

## Project

### Load packages and data

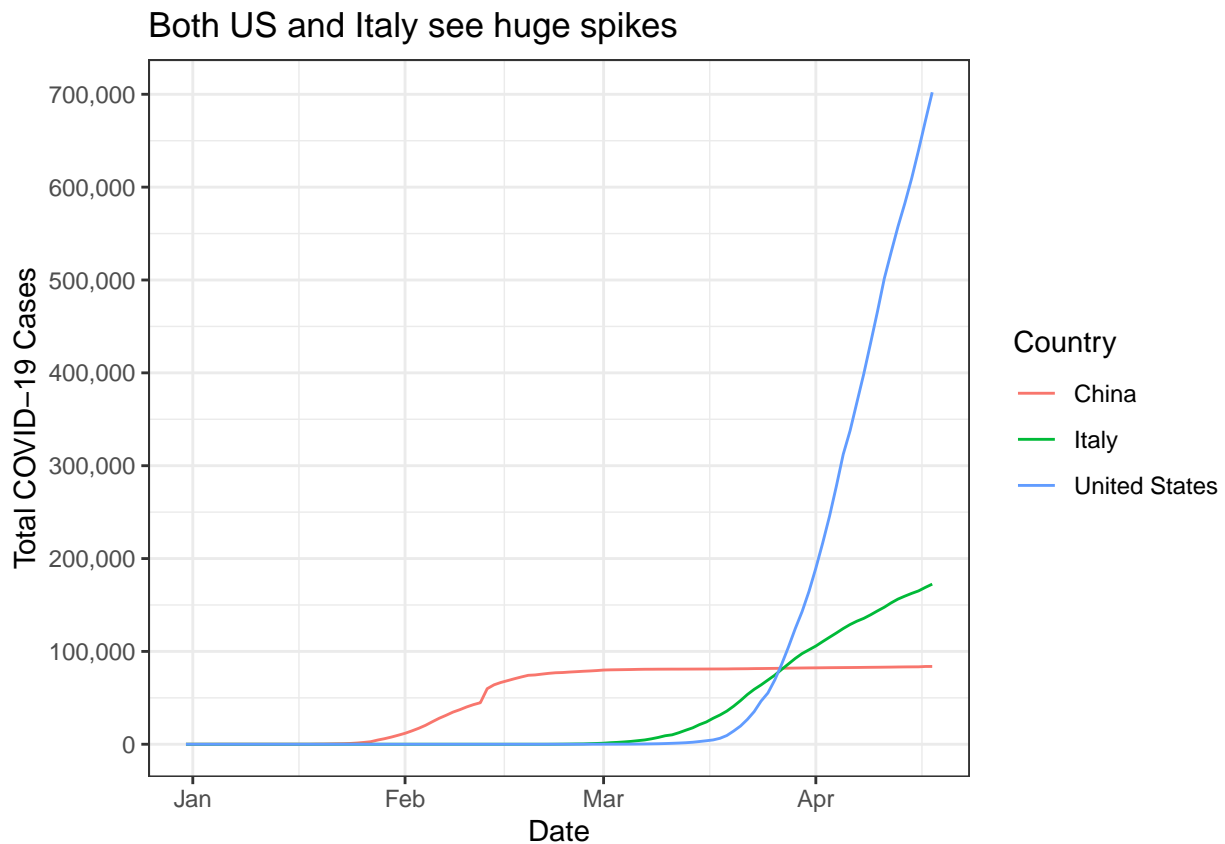
Y'all, the data file is just called data and cases is cases.

### Matt's stuff

```
countries <- c("United States", "China", "Italy")

matt_data <- cases %>%
  filter(location %in% countries) %>%
  select(location, date, total_cases, new_cases)

ggplot(matt_data, aes(x = date, y = total_cases, color = location)) +
  geom_line() +
  labs(y = "Total COVID-19 Cases",
       x = "Date",
       color = "Country",
       title = "Both US and Italy see huge spikes") +
  scale_y_continuous(breaks=seq(0, 700000, 100000),
                    labels = comma) +
  theme_bw()
```



## Larry's stuff

```
countries <- c("United States", "China", "Italy")
```

```
data_use <- data %>%  
  filter(  
    CountryName %in% countries  
  )  
data_use
```

```
# A tibble: 323 x 40
```

