Importing and Aggregating COVID-19 Data

Bbosa Robert

4/27/2020

Table of Contents

[Pulling the coronvirus data from John Hopkins repo 1](#_Toc38971915)

[https://github.com/CSSEGISandData/COVID-19 1](#_Toc38971916)

[Transforming the data from wide to long 8](#_Toc38971917)

[Creating new data frame 8](#_Toc38971918)

[Parsing the date 11](#_Toc38971919)

[Aggregate the data to daily 11](#_Toc38971920)

[Pulling death cases 12](#_Toc38971921)

[Transforming the data from wide to long 18](#_Toc38971922)

[Creating new data frame 18](#_Toc38971923)

[Parsing the date 20](#_Toc38971924)

[Aggregate the data to daily 21](#_Toc38971925)

[Pulling recovered cases 21](#_Toc38971926)

[Transforming the data from wide to long 28](#_Toc38971927)

[Creating new data frame 28](#_Toc38971928)

[Parsing the date 30](#_Toc38971929)

[Aggregate the data to daily 31](#_Toc38971930)

# Pulling the coronvirus data from John Hopkins repo

# <https://github.com/CSSEGISandData/COVID-19>

#———— Pulling confirmed cases————

conf\_url <- "https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master/  
csse\_covid\_19\_data/csse\_covid\_19\_time\_series/time\_series\_covid19\_confirmed\_global.csv"  
  
raw\_conf <- read.csv(file = conf\_url, stringsAsFactors = FALSE)  
  
lapply(1:ncol(raw\_conf), function(i){  
 if(all(is.na(raw\_conf[, i]))){  
 raw\_conf <<- raw\_conf[, -i]  
 return(print(paste("Column", names(raw\_conf)[i], "is missing", sep = " ")))  
 } else {  
 return(NULL)  
 }  
})

## [[1]]  
## NULL  
##   
## [[2]]  
## NULL  
##   
## [[3]]  
## NULL  
##   
## [[4]]  
## NULL  
##   
## [[5]]  
## NULL  
##   
## [[6]]  
## NULL  
##   
## [[7]]  
## NULL  
##   
## [[8]]  
## NULL  
##   
## [[9]]  
## NULL  
##   
## [[10]]  
## NULL  
##   
## [[11]]  
## NULL  
##   
## [[12]]  
## NULL  
##   
## [[13]]  
## NULL  
##   
## [[14]]  
## NULL  
##   
## [[15]]  
## NULL  
##   
## [[16]]  
## NULL  
##   
## [[17]]  
## NULL  
##   
## [[18]]  
## NULL  
##   
## [[19]]  
## NULL  
##   
## [[20]]  
## NULL  
##   
## [[21]]  
## NULL  
##   
## [[22]]  
## NULL  
##   
## [[23]]  
## NULL  
##   
## [[24]]  
## NULL  
##   
## [[25]]  
## NULL  
##   
## [[26]]  
## NULL  
##   
## [[27]]  
## NULL  
##   
## [[28]]  
## NULL  
##   
## [[29]]  
## NULL  
##   
## [[30]]  
## NULL  
##   
## [[31]]  
## NULL  
##   
## [[32]]  
## NULL  
##   
## [[33]]  
## NULL  
##   
## [[34]]  
## NULL  
##   
## [[35]]  
## NULL  
##   
## [[36]]  
## NULL  
##   
## [[37]]  
## NULL  
##   
## [[38]]  
## NULL  
##   
## [[39]]  
## NULL  
##   
## [[40]]  
## NULL  
##   
## [[41]]  
## NULL  
##   
## [[42]]  
## NULL  
##   
## [[43]]  
## NULL  
##   
## [[44]]  
## NULL  
##   
## [[45]]  
## NULL  
##   
## [[46]]  
## NULL  
##   
## [[47]]  
## NULL  
##   
## [[48]]  
## NULL  
##   
## [[49]]  
## NULL  
##   
## [[50]]  
## NULL  
##   
## [[51]]  
## NULL  
##   
## [[52]]  
## NULL  
##   
## [[53]]  
## NULL  
##   
## [[54]]  
## NULL  
##   
## [[55]]  
## NULL  
##   
## [[56]]  
## NULL  
##   
## [[57]]  
## NULL  
##   
## [[58]]  
## NULL  
##   
## [[59]]  
## NULL  
##   
## [[60]]  
## NULL  
##   
## [[61]]  
## NULL  
##   
## [[62]]  
## NULL  
##   
## [[63]]  
## NULL  
##   
## [[64]]  
## NULL  
##   
## [[65]]  
## NULL  
##   
## [[66]]  
## NULL  
##   
## [[67]]  
## NULL  
##   
## [[68]]  
## NULL  
##   
## [[69]]  
## NULL  
##   
## [[70]]  
## NULL  
##   
## [[71]]  
## NULL  
##   
## [[72]]  
## NULL  
##   
## [[73]]  
## NULL  
##   
## [[74]]  
## NULL  
##   
## [[75]]  
## NULL  
##   
## [[76]]  
## NULL  
##   
## [[77]]  
## NULL  
##   
## [[78]]  
## NULL  
##   
## [[79]]  
## NULL  
##   
## [[80]]  
## NULL  
##   
## [[81]]  
## NULL  
##   
## [[82]]  
## NULL  
##   
## [[83]]  
## NULL  
##   
## [[84]]  
## NULL  
##   
## [[85]]  
## NULL  
##   
## [[86]]  
## NULL  
##   
## [[87]]  
## NULL  
##   
## [[88]]  
## NULL  
##   
## [[89]]  
## NULL  
##   
## [[90]]  
## NULL  
##   
## [[91]]  
## NULL  
##   
## [[92]]  
## NULL  
##   
## [[93]]  
## NULL  
##   
## [[94]]  
## NULL  
##   
## [[95]]  
## NULL  
##   
## [[96]]  
## NULL  
##   
## [[97]]  
## NULL  
##   
## [[98]]  
## NULL  
##   
## [[99]]  
## NULL  
##   
## [[100]]  
## NULL  
##   
## [[101]]  
## NULL

