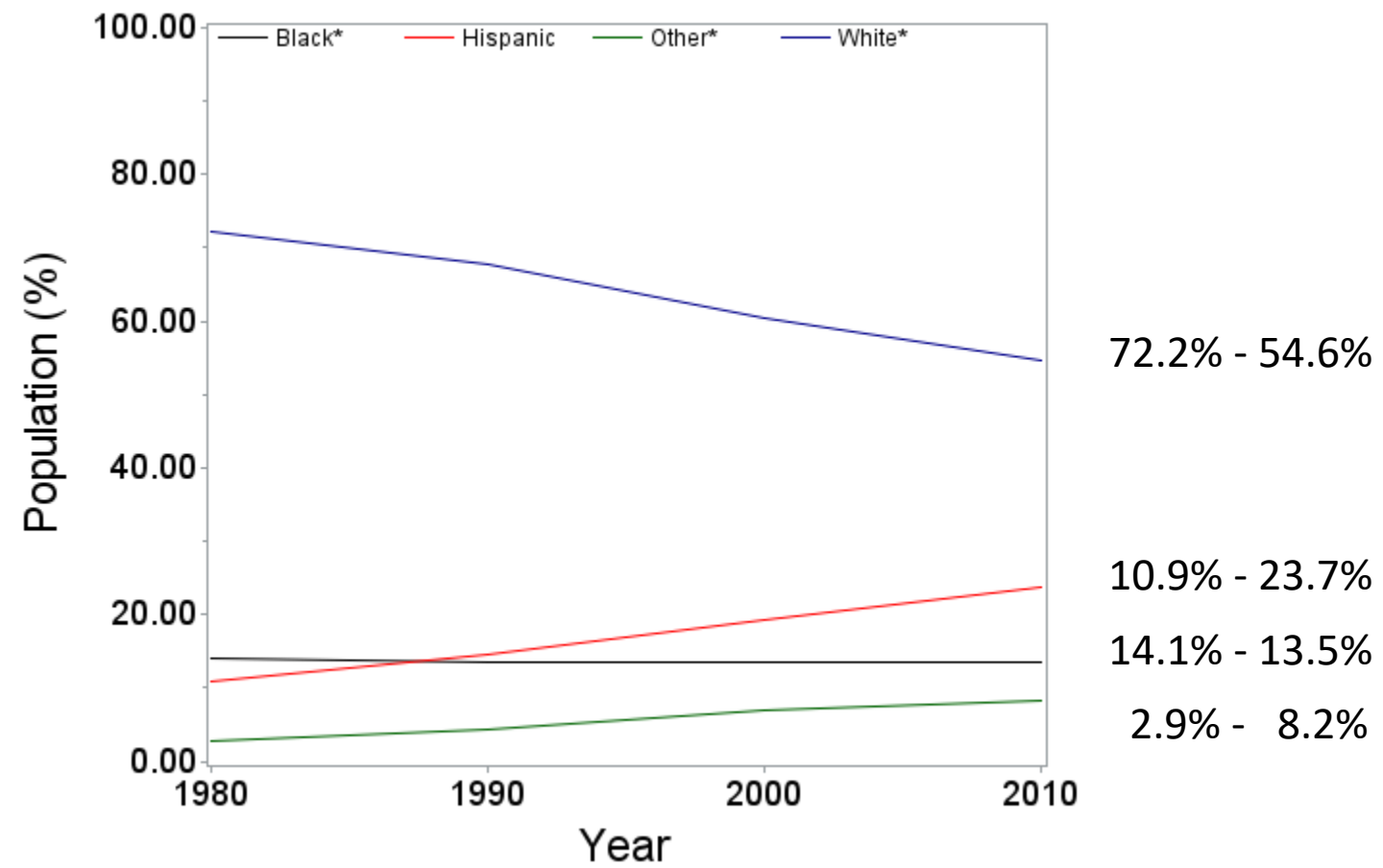


PROC GMAP to visualize 30 years of US Census data DV10

Evian Fernandez Garcia
Astellas Pharma Europe BV
Leiden, The Netherlands

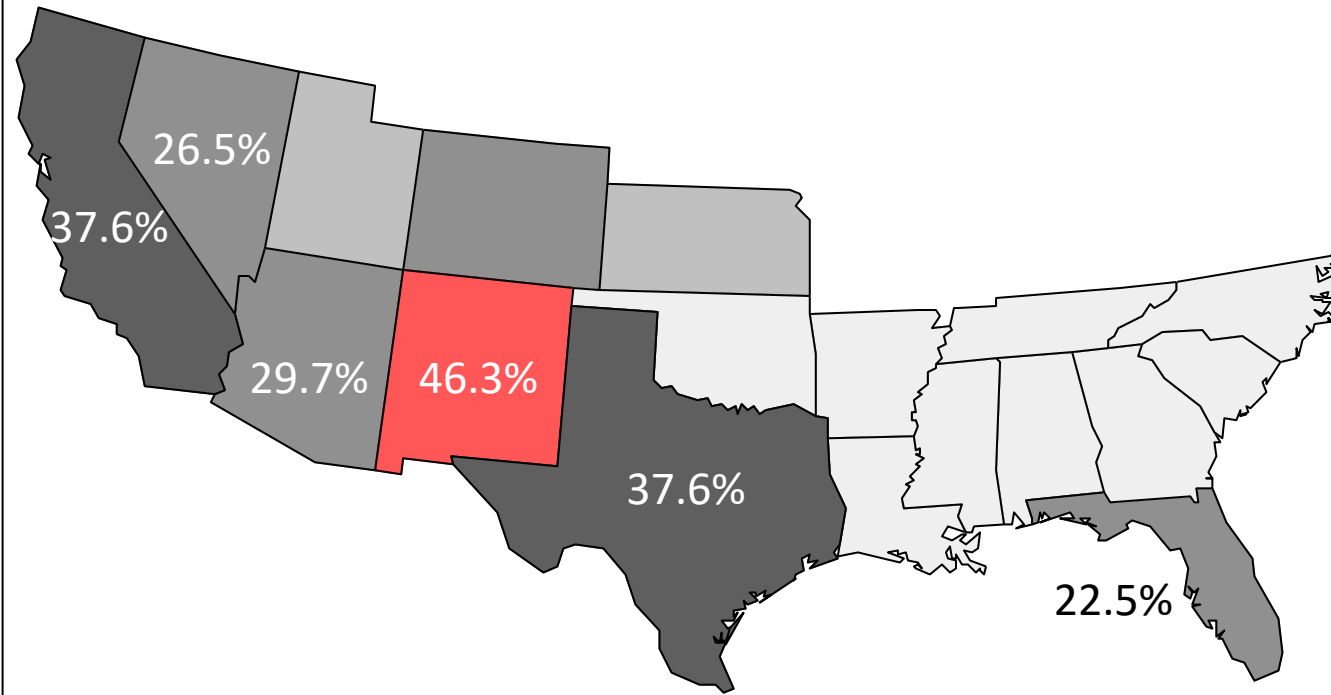
The Data

- US Census Data.
- Years: 1980, 1990, 2000 and 2010.
- States: California, Nevada, Arizona, Utah, New Mexico, Colorado, Texas, Oklahoma, Kansas, Louisiana, Arkansas, Mississippi, Alabama, Georgia, Tennessee, North Carolina, South Carolina, Florida.