	CountryName	CountryCode	Date	`S1_School closing`	S1_IsGeneral	S1_Notes
	<chr>	<chr>	<dbl>	<dbl>	<dbl>	<chr>
1	China	CHN	2.02e7	0	0	<NA>
2	China	CHN	2.02e7	0	0	<NA>
3	China	CHN	2.02e7	0	0	<NA>
4	China	CHN	2.02e7	0	0	<NA>
5	China	CHN	2.02e7	0	0	<NA>
6	China	CHN	2.02e7	0	0	<NA>
7	China	CHN	2.02e7	0	0	<NA>
8	China	CHN	2.02e7	0	0	<NA>
9	China	CHN	2.02e7	0	0	<NA>
10	China	CHN	2.02e7	0	0	<NA>

```
# ... with 313 more rows, and 34 more variables: `S2_Workplace closing` <dbl>,  
# S2_IsGeneral <dbl>, S2_Notes <chr>, `S3_Cancel public events` <dbl>,  
# S3_IsGeneral <dbl>, S3_Notes <chr>, `S4_Close public transport` <dbl>,  
# S4_IsGeneral <dbl>, S4_Notes <chr>, `S5_Public information  
# campaigns` <dbl>, S5_IsGeneral <dbl>, S5_Notes <chr>, `S6_Restrictions on  
# internal movement` <dbl>, S6_IsGeneral <dbl>, S6_Notes <chr>,  
# `S7_International travel controls` <dbl>, S7_Notes <chr>, `S8_Fiscal  
# measures` <dbl>, S8_Notes <chr>, `S9_Monetary measures` <dbl>,  
# S9_Notes <chr>, `S10_Emergency investment in health care` <dbl>,  
# S10_Notes <chr>, `S11_Investment in Vaccines` <dbl>, S11_Notes <chr>,  
# `S12_Testing framework` <dbl>, S12_Notes <chr>, `S13_Contact  
# tracing` <dbl>, S13_Notes <chr>, ConfirmedCases <dbl>,  
# ConfirmedDeaths <dbl>, StringencyIndex <dbl>,  
# StringencyIndexForDisplay <dbl>, X40 <lgl>
```

```
data_use %>%  
  filter(  
    `S1_School closing` == 1  
  )
```

```
# A tibble: 2 x 40
```

	CountryName	CountryCode	Date	`S1_School closing`	S1_IsGeneral	S1_Notes
	<chr>	<chr>	<dbl>	<dbl>	<dbl>	<chr>
1	United Sta~	USA	2.02e7	1	0	"Depart~
2	United Sta~	USA	2.02e7	1	0	<NA>

```
# ... with 34 more variables: `S2_Workplace closing` <dbl>, S2_IsGeneral <dbl>,  
# S2_Notes <chr>, `S3_Cancel public events` <dbl>, S3_IsGeneral <dbl>,  
# S3_Notes <chr>, `S4_Close public transport` <dbl>, S4_IsGeneral <dbl>,  
# S4_Notes <chr>, `S5_Public information campaigns` <dbl>,  
# S5_IsGeneral <dbl>, S5_Notes <chr>, `S6_Restrictions on internal  
# movement` <dbl>, S6_IsGeneral <dbl>, S6_Notes <chr>, `S7_International
```

```
# travel controls` <dbl>, S7_Notes <chr>, `S8_Fiscal measures` <dbl>,
# S8_Notes <chr>, `S9_Monetary measures` <dbl>, S9_Notes <chr>,
# `S10_Emergency investment in health care` <dbl>, S10_Notes <chr>,
# `S11_Investment in Vaccines` <dbl>, S11_Notes <chr>, `S12_Testing
# framework` <dbl>, S12_Notes <chr>, `S13_Contact tracing` <dbl>,
# S13_Notes <chr>, ConfirmedCases <dbl>, ConfirmedDeaths <dbl>,
# StringencyIndex <dbl>, StringencyIndexForDisplay <dbl>, X40 <lgl>
```

```
data_use %>%
  filter(
    `S1_School closing` == 2
  )
```

```
# A tibble: 179 x 40
```

