

ANALYSIS MANAGER

User's Guide for Stata



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1.0 Introduction

Analysis Manager (AM) is user-friendly software that integrates data and statistical code with document preparation in Microsoft Word. AM facilitates reproducible research by bundling Word documents, such as a manuscript, with associated data and statistical code. Word documents prepared with AM are reproducible dynamic documents: statistical results in the document can be automatically updated if either statistical code or data change. .

AM is provided as a free Word plug-in written in C#. Once installed, AM is accessible from the Word toolbar. This user's guide covers use of AM within a Windows environment for Microsoft Word partnered with Stata statistical software (StataCorp. 2015. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP). Future versions of AM will allow use of statistical code written for other programming software (R, SAS) as well as use within a Mac operating system.

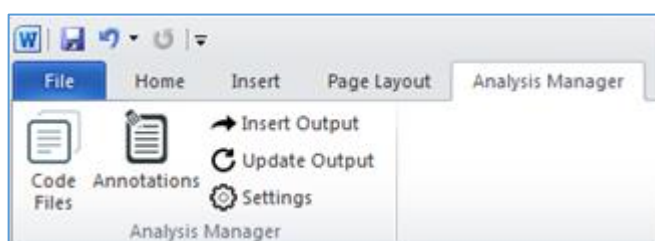
2.0 Setup

To use AM with Stata, the AM plug-in must be installed, and the Stata Automation API (Application Program Interface) must be enabled¹. The Stata Automation API allows AM and Stata to exchange information. AM sends 'calls' to Stata to execute statistical code, and Stata in turn sends back the results of the code to be inserted in the Word document.

Note: You must install the AM plug-in first, before installing the Stata Automation API. Both installation of the AM plug-in and enabling the Stata Automation API require administrator access on your computer.

Installing the AM Plug-In:

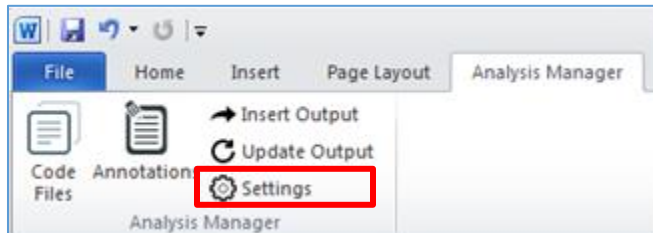
1. Download the AM setup.exe file.
2. When prompted, click "Run" and follow the InstallShield Wizard.
3. Open Microsoft Word. If AM has installed successfully, your Word toolbar will include an "Analysis Manager" tab that will look like this:



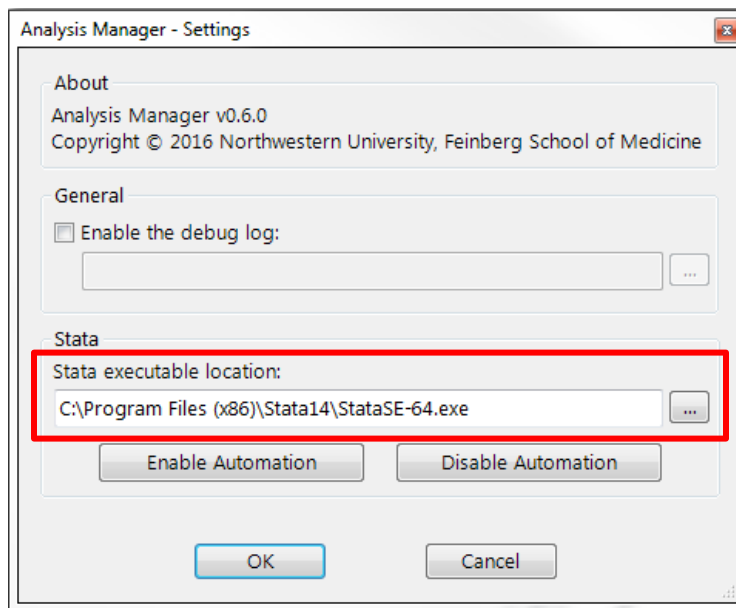
¹ <http://www.stata.com/automation/>

Enabling the Stata Automation API:

4. Select the "Analysis Manger" tab on the top tool bar.
5. Select 'Settings.'



6. Under "Stata executable location," enter the file path for Stata on your computer. This may look something like C:\Program Files (x86)\Stata14\StataSE-64.exe.



Note: To locate the file path of your Stata program, open Stata, and type 'sysdir' in the command line. This returns the installation pathway. Open the folder in your windows explorer to verify the pathway and identify the name of your Stata executable (.exe) file.

7. After the file path has been set, click 'Enable Automation' to allow Word and Stata to communicate via the Stata Automation API.
8. Click 'OK' to return to main screen.

Note: You only have to do this step on initial installation of Analysis Manager. Updates to AM will not require re-enabling Stata Automation.

3.0 Basics of Analysis Manager

We recommend that you begin with a “.do” file that already contains your statistical code and generates the results of interest. With AM, it is possible to write your statistical code directly from Word, but not as convenient as writing your .do files in Stata’s editor. Once linked to your Word document through AM, results from your statistical code may be placed within your Word document.

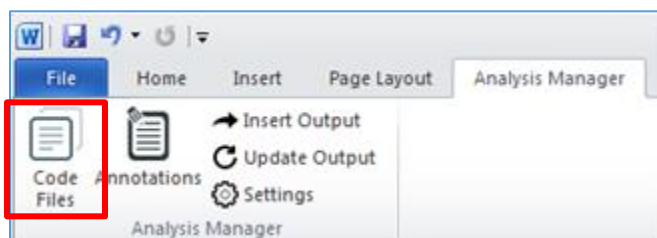
There are three steps to using AM.

1. Connect a Word document to files containing statistical code (i.e. a “do” file).
2. Annotate the code files to tag results, tables, or figures that are of interest.
3. Instruct AM where to insert those results within the Word document itself.