- Race: **Hispanic**, **White***, **Black***, **Other***. (* means non-Hispanic)
- Origin of Hispanics: Mexican, Puerto Rican, Cuban, Other.
- Population counts at State and County levels.
- New Mexico, Oklahoma and South Carolina for 1980 are missing.
- The county of Yuma was divided in two counties after 1980.

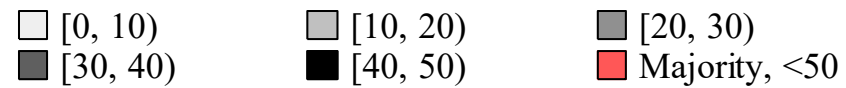


U.S. Decennial Census. Hispanics(%)

year=2010

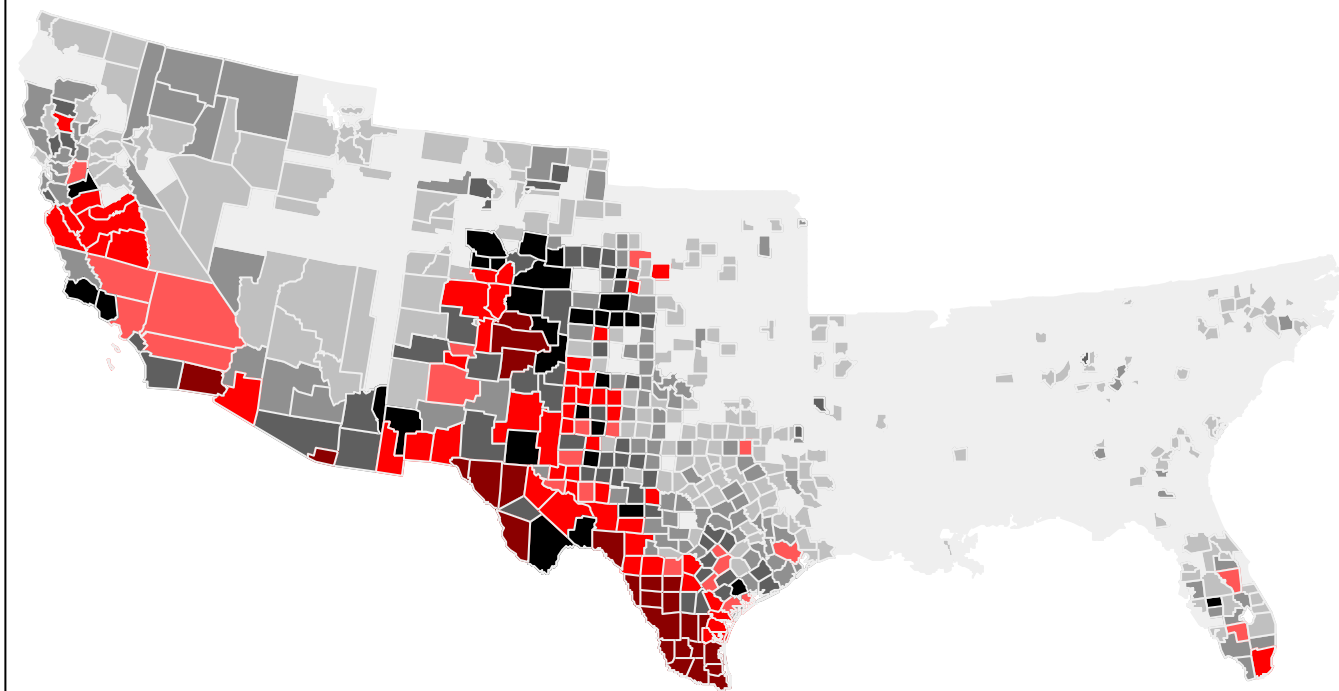


Hispanics(%)



