

> #如何用R绘制新冠病毒世界格局 (二)

> #加载所需的R包

> library(tidyverse)

-- Attaching packages ----- tidyverse 1.3.0 --

√ ggplot2 3.3.3 √ purrr 0.3.4

√ tibble 3.0.6 √ dplyr 1.0.4

√ tidyr 1.1.2 √ stringr 1.4.0

√ readr 1.4.0 √ forcats 0.5.1

-- Conflicts ----- tidyverse_conflicts() --

x dplyr::filter() masks stats::filter()

x dplyr::lag() masks stats::lag()

> library(sf)

Linking to GEOS 3.8.0, GDAL 3.0.4, PROJ 6.3.1

> library(tmap)

> #下载数据

> Confirmed <-

read_csv(url("https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master/csse_covid_19_data/csse_covid_19_time_series/time_series_covid19_confirmed_global.csv"))

-- Column specification -----

cols(

 .default = col_double(),

 `Province/State` = col_character(),

 `Country/Region` = col_character()

)

i Use `spec()` for the full column specifications.

> Deaths <-

read_csv(url("https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master/csse_covid_19_data/csse_covid_19_time_series/time_series_covid19_deaths_global.csv"))

-- Column specification -----

cols(

 .default = col_double(),

 `Province/State` = col_character(),

 `Country/Region` = col_character()

)

i Use `spec()` for the full column specifications.

> Recovered

<-read_csv(url("https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master/csse_covid_19_data/csse_covid_19_time_series/time_series_covid19_recovered_global.csv"))

-- Column specification -----

```
cols(  
  .default = col_double(),  
  `Province/State` = col_character(),  
  `Country/Region` = col_character()  
)
```

i Use `spec()` for the full column specifications.

> #查看最新日期

```
> tail(names(Confirmed), 1)
```

```
[1] "2/21/21"
```

> #确诊病例数据整理

```
> Confirmed_R <- Confirmed %>%  
+ group_by(`Country/Region`) %>%  
+ summarise(Confirmed = sum(`2/21/21`, na.rm = TRUE)) %>%  
+ rename(Region = `Country/Region`)
```

> #死亡病例数据整理

```
> Deaths_R <- Deaths %>%  
+ group_by(`Country/Region`) %>%  
+ summarise(Deaths = sum(`2/21/21`, na.rm = TRUE)) %>%  
+ rename(Region = `Country/Region`)
```

> #治愈病例数据整理

```
> Recovered_R <- Recovered %>%  
+ group_by(`Country/Region`) %>%  
+ summarise(Recovered = sum(`2/21/21`, na.rm = TRUE)) %>%  
+ rename(Region = `Country/Region`)
```

> #合并这三个数据集

```
> comb <- Confirmed_R %>%  
+ left_join(Deaths_R, by = "Region") %>%  
+ left_join(Recovered_R, by = "Region")
```

> #检查并地区名称

```
> comb <- comb %>%  
+ mutate(Region = replace(Region, Region == "US", "United States")) %>%  
+ mutate(Region = replace(Region, Region == "Korea, South", "Korea"))
```

> comb <- comb %>%

```
+ mutate(Region = replace(Region, Region == "Taiwan", "China")) %>%  
+ group_by(Region) %>%
```

```

+ summarise(Confirmed = sum(Confirmed, na.rm = TRUE),
+           Deaths = sum(Deaths, na.rm = TRUE),
+           Recovered = sum(Recovered, na.rm = TRUE)) %>%
+ ungroup()

> #加载世界地图
> library(rnaturalearth)
> W <- ne_countries(scale = 110, type = "countries", continent = NULL,
+                   country = NULL, geounit = NULL, sovereignty = NULL,
+                   returnclass = c("sf"))
>
> tm_shape(W)+ tm_polygons()

