Instituto de Salud Carlos III

Representación de datos georeferenciados

CNE/ISCIII

Los datos

Casos de cáncer colorectal residentes en Navalmoral de la Mata

```
load("data/datos_procesados.RData")
require(sf)
casos # de CRC durante 5 años, Navalmoral de la Mata
```

```
## Simple feature collection with 111 features and 7 fields
## Geometry type: POINT
## Dimension:     XY
## Bounding box:  xmin: -5.552466 ymin: 39.88766 xmax: -5.523976 ymax: 39.89844
## Geodetic CRS:  WGS 84
## First 10 features:
##              ID LOCALIZACION TIPO_VIA          DIRECCION NUM    CP   COD_MUNI
## 1  101310001539                CALLE            LUCHANA   3 10300 1100003617 POINT (-5.541
## 2  101310001579                CALLE             HIEDRA   8 10300 1100003617  POINT (-5.54
## 3  101310001839                CALLE           RIO MIÑO   6 10300 1100003617 POINT (-5.541
## 4  101310002086                CALLE    AGUSTIN CARREÑO   8 10300 1100003617 POINT (-5.545
## 5  101310003991                CALLE JUAN RAMON JIMENEZ   6 10300 1100003617 POINT (-5.539
## 6  101310004869                CALLE             ALBUERA   5 10300 1100003617 POINT (-5.539
## 7  101310006267             TRAVESIA             MURILLO   5 10300 1100003617  POINT (-5.53
## 8  101310015015                CALLE      HERNAN CORTES  12 10300 1100003617 POINT (-5.539
## 9  101310021285             TRAVESIA             WEYLER   1 10300 1100003617 POINT (-5.543
## 10 101310022153                CALLE       GENERAL PRIM  16 10300 1100003617 POINT (-5.543
```

Representación puntual

Descarga del mapa

Un mapa de Navalmoral de la Mata

```
require(tmaptools)
#navalmoral <- read_osm(casos, ext=1.1) # Mapa de Navalmoral
load("data/navalmoral.RData")
navalmoral
```

```
## stars object with 3 dimensions and 1 attribute
## attribute(s):
##    Min. 1st Qu. Median     Mean 3rd Qu. Max.
## X     7     223    233 225.9355     242  255
## dimension(s):
##      from  to  offset    delta                  refsys              values x/y
## x       1 728 -618256  4.79233 WGS 84 / Pseudo-Mercator                NULL [x]
## y       1 432 4851613 -4.80619 WGS 84 / Pseudo-Mercator                NULL [y]
## band    1   3      NA       NA                      NA red  , green, blue
```

Representación del mapa

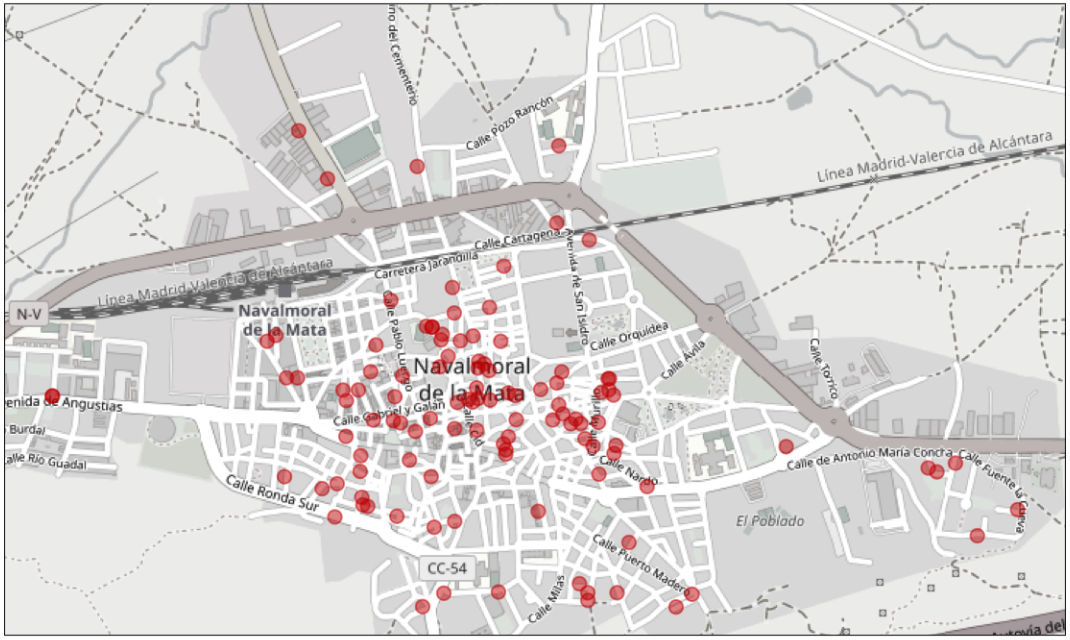
Fusión de tonalides RGB : `tm_rgb()`

```
require(tmap)
mapa <- tm_shape(navalmoral) + tm_rgb(saturation=0.1) #saturation=0: mapa en blanco y negro
mapa
```