	CountryName	CountryCode	Date	`S1_School clos~`	S1_IsGeneral	S1_Notes
	<chr>	<chr>	<dbl>	<dbl>	<dbl>	<chr>
1	China	CHN	2.02e7	2	1	http://~
2	China	CHN	2.02e7	2	1	<NA>
3	China	CHN	2.02e7	2	1	<NA>
4	China	CHN	2.02e7	2	1	<NA>
5	China	CHN	2.02e7	2	1	<NA>
6	China	CHN	2.02e7	2	1	<NA>
7	China	CHN	2.02e7	2	1	<NA>
8	China	CHN	2.02e7	2	1	<NA>
9	China	CHN	2.02e7	2	1	<NA>
10	China	CHN	2.02e7	2	1	<NA>

```
# ... with 169 more rows, and 34 more variables: `S2_Workplace closing` <dbl>,
# S2_IsGeneral <dbl>, S2_Notes <chr>, `S3_Cancel public events` <dbl>,
# S3_IsGeneral <dbl>, S3_Notes <chr>, `S4_Close public transport` <dbl>,
# S4_IsGeneral <dbl>, S4_Notes <chr>, `S5_Public information
# campaigns` <dbl>, S5_IsGeneral <dbl>, S5_Notes <chr>, `S6_Restrictions on
# internal movement` <dbl>, S6_IsGeneral <dbl>, S6_Notes <chr>,
# `S7_International travel controls` <dbl>, S7_Notes <chr>, `S8_Fiscal
# measures` <dbl>, S8_Notes <chr>, `S9_Monetary measures` <dbl>,
# S9_Notes <chr>, `S10_Emergency investment in health care` <dbl>,
# S10_Notes <chr>, `S11_Investment in Vaccines` <dbl>, S11_Notes <chr>,
# `S12_Testing framework` <dbl>, S12_Notes <chr>, `S13_Contact
# tracing` <dbl>, S13_Notes <chr>, ConfirmedCases <dbl>,
# ConfirmedDeaths <dbl>, StringencyIndex <dbl>,
# StringencyIndexForDisplay <dbl>, X40 <lgl>
```

Recommended Closing schools: USA only one out of them that recommended closing before requiring closing, during 20200303

Required Closing schools: CHN 20200126 first day ITA 20200223 first day USA 20200305 first day

```
data_use %>%
  filter(
    `S2_Workplace closing` == 1
  )
```

```
# A tibble: 6 x 40
```

	CountryName	CountryCode	Date	`S1_School clos~`	S1_IsGeneral	S1_Notes
	<chr>	<chr>	<dbl>	<dbl>	<dbl>	<chr>
1	China	CHN	2.02e7	2	0	"'Over ~
2	China	CHN	2.02e7	2	0	"'Over ~
3	China	CHN	2.02e7	2	0	"'Over ~

```

4 China      CHN      2.02e7      2      0 "'Over ~
5 China      CHN      2.02e7      2      0 "'Local~
6 China      CHN      2.02e7      2      0 "'Local~
# ... with 34 more variables: `S2_Workplace closing` <dbl>, S2_IsGeneral <dbl>,
# S2_Notes <chr>, `S3_Cancel public events` <dbl>, S3_IsGeneral <dbl>,
# S3_Notes <chr>, `S4_Close public transport` <dbl>, S4_IsGeneral <dbl>,
# S4_Notes <chr>, `S5_Public information campaigns` <dbl>,
# S5_IsGeneral <dbl>, S5_Notes <chr>, `S6_Restrictions on internal
# movement` <dbl>, S6_IsGeneral <dbl>, S6_Notes <chr>, `S7_International
# travel controls` <dbl>, S7_Notes <chr>, `S8_Fiscal measures` <dbl>,
# S8_Notes <chr>, `S9_Monetary measures` <dbl>, S9_Notes <chr>,
# `S10_Emergency investment in health care` <dbl>, S10_Notes <chr>,
# `S11_Investment in Vaccines` <dbl>, S11_Notes <chr>, `S12_Testing
# framework` <dbl>, S12_Notes <chr>, `S13_Contact tracing` <dbl>,
# S13_Notes <chr>, ConfirmedCases <dbl>, ConfirmedDeaths <dbl>,
# StringencyIndex <dbl>, StringencyIndexForDisplay <dbl>, X40 <lgl>

```

```

data_use %>%
  filter(
    `S2_Workplace closing` == 2
  )

