

Italy regions map

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Italian regions map with ggplot2

Necessary packages

```
require(ggplot2)
require(rnaturalearth)
require(rnaturalearthdata)
require(dplyr)
require(readxl)

setwd("C:/Users/luigi/Desktop/ISTAT_Poster/Farmaci_titolo_studio")
```

Regions shape

We prepare information for the shape of each italian region

```
italy <- ne_states(country = "italy", returnclass = "sf")

# Keep only information regarding regions (no province level)
it_regions <- italy %>%
  group_by(region) %>%
  summarise()

ggplot(data = it_regions) +
  geom_sf() +
  theme(panel.grid.major = element_blank(), # remove grid
        panel.grid.minor = element_blank()) + # remove grid
  coord_sf(label_axes = "SW") # remove coordinates
```



BMI

```
df<- as.data.frame(read_excel("BmiMap.xlsx",
                             col_names= T, range = 'A1:E21'))

df$regione <- ifelse(df$Territorio == "Puglia", "Apulia",
                    ifelse(df$Territorio == "Sicilia", "Sicily",
                    ifelse(df$Territorio == "Trentino Alto Adige", "Trentino-Alto Adige",
                            df$Territorio)))

df <- arrange(df, regione)

# Checking that all regions have the same name and are in the same order
table(df$regione==it_regions$region)

##
## TRUE
## 20
```

Suppose we want to evaluate the number of overweight and obese in each region; we need to sum together the corresponding columns

```
df$OwAndOb<- df$sovrappeso + df$obesi
```

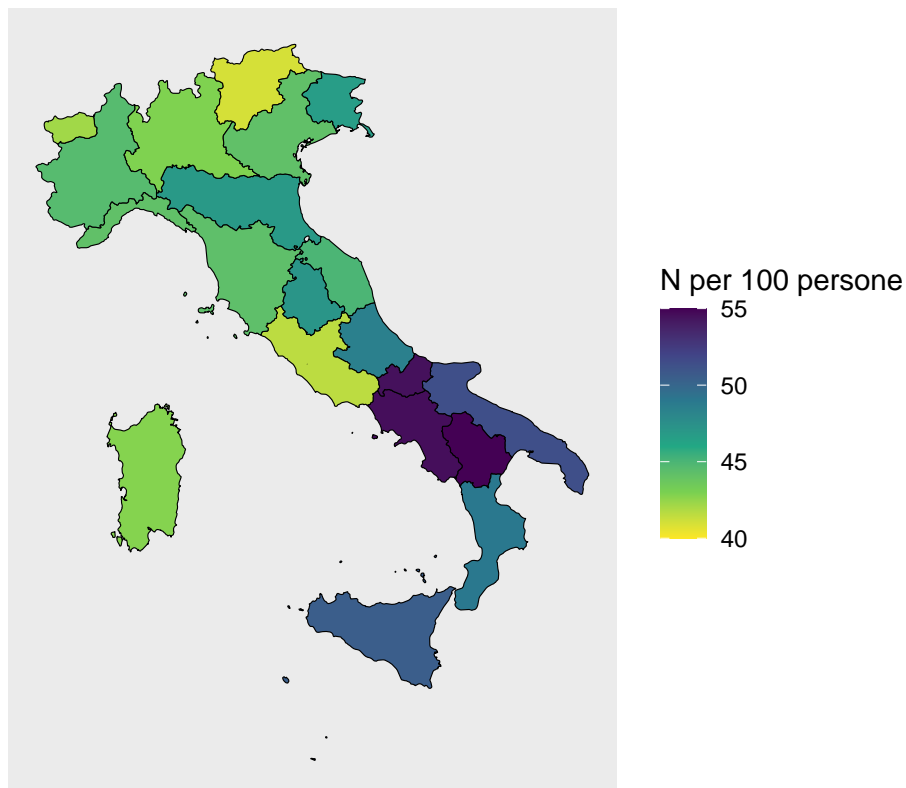
```
df_finale <- cbind(it_regions, df)
```

