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Creating Multiple Graphs to Link from a Dynamic Map Using SAS ODS/GRAPH//GMAP/MACRO

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ABSTRACT

In this paper, we will demonstrate our experience on using SAS ODS combine with using SAS MACRO to create web pages of multiple graphs. By using SAS ODS and GMAP, a dynamic map will be created, in which, different areas of the map will be linked to these graphs. The use of SAS ODS plays a very important role in these procedures.

INTRODUCTION

SAS software has been used in Public Health to analyze data. With the improvement of newer versions, presenting data in different formats became widely used. In this paper, we mainly present the application of different SAS procedures in displaying data for web pages.

I. CREATE MULTIPLE GRAPHS:

Set options for graph area through "goption" statement, where output images will be .gif file (device=gif). Color, type of font text as well as background color can be set here. (1)

We define labels for axis, legend as well as their positions and angle. Patten colors can also be defined here. (2)

A template named "bg" is created in "proc template" to set the background of the graphs to be white (the default background color when viewed in Netscape is gray). (3)

Before generating charts, there are two sets of data needed:

- "lbw" dataset includes three variables:
 - + mcd_id: is unique identification for each area.
 - + percent: attribute data for each area of the graph
 - + year

- The second dataset is "mcids", which contains:
 - + mcd_id (match to the first dataset)
 - + mcd_name: the name for each area.

We use ODS (Output Delivery System) HTML to create output web pages. (4)

Each web page needs a title. This title will appear on the top blue bar of the page. In order for SAS to write the text for title, we define this text in "ods html body" statement.

The "proc gchart" is used normally here with option to create a vertical bar graph. This macro program contains two parameters: mcdid and mcdname, in which, "mcdid" refers to unique ID for each area (in both datasets), and "mcdname" refers to mcd_name in the second dataset. In each graph, we want to compare tow areas over time. To do so, in "where" statement for each run, two areas are picked: where mcd_id in ("111111", &mcdid).

In the data step after the macro, "call execute" is used in order for SAS to run through the second dataset and use each observation in this dataset to apply into macro "new" to create one graph. Thus, the number of graphs will be equal to the number of observations in the second dataset. (5)

```
(1)
goptions reset=global transparency
```

```
device=gif
ftext='Swiss'
noborder
cback=white
gsfname=gifout
gsfmode=replace;
```

```
(2)
axis1 label=(angle=90 'Percentage' height=2
font='swissxb') minor=(n=1);
axis2 label=none value=none ;
```

```
PATTERN1 value=solid color=cxffcc66;
PATTERN2 value=solid color=cx336633;
```

```
legend1 label=none
shape=bar(4,2)
position=(bottom center)
offset=(-3);
```

```
(3)
proc template;
define style bg;
style body/
background=white;
parent=default;
end;
run;
```

```
(4)
%macro new(mcdid,mcdnam);
```

```
filename odsout "C:\lbw";
ods html body="mcd&mcdid..html"
title ="&mcdnam : Low Birthweight Births
(Trend Graph)";
path=odsout style=bg;
ods listing close;
```

```
title1 h=16pt "Incidence of Low Birthweight
Births";
title2 h=16pt "&mcdnam, NY";
title3 h=12pt "1994-1999";
```

```
proc gchart data=lbw;
vbar mcd_id / discrete
sumvar=percent
group=year
subgroup=mcd_id
legend=legend1
space=0
width=2
gspace=3
maxis=axis1
raxis=axis2
name=lbw_chart;
```

```
format mcd_id $mcd_nam. year yr.;
where mcd_id in("111111", "&mcdid");
run;quit;
```

```
ods html close;
ods listing;
%mend new;
```

```
(5)
```

```
data _null_;
set mcids;
call
execute('%new('||mcd_id||','||mcd_name||')');
run; quit;
```

II. CREATE A DYNAMIC MAP:

Set options for the map area through "goption" statement, where output image will be .gif file (device=gif). Color, type of font text as well as background color can be reset. Sizes of image are set by vsize(vertical), and hsize(horizontal). (6)

To bring in colors for the map, we use a "pattern" statement. These codes of colors will be applied for different ranges of data according to format used. (7)

The following "legend" statement defines the text for the legend of the map. You can use different colors for the text, and define font type and size. You also can set position of the legend relatively with the map area. The "mode=share" statement indicates that the legend will share area with the map. (8)

Datasets needed to create the map including the boundary dataset (boundary), attribute data represents the map areas (low_birth_weight), and an annotate dataset (annotate_data). The variable "mcd drill" in the "low_birth_weight" dataset includes all web addresses of charts created before. This will help to link from each area of the map to the chart that represents trend data for that area.