```

```

# A tibble: 152 x 40
  CountryName CountryCode Date `S1_School clos~ S1_IsGeneral S1_Notes
  <chr>         <chr>      <dbl>          <dbl>          <dbl> <chr>
1 China      CHN      2.02e7              2              1 http://~
2 China      CHN      2.02e7              2              1 <NA>
3 China      CHN      2.02e7              2              1 <NA>
4 China      CHN      2.02e7              2              1 <NA>
5 China      CHN      2.02e7              2              1 <NA>
6 China      CHN      2.02e7              2              1 <NA>
7 China      CHN      2.02e7              2              1 <NA>
8 China      CHN      2.02e7              2              1 <NA>
9 China      CHN      2.02e7              2              1 <NA>
10 China     CHN      2.02e7              2              1 <NA>
# ... with 142 more rows, and 34 more variables: `S2_Workplace closing` <dbl>,
# S2_IsGeneral <dbl>, S2_Notes <chr>, `S3_Cancel public events` <dbl>,
# S3_IsGeneral <dbl>, S3_Notes <chr>, `S4_Close public transport` <dbl>,
# S4_IsGeneral <dbl>, S4_Notes <chr>, `S5_Public information
# campaigns` <dbl>, S5_IsGeneral <dbl>, S5_Notes <chr>, `S6_Restrictions on
# internal movement` <dbl>, S6_IsGeneral <dbl>, S6_Notes <chr>,
# `S7_International travel controls` <dbl>, S7_Notes <chr>, `S8_Fiscal
# measures` <dbl>, S8_Notes <chr>, `S9_Monetary measures` <dbl>,
# S9_Notes <chr>, `S10_Emergency investment in health care` <dbl>,
# S10_Notes <chr>, `S11_Investment in Vaccines` <dbl>, S11_Notes <chr>,
# `S12_Testing framework` <dbl>, S12_Notes <chr>, `S13_Contact
# tracing` <dbl>, S13_Notes <chr>, ConfirmedCases <dbl>,
# ConfirmedDeaths <dbl>, StringencyIndex <dbl>,
# StringencyIndexForDisplay <dbl>, X40 <lgl>

```

Recommended Closing workplaces: CHN 20200403 first day

Required Closing workplaces: CHN 20200126 first day ITA 20200222 first day USA 20200319 first day

```
countries <- c("United States", "China", "Italy")
```

```
cases_use <- cases %>%
  filter(
    location %in% countries
  )
cases_use
```

```
# A tibble: 330 x 16
  iso_code location date      total_cases new_cases total_deaths new_deaths
  <chr>      <chr>   <date>         <dbl>      <dbl>         <dbl>      <dbl>
1 CHN       China   2019-12-31         27         27             0           0
2 CHN       China   2020-01-01         27          0             0           0
3 CHN       China   2020-01-02         27          0             0           0
4 CHN       China   2020-01-03         44         17             0           0
5 CHN       China   2020-01-04         44          0             0           0
6 CHN       China   2020-01-05         59         15             0           0
7 CHN       China   2020-01-06         59          0             0           0
8 CHN       China   2020-01-07         59          0             0           0
9 CHN       China   2020-01-08         59          0             0           0
10 CHN      China   2020-01-09         59          0             0           0
# ... with 320 more rows, and 9 more variables: total_cases_per_million <dbl>,
#   new_cases_per_million <dbl>, total_deaths_per_million <dbl>,
#   new_deaths_per_million <dbl>, total_tests <dbl>, new_tests <dbl>,
#   total_tests_per_thousand <dbl>, new_tests_per_thousand <dbl>,
#   tests_units <chr>
```

Required Closing workplaces: CHN 20200126 first day ITA 20200222 first day USA 20200319 first day

Required Closing schools: CHN 20200126 first day ITA 20200223 first day USA 20200305 first day

```
cases_work <- cases_use %>%
  filter(
    date == ("2020-01-26") & location == "China" | date == ("2020-02-22") & location == "Italy" | date == ("2020-03-19") & location == "United States"
  ) %>%
  select(location, date, total_cases)

cases_school <- cases_use %>%
  filter(
    date == ("2020-01-26") & location == "China" | date == ("2020-02-23") & location == "Italy" | date == ("2020-03-05") & location == "United States"
  ) %>%
  select(location, date, total_cases)

cases_work
```

```
# A tibble: 3 x 3
  location      date      total_cases
  <chr>        <date>         <dbl>
1 China      2020-01-26      1988
2 Italy      2020-02-22        17
3 United States 2020-03-19     9415
```