# Transforming the data from wide to long

# Creating new data frame

library(tidyr)  
library(dplyr)

## Warning: package 'dplyr' was built under R version 3.6.3

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

df\_conf <- raw\_conf[, 1:4]  
  
for(i in 5:ncol(raw\_conf)){  
  
 raw\_conf[,i] <- as.integer(raw\_conf[,i])  
 # raw\_conf[,i] <- ifelse(is.na(raw\_conf[, i]), 0 , raw\_conf[, i])  
 print(names(raw\_conf)[i])  
  
 if(i == 5){  
 df\_conf[[names(raw\_conf)[i]]] <- raw\_conf[, i]  
 } else {  
 df\_conf[[names(raw\_conf)[i]]] <- raw\_conf[, i] - raw\_conf[, i - 1]  
 }  
  
  
}

## [1] "X1.22.20"  
## [1] "X1.23.20"  
## [1] "X1.24.20"  
## [1] "X1.25.20"  
## [1] "X1.26.20"  
## [1] "X1.27.20"  
## [1] "X1.28.20"  
## [1] "X1.29.20"  
## [1] "X1.30.20"  
## [1] "X1.31.20"  
## [1] "X2.1.20"  
## [1] "X2.2.20"  
## [1] "X2.3.20"  
## [1] "X2.4.20"  
## [1] "X2.5.20"  
## [1] "X2.6.20"  
## [1] "X2.7.20"  
## [1] "X2.8.20"  
## [1] "X2.9.20"  
## [1] "X2.10.20"  
## [1] "X2.11.20"  
## [1] "X2.12.20"  
## [1] "X2.13.20"  
## [1] "X2.14.20"  
## [1] "X2.15.20"  
## [1] "X2.16.20"  
## [1] "X2.17.20"  
## [1] "X2.18.20"  
## [1] "X2.19.20"  
## [1] "X2.20.20"  
## [1] "X2.21.20"  
## [1] "X2.22.20"  
## [1] "X2.23.20"  
## [1] "X2.24.20"  
## [1] "X2.25.20"  
## [1] "X2.26.20"  
## [1] "X2.27.20"  
## [1] "X2.28.20"  
## [1] "X2.29.20"  
## [1] "X3.1.20"  
## [1] "X3.2.20"  
## [1] "X3.3.20"  
## [1] "X3.4.20"  
## [1] "X3.5.20"  
## [1] "X3.6.20"  
## [1] "X3.7.20"  
## [1] "X3.8.20"  
## [1] "X3.9.20"  
## [1] "X3.10.20"  
## [1] "X3.11.20"  
## [1] "X3.12.20"  
## [1] "X3.13.20"  
## [1] "X3.14.20"  
## [1] "X3.15.20"  
## [1] "X3.16.20"  
## [1] "X3.17.20"  
## [1] "X3.18.20"  
## [1] "X3.19.20"  
## [1] "X3.20.20"  
## [1] "X3.21.20"  
## [1] "X3.22.20"  
## [1] "X3.23.20"  
## [1] "X3.24.20"  
## [1] "X3.25.20"  
## [1] "X3.26.20"  
## [1] "X3.27.20"  
## [1] "X3.28.20"  
## [1] "X3.29.20"  
## [1] "X3.30.20"  
## [1] "X3.31.20"  
## [1] "X4.1.20"  
## [1] "X4.2.20"  
## [1] "X4.3.20"  
## [1] "X4.4.20"  
## [1] "X4.5.20"  
## [1] "X4.6.20"  
## [1] "X4.7.20"  
## [1] "X4.8.20"  
## [1] "X4.9.20"  
## [1] "X4.10.20"  
## [1] "X4.11.20"  
## [1] "X4.12.20"  
## [1] "X4.13.20"  
## [1] "X4.14.20"  
## [1] "X4.15.20"  
## [1] "X4.16.20"  
## [1] "X4.17.20"  
## [1] "X4.18.20"  
## [1] "X4.19.20"  
## [1] "X4.20.20"  
## [1] "X4.21.20"  
## [1] "X4.22.20"  
## [1] "X4.23.20"  
## [1] "X4.24.20"  
## [1] "X4.25.20"  
## [1] "X4.26.20"  
## [1] "X4.27.20"