Representación con puntos

`tm_dots()`

```
mapa + tm_shape(casos) + tm_dots(alpha=.5, col="red3", size=.25)
```



Representación estratificada

Facetas: `tm_facets()`

```
mapa +
  tm_shape(casos) + tm_dots(alpha=.5, col="red3", size=.25) +
  tm_facets("sexo", ncol=2)
```

Representación dinamica

`tmap_mode("view")`

```
tmap_mode("view") #tmap_mode("plot") para mapas estaticos

tm_shape(casos) + tm_dots(alpha=.5, col="red3")
```

Representación de datos agregados

Datos agregados

Incidencia de casos por sección censal

```
casos.sec=aggregate(ID~CUSEC, data=casos, FUN =length) #calcula numero de casos por sc
casos.sec
```

```
##         CUSEC ID
## 1  1013101001 18
## 2  1013101002 12
## 3  1013101003 15
## 4  1013101004  8
## 5  1013102001  4
## 6  1013102002 12
## 7  1013102003 14
## 8  1013102004  9
## 9  1013102005 12
## 10 1013102006  5
## 11 1013102007  2
```

Descarga de la rejilla (shape)

Secciones censales de Navalmoral de la Mata

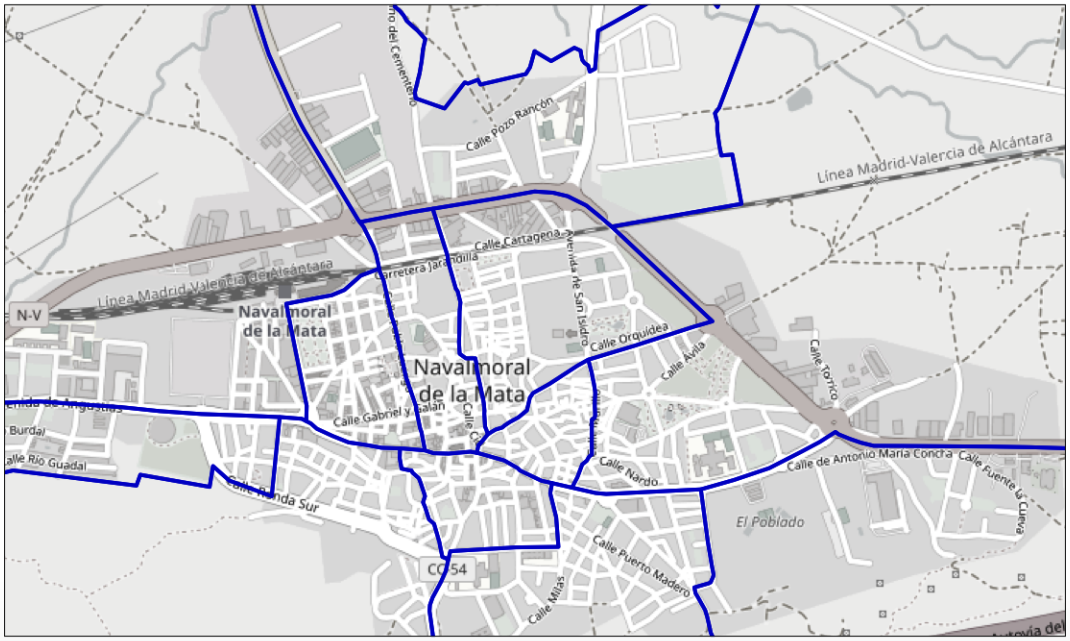
```
# load("data/datos_procesados.RData")
navalmoral.shp[, c("CUSEC","ambos")] #ID de la sc y su población
```

```
## Simple feature collection with 5 features and 2 fields
## Geometry type: POLYGON
## Dimension:     XY
## Bounding box:  xmin: -5.673221 ymin: 39.86799 xmax: -5.532984 ymax: 39.97798
## Geodetic CRS:  WGS 84
##        CUSEC ambos                          geometry
## 1 1013101001  1050 POLYGON ((-5.539614 39.8915...
## 2 1013101002  1027 POLYGON ((-5.541571 39.8916...
## 3 1013101003  1267 POLYGON ((-5.535957 39.8962...
## 4 1013101004  2008 POLYGON ((-5.648417 39.9739...
## 5 1013102001  1618 POLYGON ((-5.541469 39.8912...
```

