

STATS 205: Final Project Write-Up

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1. Background of the data and why it is interesting or important

The data we are using is the data from WHO suicide statistics from Kaggle. This gives population-based statistics on suicide rate...

2. Explanation of the method studied and its properties

3. Data analysis or simulation study

We will use the crude rate of suicide per 100,000 people.

This analysis provides information on age-standardized rates...

```
who_suicide_statistics_df <- read.csv("who_suicide_statistics.csv")
head(who_suicide_statistics_df)
```

```
##   country year    sex      age suicides_no population
## 1 Albania 1985 female 15-24 years         NA      277900
## 2 Albania 1985 female 25-34 years         NA      246800
## 3 Albania 1985 female 35-54 years         NA      267500
## 4 Albania 1985 female  5-14 years         NA      298300
## 5 Albania 1985 female 55-74 years         NA      138700
## 6 Albania 1985 female  75+ years         NA       34200
```

```
colnames(who_suicide_statistics_df)
```

```
## [1] "country"    "year"       "sex"        "age"        "suicides_no"
## [6] "population"
```

Filter and save countries with missing suicide rate.

```
library(tidyverse)
```

```
## Registered S3 methods overwritten by 'ggplot2':
```

```
##   method      from
## [.quosures   rlang
## c.quosures   rlang
## print.quosures rlang
```

```
## -- Attaching packages ----- tidyverse 1.2.1 --
```

```
## v ggplot2 3.1.1    v purrr   0.3.2
## v tibble  2.1.1    v dplyr  0.8.1
## v tidyr   0.8.3    v stringr 1.4.0
## v readr   1.3.1    v forcats 0.4.0
```

```
## -- Conflicts ----- tidyverse_conflicts() --
```

```
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
filtered_suicide_df <- drop_na(who_suicide_statistics_df, "suicides_no")
head(filtered_suicide_df)
```

```
##   country year   sex      age suicides_no population
## 25 Albania 1987 female 15-24 years         14    289700
## 26 Albania 1987 female 25-34 years          4    257200
## 27 Albania 1987 female 35-54 years          6    278800
## 28 Albania 1987 female  5-14 years          0    311000
## 29 Albania 1987 female 55-74 years          0    144600
## 30 Albania 1987 female  75+ years          1     35600
```

After filtering countries with missing suicide rate, take a random sample of 100 countries and make sure each continent has approximately equal countries.

Filter countries by continent:

```
library(countrycode)
filtered_suicide_df$continent <- countrycode(sourcevar = filtered_suicide_df[, "country"],
                                             origin = "country.name",
                                             destination = "continent")
```

```
## Warning in countrycode(sourcevar = filtered_suicide_df[, "country"], origin = "country.name", : Some
## Warning in countrycode(sourcevar = filtered_suicide_df[, "country"], origin = "country.name", : Some
head(filtered_suicide_df)
```

```
##   country year   sex      age suicides_no population continent
## 25 Albania 1987 female 15-24 years         14    289700    Europe
## 26 Albania 1987 female 25-34 years          4    257200    Europe
## 27 Albania 1987 female 35-54 years          6    278800    Europe
## 28 Albania 1987 female  5-14 years          0    311000    Europe
## 29 Albania 1987 female 55-74 years          0    144600    Europe
## 30 Albania 1987 female  75+ years          1     35600    Europe
```

```
write.csv(filtered_suicide_df, 'filtered_suicide.csv')
```

Let us find out which continents are counted:

```
# Get list of continents
list_of_continents <- unique(filtered_suicide_df$continent); list_of_continents
```

```
## [1] "Europe" "Americas" "Asia" "Oceania" "Africa" NA
```

Therefore,

$$\frac{100 \text{ countries}}{6 \text{ continents}} \approx 16 \text{ to } 17 \text{ countries per continent}$$

we should randomly sample 17 countries from each continent.