df\_conf1 <- df\_conf %>% tidyr::pivot\_longer(cols = dplyr::starts\_with("X"),  
 names\_to = "date\_temp",  
 values\_to = "cases\_temp")

# Parsing the date

df\_conf1$month <- sub("X", "", strsplit(df\_conf1$date\_temp, split = "\\.") %>%  
 purrr::map\_chr(~.x[1]) )  
  
df\_conf1$day <- strsplit(df\_conf1$date\_temp, split = "\\.") %>%  
 purrr::map\_chr(~.x[2])  
  
  
df\_conf1$date <- as.Date(paste("2020", df\_conf1$month, df\_conf1$day, sep = "-"))

# Aggregate the data to daily

df\_conf2 <- df\_conf1 %>%  
 dplyr::group\_by(Province.State, Country.Region, Lat, Long, date) %>%  
 dplyr::summarise(cases = sum(cases\_temp)) %>%  
 dplyr::ungroup() %>%  
 dplyr::mutate(type = "confirmed",  
 Country.Region = trimws(Country.Region),  
 Province.State = trimws(Province.State))  
head(df\_conf2)

## # A tibble: 6 x 7  
## Province.State Country.Region Lat Long date cases type   
## <chr> <chr> <dbl> <dbl> <date> <int> <chr>   
## 1 "" Afghanistan 33 65 2020-01-22 0 confirmed  
## 2 "" Afghanistan 33 65 2020-01-23 0 confirmed  
## 3 "" Afghanistan 33 65 2020-01-24 0 confirmed  
## 4 "" Afghanistan 33 65 2020-01-25 0 confirmed  
## 5 "" Afghanistan 33 65 2020-01-26 0 confirmed  
## 6 "" Afghanistan 33 65 2020-01-27 0 confirmed

tail(df\_conf2)

## # A tibble: 6 x 7  
## Province.State Country.Region Lat Long date cases type   
## <chr> <chr> <dbl> <dbl> <date> <int> <chr>   
## 1 Zhejiang China 29.2 120. 2020-04-22 0 confirmed  
## 2 Zhejiang China 29.2 120. 2020-04-23 0 confirmed  
## 3 Zhejiang China 29.2 120. 2020-04-24 0 confirmed  
## 4 Zhejiang China 29.2 120. 2020-04-25 0 confirmed  
## 5 Zhejiang China 29.2 120. 2020-04-26 0 confirmed  
## 6 Zhejiang China 29.2 120. 2020-04-27 0 confirmed

# Pulling death cases

death\_url <- "https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master  
/csse\_covid\_19\_data/csse\_covid\_19\_time\_series/time\_series\_covid19\_deaths\_global.csv"  
  
raw\_death <- read.csv(file =death\_url, stringsAsFactors = FALSE, fill =FALSE)  
  
lapply(1:ncol(raw\_death), function(i){  
 if(all(is.na(raw\_death[, i]))){  
 raw\_death <<- raw\_death[, -i]  
 return(print(paste("Column", names(raw\_death)[i], "is missing", sep = " ")))  
 } else {  
 return(NULL)  
 }  
})