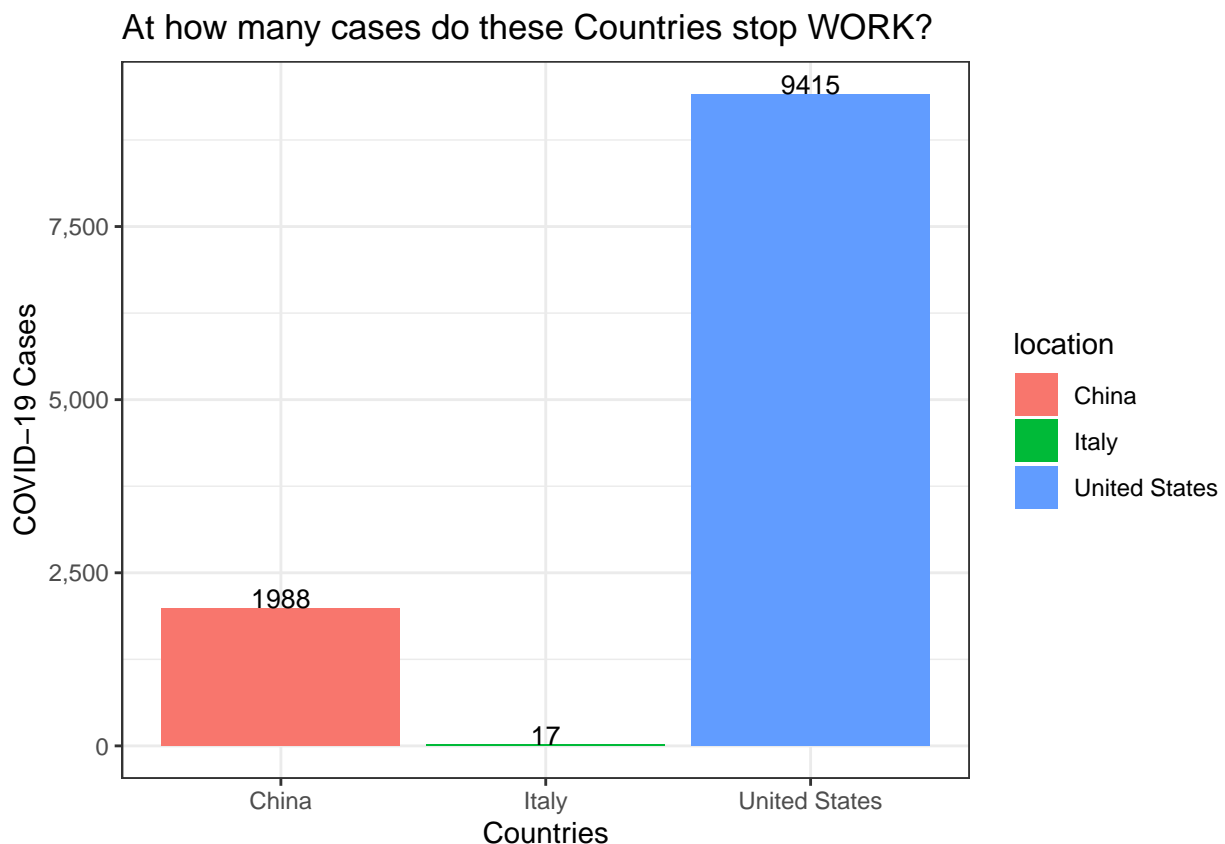
```
cases_school
```

```
# A tibble: 3 x 3
  location      date      total_cases
  <chr>        <date>         <dbl>
1 China      2020-01-26      1988
```

```
2 Italy          2020-02-23          79
3 United States  2020-03-05         159
```