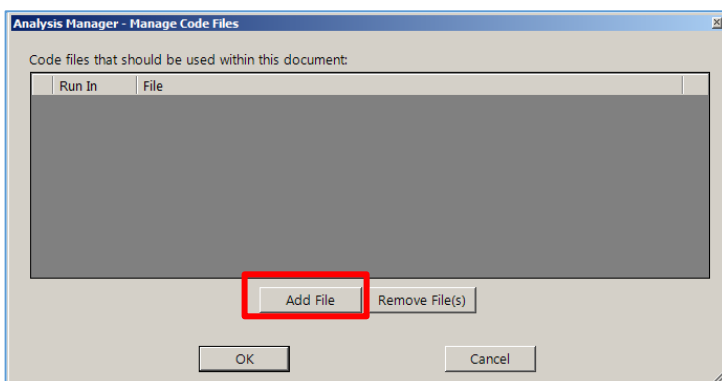
3.1 Connecting Word and Statistical Code

The first step to using AM is to connect your Word document with your statistical code. Note that it is possible to connect multiple code files to one Word document. On the Analysis Manager tab:

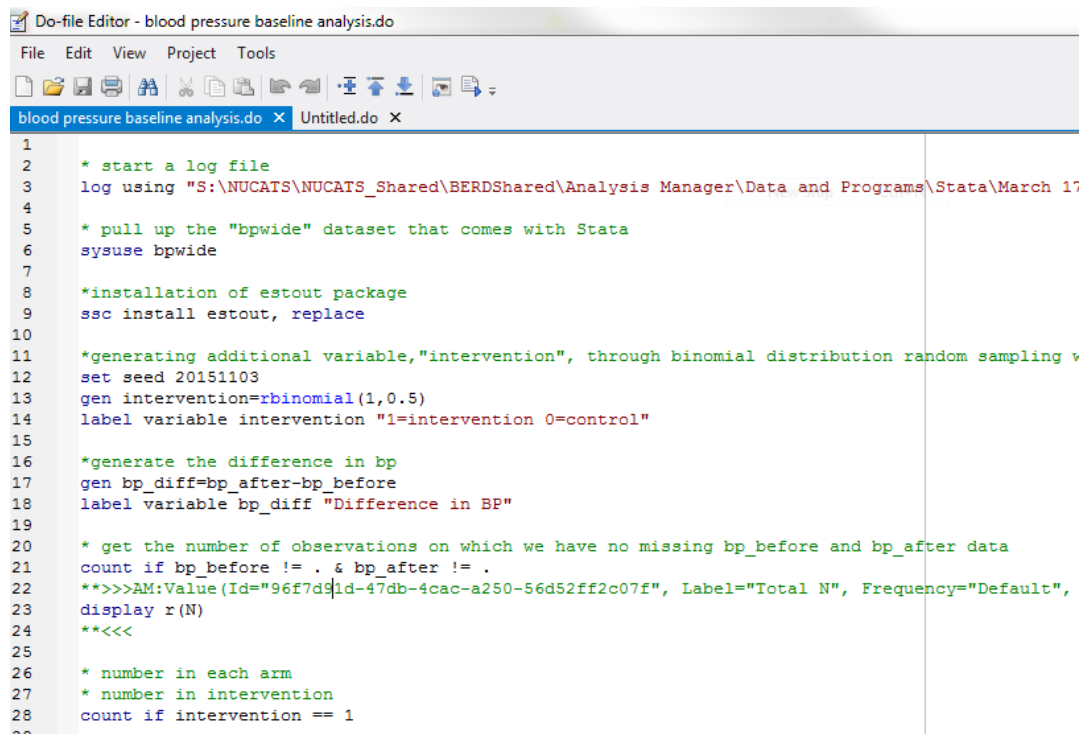
1. Click “Code Files” to open the following dialog box.



2. Select ‘Add File’ to add a new statistical code file. A Windows Explorer box will open through which you should navigate to find the appropriate code file. This must be a Stata do file.



3. Locate the statistical code file and click "Open". For illustration, we will use the following example do file, which is included in full in Appendix 2:



```
Do-file Editor - blood pressure baseline analysis.do
File Edit View Project Tools
blood pressure baseline analysis.do x Untitled.do x

1
2 * start a log file
3 log using "S:\NUCATS\NUCATS_Shared\BERDShared\Analysis Manager\Data and Programs\Stata\March 17
4
5 * pull up the "bpwide" dataset that comes with Stata
6 sysuse bpwide
7
8 *installation of estout package
9 ssc install estout, replace
10
11 *generating additional variable, "intervention", through binomial distribution random sampling v
12 set seed 20151103
13 gen intervention=rbinomial(1,0.5)
14 label variable intervention "1=intervention 0=control"
15
16 *generate the difference in bp
17 gen bp_diff=bp_after-bp_before
18 label variable bp_diff "Difference in BP"
19
20 * get the number of observations on which we have no missing bp_before and bp_after data
21 count if bp_before != . & bp_after != .
22 **>>>AM:Value(Id="96f7d91d-47db-4cac-a250-56d52ff2c07f", Label="Total N", Frequency="Default",
23 display r(N)
24 **<<<
25
26 * number in each arm
27 * number in intervention
28 count if intervention == 1
29
```

4. Click 'OK'.

Note: You can connect multiple Stata source code files to a single Word document. By default, the current version of AM will recognize only "do" files.

3.2 Annotating Statistical Code

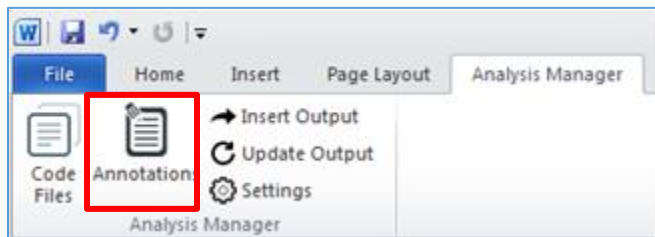
Once you have connected your statistical code file to your Word document, you are ready to create annotations. Annotations in your code file(s) identify numbers, tables, or figures that you would like to embed in your Word document. Annotations can be inserted through AM, using the following instructions, or can be directly written by you into your Stata code. Annotations are specifically formatted text that Stata interprets as comments but that allow AM to pull results in to Word.

In the following example, we create an annotation for a single value. Section 4 covers additional information on creating annotations for tables and figures, and the corresponding commands that must be present in your statistical code.

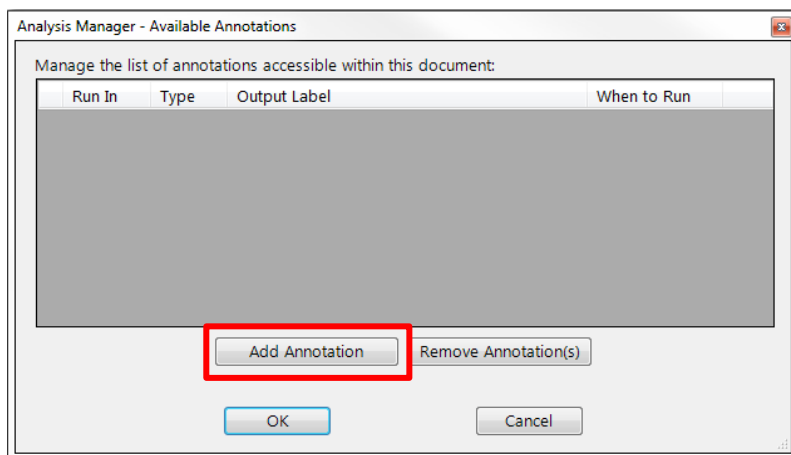
To create annotations through AM:

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1. On the “Analysis Manager” tab, click “Annotations” to open the dialog box