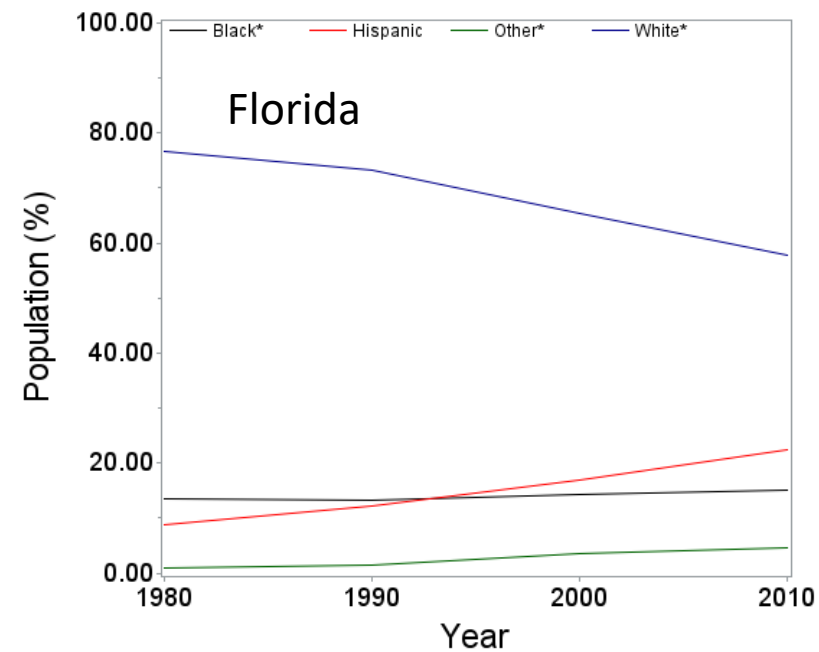
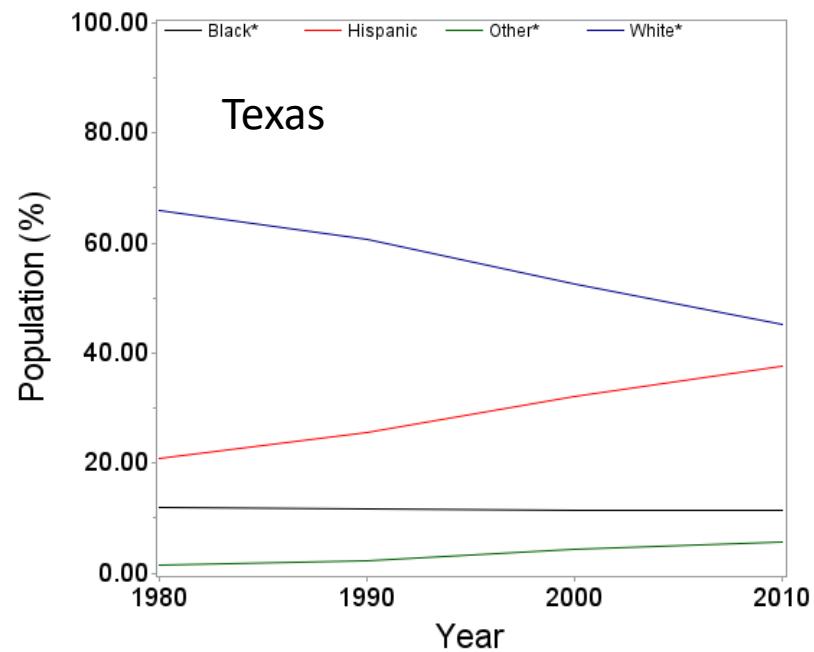
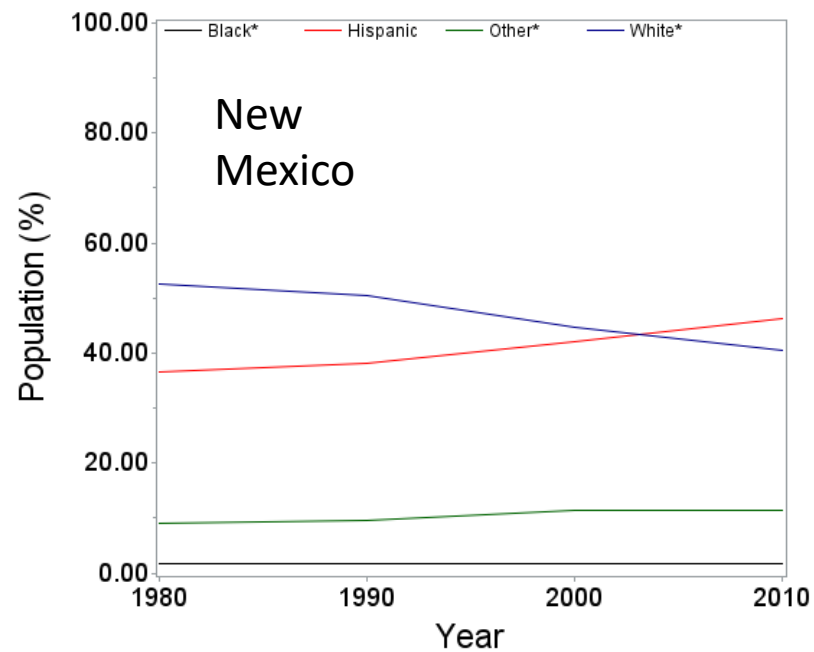
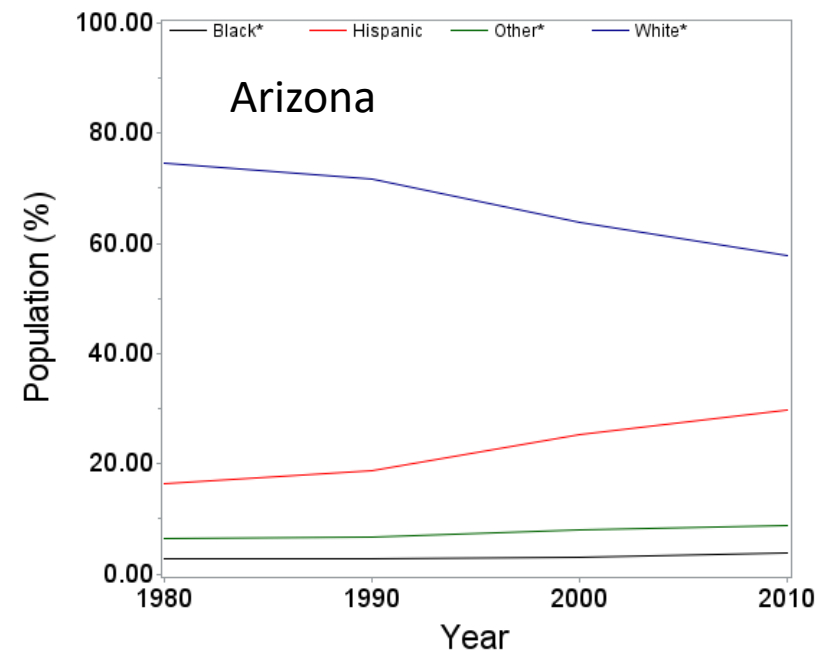
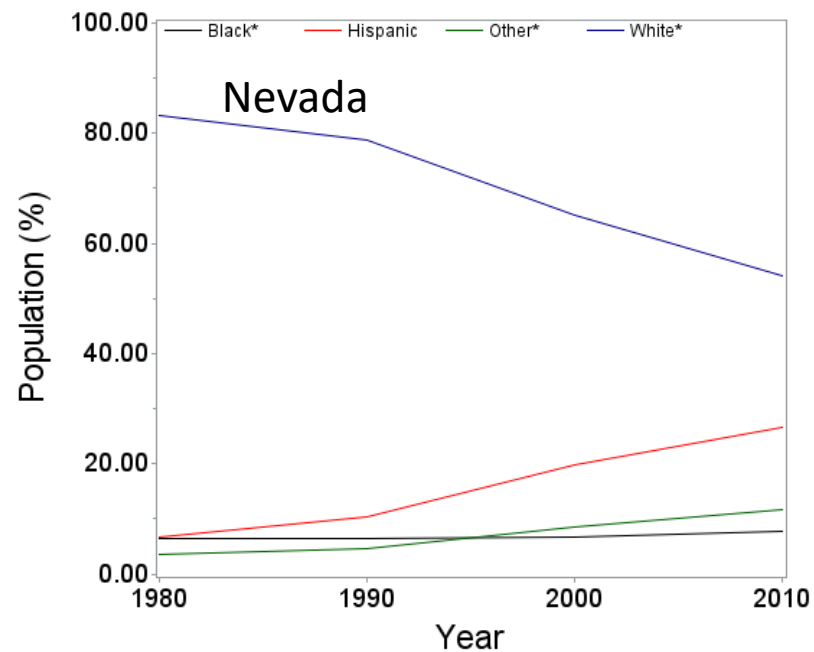