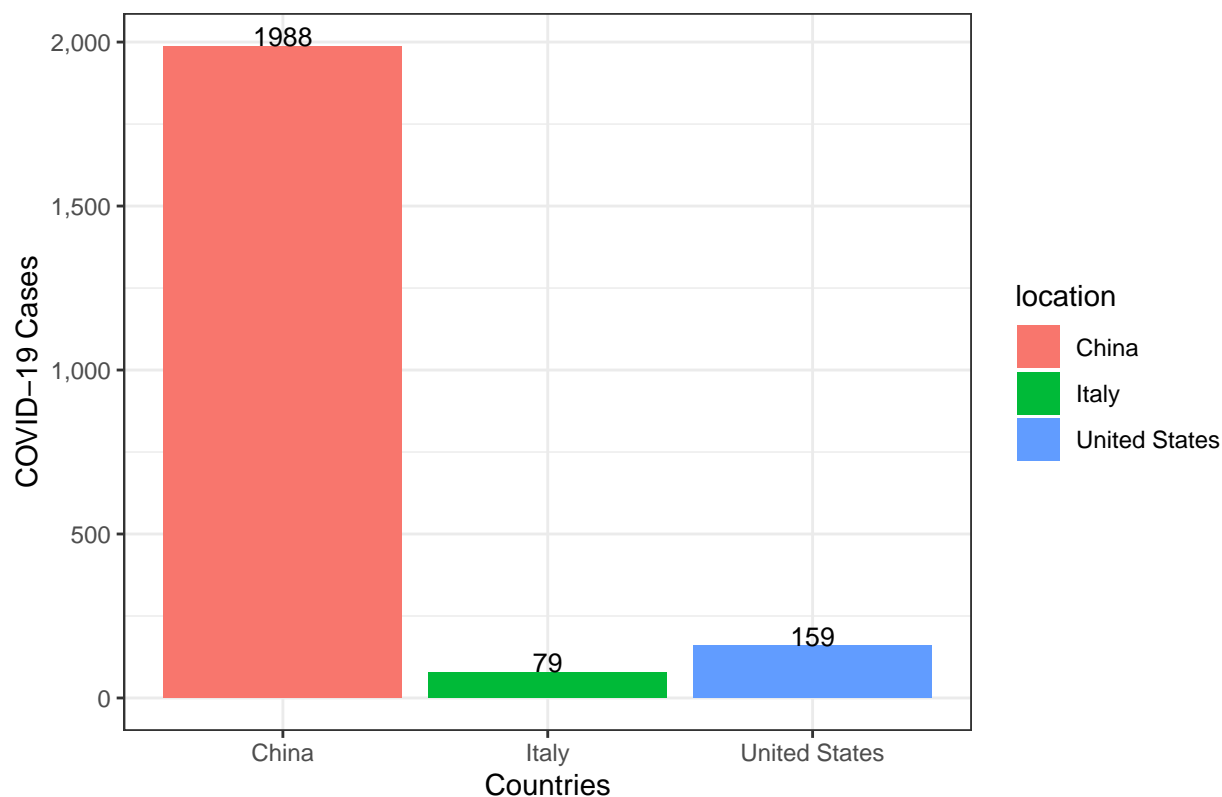
```
cases_use_new <- cases_use %>%
  filter(
    date == ("2020-04-18")
  )
```

```
ggplot(data = cases_work,
  aes(x = location, y = total_cases, fill = location)) +
  geom_bar(stat = "identity", ylim = c(0, 10000)) +
  scale_y_continuous(labels = comma) +
  labs(title = "At how many cases do these Countries stop WORK?",
    x = "Countries", y = "COVID-19 Cases") +
  geom_text(aes(label = total_cases), vjust=0, color="black", size=3.5) +
  theme_bw()
```



```
ggplot(data = cases_school,
  aes(x = location, y = total_cases, fill = location)) +
  geom_bar(stat = "identity", ylim = c(0, 10000)) +
  ylim(0, 10000) +
  scale_y_continuous(labels = comma) +
  labs(title = "At how many cases do these Countries stop SCHOOL?",
    x = "Countries", y = "COVID-19 Cases") +
  geom_text(aes(label = total_cases), vjust=0, color="black", size=3.5) +
  theme_bw()
```