## [[1]]  
## NULL  
##   
## [[2]]  
## NULL  
##   
## [[3]]  
## NULL  
##   
## [[4]]  
## NULL  
##   
## [[5]]  
## NULL  
##   
## [[6]]  
## NULL  
##   
## [[7]]  
## NULL  
##   
## [[8]]  
## NULL  
##   
## [[9]]  
## NULL  
##   
## [[10]]  
## NULL  
##   
## [[11]]  
## NULL  
##   
## [[12]]  
## NULL  
##   
## [[13]]  
## NULL  
##   
## [[14]]  
## NULL  
##   
## [[15]]  
## NULL  
##   
## [[16]]  
## NULL  
##   
## [[17]]  
## NULL  
##   
## [[18]]  
## NULL  
##   
## [[19]]  
## NULL  
##   
## [[20]]  
## NULL  
##   
## [[21]]  
## NULL  
##   
## [[22]]  
## NULL  
##   
## [[23]]  
## NULL  
##   
## [[24]]  
## NULL  
##   
## [[25]]  
## NULL  
##   
## [[26]]  
## NULL  
##   
## [[27]]  
## NULL  
##   
## [[28]]  
## NULL  
##   
## [[29]]  
## NULL  
##   
## [[30]]  
## NULL  
##   
## [[31]]  
## NULL  
##   
## [[32]]  
## NULL  
##   
## [[33]]  
## NULL  
##   
## [[34]]  
## NULL  
##   
## [[35]]  
## NULL  
##   
## [[36]]  
## NULL  
##   
## [[37]]  
## NULL  
##   
## [[38]]  
## NULL  
##   
## [[39]]  
## NULL  
##   
## [[40]]  
## NULL  
##   
## [[41]]  
## NULL  
##   
## [[42]]  
## NULL  
##   
## [[43]]  
## NULL  
##   
## [[44]]  
## NULL  
##   
## [[45]]  
## NULL  
##   
## [[46]]  
## NULL  
##   
## [[47]]  
## NULL  
##   
## [[48]]  
## NULL  
##   
## [[49]]  
## NULL  
##   
## [[50]]  
## NULL  
##   
## [[51]]  
## NULL  
##   
## [[52]]  
## NULL  
##   
## [[53]]  
## NULL  
##   
## [[54]]  
## NULL  
##   
## [[55]]  
## NULL  
##   
## [[56]]  
## NULL  
##   
## [[57]]  
## NULL  
##   
## [[58]]  
## NULL  
##   
## [[59]]  
## NULL  
##   
## [[60]]  
## NULL  
##   
## [[61]]  
## NULL  
##   
## [[62]]  
## NULL  
##   
## [[63]]  
## NULL  
##   
## [[64]]  
## NULL  
##   
## [[65]]  
## NULL  
##   
## [[66]]  
## NULL  
##   
## [[67]]  
## NULL  
##   
## [[68]]  
## NULL  
##   
## [[69]]  
## NULL  
##   
## [[70]]  
## NULL  
##   
## [[71]]  
## NULL  
##   
## [[72]]  
## NULL  
##   
## [[73]]  
## NULL  
##   
## [[74]]  
## NULL  
##   
## [[75]]  
## NULL  
##   
## [[76]]  
## NULL  
##   
## [[77]]  
## NULL  
##   
## [[78]]  
## NULL  
##   
## [[79]]  
## NULL  
##   
## [[80]]  
## NULL  
##   
## [[81]]  
## NULL  
##   
## [[82]]  
## NULL  
##   
## [[83]]  
## NULL  
##   
## [[84]]  
## NULL  
##   
## [[85]]  
## NULL  
##   
## [[86]]  
## NULL  
##   
## [[87]]  
## NULL  
##   
## [[88]]  
## NULL  
##   
## [[89]]  
## NULL  
##   
## [[90]]  
## NULL  
##   
## [[91]]  
## NULL  
##   
## [[92]]  
## NULL  
##   
## [[93]]  
## NULL  
##   
## [[94]]  
## NULL  
##   
## [[95]]  
## NULL  
##   
## [[96]]  
## NULL  
##   
## [[97]]  
## NULL  
##   
## [[98]]  
## NULL  
##   
## [[99]]  
## NULL  
##   
## [[100]]  
## NULL  
##   
## [[101]]  
## NULL