Representación de la rejilla

Capa de las secciones censales

```
tmap_mode("plot") # vuelta al modo estático
mapa + tm_shape(navalmoral.shp) + tm_borders("blue3",lwd=2)
```



Cálculo de las tasas

Población en el numerador

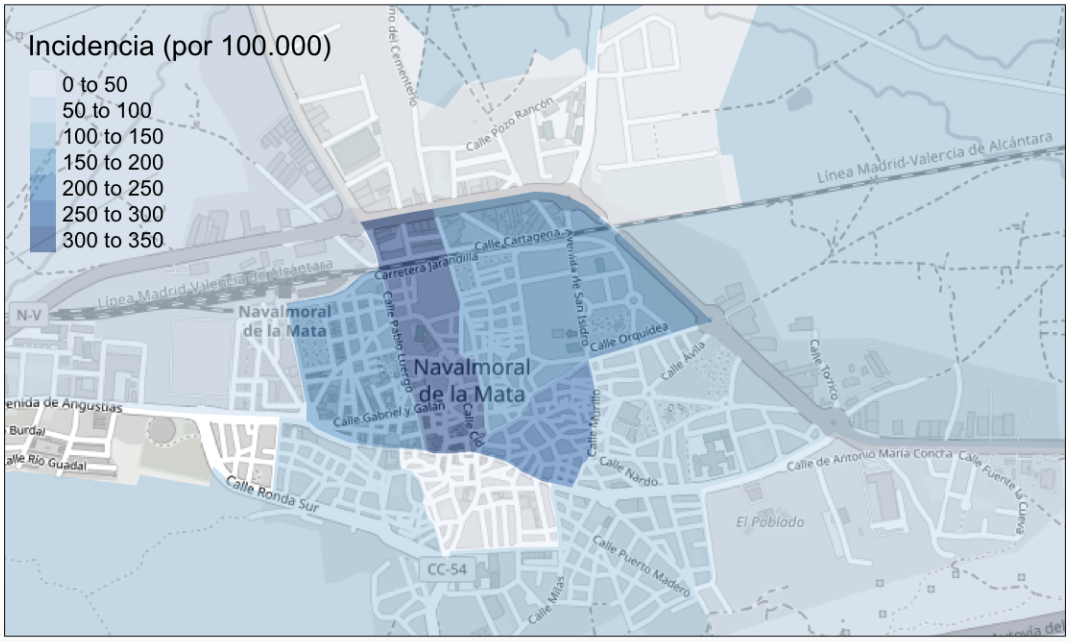
```
casos.shp = merge(navalmoral.shp,casos.sec,by="CUSEC") #junta casos y el shape de sc
casos.shp$tasa = casos.shp$ID / (casos.shp$ambos*5) * 100000 # tasa por 100.000 personas año
casos.shp[,c("CUSEC","ambos","tasa")]
```

```
## Simple feature collection with 5 features and 3 fields
## Geometry type: POLYGON
## Dimension:     XY
## Bounding box:  xmin: -5.673221 ymin: 39.86799 xmax: -5.532984 ymax: 39.97798
## Geodetic CRS:  WGS 84
##        CUSEC ambos      tasa                         geometry
## 1 1013101001  1050 342.85714 POLYGON ((-5.539614 39.8915...
## 2 1013101002  1027 233.69036 POLYGON ((-5.541571 39.8916...
## 3 1013101003  1267 236.77979 POLYGON ((-5.535957 39.8962...
## 4 1013101004  2008  79.68127 POLYGON ((-5.648417 39.9739...
## 5 1013102001  1618  49.44376 POLYGON ((-5.541469 39.8912...
```

Representación de las tasas

Mapa coroplético

```
tmap_mode("plot") #vuelta a la versión estatica
mapa + tm_shape(casos.shp) + tm_fill("tasa",alpha=.5, title="Incidencia (por 100.000)")
```



Exportar un mapa

tmap_save

```
grafico <- mapa + tm_shape(casos.shp) + tm_fill("tasa",alpha=.5, title="Incidencia (por 100.00

## Formato vectorial
tmap_save(grafico, filename="mi_grafico.pdf") # 150 KB

## Formato pixel
tmap_save(grafico, filename="mi_grafico.png") # 1.9 MB !
```