## At how many cases do these Countries stop SCHOOL?



## Marcus's Stuff

```
data1 <- data %>%
  filter(CountryName == "Taiwan" | CountryName == "South Korea") %>%
  select(CountryName, Date, `S5_Public information campaigns`, `S6_Restrictions on internal movement`, `S7_Restrictions on international movement`)

pubinfo <- data1 %>%
  filter(`S5_Public information campaigns` == 1) %>%
  select(CountryName, Date, `S5_Public information campaigns`) %>%
  group_by(CountryName) %>%
  slice(1)
pubinfo

# A tibble: 2 x 3
# Groups:   CountryName [2]
  CountryName      Date `S5_Public information campaigns`
  <chr>           <dbl> <dbl>
1 South Korea 20200120      1
2 Taiwan      20200120      1

recrestrict <- data1 %>%
  filter(`S6_Restrictions on internal movement` == 1) %>%
  select(CountryName, Date, `S6_Restrictions on internal movement`) %>%
  group_by(CountryName) %>%
  slice(1)
```

```
recrestrict
```

```
# A tibble: 1 x 3
# Groups:   CountryName [1]
  CountryName      Date `S6_Restrictions on internal movement`
  <chr>           <dbl>                                <dbl>
1 South Korea 20200223                                     1
```

```
restrict <- data1 %>%
  filter(`S6_Restrictions on internal movement` == 2) %>%
  group_by(CountryName) %>%
  select(CountryName, Date, `S6_Restrictions on internal movement`) %>%
  slice(1)
restrict
```

```
# A tibble: 1 x 3
# Groups:   CountryName [1]
  CountryName      Date `S6_Restrictions on internal movement`
  <chr>           <dbl>                                <dbl>
1 South Korea 20200321                                     2
```

```
travelscreening <- data1 %>%
  filter(`S7_International travel controls` == 1) %>%
  group_by(CountryName) %>%
  select(CountryName, Date, `S7_International travel controls`) %>%
  slice(1)
travelscreening
```

```
# A tibble: 1 x 3
# Groups:   CountryName [1]
  CountryName      Date `S7_International travel controls`
  <chr>           <dbl>                                <dbl>
1 Taiwan      20200207                                     1
```

```
highriskquarantine <- data1 %>%
  filter(`S7_International travel controls` == 2) %>%
  group_by(CountryName) %>%
  select(CountryName, Date, `S7_International travel controls`) %>%
  slice(1)
highriskquarantine
```

```
# A tibble: 1 x 3
# Groups:   CountryName [1]
  CountryName      Date `S7_International travel controls`
  <chr>           <dbl>                                <dbl>
1 Taiwan      20200224                                     2
```

```
highriskban <- data1 %>%
  filter(`S7_International travel controls` == 3) %>%
  group_by(CountryName) %>%
  select(CountryName, Date, `S7_International travel controls`) %>%
  slice(1)
highriskban
```

```
# A tibble: 2 x 3
# Groups:   CountryName [2]
  CountryName      Date `S7_International travel controls`
```



	<chr>	<dbl>	<dbl>
1	South Korea	20200203	3
2	Taiwan	20200223	3

Public Info Campaign Start Dates. South Korea: 01/20, Taiwan: 01/20 Recommended Movement Restriction. South Korea: 02/23, Taiwan: NA Restrict Movement. South Korea: 03/21, Taiwan: NA International Travel Screening. South Korea: NA, Taiwan: 02/07 Quarantine on high-risk regions. South Korea: NA, Taiwan: 02/24 Ban on high-risk regions. South Korea: 02/03, Taiwan: 02/23