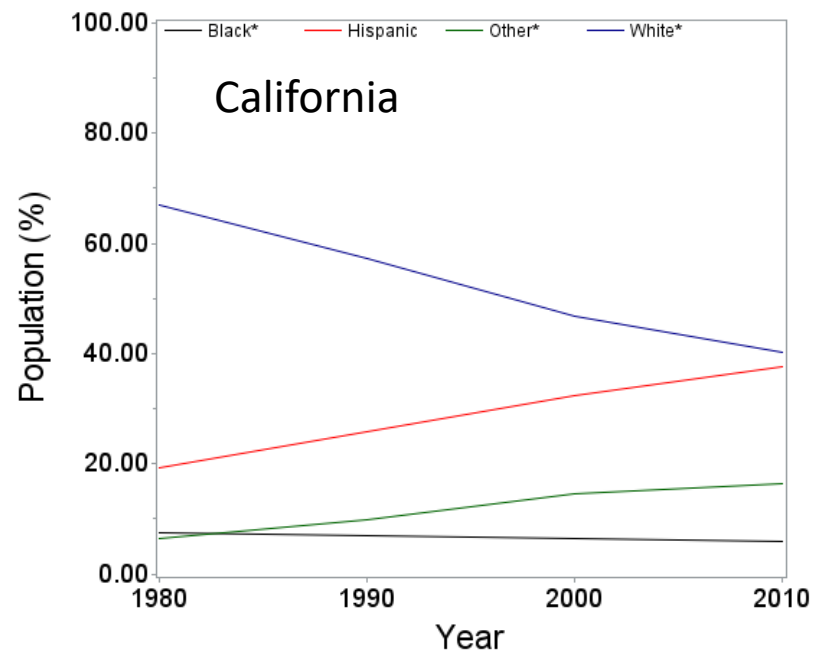
```
PROC GMAP DATA= stat3 MAP= mapssas.us;  
    ID statecode;  
    CHORO percc / LEVELS= 8 UNIFORM LEGEND= legend1;  
    BY year;  
RUN;
```