# Transforming the data from wide to long

# Creating new data frame

df\_death <- raw\_death[, 1:4]  
  
for(i in 5:ncol(raw\_death)){  
 print(i)  
 raw\_death[,i] <- as.integer(raw\_death[,i])  
 raw\_death[,i] <- ifelse(is.na(raw\_death[, i]), 0 , raw\_death[, i])  
  
 if(i == 5){  
 df\_death[[names(raw\_death)[i]]] <- raw\_death[, i]  
 } else {  
 df\_death[[names(raw\_death)[i]]] <- raw\_death[, i] - raw\_death[, i - 1]  
 }  
}

## [1] 5  
## [1] 6  
## [1] 7  
## [1] 8  
## [1] 9  
## [1] 10  
## [1] 11  
## [1] 12  
## [1] 13  
## [1] 14  
## [1] 15  
## [1] 16  
## [1] 17  
## [1] 18  
## [1] 19  
## [1] 20  
## [1] 21  
## [1] 22  
## [1] 23  
## [1] 24  
## [1] 25  
## [1] 26  
## [1] 27  
## [1] 28  
## [1] 29  
## [1] 30  
## [1] 31  
## [1] 32  
## [1] 33  
## [1] 34  
## [1] 35  
## [1] 36  
## [1] 37  
## [1] 38  
## [1] 39  
## [1] 40  
## [1] 41  
## [1] 42  
## [1] 43  
## [1] 44  
## [1] 45  
## [1] 46  
## [1] 47  
## [1] 48  
## [1] 49  
## [1] 50  
## [1] 51  
## [1] 52  
## [1] 53  
## [1] 54  
## [1] 55  
## [1] 56  
## [1] 57  
## [1] 58  
## [1] 59  
## [1] 60  
## [1] 61  
## [1] 62  
## [1] 63  
## [1] 64  
## [1] 65  
## [1] 66  
## [1] 67  
## [1] 68  
## [1] 69  
## [1] 70  
## [1] 71  
## [1] 72  
## [1] 73  
## [1] 74  
## [1] 75  
## [1] 76  
## [1] 77  
## [1] 78  
## [1] 79  
## [1] 80  
## [1] 81  
## [1] 82  
## [1] 83  
## [1] 84  
## [1] 85  
## [1] 86  
## [1] 87  
## [1] 88  
## [1] 89  
## [1] 90  
## [1] 91  
## [1] 92  
## [1] 93  
## [1] 94  
## [1] 95  
## [1] 96  
## [1] 97  
## [1] 98  
## [1] 99  
## [1] 100  
## [1] 101

df\_death1 <- df\_death %>% tidyr::pivot\_longer(cols = dplyr::starts\_with("X"),  
 names\_to = "date\_temp",  
 values\_to = "cases\_temp")

# Parsing the date

df\_death1$month <- sub("X", "",strsplit(df\_death1$date\_temp, split = "\\.") %>%  
 purrr::map\_chr(~.x[1]) )  
  
df\_death1$day <- strsplit(df\_death1$date\_temp, split = "\\.") %>%  
 purrr::map\_chr(~.x[2])  
  
  
df\_death1$date <- as.Date(paste("2020", df\_death1$month, df\_death1$day, sep = "-"))

# Aggregate the data to daily

df\_death2 <- df\_death1 %>%  
 dplyr::group\_by(Province.State, Country.Region, Lat, Long, date) %>%  
 dplyr::summarise(cases = sum(cases\_temp)) %>%  
 dplyr::ungroup() %>%  
 dplyr::mutate(type = "death",  
 Country.Region = trimws(Country.Region),  
 Province.State = trimws(Province.State))  
  
head(df\_death2)

## # A tibble: 6 x 7  
## Province.State Country.Region Lat Long date cases type   
## <chr> <chr> <dbl> <dbl> <date> <int> <chr>  
## 1 "" Afghanistan 33 65 2020-01-22 0 death  
## 2 "" Afghanistan 33 65 2020-01-23 0 death  
## 3 "" Afghanistan 33 65 2020-01-24 0 death  
## 4 "" Afghanistan 33 65 2020-01-25 0 death  
## 5 "" Afghanistan 33 65 2020-01-26 0 death  
## 6 "" Afghanistan 33 65 2020-01-27 0 death

tail(df\_death2)