2. Click “Add Annotation” to create a new annotation.



3. A dialog box will open containing:

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Annotation

1 Code file: S:\NUCATS\NUCATS_Shared\BERDShared\Analysis Manager\Data and Programs\Stata\March 17

2 When should this code run: Default

3 Output label:

4 Click in the margin to define annotations:

```
1
2 * start a log file
3 log using "S:\NUCATS\NUCATS_Shared\BERDShared\Analysis Manager\Data and Programs\Stata\March 17"
4
5 * pull up the "bpwide" dataset that comes with Stata
6 sysuse bpwide
7
8 *installation of estout package
9 ssc install estout, replace
10
11 *generating additional variable, "intervention", through binomial distribution random sampling w
12 set seed 20151103
13 gen intervention=rbinomial(1,0.5)
14 label variable intervention "1=intervention 0=control"
15
16 *generate the difference in bp
17 gen bp_diff=bp_after-bp_before
18 label variable bp_diff "Difference in BP"
19
20 * get the number of observations on which we have no missing bp_before and bp_after data
21 count if bp_before != . & bp_after != .
22
23 * number in each arm
24 * number in intervention
25 count if intervention == 1
26
```

5 How should these results be accessible from the document:

Value ☒ Default (exact output from statistical package)

Figure ☐ Numeric

Table ☐ Date/Time

☐ Percentage

OK Cancel

4. The dialog box has the following components:

(1) Code File

- If you have only 1 code file linked to your Word document, this will be automatically selected in the drop down menu
- If you have 2 or more code files linked to your document, use the drop down menu to select the code file you are using to make the new annotation.

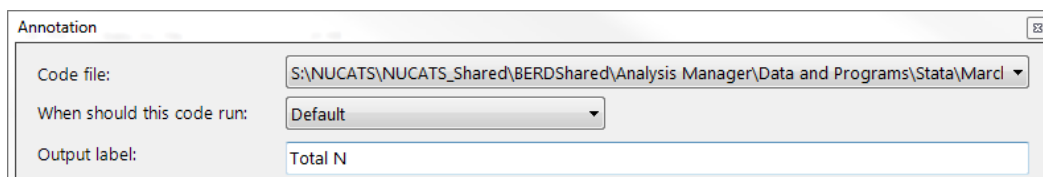
(2) When should this code run

- Default is the automatic selection. The results within the Word document will be updated automatically by AM.
- On Demand may also be selected. The results within the Word document will be updated only when you instruct AM to update them. This is particularly useful for code that takes a long time to run.

(3) Output label

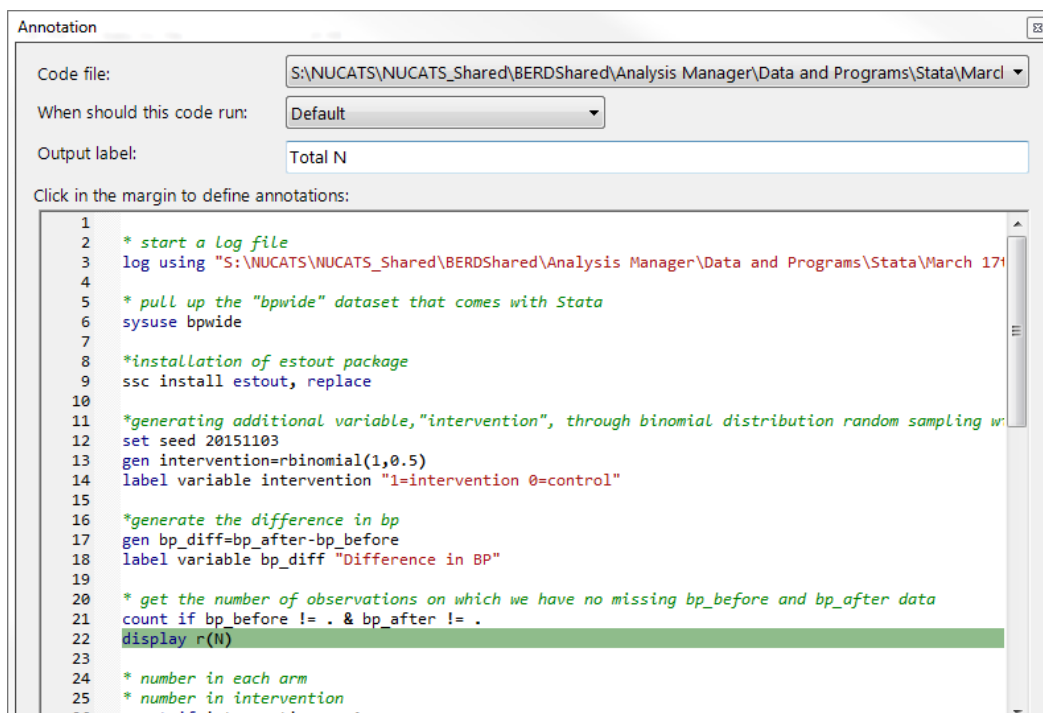
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- i. The output label is the unique name of the annotation, and should only be used to identify one annotation.
 - ii. The output label can contain any string of characters including special characters and spaces.
 - (4) Text editor showing the statistical code
 - i. The statistical code may be edited directly through AM. Any changes you make are made to the file itself and saved immediately.
 - (5) Selection pane to tell AM if the annotation will be a value, figure, or table, and how the data should be managed. More information on annotations for tables and figures is provided in section 4.
5. For each new annotation enter an Output label.



The screenshot shows the 'Annotation' dialog box. It has three main fields: 'Code file:' with a dropdown menu showing 'S:\NUCATS\NUCATS_Shared\BERDShared\Analysis Manager\Data and Programs\Stata\Marc...', 'When should this code run:' with a dropdown menu showing 'Default', and 'Output label:' with a text input field containing 'Total N'.

6. Highlight the segment of code containing display command (or matrix or graph export; see Section 4) for the result of interest. To highlight the code segment, click between the line number and the start of the line of code. Clicking in this margin will highlight the line of code in green. You can select multiple lines, but as best practice, select only the lines containing the result of interest.