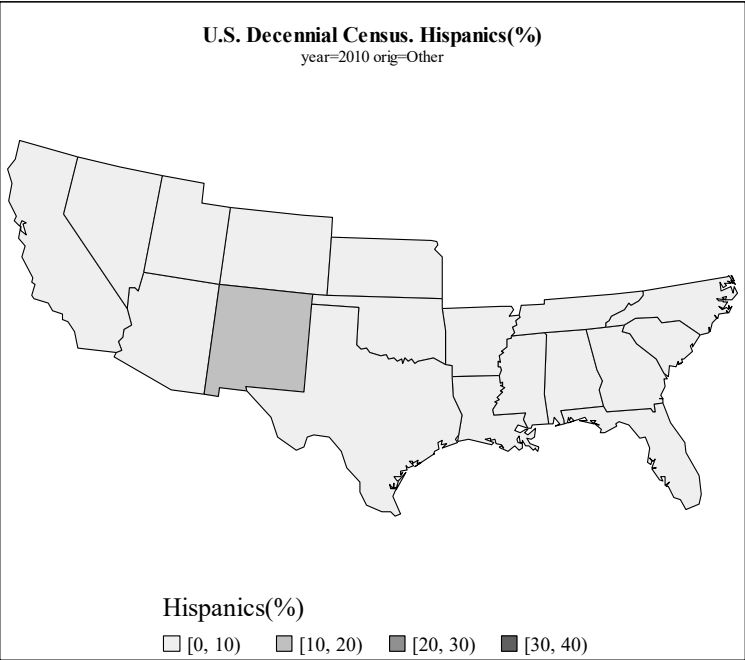
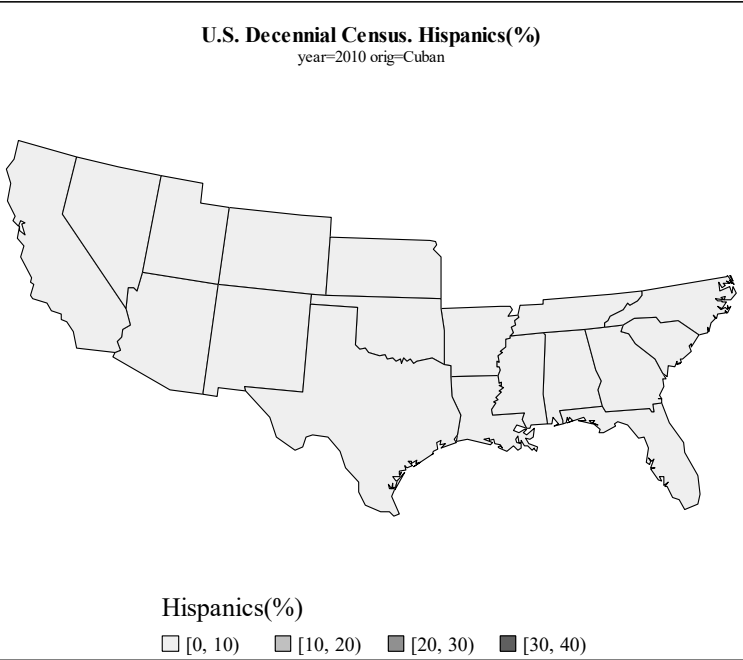
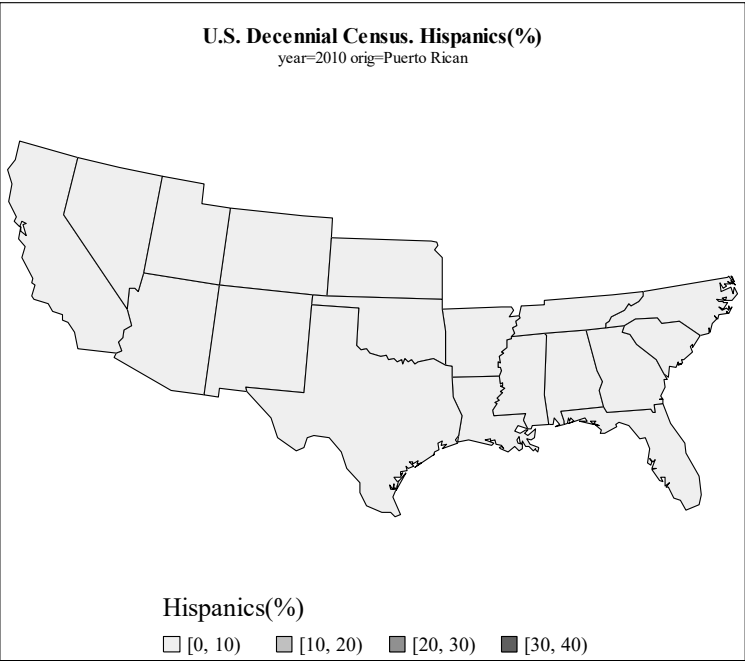
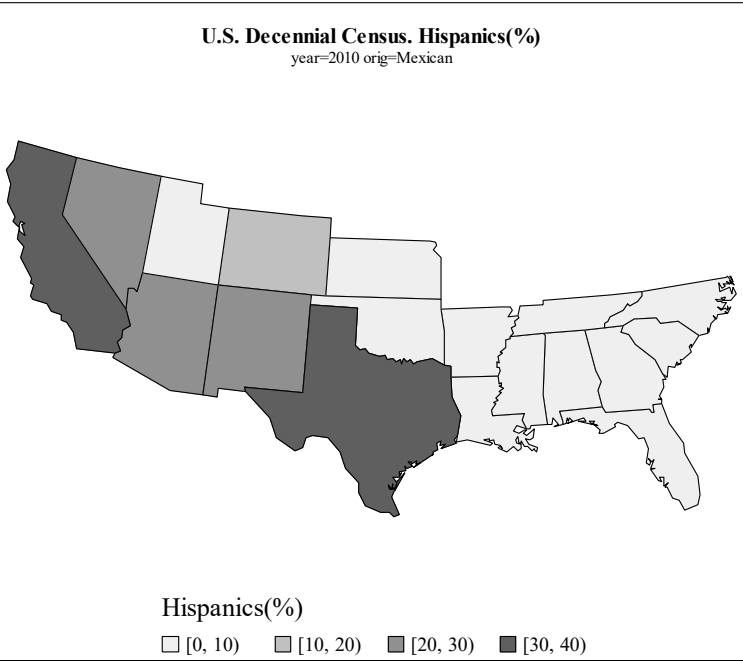
U.S. Decennial Census. Hispanics(%)
year=2010