## # A tibble: 6 x 7  
## Province.State Country.Region Lat Long date cases type   
## <chr> <chr> <dbl> <dbl> <date> <int> <chr>  
## 1 Zhejiang China 29.2 120. 2020-04-22 0 death  
## 2 Zhejiang China 29.2 120. 2020-04-23 0 death  
## 3 Zhejiang China 29.2 120. 2020-04-24 0 death  
## 4 Zhejiang China 29.2 120. 2020-04-25 0 death  
## 5 Zhejiang China 29.2 120. 2020-04-26 0 death  
## 6 Zhejiang China 29.2 120. 2020-04-27 0 death

# Pulling recovered cases

raw\_rec <- read.csv(file = "https://raw.githubusercontent.com/CSSEGISandData/COVID-19  
/master/csse\_covid\_19\_data/csse\_covid\_19\_time\_series  
/time\_series\_covid19\_recovered\_global.csv", stringsAsFactors = FALSE, fill =FALSE)  
  
lapply(1:ncol(raw\_rec), function(i){  
 if(all(is.na(raw\_rec[, i]))){  
 raw\_rec <<- raw\_rec[, -i]  
 return(print(paste("Column", names(raw\_rec)[i], "is missing", sep = " ")))  
 } else {  
 return(NULL)  
 }  
})

## [[1]]  
## NULL  
##   
## [[2]]  
## NULL  
##   
## [[3]]  
## NULL  
##   
## [[4]]  
## NULL  
##   
## [[5]]  
## NULL  
##   
## [[6]]  
## NULL  
##   
## [[7]]  
## NULL  
##   
## [[8]]  
## NULL  
##   
## [[9]]  
## NULL  
##   
## [[10]]  
## NULL  
##   
## [[11]]  
## NULL  
##   
## [[12]]  
## NULL  
##   
## [[13]]  
## NULL  
##   
## [[14]]  
## NULL  
##   
## [[15]]  
## NULL  
##   
## [[16]]  
## NULL  
##   
## [[17]]  
## NULL  
##   
## [[18]]  
## NULL  
##   
## [[19]]  
## NULL  
##   
## [[20]]  
## NULL  
##   
## [[21]]  
## NULL  
##   
## [[22]]  
## NULL  
##   
## [[23]]  
## NULL  
##   
## [[24]]  
## NULL  
##   
## [[25]]  
## NULL  
##   
## [[26]]  
## NULL  
##   
## [[27]]  
## NULL  
##   
## [[28]]  
## NULL  
##   
## [[29]]  
## NULL  
##   
## [[30]]  
## NULL  
##   
## [[31]]  
## NULL  
##   
## [[32]]  
## NULL  
##   
## [[33]]  
## NULL  
##   
## [[34]]  
## NULL  
##   
## [[35]]  
## NULL  
##   
## [[36]]  
## NULL  
##   
## [[37]]  
## NULL  
##   
## [[38]]  
## NULL  
##   
## [[39]]  
## NULL  
##   
## [[40]]  
## NULL  
##   
## [[41]]  
## NULL  
##   
## [[42]]  
## NULL  
##   
## [[43]]  
## NULL  
##   
## [[44]]  
## NULL  
##   
## [[45]]  
## NULL  
##   
## [[46]]  
## NULL  
##   
## [[47]]  
## NULL  
##   
## [[48]]  
## NULL  
##   
## [[49]]  
## NULL  
##   
## [[50]]  
## NULL  
##   
## [[51]]  
## NULL  
##   
## [[52]]  
## NULL  
##   
## [[53]]  
## NULL  
##   
## [[54]]  
## NULL  
##   
## [[55]]  
## NULL  
##   
## [[56]]  
## NULL  
##   
## [[57]]  
## NULL  
##   
## [[58]]  
## NULL  
##   
## [[59]]  
## NULL  
##   
## [[60]]  
## NULL  
##   
## [[61]]  
## NULL  
##   
## [[62]]  
## NULL  
##   
## [[63]]  
## NULL  
##   
## [[64]]  
## NULL  
##   
## [[65]]  
## NULL  
##   
## [[66]]  
## NULL  
##   
## [[67]]  
## NULL  
##   
## [[68]]  
## NULL  
##   
## [[69]]  
## NULL  
##   
## [[70]]  
## NULL  
##   
## [[71]]  
## NULL  
##   
## [[72]]  
## NULL  
##   
## [[73]]  
## NULL  
##   
## [[74]]  
## NULL  
##   
## [[75]]  
## NULL  
##   
## [[76]]  
## NULL  
##   
## [[77]]  
## NULL  
##   
## [[78]]  
## NULL  
##   
## [[79]]  
## NULL  
##   
## [[80]]  
## NULL  
##   
## [[81]]  
## NULL  
##   
## [[82]]  
## NULL  
##   
## [[83]]  
## NULL  
##   
## [[84]]  
## NULL  
##   
## [[85]]  
## NULL  
##   
## [[86]]  
## NULL  
##   
## [[87]]  
## NULL  
##   
## [[88]]  
## NULL  
##   
## [[89]]  
## NULL  
##   
## [[90]]  
## NULL  
##   
## [[91]]  
## NULL  
##   
## [[92]]  
## NULL  
##   
## [[93]]  
## NULL  
##   
## [[94]]  
## NULL  
##   
## [[95]]  
## NULL  
##   
## [[96]]  
## NULL  
##   
## [[97]]  
## NULL  
##   
## [[98]]  
## NULL  
##   
## [[99]]  
## NULL  
##   
## [[100]]  
## NULL  
##   
## [[101]]  
## NULL

