. The role of laparoscopic surgery for complicated appen remains controversial due to concerns of an increased incidence of post-operative in compared to open appendicectomy (OA). The aim of this study was to compare the o cated appendicitis.

Methods A systematic literature search following PRISMA guidelines was conducted and Cochrane Database for randomised controlled trials (RCT) and case–control stud for complicated appendicitis.

Results Data from three RCT and 30 CCS on 6428 patients (OA 3,254, LA 3,174) w difference in the rate of IAA (LA = 6.1% vs. OA = 4.6%; OR = 1.02, 95% CI = 0.71 appendicitis has decreased overall post-operative morbidity (LA = 15.5% vs. OA = 2 $p < 0.0001$), wound infection, (LA = 4.7% vs. OA = 12.8%; OR = 0.26, 95% CI: 0.19–(tions (LA = 1.8% vs. OA = 6.4%; OR = 0.25, 95% CI: 0.13–0.49, $p < 0.001$), post-op (LA = 3.1% vs. OA = 3.6%; OR = 0.65, 95% CI: 0.42–1.0, $p = 0.048$) and mortality rat 95% CI: 0.04–0.61, $p = 0.008$). LA has a significantly shorter hospital stay (6.4 days vs. tion of solid food (2.7 days vs. 3.7 days, $p = 0.03$).

Conclusion These results clearly demonstrate that LA for complicated appendicitis significantly reduced morbidity, mortality and length of hospital stay compared with C dicitis at laparoscopy is not an indication for conversion to open surgery. LA should with complicated appendicitis.

Keywords Laparoscopic appendicectomy · Open appendicectomy · Complicated appendicitis · Gangrenous appendicitis · Perforated appendicitis · Appendiceal abscess

Secondary outcomes

Twenty-five studies reported the operative duration (OT) [26–30, 32, 34, 36–39, 42–46, 48–50, 52–57] which was similar (LA group 74.6 min ± 19.6 and OA group 82.2 min ± 24.7, $p = 0.19$) (Table 4). Thirty studies reported the average LOS [26–30, 32–34, 36–39, 42–57] which was significantly shorter for the LA group (6.4 ± 2.8 days) compared to the OA group (8.9 ± 4.8 days) ($p = 0.02$) (Table 4). Twelve studies reported the average time to resume normal diet [26–30, 32–34, 36–39, 42–57] which was significantly shorter for the LA group (2.7 ± 0.9 days) compared with the OA group (3.7 ± 1.1 days) ($p = 0.03$) (Table 4). Eight studies reported the duration of IV antibiotics and there was no significant difference between LA and OA ($p = 0.49$) (Table 4).

Table 4 Secondary outcomes for combined RCT and CSS data

	# of studies	LA	OA	*p* value
Mean length of hospital stay (days)	30	6.4 ± 2.8	8.9 ± 4.8	0.02
Mean OT (min)	25	82.2 ± 24.7	74.6 ± 19.6	0.19
Solid food resumption (days)	12	2.7 ± 0.9	3.7 ± 1.1	0.03
IV Abx (day)	8	5.5 ± 1.8	6.3 ± 3.2	0.49

acute cholecystitis [60].

As the majority of the studies used in the present study were CCS, there may be some risks of bias of some form that may favours better outcomes in the LA group. One potential selection bias is the patient co-morbidities resulting in bias that may favour either LA or OA. As the patient characteristics in both groups including sex, gender, BMI and ASA scores were similar, a selection bias based on co-morbidities is most unlikely. Another potential bias is the nature or extent of disease may be different due to a selection bias that may favour one approach. Although there was a range of definitions for complicated appendicitis across the various studies, there was no significant difference in the distribution of disease between the LA and OA groups. Similarly, there was no significant difference in the duration of symptoms between LA and OA. The

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Journal of Bone Oncology

journal homepage: www.elsevier.com/locate/jbo

The minimally invasive endoscopic technique for the treatment of symptomatic benign bone lesions: Preliminary results from a retrospective study

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ARTICLE INFO

Keywords:
Minimally invasive
Endoscopy
Benign bone lesion
Clinical efficacy
Surgical intervention