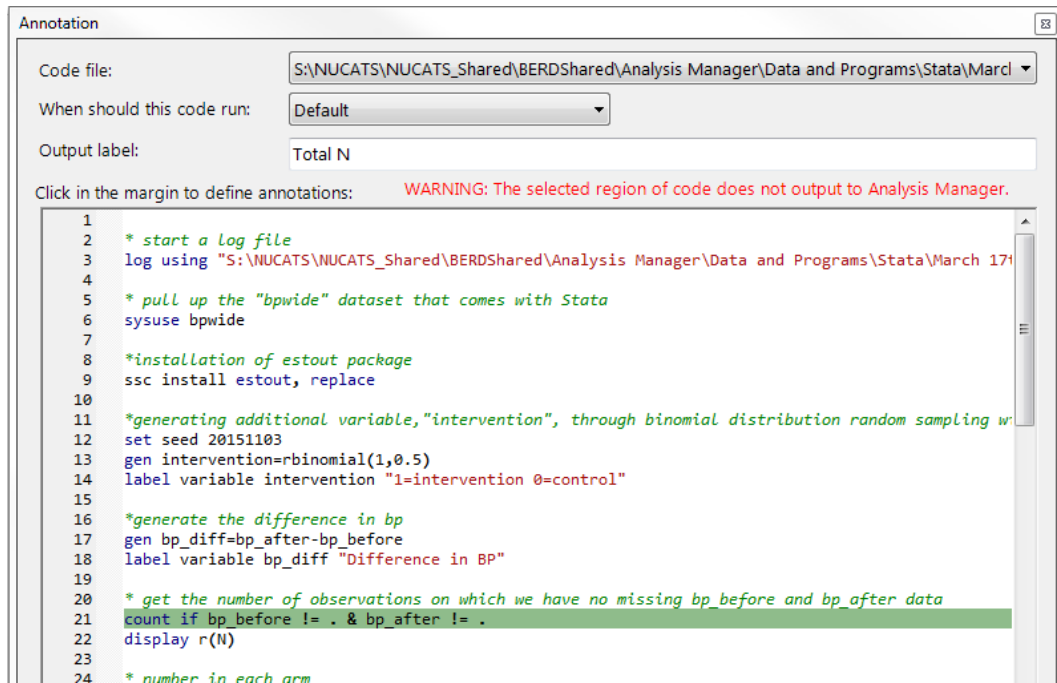


The screenshot shows the 'Annotation' dialog box with a code editor. The code editor displays Stata commands. Line 22, which contains the command `display r(N)`, is highlighted in green. The code editor also shows line numbers from 1 to 26. The code includes comments and commands for setting up the environment, installing packages, generating variables, and displaying results.

```
1
2  * start a log file
3  log using "S:\NUCATS\NUCATS_Shared\BERDShared\Analysis Manager\Data and Programs\Stata\March 17"
4
5  * pull up the "bpwide" dataset that comes with Stata
6  sysuse bpwide
7
8  *installation of estout package
9  ssc install estout, replace
10
11 *generating additional variable, "intervention", through binomial distribution random sampling w
12 set seed 20151103
13 gen intervention=rbinomial(1,0.5)
14 label variable intervention "1=intervention 0=control"
15
16 *generate the difference in bp
17 gen bp_diff=bp_after-bp_before
18 label variable bp_diff "Difference in BP"
19
20 * get the number of observations on which we have no missing bp_before and bp_after data
21 count if bp_before != . & bp_after != .
22 display r(N)
23
24 * number in each arm
25 * number in intervention
26 count if intervention == 1
```

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- Note, if your selection of code does not include a display, matrix, or graph export command, AM will print an error in the top right of the text editor.



- Select any formatting preferences in the bottom pane.

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Annotation

Code file: S:\NUCATS\NUCATS_Shared\BERDShared\Analysis Manager\Data and Programs\Stata\Marc

When should this code run: Default

Output label: Total N

Click in the margin to define annotations:

```
1
2 * start a log file
3 log using "S:\NUCATS\NUCATS_Shared\BERDShared\Analysis Manager\Data and Programs\Stata\Marc
4
5 * pull up the "bpwide" dataset that comes with Stata
6 sysuse bpwide
7
8 *installation of estout package
9 ssc install estout, replace
10
11 *generating additional variable,"intervention", through binomial distribution random sampling w
12 set seed 20151103
13 gen intervention=rbinomial(1,0.5)
14 label variable intervention "1=intervention 0=control"
15
16 *generate the difference in bp
17 gen bp_diff=bp_after-bp_before
18 label variable bp_diff "Difference in BP"
19
20 * get the number of observations on which we have no missing bp_before and bp_after data
21 count if bp_before != . & bp_after != .
22 display r(N)
23
24 * number in each arm
25 * number in intervention
26 count if intervention == 1
```

How should these results be accessible from the document:

Value ☒ Default (exact output from statistical package)

Figure ☐ Numeric

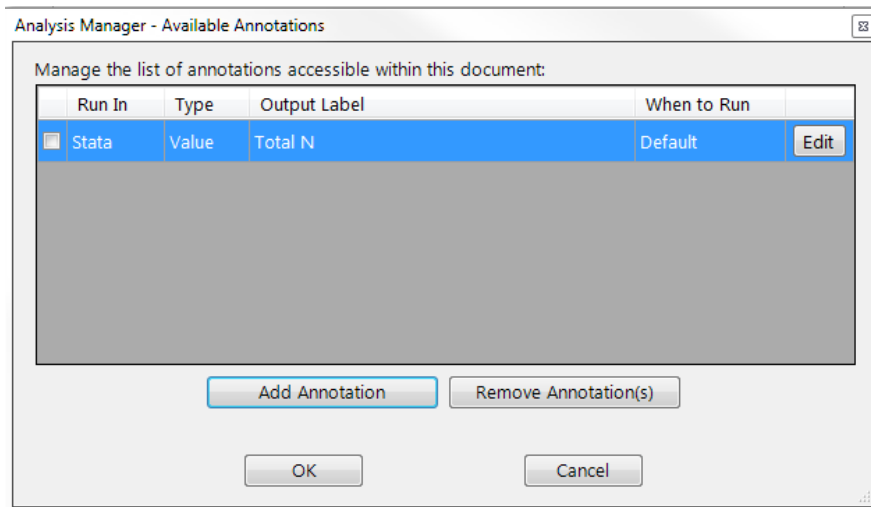
Table ☐ Date/Time

☐ Percentage

OK Cancel

9. Click 'OK'.

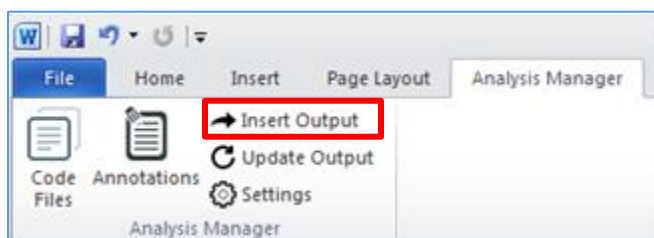
10. Once your annotation has been made, it will appear in the Available Annotations window.



- Existing annotations can be edited or removed from the Available Annotations window. Click 'edit' to open any existing annotation to change the settings. Click one or more annotation check boxes, and "Remove Annotation(s)" to remove them from your statistical code file.