Sovrappeso e obesi insieme

```
#tiff(filename = "Overw_obese2022_map", width = 2000, height = 2000)
```

```
ggplot(data = df_finale)+  
  geom_sf(color = "black", aes(fill = OwAndOb))+  
  scale_fill_viridis_c(option='viridis', na.value = 'grey80',  
                        direction= -1,  
                        begin=0, limits= c(40,55))+  
  ggtitle("Sovrappeso e obesi")+  
  labs(fill = "N per 100 persone")+  
  theme(panel.grid.major = element_blank(), # remove grid  
        panel.grid.minor = element_blank())+ # remove grid  
  coord_sf(label_axes = "SW") # remove coordinates
```

Sovrappeso e obesi



```
#dev.off()
```

Solo obesi

```
#tiff(filename = "obese2022_map", width = 2000, height = 2000)
```

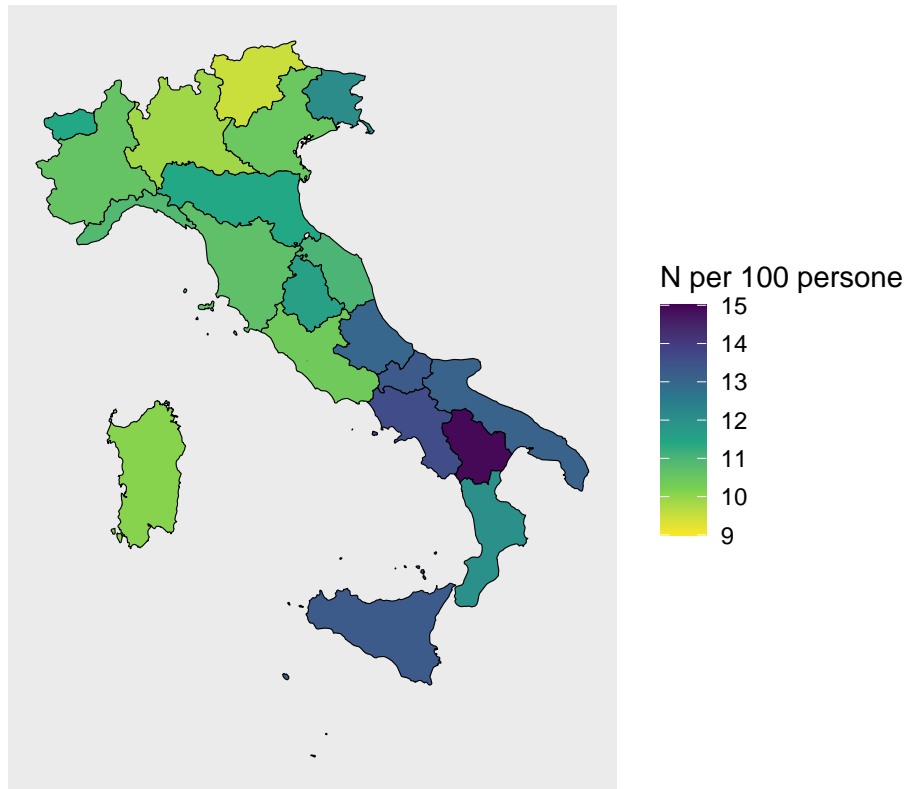
```
ggplot(data = df_finale)+  
  geom_sf(color = "black", aes(fill = obesi))+  
  scale_fill_viridis_c(option='viridis', na.value = 'grey80',  
                        direction= -1,
```

```

begin=0, limits= c(9,15))+
ggtitle("Obesi")+
labs(fill = "N per 100 persone")+
theme(panel.grid.major = element_blank(), # remove grid
       panel.grid.minor = element_blank())+ # remove grid
coord_sf(label_axes = "SW") # remove coordinates

```

Obesi



```
#dev.off()
```

Alcol fuori pasto

```

df<- as.data.frame(read_excel("AlcolFuoriPastoMap.xlsx",
                             col_names= T, range = 'A1:C21'))

dimnames(df)[[2]][c(2,3)]<- c("AlcolFP", "NoAlcolFP")

df$regione <- ifelse(df$Territorio == "Puglia", "Apulia",
                    ifelse(df$Territorio == "Sicilia", "Sicily",
                    ifelse(df$Territorio == "Trentino Alto Adige", "Trentino-Alto Adige",
                           df$Territorio)))

df <- arrange(df, regione)