We use "proc format" to define the ranges of attribute data (based on quartiles). There will be three ranges relate to three colors on the map. (9)

In this map, the title will share area with the map area. We use "note" statement and define the text for title here. It allows us to display the map larger compare to it when use "title" statement. In GMAP procedure, using "html=mcd drill" statement will help to link from each area of the map to its chart create before. (10)

```
(6)
goptions reset=all transparency
           device=gif
           ctext = black
           ftext='Tahoma'
           cback=white
           vsize=4.7 in
           hsize=6.8 in
           noborder
           gsfname=gifout
           gsfmode=replace;
```

```
(7)
PATTERN1 value=solid color=cxffcc99;
PATTERN2 value=solid color=cxccc99;
PATTERN3 value=solid color=cxcc9933;
```

```
(8)
LEGEND label=(position =(bottom left)
height= 9pt color=blue
'Click on the color box in the legend to view
bar graph'
           color=black
'Quartile Ranges are weighted')
```

```
value=(height=9pt font='Tahoma')
across= 2
mode=share
origin=(0,0)
shape = bar(3,1)
mode=share;
```

```
(9)
proc format;
value lbw_fmt
0-4.52830188868="Q1 & Below"
4.52830188869-8.4536082474="Q1-Q3"
8.4536082475-high="Above Q3"
;
run;
```

```
(10)
ods listing close;
options center;
filename odsout "c:\lbw";
ods html body="lbw_map.html"
(title='Orange County : Low Birthweight Births')
path=odsout
style=bg;
```

```
proc gmap map=boundary
           data=low_birth_weight;

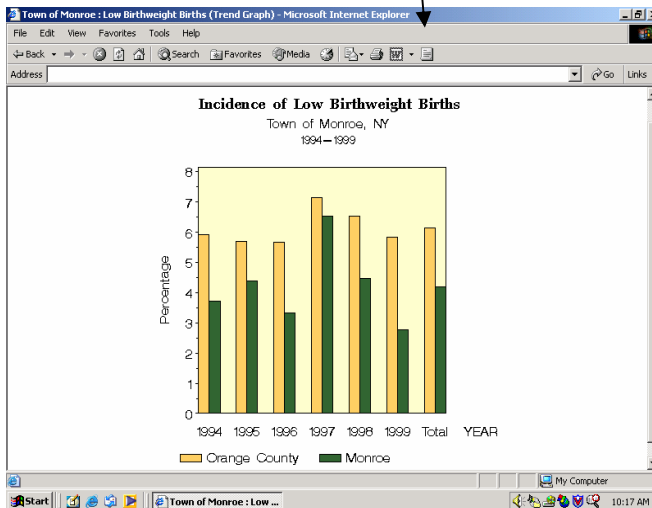
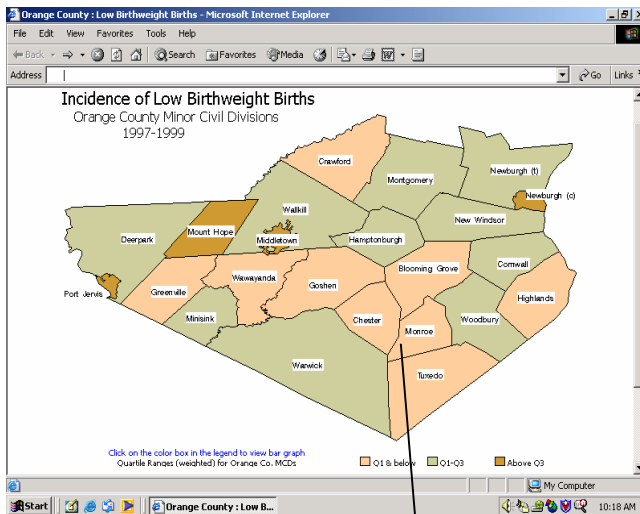
Note justify=left h=18pt
"Incidence of Low Birthweight Births";
Note justify=left h=15pt
" Orange County Minor Civil Divisions";
Note justify=left h=15pt
"
           1997-1999";
           id mcd_ID;
           format percent lbw_fmt.;
           choro percent /
                   discrete
                   annotate=annotate_data
                   legend=legend
                   html=mcd drill
                   name='lbw';

run; quit;

ods html close;
ods listing;
```

RESULTS:

Following is a clickable map, which includes 23 areas that link to 23 graphs created in the first part of this paper. For instance, click on Town of Monroe on the map will link to the trend graph of this town.



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CONCLUSION

The use of SAS ODS with different types of output files, especially HTML, is a good tool for creating web pages. Creating graphs and maps through SAS programming increases means for presenting data, especially with dynamic maps and graphs. These applications when combined with SAS MACRO become extremely convenient and flexible to produce series of output files.

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