Notably, there are countries that are not on any of the listed continents. Let us see which ones those are:

```
not_in_a_continent = filtered_suicide_df[is.na(filtered_suicide_df$continent),]
write.csv(not_in_a_continent, 'not_in_a_continent.csv')
head(not_in_a_continent)
```

```
##   country year   sex      age suicides_no population continent
## 32317 Rodrigues 2001 female 15-24 years          0      NA      <NA>
## 32318 Rodrigues 2001 female 25-34 years          0      NA      <NA>
```

```
## 32319 Rodrigues 2001 female 35-54 years      0      NA      <NA>
## 32320 Rodrigues 2001 female  5-14 years      0      NA      <NA>
## 32321 Rodrigues 2001 female 55-74 years      0      NA      <NA>
## 32322 Rodrigues 2001 female  75+ years      0      NA      <NA>
```

```
unique(not_in_a_continent$country)
```

```
## [1] Rodrigues          Virgin Islands (USA)
## 141 Levels: Albania Anguilla Antigua and Barbuda Argentina ... Zimbabwe
```

Let us make the choice not to include these countries in the analysis, since there are only two countries.

```
# Take off `NA` from list of continents
list_of_continents <- list_of_continents[-length(list_of_continents)]
list_of_continents
```

```
## [1] "Europe"    "Americas"  "Asia"      "Oceania"   "Africa"
```

We will now create six dataframes, filtered by list of countries for each continent.

```
# library(rlist)
countries_per_continent <- list()

for (i in seq_along(list_of_continents))
{
  countries_per_continent[[i]] <- filtered_suicide_df[filtered_suicide_df$continent == list_of_continents[i]]
}

length(countries_per_continent)
```

```
## [1] 5
```

```
length(countries_per_continent)
```

```
## [1] 5
```

```
for (i in seq_along(countries_per_continent))
{
  print(head(countries_per_continent[[i]]))
  cat("\n")
}
```

```
##      country year    sex      age suicides_no population continent
## 25 Albania 1987 female 15-24 years      14      289700    Europe
## 26 Albania 1987 female 25-34 years       4      257200    Europe
## 27 Albania 1987 female 35-54 years       6      278800    Europe
## 28 Albania 1987 female  5-14 years       0      311000    Europe
## 29 Albania 1987 female 55-74 years       0      144600    Europe
## 30 Albania 1987 female  75+ years       1       35600    Europe
##
##      country year    sex      age suicides_no population continent
## 373 Anguilla 1983 female 15-24 years       0        NA  Americas
## 374 Anguilla 1983 female 25-34 years       0        NA  Americas
## 375 Anguilla 1983 female 35-54 years       0        NA  Americas
## 376 Anguilla 1983 female  5-14 years       0        NA  Americas
## 377 Anguilla 1983 female 55-74 years       0        NA  Americas
## 378 Anguilla 1983 female  75+ years       0        NA  Americas
##
##      country year    sex      age suicides_no population continent
```

```
## 1501 Armenia 1981 female 15-24 years      5      348000      Asia
## 1502 Armenia 1981 female 25-34 years      6      242200      Asia
## 1503 Armenia 1981 female 35-54 years      6      333500      Asia
## 1504 Armenia 1981 female 5-14 years       0      295200      Asia
## 1505 Armenia 1981 female 55-74 years     10      164300      Asia
## 1506 Armenia 1981 female 75+ years       7       43100      Asia
##
##      country year    sex      age suicides_no population continent
## 2161 Australia 1979 female 15-24 years      71    1236800    Oceania
## 2162 Australia 1979 female 25-34 years      86    1138500    Oceania
## 2163 Australia 1979 female 35-54 years     171    1572100    Oceania
## 2164 Australia 1979 female 5-14 years       1    1246500    Oceania
## 2165 Australia 1979 female 55-74 years     135    1137800    Oceania
## 2166 Australia 1979 female 75+ years       15     309900    Oceania
##
##      country year    sex      age suicides_no population continent
## 7669 Cabo Verde 2011 female 15-24 years      1     56039     Africa
## 7670 Cabo Verde 2011 female 25-34 years      0     38528     Africa
## 7671 Cabo Verde 2011 female 35-54 years      2     49078     Africa
## 7672 Cabo Verde 2011 female 5-14 years       0     56558     Africa
## 7673 Cabo Verde 2011 female 55-74 years      2     19887     Africa
## 7674 Cabo Verde 2011 female 75+ years       0       7582     Africa
```