```

```

# Checking that all regions have the same name and are in the same order
table(df$regione==it_regions$region)

##
## TRUE
## 20

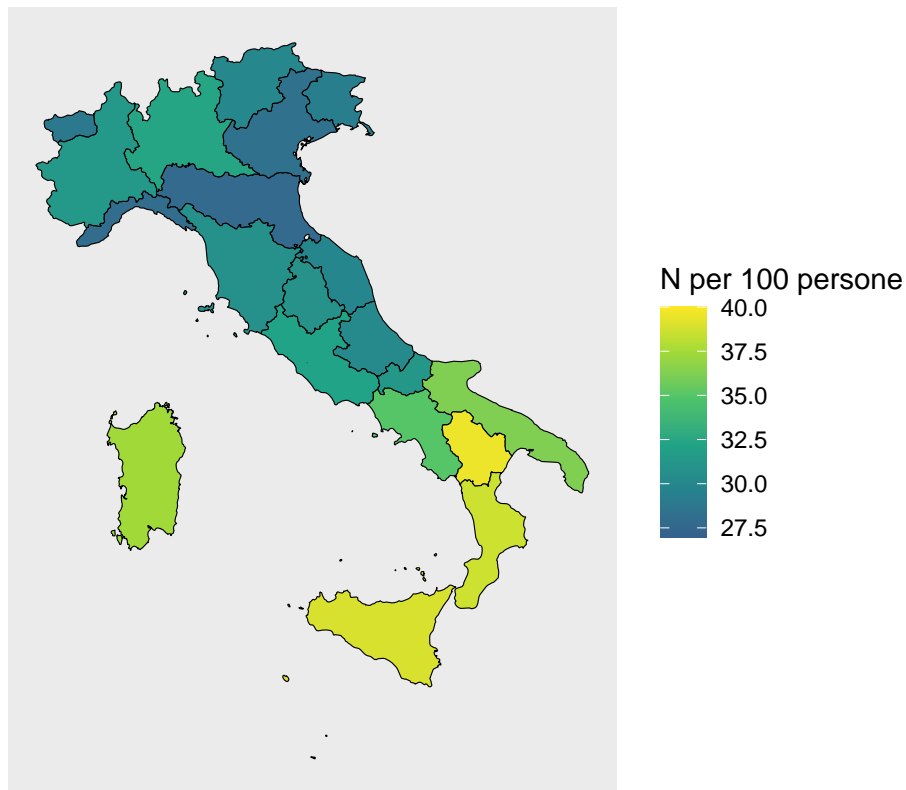
df_finale <- cbind(it_regions, df)

#tiff(filename = "NoAlcolFP2022_map", width = 2000, height = 2000)

ggplot(data = df_finale)+
  geom_sf(color = "black", aes(fill = NoAlcolFP))+
  scale_fill_viridis_c(option='viridis', na.value = 'grey80',direction=1,begin=0.3,
    limits= c(floor(min(df$NoAlcolFP)),ceiling(max(df$NoAlcolFP))))+
  ggtitle("Persone >11 anni che NON consumano alcol fuori pasto")+
  labs(fill = "N per 100 persone")+
  theme(panel.grid.major = element_blank(), # remove grid
    panel.grid.minor = element_blank())+ # remove grid
  coord_sf(label_axes = "SW") # remove coordinates

