

## Paper 118-27

# How ODS Simplified our Web-based Clinical Trial Reports

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### Abstract

The Output Delivery System (ODS) capability available with version 8.0 and 8.2 of the SAS® system has simplified and accelerated the means by which data visualization can be achieved for our clinical trial studies. We have produced a battery of SAS generated Web-base graphics and reports for our national multi-site clinical studies. The Kaiser Permanente Center for Health Research Coordinating Center makes extensive use of base SAS, SAS Graph, SAS/STAT, SAS Macro language and the new ODS capability. These reports are stored in HTML or PDF format on a secured server (password protected) that is accessed via the Internet by the studies physicians, clinical and research scientists, study coordinators, clinical and research staff.

### Introduction

During a clinical trial study, many monitoring reports are created to assure the quality of data collection and outcome measurements. This paper uses data reporting examples, but not actual data from two dietary studies coordinated by the Center for Health Research at Kaiser Permanente. One study aimed to reduce blood pressure by varying sodium levels in the diets of participants for three months (Svetkey, LP. et al., 1999). The other is a behavior modification trial to teach subjects to eat low-fat diets and increase exercise to lose weight and also decrease blood pressure over an eighteen-month time period.

### The data

The data for this presentation is fictional. The first data set, called baseline, contains variables for baseline characteristics such as age, race, gender, and blood pressure and treatment group. A second data set, called graph, contains variables for the attendance to the intervention, visits, and treatment group.

### ODS OUTPUT DATA SETS

Since our studies are at centers nationwide the best way to communicate data was to post the information to the study web site. Prior to the

new capabilities of ODS frequencies and means were generated in SAS and the values were then typed into Microsoft Word tables which were then made into PDF files. The regular output from Proc Freq and Proc Means comes out in many different tables and doesn't show the key information in an easy to read format. Using the ODS capability to output data sets and then merging them to create one data set and then printing it made it much simpler. The information is shown more concisely and more professionally.

```
ODS output crosstabfreqs=new1
crosstabfreqs2=new2 crosstabfreqs3=new3;
```

```
Proc freq data=baseline;
Tables (hibp sex race)*tx/norow;
```

```
Proc sort data=new1 (keep=tx hibp colpercent
percent where=(hibp=1)); by hibp;
Proc sort data=new2 (keep=tx sex colpercent
percent where=(sex=2)); by sex;
Proc sort data=new3 (keep=tx race colpercent
percent where=(race ne "")); by race;
```

```
Data hibp;
Set new1;
If tx=. Then do;
tx=0;
colpercent=percent;
run;
```

```
proc transpose data=hibp out=data1 prefix=tx;
by hibp;
```

\*\*this data step and transpose need to be repeated for new2 and new3;

```
data new (drop=hibp sex race _name_ _label_
rename=(tx1=a tx2=b tx3=Overall));
set data1 data2 data3;
if hibp=1 and _name_="COLPERCENT" then
variable="%Hypertensive at Baseline";
else if sex=2 and _name_="COLPERCENT"
then variable="%Female";
else if race="African American" and
_name_="COLPERCENT" then variable="Race
% African American";
```

```

else if race="Non-hispanic white" and
_name_="COLPERCENT" then variable="Race
% Non-Hispanic White";
else if race="Other" and
_name_="COLPERCENT" then variable="Race
% Other";
else delete;

```

Table 1. One table with info from the frequency tables

### Baseline Characteristics

VARIABLE	A	B	OVERALL
% Female	62.5	61.5	62.0
% Hypertensive at baseline	33.3	42.3	38.0
% Race African American	54.2	65.4	60.0
% Race Non-Hispanic white	41.7	30.8	36.0
% Race Other	4.2	3.8	4.0

### PROC TEMPLATE AND ODS HTML

The proc template procedure here is used to modify the default style and add a logo that will be placed in the upper left corner before the output. Then the ODS html statement is used to create an output file in html format. The logo image is saved as a GIF file under c:\paintlogo.gif.

```

Proc template;
Define style defaultlogo;
Parent=styles.default;
Replace body from document/
Prehtml='';
End; run;

```

```

Ods html "c:\baseline.html" style=defaultlogo;
proc print data=new noobs;
proc means data=baselinep;
class tx;
var age bmi sbp dbp;
run;
ods html close;

```

### ODS PDF AND PROC GLOT

Using SAS/Graph and the new ODS capability to create PDF files we graphed the attendance by treatment groups and created a PDF file, which we then posted to our secure web site. The option to change the page orientation needs to be

specified before the output destination is named otherwise it would not affect the page orientation.

```

options orientation=landscape;
Ods pdf file = "e:\attendance.pdf";

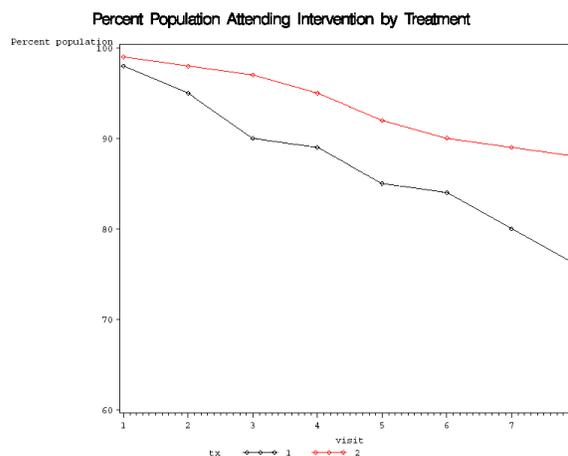
```

```

symbol1 i=j value=diamond;
symbol2 i=j value=circle;
title1 "Percent Population Attending Intervention
by Treatment";
axis1 order=(60 to 100 by 10) label=("Percent
population") minor=none;
proc gplot data=graph;
plot attend*visit=tx/legend overlay vaxis=axis1;
run;
quit;

```

```
ods pdf close;
```



Graph 1. Graph using ODS Pdf.

### Conclusion

The Output Delivery System has improved the quality and simplicity of putting our data analysis and monitoring reports from a national clinical trial onto our secured web site. More

### References

Gupta, S. (2001) Using Styles and Templates to Customize SAS ODS Output, Proceeding of the 26<sup>th</sup> Annual SAS Users Group International Conference, Cary, NC: SAS Institute Inc.

Haworth, Lauren (2001), Output Delivery System The Basics, Cary, N.C.: SAS Institute Inc.

Lafler, KP. (2001), Output Deliver Tips, Tricks, and Techniques, Using SAS Output Delivery System(ODS), Proceeding of the 26<sup>th</sup> Annual SAS Users Group International Conference, Cary, NC: SAS Institute Inc.

SAS Institute Inc. (1999), SAS OnlineDoc, Version 8, Cary, N.C.: SAS Institute, Inc.

Svetkey, LP, Sack, FM, Obarzanek, E., Vollmer, WM, Appel, LJ, Lin, P, Karanja, NM, Harsha, DW, Bray, GA, Aickin, M, Proschan, MA, Windhauser, MM, Swain, J, Mc The DASH Diet, Sodium Intake and Blood Pressure Trial (DASH-Sodium) Rationale and design. J. Am Diet Assoc. 99:8(suppl):pp.S96-S104.

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