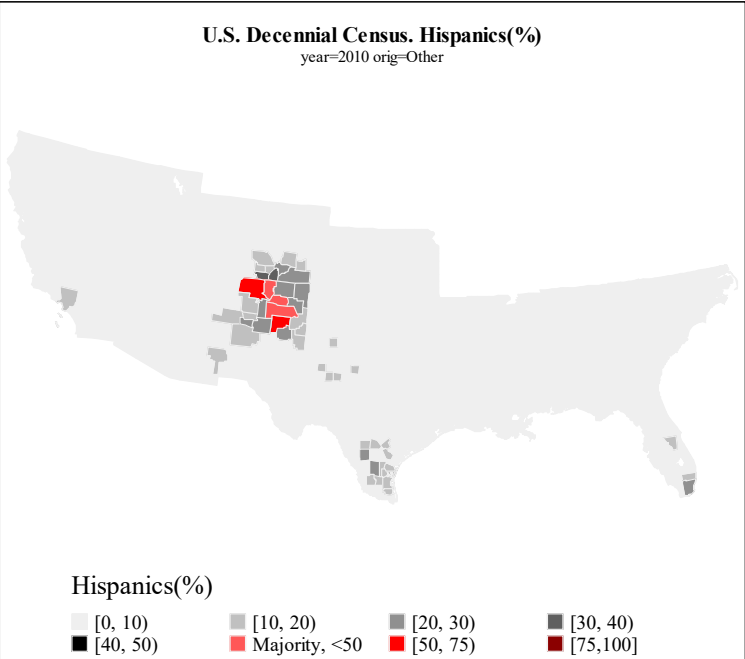
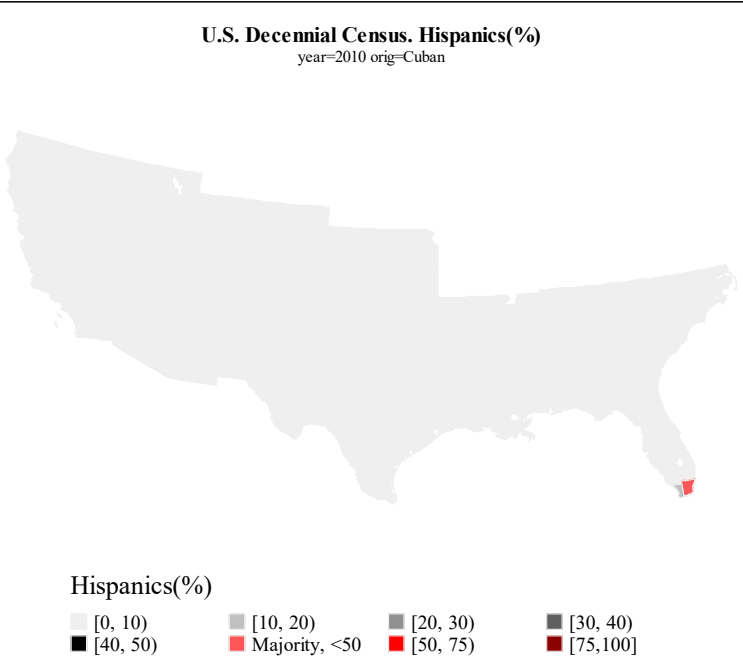
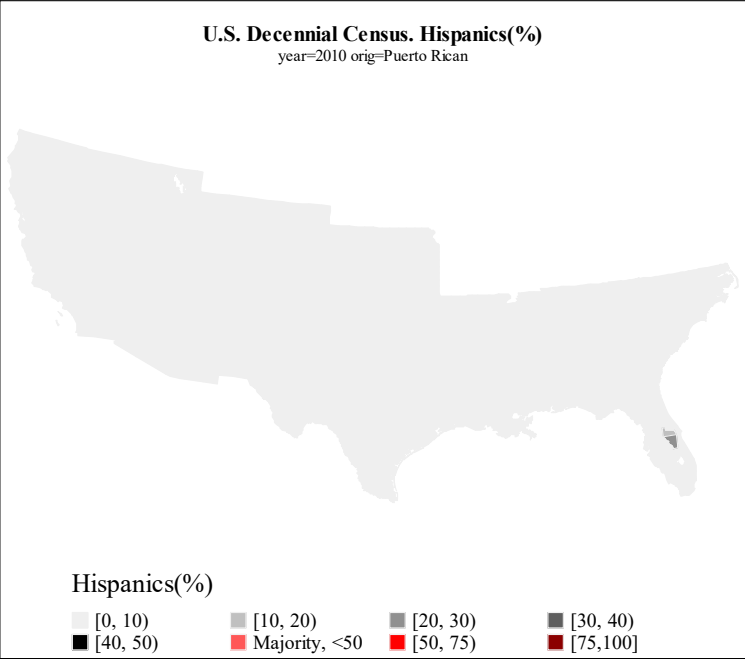
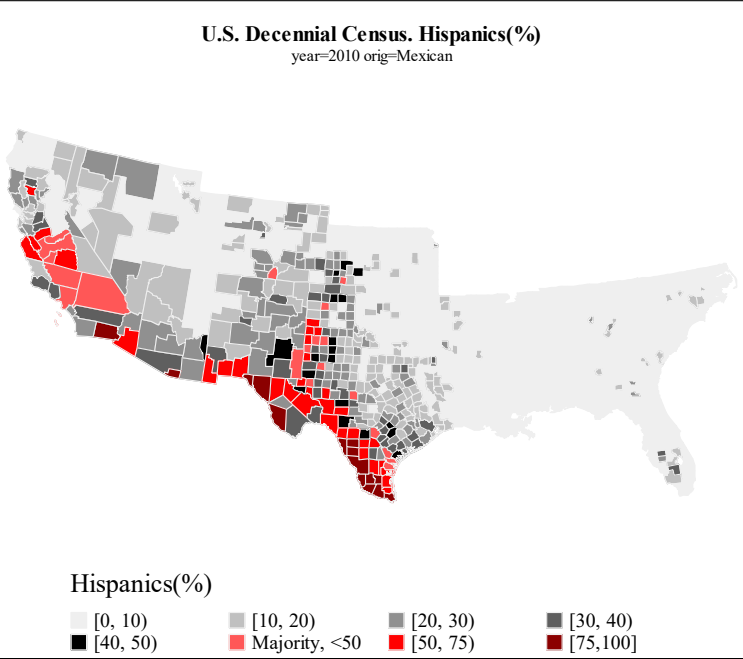