```

Persone >11 anni che NON consumano alcol fuori pasto



```

#dev.off()

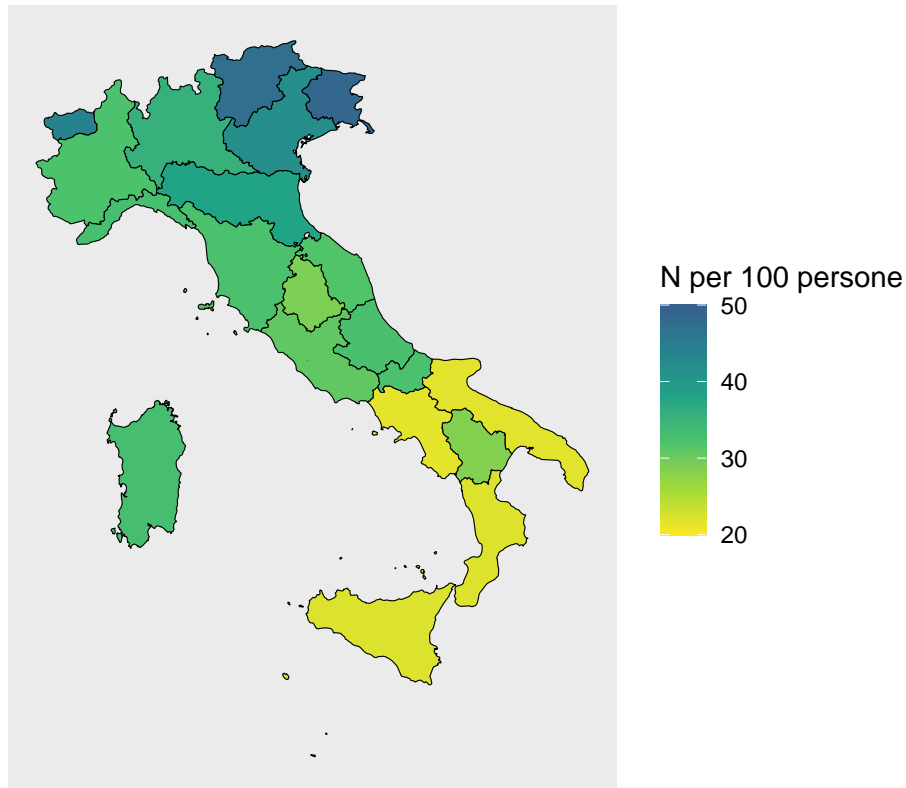
#tiff(filename = "SiAlcolFP2022_map", width = 2000, height = 2000)

ggplot(data = df_finale)+
  geom_sf(color = "black", aes(fill = AlcolFP))+

```

```
scale_fill_viridis_c(option='viridis', na.value = 'grey80',
                     direction= -1, begin=0.3,
                     limits= c(20,50))+
ggtitle("Persone >11 anni che consumano alcol fuori pasto")+
labs(fill = "N per 100 persone")+
theme(panel.grid.major = element_blank(), # remove grid
      panel.grid.minor = element_blank())+ # remove grid
coord_sf(label_axes = "SW") # remove coordinates
```

Persone >11 anni che consumano alcol fuori pasto



```
#dev.off()
```

Verdura, ortaggi e frutta

```
df<- as.data.frame(read_excel("VerduraMap.xlsx",
                             col_names= T, range = 'A1:H21'))

dimnames(df)[[2]][2:8]<- c("Verd>1", "Ort>1", "Frut>1", "General>1",
                          "OnlyOne", "TwoFour", "MoreThanFive")

df$regione <- ifelse(df$Territorio == "Puglia", "Apulia",
                    ifelse(df$Territorio == "Sicilia", "Sicily",
                    ifelse(df$Territorio == "Trentino Alto Adige", "Trentino-Alto Adige",
                           df$Territorio)))
```

```
df <- arrange(df, regione)

# Checking that all regions have the same name and are in the same order
table(df$regione==it_regions$region)

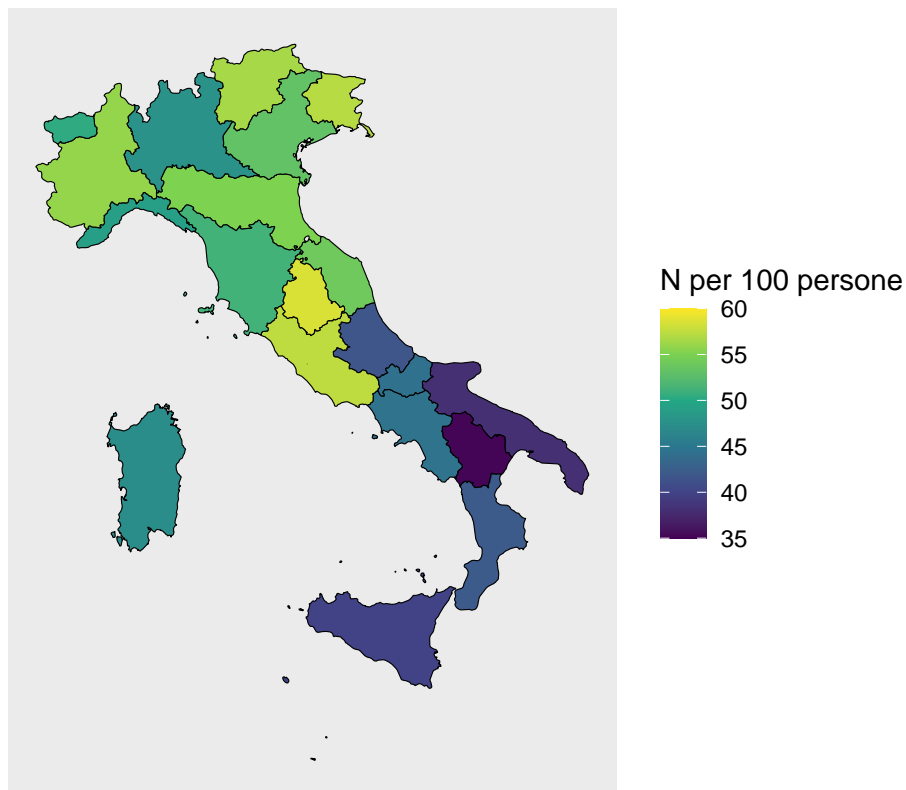
##
## TRUE
## 20

df_finale <- cbind(it_regions, df)
```

```
#tiff(filename = "Verd2022_map", width = 2000, height = 2000)

ggplot(data = df_finale)+
  geom_sf(color = "black", aes(fill = df$`Verd>1`))+
  scale_fill_viridis_c(option='viridis', na.value = 'grey80',
    direction= 1,
    begin=0,
    limits= c(35, 60))+
  ggtitle("Persone che consumano almeno una verdura al giorno")+
  labs(fill = "N per 100 persone")+
  theme(panel.grid.major = element_blank(), # remove grid
    panel.grid.minor = element_blank())+ # remove grid
  coord_sf(label_axes = "SW") # remove coordinates
```