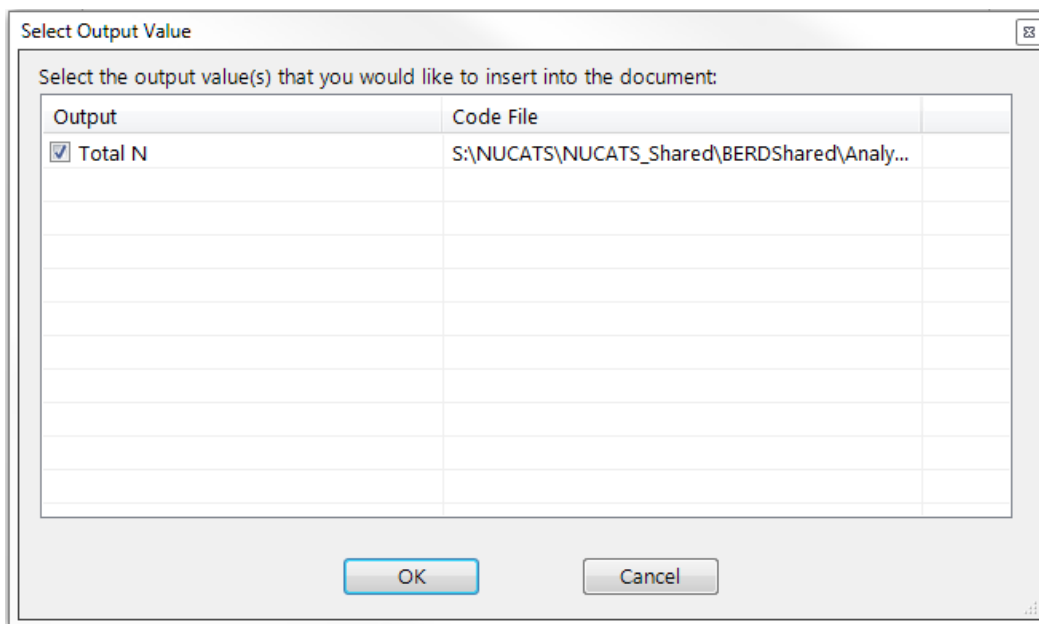
3.3 Inserting Statistical Output into the Word Document

- After your Annotation has been made, and the Available Annotations window is closed, select the location in your Word document in which you would like to place the number, matrix, or graph, by placing your cursor there.
- Click 'Insert Output' in the AM tab

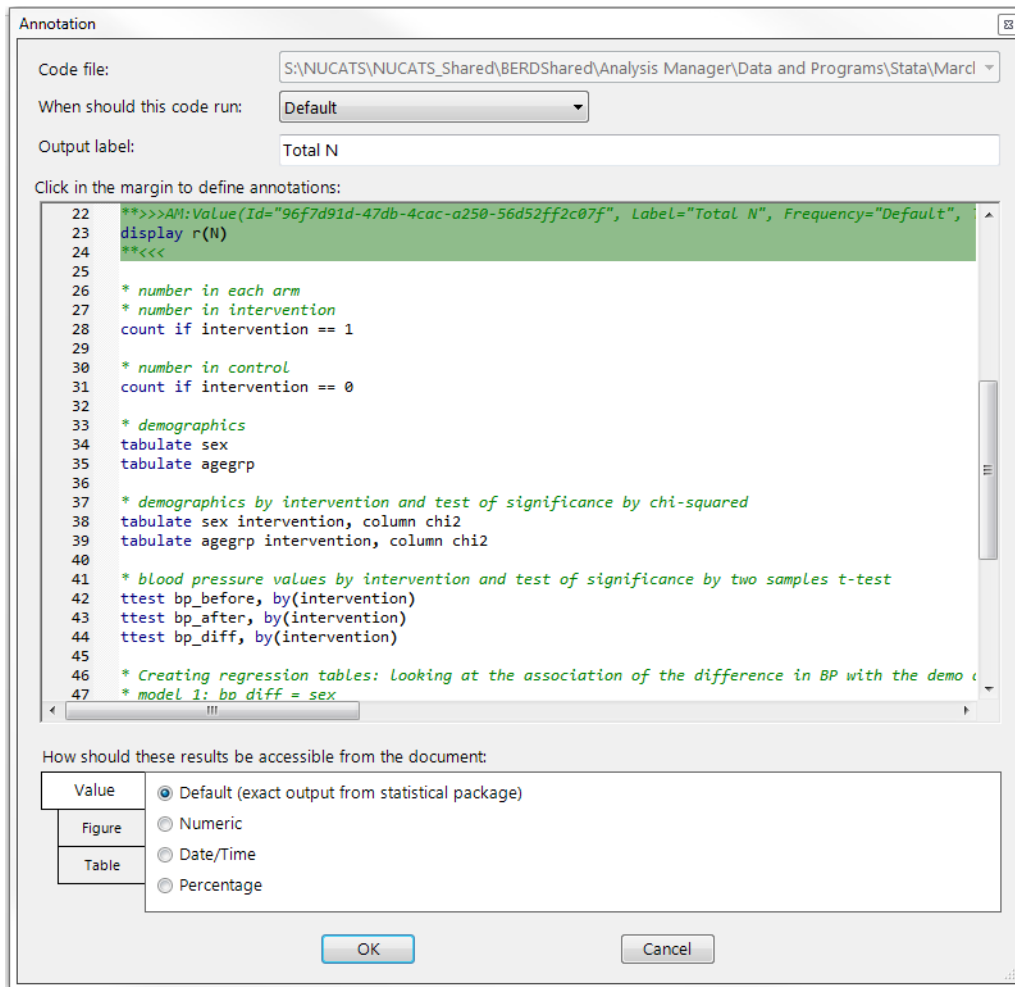


- Select the annotation to insert from the pop-up window, and click 'Ok'.

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4. When an annotation is inserted into Word, AM will run the entire .do file, and pull the specific result (either a number, table, or figure) into your Word file.
5. Once the returned number, figure, or table is inserted into your Word document, double clicking on the annotation will open the Annotation window, from which you can modify the characteristics of the annotation (name, when to run) or the associated Stata code.



4.0 Annotation Structure and Syntax

We use three Stata commands to identify results of interest and create annotations.

1. display
2. matrix list
3. graph export

In order to return results from your statistical analysis to Word, your results must be displayed to your Stata results window through one of the above commands, and encapsulated in an annotation. Other lines in your Stata code should not be encapsulated by annotation, as they may cause errors.