## Kehan's stuff

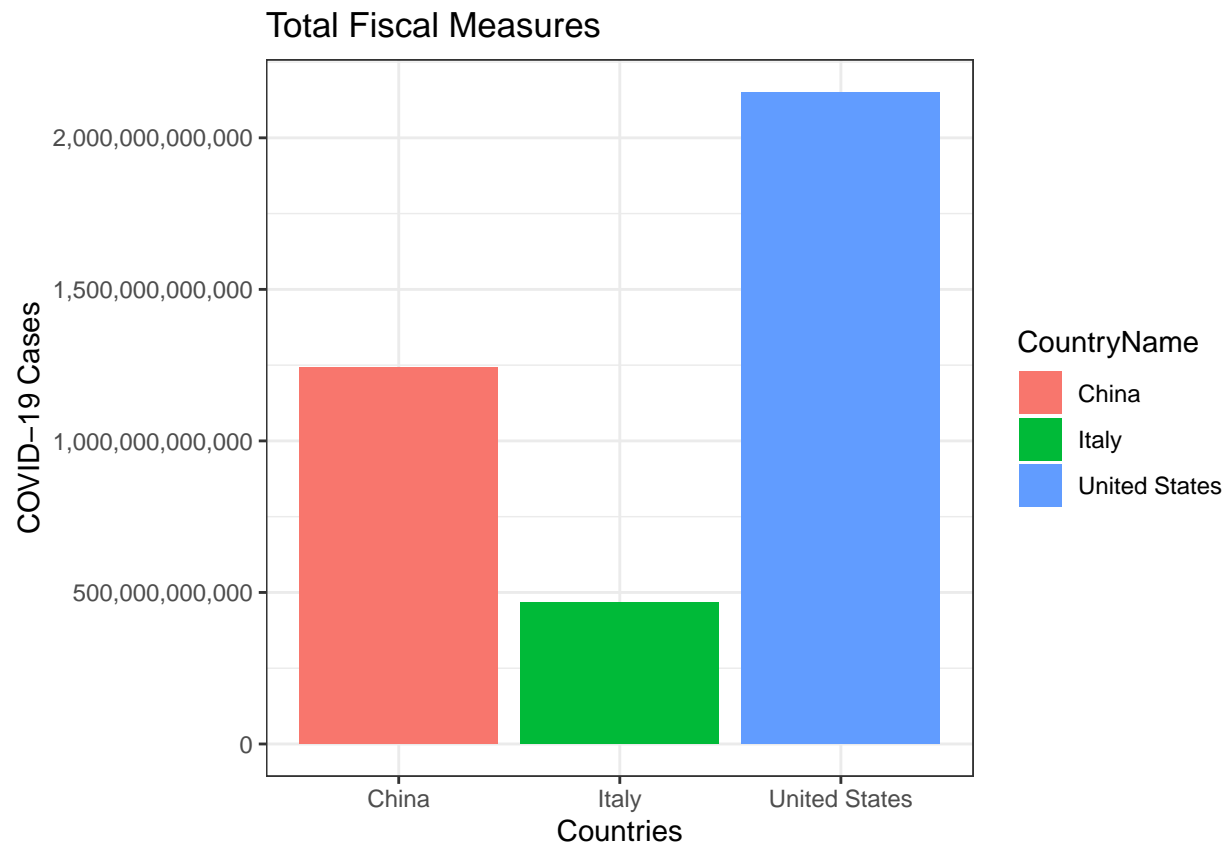
```
MONEYS<-data_use %>%
  group_by(CountryName) %>%
  filter(`S8_Fiscal measures`>0) %>%
  summarise(sum(`S8_Fiscal measures`))
```

```
names(MONEYS)[names(MONEYS) == "sum(`S8_Fiscal measures`)"] <- "Total_Fiscal_Measures"
```

```
MONEYS
```

```
# A tibble: 3 x 2
  CountryName Total_Fiscal_Measures
  <chr>          <dbl>
1 China          1242220000000
2 Italy           468040843806
3 United States   2151200000000
```

```
ggplot(data = MONEYS,
  aes(x = CountryName, y = Total_Fiscal_Measures, fill = CountryName)) +
  geom_bar(stat = "identity") +
  scale_y_continuous(breaks=seq(0, 700000, 100000)) +
  scale_y_continuous(labels = comma) +
  labs(title = "Total Fiscal Measures",
    x = "Countries", y = "COVID-19 Cases") +
  theme_bw()
```



```
data_use %>%
  filter(`S8_Fiscal measures`>0) %>%
  arrange(Date) %>%
  select(CountryName, `S8_Fiscal measures`, Date)
```

```
# A tibble: 13 x 3
  CountryName `S8_Fiscal measures` Date
  <chr>      <dbl>      <dbl>
1 China      42780000000 20200131
2 China      476000000000 20200201
3 China      242440000000 20200204
4 Italy       100000000 20200228
5 Italy       4000000000 20200301
6 United States 1600000000 20200306
7 Italy       8500000000 20200308
8 Italy       2784500000 20200311
9 China      129000000000 20200315
10 United States 192000000000 20200318
11 China      352000000000 20200327
12 United States 195760000000 20200327
13 Italy      452656343806 20200406
```

I WANT TO MAKE TIME MODEL GIF THING