Persone che consumano almeno una verdura al giorno

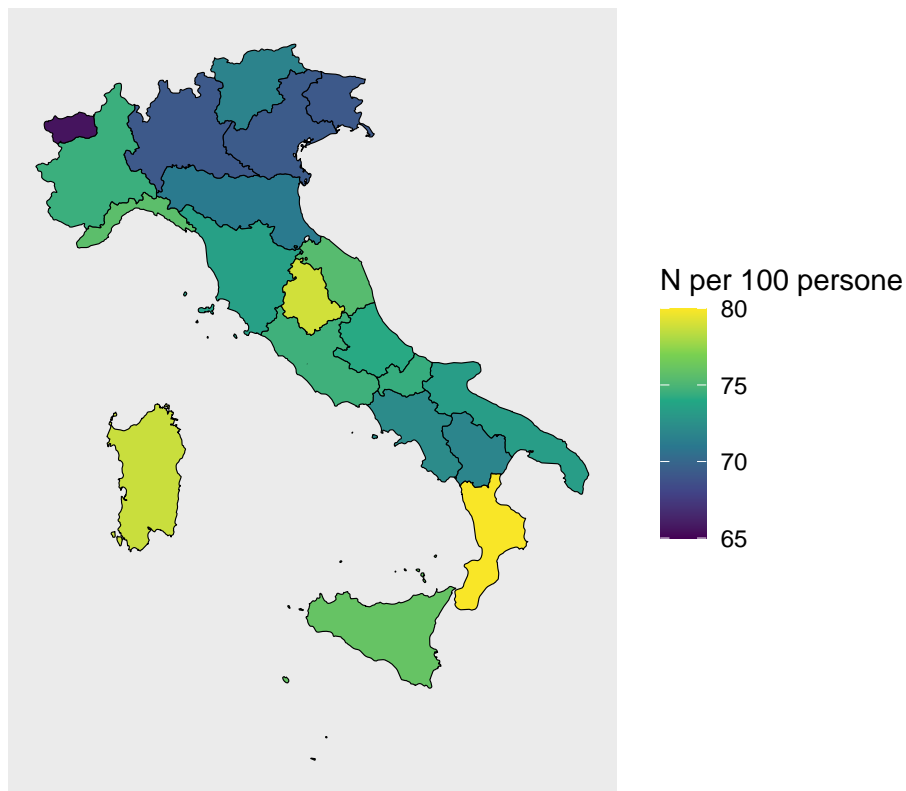


```
#dev.off()
```

```
#tiff(filename = "Frut2022_map", width = 2000, height = 2000)

ggplot(data = df_finale)+
  geom_sf(color = "black", aes(fill = df$`Frut>1`))+
  scale_fill_viridis_c(option='viridis', na.value = 'grey80',
    direction= 1,
    begin=0,
    limits= c(65, 80))+
  ggtitle("Persone che consumano almeno una frutta al giorno")+
  labs(fill = "N per 100 persone")+
  theme(panel.grid.major = element_blank(), # remove grid
    panel.grid.minor = element_blank())+ # remove grid
  coord_sf(label_axes = "SW") # remove coordinates
```

