Introduction

Most of the healthcare data have a spatial dimension. Maps convey the geographical information more visually than tables or other non-map graphs. However, map creation usually involves specialized software and is time-consuming.

In SAS 9.2, creating highly-customized maps becomes surprisingly easy using GMAP procedure in SAS/GRAPH. This poster aims at showing how easy it is to create maps just within SAS/GRAPH.

Text Pathology Data

Text pathology reports of GHC from 2005 to the present are stored in the table Daily_HL7 in MS SQL-Server on CTRHS-SQL2K in Pathology database. Text pathology reports between 1976 and 2005 are stored in two other tables in the same database. Data of following graphs are mainly based on text pathology reports in 2010 (excluding pap smear reports and autopsy reports) and enrollment in July 2010. Data from 2005 to 2010 are displayed in: http://ghri-wiki/datawiki/perspective.aspx?action=view&page=PathologyReportNumber.

Step 1: Prepare a map data set and a response data set

A map data set contains the information needed to draw map boundaries. The minimum set of variables are X and Y coordinates, and ID. X and Y coordinates are longitude and latitude expressed in radians; ID is the geographic area associated with each pair of X-Y coordinates. SAS/GRAPH offers some map data sets in the MAPS library. Also, lots of shapefiles are available online and can be converted into SAS map datasets by PROC MAPIMPORT.

A response data set contains the information that will be displayed on the map. In order to allow SAS/GRAPH to match the response data set to the map data set, the response data set must contain the same ID variable as the ID variable in the map data set.

Step 2: Match two datasets using PROC GMAP

PROC GMAP DATA = response_dataset MAP = map_dataset ID ID_variable;

PROC GMAP DATA = response_dataset MAP = map_dataset ID ID_variable CHORO response_variable / options;

RUN QUIT;

Step 3: Let the Annotation do

The most powerful tool for customizing maps is the Annotation, which is also true for other graphs. It instructs SAS/GRAPH on how to customize graphs as if you were drawing with a pencil on a paper.

Tables in the next column are some examples of annotation data sets.

An annotation data set for adding a pie:

X Y Function Style Text Comment
5 85 Pie 270 Red Solid Fill ¾ of the pie with red
5 85 Pie 90 Blue Solid Fill ½ of the pie with blue

An annotation dataset for adding a reference line:

X Y Function Color Size Comment
5 85 Move 2 Red Draw a line from (5,85) to (10,85)

An annotation dataset for adding a polygon:

X Y Function Style Comment
5 85 Poly cont 270 Move to (5,85) to prepare the draw
10 85 Polycont 2 Red Draw a line from (5,85) to (10,85)

An annotation dataset for adding an image:

X Y Function Style Text Comment
5 85 MSpecialLabel 45 Add a star in (5,85)

Choropleth Maps of Text Pathology Data

Map Creation in SAS/GRAPH

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