This text links to very important information about why a `for` loop doesn't print anything.¹

[Link to Pandoc Markdown formatting](#)

Randomly sample 17 countries from each continent:

```
list_of_continents
```

```
## [1] "Europe" "Americas" "Asia" "Oceania" "Africa"
```

```
for (i in seq_along(countries_per_continent))
{
  print(unique(countries_per_continent[[i]]$country))
}
```

```
## [1] Albania      Austria      Belarus
## [4] Belgium     Bosnia and Herzegovina Bulgaria
## [7] Croatia     Czech Republic Denmark
## [10] Estonia     Finland     France
## [13] Germany     Greece      Hungary
## [16] Iceland     Ireland     Italy
## [19] Latvia      Lithuania   Luxembourg
## [22] Malta       Monaco      Montenegro
## [25] Netherlands Norway      Poland
## [28] Portugal    Republic of Moldova <NA>
## [31] Romania     Russian Federation San Marino
## [34] Serbia      Slovakia    Slovenia
## [37] Spain       Sweden      Switzerland
## [40] TFYR Macedonia Ukraine      United Kingdom
## 141 Levels: Albania Anguilla Antigua and Barbuda Argentina ... Zimbabwe
```

¹Basically, `for` loops are functions themselves. R prints out the result of a command automatically, but functions are not inherently a command, and will therefore not print anything unless explicitly run. The solution is to have `print(command())` to get output. You will never again spend hours trying to find out why a `for` loop doesn't print anything because you're no longer an R newbie.

## [1] Anguilla	Antigua and Barbuda
## [3] Argentina	Aruba
## [5] Bahamas	Barbados
## [7] Belize	Bermuda
## [9] Bolivia	Brazil
## [11] British Virgin Islands	Canada
## [13] Cayman Islands	Chile
## [15] Colombia	Costa Rica
## [17] Cuba	Dominica
## [19] Dominican Republic	Ecuador
## [21] El Salvador	Falkland Islands (Malvinas)
## [23] French Guiana	Grenada
## [25] Guadeloupe	Guatemala
## [27] Guyana	Haiti
## [29] Honduras	Jamaica
## [31] Martinique	Mexico
## [33] Montserrat	Netherlands Antilles
## [35] Nicaragua	Panama
## [37] Paraguay	Peru
## [39] Puerto Rico	<NA>
## [41] Saint Kitts and Nevis	Saint Lucia
## [43] Saint Pierre and Miquelon	Saint Vincent and Grenadines
## [45] Suriname	Trinidad and Tobago
## [47] Turks and Caicos Islands	United States of America
## [49] Uruguay	Venezuela (Bolivarian Republic of)
## 141 Levels: Albania Anguilla Antigua and Barbuda Argentina ... Zimbabwe	
## [1] Armenia	Azerbaijan
## [3] Bahrain	Brunei Darussalam
## [5] Cyprus	Georgia
## [7] Hong Kong SAR	Iran (Islamic Rep of)
## [9] Iraq	Israel
## [11] Japan	Jordan
## [13] Kazakhstan	Kuwait
## [15] Kyrgyzstan	Macau
## [17] Malaysia	Maldives
## [19] Mongolia	Occupied Palestinian Territory
## [21] Oman	Philippines
## [23] Qatar	Republic of Korea
## [25] <NA>	Saudi Arabia
## [27] Singapore	Sri Lanka
## [29] Syrian Arab Republic	Tajikistan
## [31] Thailand	Turkey
## [33] Turkmenistan	United Arab Emirates
## [35] Uzbekistan	
## 141 Levels: Albania Anguilla Antigua and Barbuda Argentina ... Zimbabwe	
## [1] Australia	Fiji Kiribati New Zealand <NA>
## 141 Levels: Albania Anguilla Antigua and Barbuda Argentina ... Zimbabwe	
## [1] Cabo Verde	Egypt Mauritius
## [4] Mayotte	Morocco Reunion
## [7] <NA>	Sao Tome and Principe Seychelles
## [10] South Africa	Tunisia Zimbabwe
## 141 Levels: Albania Anguilla Antigua and Barbuda Argentina ... Zimbabwe	

4. Interpretation of the results or discussion