Hispanics(%)





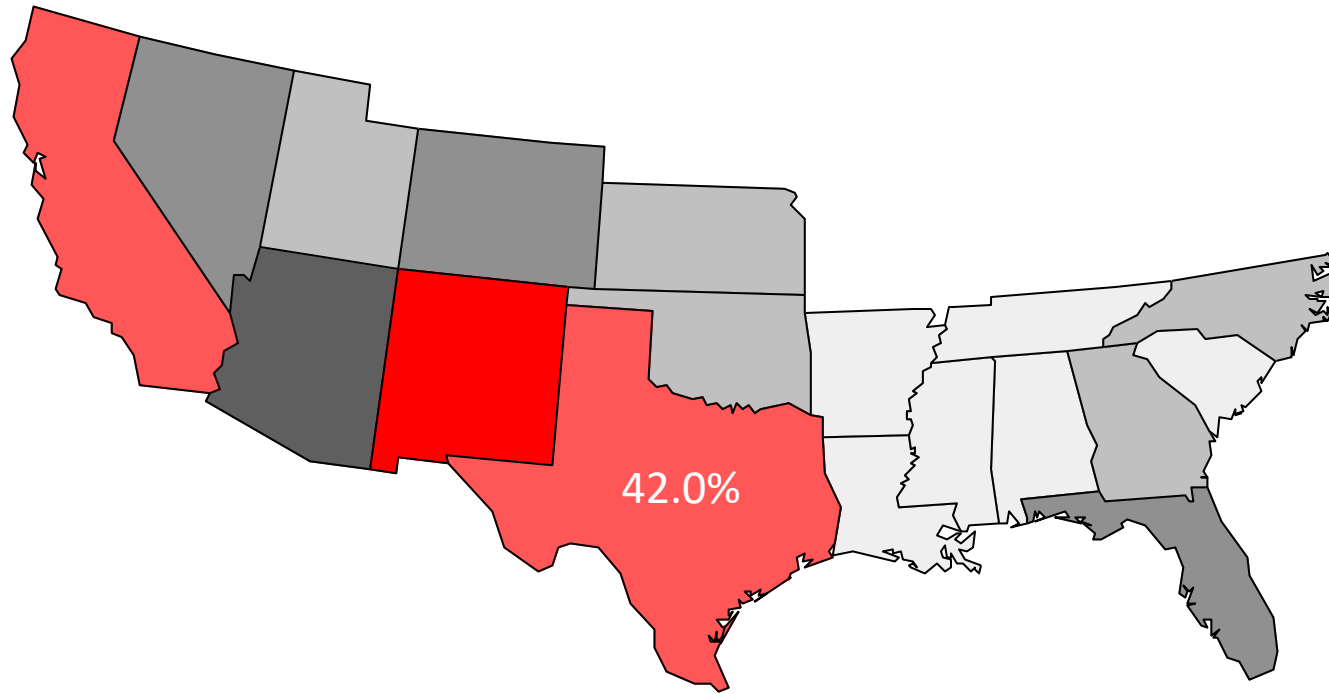




```
PROC GMAP DATA= stat5 MAP= outline2;  
    ID state county;  
    CHORO percc / LEVELS= 8 UNIFORM LEGEND= legend1  
                  COUTLINE= GRAYF0;  
    BY year orig;  
RUN;
```

U.S. Decennial Census. Hispanics(%)

year=2030



Hispanics(%)

[0, 10)

[10, 20)

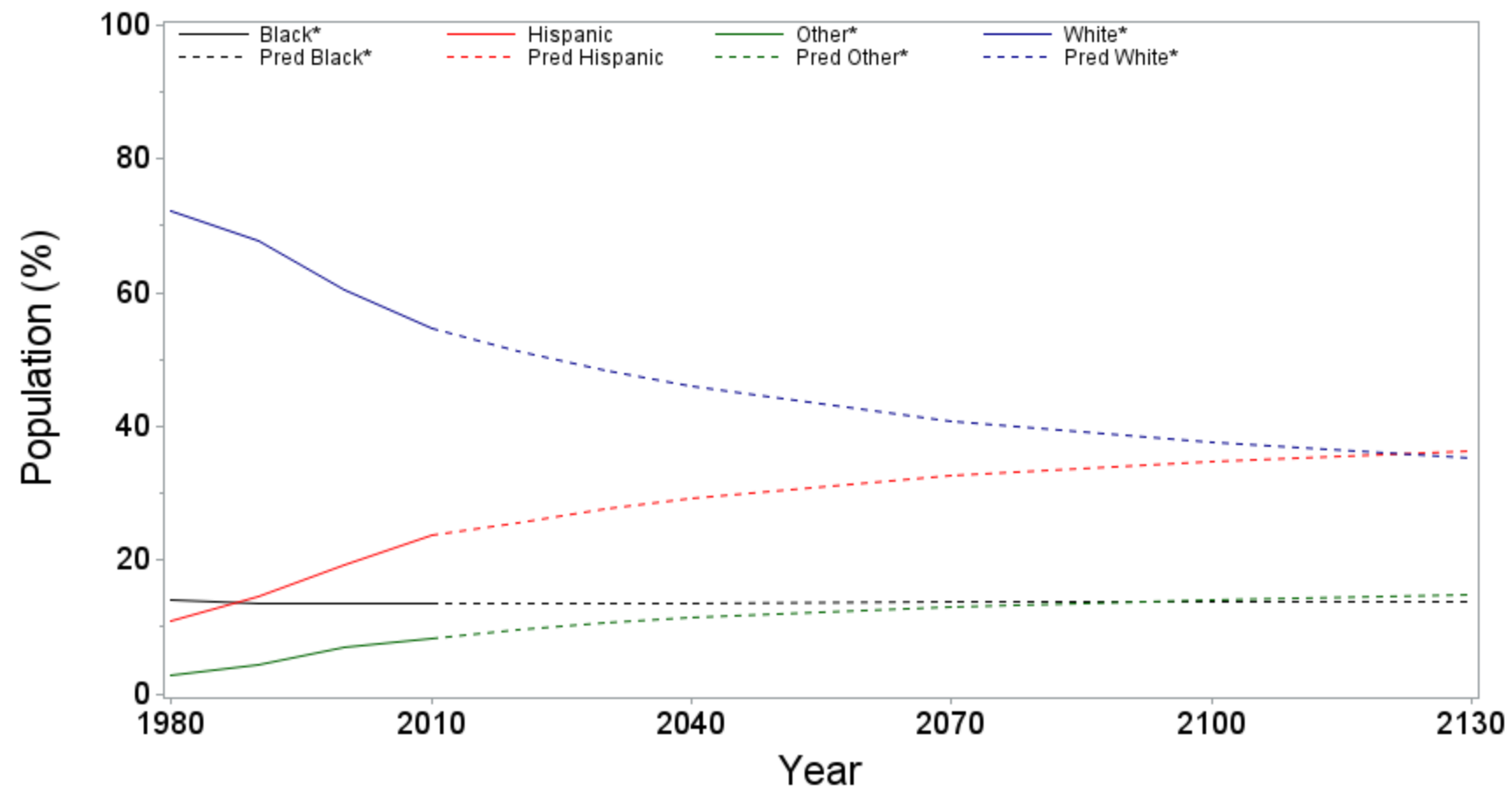
[20, 30)