ABSTRACT

Objective: The present study aimed to evaluate the short-term clinical feasibility and effic invasive endoscopic technique (MIET) for the treatment of symptomatic benign bone lesic
Materials and methods: This single-institution retrospective study investigated 34 patien benign bone lesions from December 2015 to June 2017. Patients involved in this study pr indications for surgical intervention. All procedures were performed under endoscopic gu sualization followed by complete curettage of tumor tissue. There were 19 males and 15 f age of 33.3 ± 12.7 years (range, 17–68 years). The lesions were located in the upper extr lower extremities (9, 26.5%) and pelvis (5, 14.7%). Primary outcomes were measured be vention using the visual analog scale (VAS), the Musculoskeletal Tumor Society (MSTS) stage and the 36-item Short-Form Health Survey (SF-36) scoring system.
Results: Of the 34 patients included in this study, all completed follow-up examinations, with a mean follow-up duration of 22.4 ± 7.6 months (range, 13–35 months). Significantly improved VAS, MSTS and SF-36 scores were observed at 3 months after the initial treatment ($P < 0.001$), suggesting enhanced pain relief and improved functional recovery and quality of life following surgery. All procedures were technically successful, with the exception of 3 cases (8.8%) manifesting access site numbness; these patients recovered within the follow-up period through symptomatic treatment alone. Only 2 patients (5.9%; one osteoblastoma and one enchondroma) experienced local recurrence and underwent standard open curettage within the follow-up period. All patients showed functional stability without any major complications.
Conclusion: The MIET is an effective and safe alternative treatment for symptomatic benign bone lesions. The short-term efficacy of MIET was favorable and associated with improved pain palliation, quality of life and functional recovery.

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Table 2
Preoperative and postoperative data regarding surgical efficacy according to the VAS, MSTS and SF-36 scores.

	Pre	Pos	t value	P value
VAS score	4.9 ± 1.4	0.3 ± 0.5	18.6053	< 0.001
MSTS score	17.8 ± 2.8	25.5 ± 1.9	−20.0909	< 0.001
SF-36 score	61.1 ± 6.2	79.7 ± 5.5	−26.6391	< 0.001

Pre: Preoperatively, Pos: Postoperatively, VAS: Visual analog scale, MSTS: Musculoskeletal Tumor Society, SF-36: 36-item Short-Form Health Survey.

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OF MEANS

Randomised Controlled Trial

A randomized controlled trial on irrigation of open appe with gentamicin- saline solution versus saline solution fo surgical site infection

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ABSTRACT

Background: Surgical site infection (SSI) is one of the m present trial examined the efficacy of saline irrigation antibiotics in prevention of SSI.

Methods: This was a double-blind randomized trial on patients with acute appendicitis who underwent open appendectomy. Patients were randomly allocated to one of three equal groups; group I had layer-by-layer wound irrigation with gentamicin-saline solution, group II had wound irrigation with saline solution, and group III received no irrigation (Control group). The main outcome measures were the incidence of incisional SSI, surgical site occurrence (SSO), other complications, operation time, postoperative pain, and patients' satisfaction.

Results: 205 patients (113 female) of a mean age of 27.9 years were included. The average hospital stay and pain scores were similar in the three groups. Groups I and II had significantly lower rates of incisional SSI (4.3% Vs 2.9%; Vs 17.4%, p = 0.005) and SSO (24.6% Vs 13.4% Vs 43.5%; p = 0.0003) as compared to group III. Groups I and II had comparable rates of SSI and SSO. The three groups had similar rates of wound seroma, hematoma, and dehiscence. Groups I and II had significantly higher satisfaction with the procedure than group III.

Conclusions: Layer-by-layer irrigation of open appendectomy wound decreased the rates of incisional SSI and SSO significantly compared to the no-irrigation group. Adding gentamicin to saline solution was useless to improve the outcome and did not decrease rates of SSI or other complications.

Table 2
Outcome of the three groups.

Variable	Gentamicin-saline (N = 69)	Saline (N = 67)	No irrigation (N = 69)	P value
Mean operation time in minutes	55.1 (SD 8.7)	55.6 (SD 8.2)	50.2 (SD 8.4)	**<0.001**
Surgical site infection (%)	3 (4.3)	2 (2.9)	12 (17.4)	**0.005**
Seroma (%)	12 (17.4)	6 (8.9)	15 (21.7)	0.11
Hematoma (%)	2 (2.8)	1 (1.5)	1 (1.4)	0.84
Wound dehiscence (%)	0	0	2 (2.8)	0.22
Total surgical site occurrence (%)	17 (24.6)	9 (13.4)	30 (43.5)	**<0.001**
Other complications (%)	2 (2.8)	3 (4.4)	1 (1.4)	0.45
Mean hospital stay in days	1.1 (SD 0.26)	1.05 (SD 0.24)	1.14 (SD 0.3)	0.18

Table 3
Patient-reported outcomes of the three groups.

Variable		Gentamicin-saline (N = 69)	Saline (N = 67)	No irrigation (N = 69)	P value
Pain visual analogue score		4.04 (SD 1.4)	3.68 (SD 1.2)	4.13 (SD 1.6)	0.83
Satisfaction	**Satisfied (%)**	52 (75.3)	59 (88)	41 (59.4)	**<0.001**
	Partly satisfied (%)	12 (17.4)	6 (9)	13 (18.8)	
	Unsatisfied (%)	5 (7.2)	2 (3)	15 (21.7)	

4. Discussion