```



```

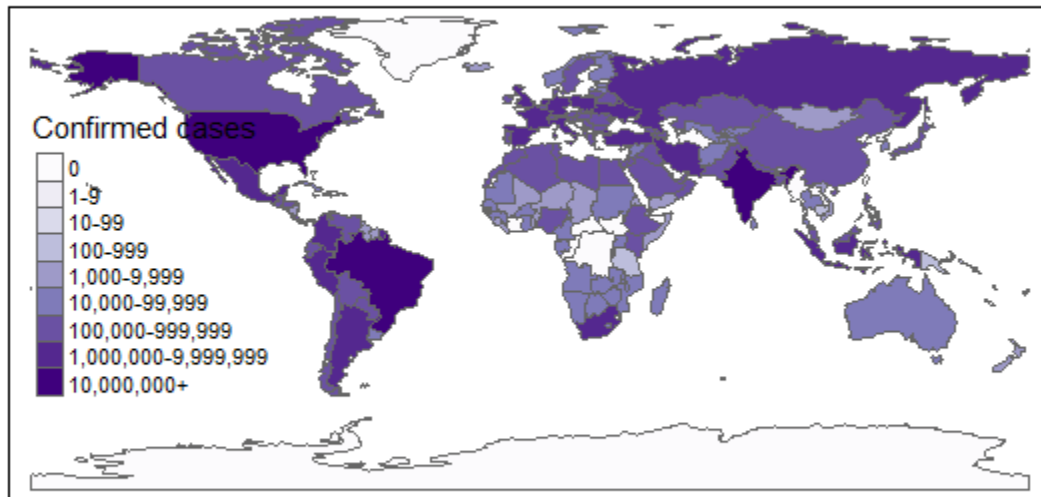
> #合并病例数据和地理数据
> cov_world <- left_join(W, comb, by = c("name" = "Region")) %>%
+ replace_na(list(Confirmed=0, Deaths=0, Recovered=0))

```

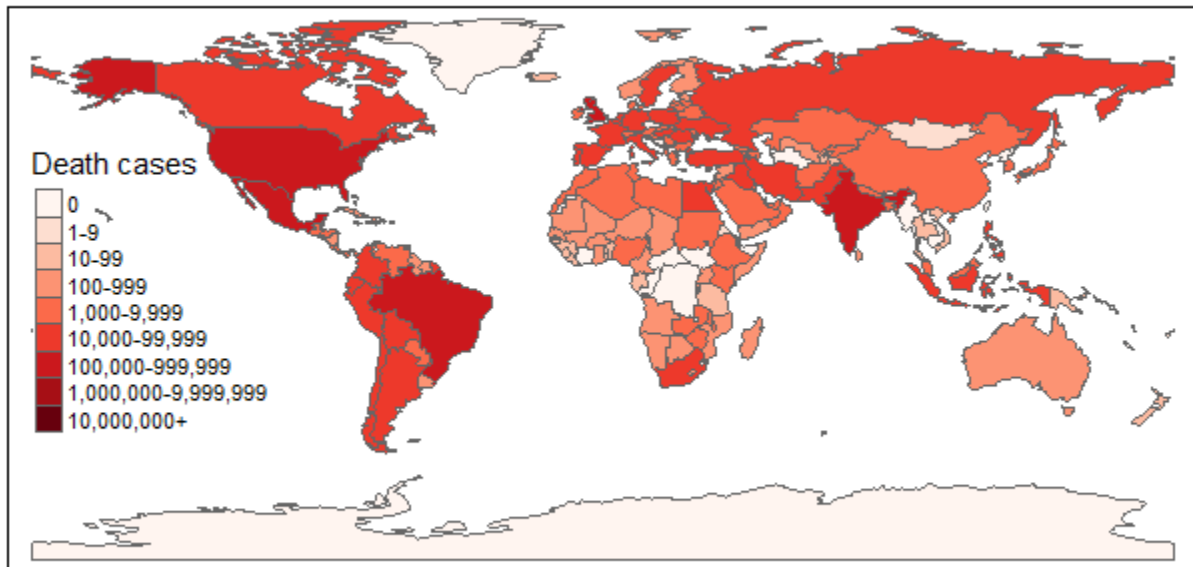
```

> #作图
> #确诊病例
> breaks <- c(0, 1, 10, 10**2, 10**3, 10**4, 10**5, 10**6, 10**7, 10**8)
> labels <- c("0",
"1-9", "10-99", "100-999", "1,000-9,999", "10,000-99,999", "100,000-999,999", "1,000,000-9,999,999",
",", "10,000,000+")
> tm_shape(cov_world) +
+   tm_polygons(col="Confirmed", breaks=breaks, labels=labels, title="Confirmed cases",
palette="Purples") +
+   tm_legend(position=c("left", "centre"))

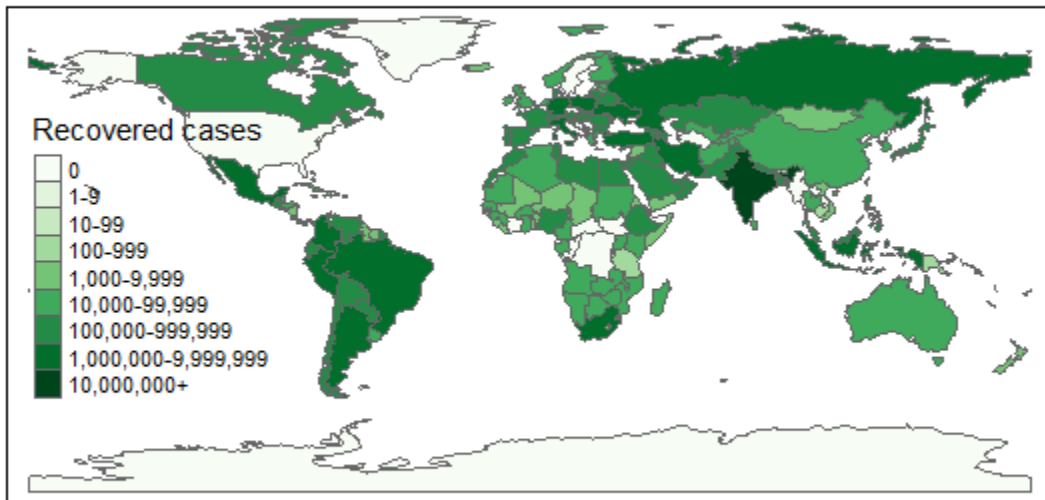
```



```
> #死亡病例
> tm_shape(cov_world) +
+   tm_polygons(col="Deaths", breaks=breaks, labels=labels, title="Death cases",
+   palette="Reds") +
+   tm_legend(position=c("left", "centre"))
```



```
> #治愈病例  
> tm_shape(cov_world) +  
+   tm_polygons(col="Recovered", breaks=breaks, labels=labels, title="Recovered cases",  
palette="Greens") +  
+   tm_legend(position=c("left", "centre"))
```



```

> #计算死亡率和治愈率
> cov_world <- cov_world %>%
+   mutate(DeathRate=Deaths/Confirmed, RecoveredRate=Recovered/Confirmed)

> #查看治愈率前十名的地区
> cov_world %>%
+   arrange(-RecoveredRate) %>%
+   select(name, Confirmed, Deaths, Recovered, DeathRate, RecoveredRate)