4.1 Values

Values are returned to Word with the “display” command. The “display” command is used in Stata code to print strings or scalar values. The display command is typically used with the return command to retrieve stored results. The following examples use the blood pressure data set, with random assignment of intervention as in Appendix B:

1. Counting the number of observations

```
. count if bp_before != . & bp_after != .
120

. return list

scalars:

               r(N) = 120

. display r(N)
120
```

2. 2-way frequency table, returning the chi-squared p-value

```
. tabulate agegrp intervention, chi2
```

Age Group	1=intervention 0=control		Total
	0	1	
30-45	23	17	40
46-59	19	21	40
60+	14	26	40
Total	56	64	120

```

Pearson chi2 (2) = 4.0848 Pr = 0.130

. return list

scalars:

               r(N) = 120
               r(r) = 3
               r(c) = 2
             r(chi2) = 4.084821428571428
               r(p) = .129715626337871

. display r(p)
.12971563
```

3. Return Estimates

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```
. regress bp_diff sex
```

Source	SS	df	MS	Number of obs	=	120
Model	216.008333	1	216.008333	F(1, 118)	=	0.77
Residual	33025.9833	118	279.881215	Prob > F	=	0.3815
				R-squared	=	0.0065
				Adj R-squared	=	-0.0019
Total	33241.9917	119	279.344468	Root MSE	=	16.73

bp_diff	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sex	-2.683333	3.054402	-0.88	0.381	-8.731882	3.365215
_cons	-3.75	2.159789	-1.74	0.085	-8.026969	.5269695

```
. ereturn list
```

scalars:

```

      e(N) = 120
    e(df_m) = 1
    e(df_r) = 118
      e(F) = .7717857505126204
      e(r2) = .0064980562987729
    e(rmse) = 16.72965076411536
    e(mss) = 216.0083333333387
    e(rss) = 33025.98333333334
    e(r2_a) = -.0019214516986952
    e(ll) = -507.3261136798324
    e(ll_0) = -507.7172693142865
    e(rank) = 2

```

macros:

```

      e(cmdline) : "regress bp_diff sex"
      e(title) : "Linear regression"
    e(marginsok) : "XB default"
      e(vce) : "ols"
    e(depvar) : "bp_diff"
      e(cmd) : "regress"
    e(properties) : "b V"
    e(predict) : "regres_p"
    e(estat_cmd) : "regress_estat"

```

matrices:

```

      e(b) : 1 x 2
      e(V) : 2 x 2

```

functions:

```

      e(sample)

```

4. Display a local or global variable

```
. tabulate agegrp intervention, matcell(x)
```

Age Group	1=intervention 0=control		Total
	0	1	
30-45	23	17	40
46-59	19	21	40
60+	14	26	40
Total	56	64	120

```
. local group1control = x[1,1]
```

```
. display `group1control'
```

```
23
```

The “display” command will always return a scalar value or a string. It will not return data in any other format, such as a matrix, and it cannot be used to display a component of a matrix. If a value or scalar cannot be printed to Stata using the “display” command, additional code to store the value in a local or global macro variable can be included as in example 4 above.

4.2 Matrix

Tables are returned to Word with the “matrix list” command. The “matrix list” command is used in Stata code to print a matrix to the output window. The “matrix list” command is typically used after creation of a matrix with the “mkmat” or “matrix define” commands. The following examples use the blood pressure data set, with random assignment of intervention as in Appendix B:

1. Simple matrix of tabulated results

```
. tabulate agegrp intervention, matcell(A)
```

Age Group	1=intervention 0=control		Total
	0	1	
30-45	23	17	40
46-59	19	21	40
60+	14	26	40
Total	56	64	120

```
. matrix list A
```

```
A[3,2]
      c1  c2
r1  23  17
r2  19  21
r3  14  26
```

2. Table 1 using a function (See Appendix B for full code)

```
. mkmat control1 - pval if nn < $rowct, matrix(B) rownames(rowname)
```

```
. matrix list B
```

```
B[8,5]
      control1  control2  int1  int2  pval
sex__0      29  .24166666  31  .25833333  .71439302
sex__1      27  .22499999  33  .27500001  .
agegrp__1    23  .19166666  17  .14166667  .12971562
agegrp__2    19  .15833333  21  .175      .
agegrp__3    14  .11666667  26  .21666667  .
bp_before  155.08928  10.645147  157.64063  11.959412  .22235107
bp_after   149.80357  13.783283  152.71875  14.484221  .26288676
bp_diff    -5.2857141  15.513882  -4.921875  17.817688  .90589285
```

3. Matrix of Regression Model output using “estimates table”

```
regress bp_diff sex
estimates store model1

xi: regress bp_diff i.agegrp
estimates store model2

regress bp_diff intervention
estimates store model3

xi: regress bp_diff sex i.agegrp intervention
estimates store model4
```

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```
. estimates table model1 model2 model3 model4
```

Variable	model1	model2	model3	model4
sex	-2.6833333			-2.6799306
_Iagegrp_2		3.025		3.0352082
_Iagegrp_3		3.75		3.7729685
intervention			.36383929	-.10208213
_cons	-3.75	-7.35	-5.2857143	-5.9666498

```
. matrix define C = r(coef)
```

```
. matrix list C
```

```
C[5,8]
```

	model1:	model1:	model2:	model2:	model3:	model3:	model4:	model4:
	b	var	b	var	b	var	b	var
sex	-2.6833333	9.3293738	.z	.z	.z	.z	-2.6799306	9.4918847
_Iagegrp_2	.z	.z	3.025	14.070716	.z	.z	3.0352082	14.320079
_Iagegrp_3	.z	.z	3.75	14.070716	.z	.z	3.7729685	14.721058
intervention	.z	.z	.z	.z	.36383929	9.4311927	-.10208213	9.8702441
_cons	-3.75	4.6646869	-7.35	7.0353579	-5.2857143	5.0299694	-5.9666498	11.126644

4. Matrix of Regression Model output using “estout”

```
. estout model1 model2 model3 model4, cells("b p")
```

	model1		model2		model3		model4	
	b	p	b	p	b	p	b	p
sex	-2.683333	.3814506					-2.679931	.3861911
_Iagegrp_2			3.025	.4216305			3.035208	.4241631
_Iagegrp_3			3.75	.3195149			3.772968	.3274934
intervention					.3638393	.9058928	-.1020821	.9741355
_cons	-3.75	.0851242	-7.35	.0065018	-5.285714	.0200811	-5.96665	.0762886

```
. matrix define D = r(coefs)
```

```
. matrix list D
```

```
D[5,8]
```

	model1:	model1:	model2:	model2:	model3:	model3:	model4:	model4:
	b	p	b	p	b	p	b	p
sex	-2.6833333	.38145055	.z	.z	.z	.z	-2.6799306	.38619115
_Iagegrp_2	.z	.z	3.025	.42163046	.z	.z	3.0352082	.42416306
_Iagegrp_3	.z	.z	3.75	.31951493	.z	.z	3.7729685	.32749338
intervention	.z	.z	.z	.z	.36383929	.90589284	-.10208213	.97413547
_cons	-3.75	.08512416	-7.35	.00650176	-5.2857143	.02008105	-5.9666498	.07628865

4.3 Figure

Figures are returned to Word with the “graph export” command. The “graph export” command saves a graph or figure to file outside of Stata, the location of which is specified by the user. AM will retrieve the file to insert into Word. The graph export command expects a pathway and file name to be specified along with the file format, and the “replace” option to overwrite an existing file as required.

Before they can be exported, graphs must first be displayed to the screen.