[30, 40)

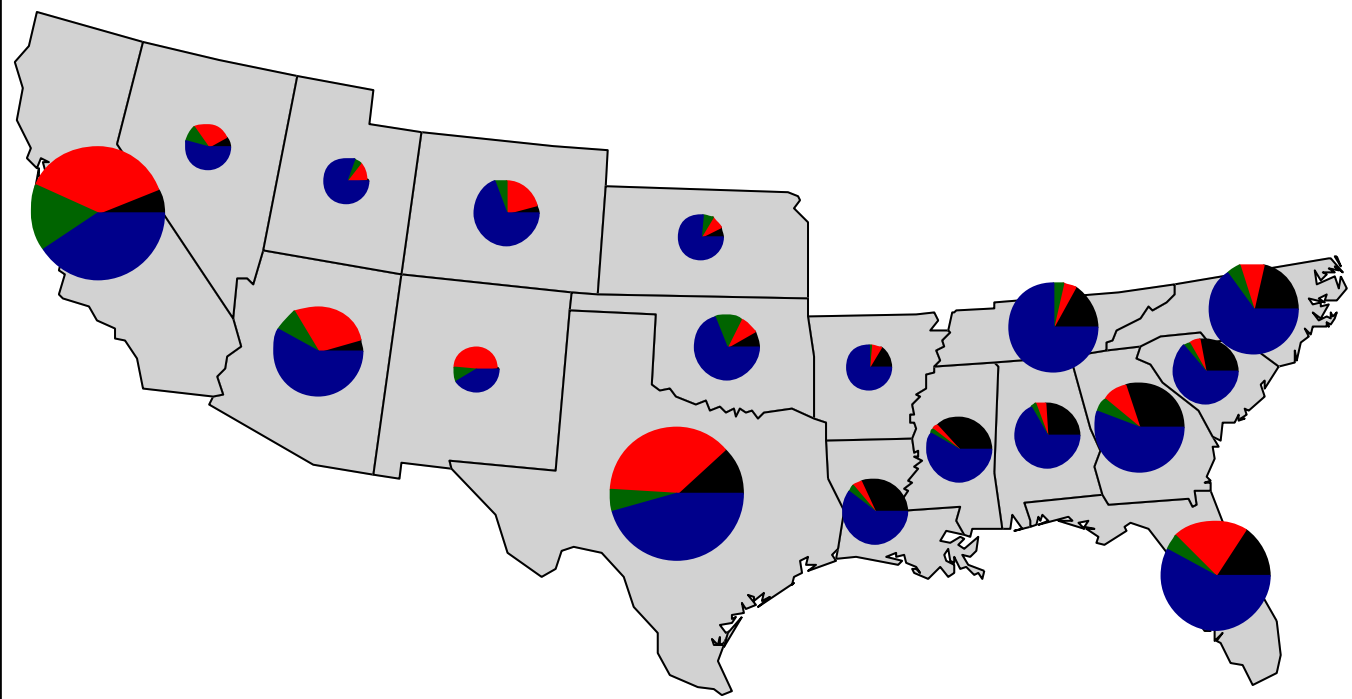
Majority, <50

[50, 75)

```
PROC MIXED DATA= stat2;  
    CLASS race id state;  
    MODEL count = race race*year / NOINT S;  
    REPEATED / SUB= id;  
    RANDOM int / SUB= id;  
RUN;
```



U.S. Decennial Census. Race Pies by State(%)
year=2010



```

DATA anno;
  FORMAT color $10.;
  /* Get the coordinates for the center of the
     state from the MAPS.USCENTER data set */
  MERGE stat3(IN=a) maps.uscenter;
  BY state;
  IF a;
  /* X and Y coordinate system is set to data values */
  xsys='2';
  ysys='2';
  /* Apply the annotation after the procedure output */
  WHEN='a';
  /* Draw a pie */
  function='pie';
  /* Color the slices for each race */
  SELECT (race);
    WHEN (1) color= 'black';
    WHEN (2) color= 'red';
    WHEN (3) color= 'darkgreen';
    WHEN (4) color= 'darkblue';
    OTHERWISE;
  END;
  /* Draw the portion of the pie */
  rotate=360*perc/100;
  size= (round(log2(count_sum),1)- 19)/2.2;
  /* Use a solid pattern fill */
  style='solid';
  line=0;
RUN;

```

```

PROC GMAP DATA= anno
           MAP= mapssas.us

  ID state;

  CHORO state / nolegend annotate=anno
               coutline=black;

  BY year;

RUN;

```

Conclusions

- Not possible (in an easy way) to merge two or more areas inside a geographical level, e.g. two counties, and plot them as such. This can be done using PROC GREMOVE.
- At county level, the SAS map mapssas.uscounty do not contain the names of the counties and states, only the respective code numbers.
- There are no options to combine different maps. This has to be done through programming, modifying coordinates.
- There are no options to plot different type of lines at different geographical levels, e.g., black outline for the US and grey outline for the States. This can be done using the ANNO option in CHORO.
- There are no options to label geographical areas. This can be done using the ANNO option in CHORO.
- This SAS procedure is not for the beginner programmer if we want to use several advance options.

REFERENCES

<https://www.census.gov/>

https://support.sas.com/sassamples/graphgallery/PROC_GMAP.html

CONTACT INFORMATION

Evian Fernandez Garcia

Astellas Pharma Europe BV

evian.fernandezgarcia@astellas.com