```

Simple feature collection with 177 features and 6 fields

geometry type: MULTIPOLYGON

dimension: XY

bbox: xmin: -180 ymin: -90 xmax: 180 ymax: 83.64513

CRS: +proj=longlat +datum=WGS84 +no_defs +ellps=WGS84 +towgs84=0,0,0

First 10 features:

	name	Confirmed	Deaths	Recovered	DeathRate	RecoveredRate
1	Vanuatu	1	0	1	0.000000000	1.0000000
2	Tajikistan	13308	90	13218	0.006762849	0.9932372
3	Iceland	6045	29	5989	0.004797353	0.9907361
4	Bhutan	866	1	857	0.001154734	0.9896074
5	Nepal	273431	2061	269876	0.007537551	0.9869985
6	Uzbekistan	79654	622	78152	0.007808773	0.9811434
7	Azerbaijan	233129	3198	227761	0.013717727	0.9769741
8	Saudi Arabia	375006	6461	366094	0.017229058	0.9762350
9	Georgia	268355	3435	261637	0.012800209	0.9749660
10	Djibouti	6024	63	5873	0.010458167	0.9749336

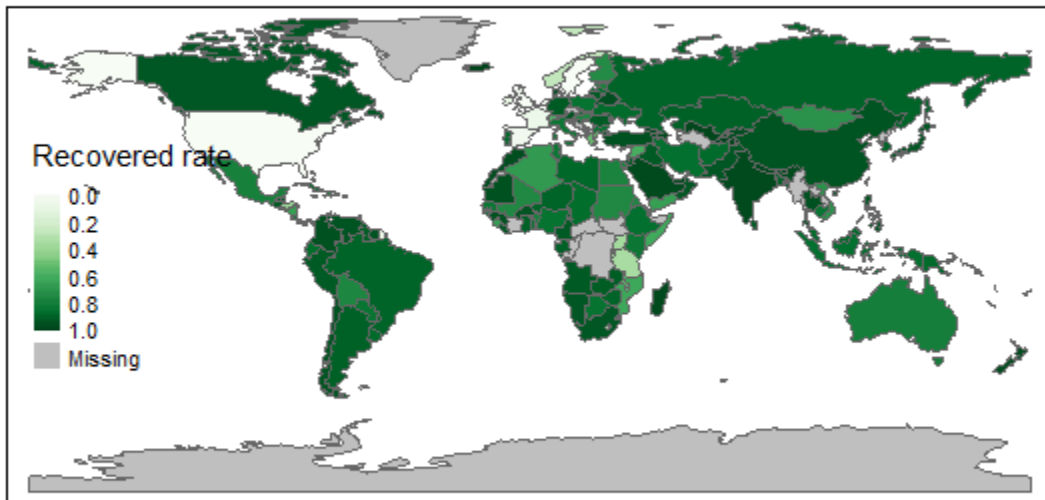
geometry

```

1 MULTIPOLYGON (((167.8449 -1...
2 MULTIPOLYGON (((71.0142 40....
3 MULTIPOLYGON (((-14.5087 66...
4 MULTIPOLYGON (((91.69666 27...
5 MULTIPOLYGON (((88.12044 27...
6 MULTIPOLYGON (((66.51861 37...
7 MULTIPOLYGON (((45.00199 39...
8 MULTIPOLYGON (((42.77933 16...
9 MULTIPOLYGON (((41.55408 41...
10 MULTIPOLYGON (((43.08123 12...

```

```
> tm_shape(cov_world) +  
+   tm_polygons(col="RecoveredRate", style = "cont", title="Recovered rate", palette="Greens")  
+  
+   tm_legend(position=c("left", "centre"))
```




```
#计算感染人数占每个地区总人口的比例
```

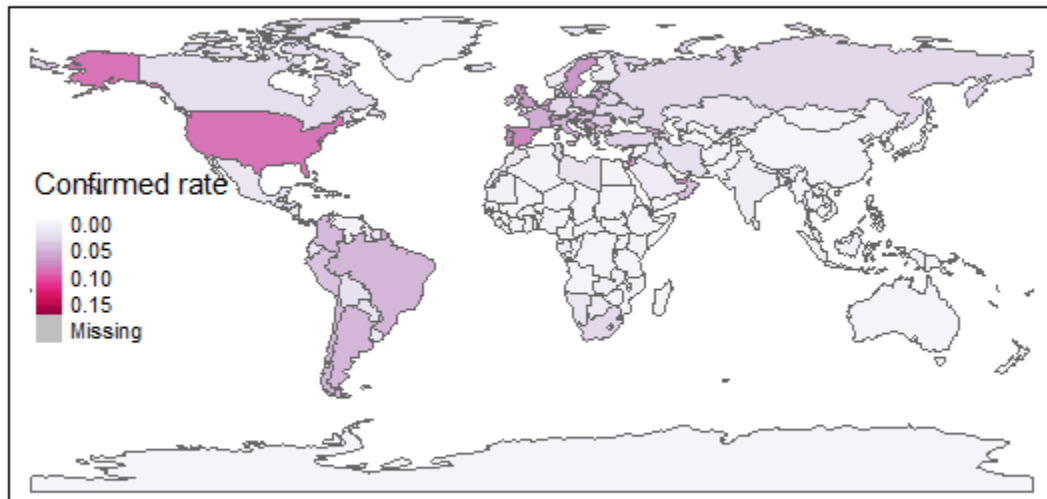
```
#人口数据可以使用地图数据里自带的变量pop_est
```

```
cov_world<- mutate(cov_world, ConfirmedRate=Confirmed/pop_est)
```

```
> tm_shape(cov_world) +
```

```
+ tm_polygons(col="ConfirmedRate", style = "cont", title="Confirmed rate", palette="PuRd") +
```

```
+ tm_legend(position=c("left", "centre"))
```



```
> #试试用viridis这个包的色板  
> library(viridisLite)  
> tm_shape(cov_world) +  
+   tm_polygons(col="ConfirmedRate", style = "cont", title="Confirmed rate", palette=viridis(n=5,  
direction=-1,option = "A")) +  
+   tm_legend(position=c("left", "centre"))
```