1. Create a graph

```
graph box bp_diff, over(intervention) title("Change in Blood Pressure by Group")
```

2. Export the graph in various formats

```
graph export "PathToFile\FileName.pdf", as(pdf) replace
graph export "PathToFile\FileName.eps", as(eps) replace
graph export "PathToFile\FileName.wmf", as(wmf) replace
graph export "PathToFile\FileName.emf", as(emf) replace
graph export "PathToFile\FileName.png", as(png) replace
graph export "PathToFile\FileName.tif", as(tif) replace
```

4.4 Syntax

An annotation always starts with `**>>>AM:Value(Label=" ", Frequency="",` and may contain additional information based on the type of annotation (number, table, or figure) it identifies. The annotation always ends with `**<<<`

```
**>>>AM:Value(Label=" ", Frequency="", Type="")
display r(N)
**<<<
```

```
**>>>AM:Table(Label="", Frequency="", ColumnNames=True, RowNames=True, Type="",
AllowInvalid=True, Decimals=0, Thousands=False)
matrix list matrixname
**<<<
```

```
**>>>AM:Figure(Label="", Frequency="")
graph export "S:\Pathway\File.pdf", as(pdf) replace
**<<<
```

If annotations are made through AM, this text will be written into your statistical code by the plug-in. The Label, Frequency, Type and Table parameters are inserted with the opening and closing tags by AM. For the more advanced user, you can also directly write annotations into your statistical code. If written by hand in the Stata code, you must write both the opening and closing tags, and provide a Label for each annotation.

Note: Annotations cannot be nested within each other.

5.0 Formatting Annotations

When created, formats should be chosen for each annotation using the Annotation window. Options may be selected for either Values or Tables. There are no formatting options for Figures.

5.1 Values

Values can be formatted by default (per the exact Stata output), as number with a specific number of decimal places, as a date/time combination, or as a percentage with a specific number of decimal places.

How should these results be accessible from the document:

Value	<input checked="" type="radio"/> Default (exact output from statistical package)
Figure	<input type="radio"/> Numeric
Table	<input type="radio"/> Date/Time
	<input type="radio"/> Percentage

OK Cancel

5.2 Tables

Matrices from Stata can be inserted to Word with or without their row and column names, and with a specific number of decimal places. Currently, formatting is applied to the entire table. Where data are blank or missing, a "." is returned in the particular cell. Once inserted to Word, the dimensions of a table should not be modified, as this will cause errors when updating the results. Data from individual cells in an inserted table can be copied to the text, and will retain their linkage to the original data. For example, if you wished to include a p-value in the text, copy the result from the table and paste into the text. When the table is updated, the value in the text will be updated as well.

How should these results be accessible from the document:

Value	<input type="checkbox"/> Include column names	Decimal places: 0
Figure	<input type="checkbox"/> Include row names	<input type="checkbox"/> Use 1000 separator (,)
Table		

OK Cancel

5.3 Formatting After Insertion

Once inserted, values and tables can be formatted using Word text formatting options, such as changing fonts, bolding, or italicizing. Updating the annotations will not affect the applied formatting in Word.

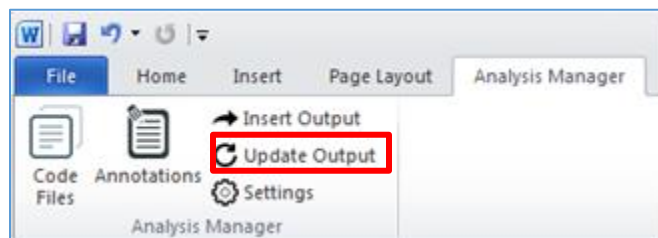
Annotations can also be copy and pasted, or cut and pasted to other parts of the text, and will retain their linkage to the statistical code. If your annotation is copied or inserted in multiple locations, updates within your statistical code will update every instance of the annotation within your text.

Annotations can be deleted from the text. Deleting the annotation from the text will not delete the annotation syntax within your statistical code. To delete the syntax, use the “Remove Annotations” option in the Annotations Window.

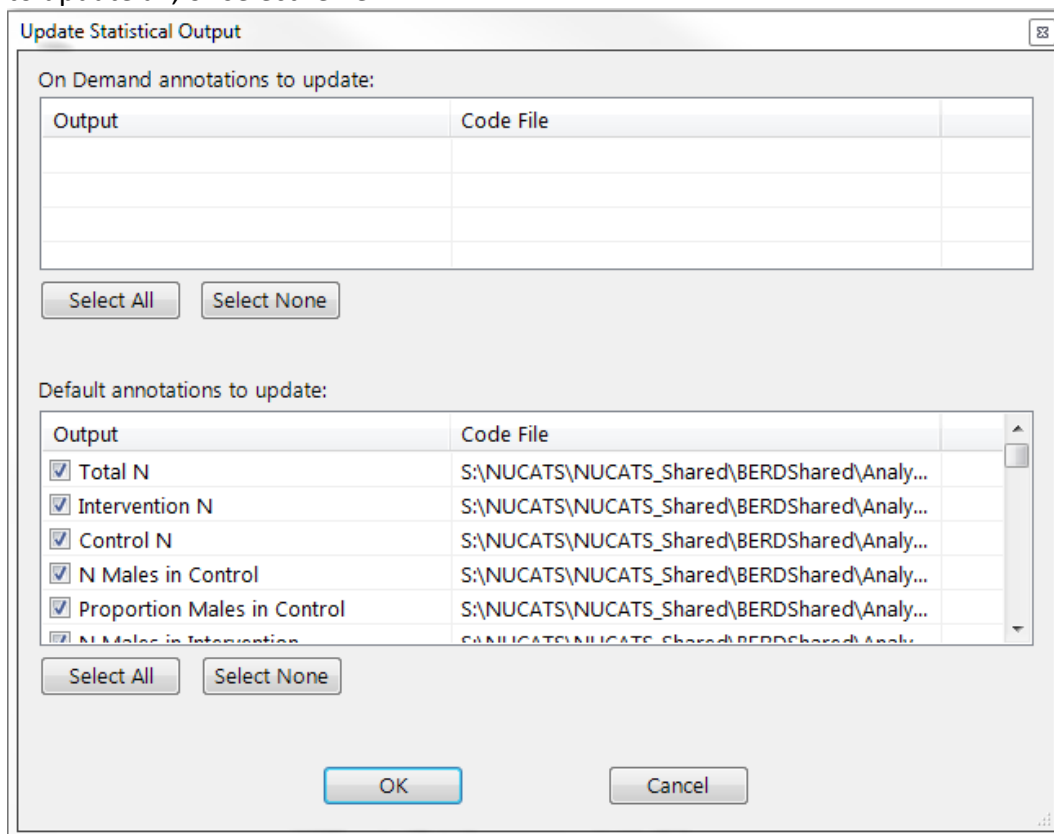
6.0 Updating Your Annotations

Annotations within your code will be updated when new annotations are made, each time the Stata code is executed. You can change this by setting the update frequency to ‘On Demand’ instead of ‘Default’.