Persone che consumano almeno una frutta al giorno



```
#dev.off()

#tiff(filename = "Genmorethan5_2022_map.jpeg", width = 2000, height = 2000)

ggplot(data = df_finale)+
  geom_sf(color = "black", aes(fill = df$MoreThanFive))+
  scale_fill_viridis_c(option='viridis', na.value = 'grey80',
    direction= 1,
    begin=0,
    limits= c(2,8))+
  ggtitle("Persone che consumano 5 o piu tra frutta, verdura e ortaggi al giorno")+
  labs(fill = "N per 100 persone")+
  #dev.off()
```

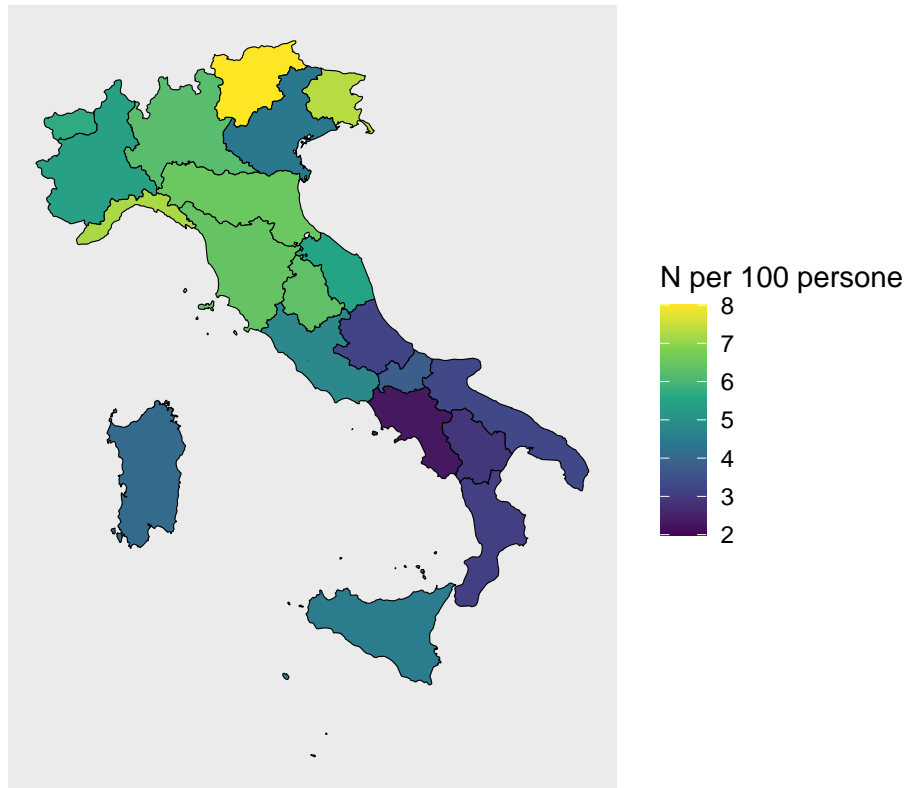


```

theme(panel.grid.major = element_blank(),      # remove grid
      panel.grid.minor = element_blank()#,    # remove grid
      #legend.key.size = unit(3.5, 'lines'),   # Dimensions parameters
      #legend.text = element_text(size= 20),
      #legend.title = element_text(size= 30),
      #plot.title = element_text(size=50)
      )+
coord_sf(label_axes = "SW")                    # remove coordinates

```

Persone che consumano 5 o piu tra frutta, verdura e ortaggi al giorno



```
#dev.off()
```