In order to update the output through the entire document, select the ‘Update Output’ command from the AM tab.



AM will open a window, which by default will select all annotations to update. You may choose to update all, or select fewer.



After selecting 'OK', AM will run the entire .do file, and replace all existing annotations with the new results, tables or figures.

7.0 Stata Reference

display function

<http://www.stata.com/manuals13/pdisplay.pdf>

return function

<http://www.stata.com/manuals13/preturn.pdf>

ereturn function

<http://www.stata.com/manuals13/pereturn.pdf>

mkmat function

<http://www.stata.com/manuals13/pmatrixmkmat.pdf>

matrix function

<http://www.stata.com/manuals13/pmatrix.pdf>

estimates function

<http://www.stata.com/manuals13/restimates.pdf>

graph export function

<http://www.stata.com/manuals13/g-2graphexport.pdf>

8.0 Troubleshooting

Error	Solution
[NO RESULT]	AM returns this value when the plug-in does not capture any information from Stata. If your annotation returns this result, check to ensure the annotation encapsulates a display, matrix list or graph export command. If it does, check to ensure the Stata code is running correctly, and that your expected output is generated in Stata. Recall that the display command will return local or global variables, and data stored in an r() list. The matrix list command will display a defined matrix. The graph export command will export an existing graph to disk.

Appendix A. Example Word Document

Instructions:

1. After installation of AM, copy and paste the Stata code in the next section into a Stata do file, "Example Do.do".
2. Link a new Word document with the "Example Do.do" file.
3. Create an annotation for the number of participants in the trial (Row 17)

The returned values should be: 120

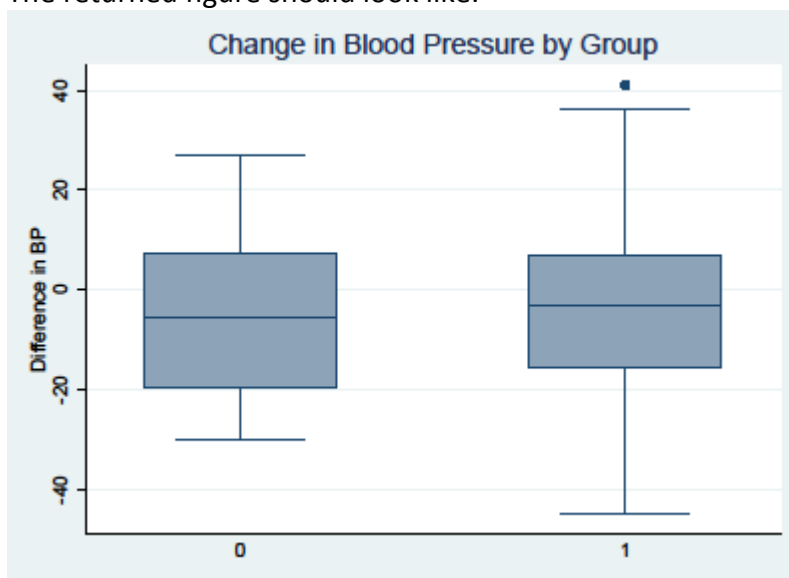
4. Create an annotation for the table 1 matrix (Row 80)

The returned table should look like:

	control1	control2	int1	int2	pval
sex_=_0	29.00	0.24	31.00	0.26	0.71
sex_=_1	27.00	0.22	33.00	0.28	.
agegrp_=_1	23.00	0.19	17.00	0.14	0.13
agegrp_=_2	19.00	0.16	21.00	0.17	.
agegrp_=_3	14.00	0.12	26.00	0.22	.
bp_before	155.09	10.65	157.64	11.96	0.22
bp_after	149.80	13.78	152.72	14.48	0.26
bp_diff	-5.29	15.51	-4.92	17.82	0.91

5. Update the export on row 83 location to a folder on your computer.
6. Create an annotation for the box plot of blood pressure differences by intervention (Row 83)

The returned figure should look like:



Appendix B. Example Stata do file

```
* code to generate a Value, Matrix and Graph

* pull up the "bpwide" dataset that comes with Stata
sysuse bpwide

*generating additional variable,"intervention", through binomial distribution
random sampling with probability of ~0.5 to be assigned to intervention group
set seed 20151103
gen intervention=rbinomial(1,0.5)
label variable intervention "1=intervention 0=control"

*generate the difference in bp
gen bp_diff=bp_after-bp_before
label variable bp_diff "Difference in BP"

* get the number of observations on which we have no missing bp_before and
bp_after data
count if bp_before != . & bp_after != .
display r(N)

* variables to hold results
gen str12 rowname = ""
gen controll1 = .
gen control2 = .
gen int1 = .
gen int2 = .
gen pval = .

* list of variables (one for categorical, one for continuous)
local catlist sex agegrp
local conlist bp_before bp_after bp_diff

* gen row counter
gen nn = _n
local rowct 1

* get total n
count if bp_before != . & bp_after != .
local totn = r(N)

* cycle through and fill out table 1
* note this is hard coded for intervention with 2 levels
* coded as 0 for control and 1 for intervention
foreach var of local catlist {

    qui tabulate `var' intervention, chi2
    replace pval = r(p) if nn == `rowct'

    levelsof `var', local(varlevs)
    foreach lev of local varlevs {

        replace rowname = "`var' = `lev'" if nn == `rowct'
        qui count if `var' == `lev' & intervention == 0
        replace controll1 = r(N) if nn == `rowct'
    }
}
```

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```
replace control2 = r(N)/`totn' if nn == `rowct'

qui count if `var'== `lev' & intervention == 1
replace int1 = r(N) if nn == `rowct'
replace int2 = r(N)/`totn' if nn == `rowct'

local rowct = `rowct' + 1
}
}

foreach var of local conlist {
    replace rowname = "`var'" if nn == `rowct'
    qui summarize `var' if intervention == 0
    replace control1 = r(mean) if nn == `rowct'
    replace control2 = r(sd) if nn == `rowct'

    qui summarize `var' if intervention == 1
    replace int1 = r(mean) if nn == `rowct'
    replace int2 = r(sd) if nn == `rowct'

    qui ttest `var', by(intervention)
    replace pval = r(p) if nn == `rowct'

    local rowct = `rowct' + 1
}

mkmat control1 - pval if nn < `rowct', matrix(tab1) rownames(rowname)
matrix list tab1
*comparing the change in bp by intervention group
graph box bp_diff, over(intervention) title("Change in Blood Pressure by
Group")
graph export "S:\NUCATS\NUCATS_Shared\BERDShared\Analysis Manager\Data and
Programs\Stata\BPDiff_BY_Intervention.pdf", as(pdf) replace
```