La mappa seguente mostra la variazione del numero di individui che consumano almeno uno tra verdura, ortaggi o frutta al giorno, ogni 100 abitanti, per ciascuna regione

```

df2011<- as.data.frame(read_excel("VerduraMap.xlsx",
                                col_names= T, range = 'J1:Q21'))

dimnames(df2011)[[2]][2:8]<- c("Verd>1", "Ort>1", "Frut>1", "General>1",
                              "OnlyOne", "TwoFour", "MoreThanFive")

df2011$regione <- ifelse(df2011$Territorio == "Puglia", "Apulia",
                        ifelse(df2011$Territorio == "Sicilia", "Sicily",
                        ifelse(df2011$Territorio == "Trentino Alto Adige", "Trentino-Alto Adige",
                              df2011$Territorio)))

```

```

df2011 <- arrange(df2011, regione)

# Checking that all regions have the same name and are in the same order
table(df2011$regione==it_regions$region)

##
## TRUE
## 20

tot_change <- df$`General>1` - df2011$`General>1`

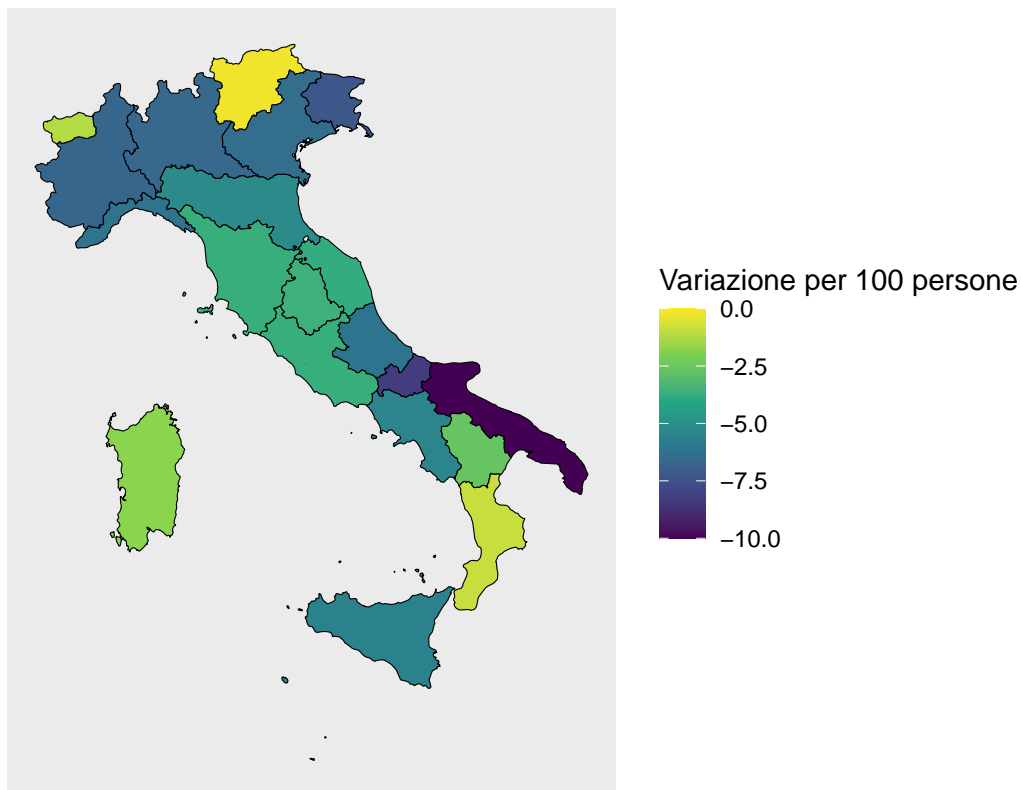
df_finale <- cbind(it_regions, tot_change)

#tiff(filename = "Frut2022_map", width = 2000, height = 2000)

ggplot(data = df_finale)+
  geom_sf(color = "black", aes(fill = tot_change))+
  scale_fill_viridis_c(option='viridis', na.value = 'grey80',
    direction= 1,
    begin=0,
    limits= c(-10, 0))+
  ggtitle("Almeno 1 elemento al gg dal 2011 al 2022, per 100 abitanti")+
  labs(fill = "Variazione per 100 persone")+
  theme(panel.grid.major = element_blank(), # remove grid
    panel.grid.minor = element_blank())+ # remove grid
  coord_sf(label_axes = "SW") # remove coordinates

```

Almeno 1 elemento al gg dal 2011 al 2022, per 100 abitanti



```
#dev.off()
```