# Transforming the data from wide to long

# Creating new data frame

df\_rec <- raw\_rec[, 1:4]  
  
for(i in 5:ncol(raw\_rec)){  
 print(i)  
 raw\_rec[,i] <- as.integer(raw\_rec[,i])  
 raw\_rec[,i] <- ifelse(is.na(raw\_rec[, i]), 0 , raw\_rec[, i])  
  
 if(i == 5){  
 df\_rec[[names(raw\_rec)[i]]] <- raw\_rec[, i]  
 } else {  
 df\_rec[[names(raw\_rec)[i]]] <- raw\_rec[, i] - raw\_rec[, i - 1]  
 }  
}

## [1] 5  
## [1] 6  
## [1] 7  
## [1] 8  
## [1] 9  
## [1] 10  
## [1] 11  
## [1] 12  
## [1] 13  
## [1] 14  
## [1] 15  
## [1] 16  
## [1] 17  
## [1] 18  
## [1] 19  
## [1] 20  
## [1] 21  
## [1] 22  
## [1] 23  
## [1] 24  
## [1] 25  
## [1] 26  
## [1] 27  
## [1] 28  
## [1] 29  
## [1] 30  
## [1] 31  
## [1] 32  
## [1] 33  
## [1] 34  
## [1] 35  
## [1] 36  
## [1] 37  
## [1] 38  
## [1] 39  
## [1] 40  
## [1] 41  
## [1] 42  
## [1] 43  
## [1] 44  
## [1] 45  
## [1] 46  
## [1] 47  
## [1] 48  
## [1] 49  
## [1] 50  
## [1] 51  
## [1] 52  
## [1] 53  
## [1] 54  
## [1] 55  
## [1] 56  
## [1] 57  
## [1] 58  
## [1] 59  
## [1] 60  
## [1] 61  
## [1] 62  
## [1] 63  
## [1] 64  
## [1] 65  
## [1] 66  
## [1] 67  
## [1] 68  
## [1] 69  
## [1] 70  
## [1] 71  
## [1] 72  
## [1] 73  
## [1] 74  
## [1] 75  
## [1] 76  
## [1] 77  
## [1] 78  
## [1] 79  
## [1] 80  
## [1] 81  
## [1] 82  
## [1] 83  
## [1] 84  
## [1] 85  
## [1] 86  
## [1] 87  
## [1] 88  
## [1] 89  
## [1] 90  
## [1] 91  
## [1] 92  
## [1] 93  
## [1] 94  
## [1] 95  
## [1] 96  
## [1] 97  
## [1] 98  
## [1] 99  
## [1] 100  
## [1] 101

df\_rec1 <- df\_rec %>% tidyr::pivot\_longer(cols = dplyr::starts\_with("X"),  
 names\_to = "date\_temp",  
 values\_to = "cases\_temp")

# Parsing the date

df\_rec1$month <- sub("X", "", strsplit(df\_rec1$date\_temp, split = "\\.") %>%  
 purrr::map\_chr(~.x[1]) )  
  
df\_rec1$day <- strsplit(df\_rec1$date\_temp, split = "\\.") %>%  
 purrr::map\_chr(~.x[2])  
  
  
df\_rec1$date <- as.Date(paste("2020", df\_rec1$month, df\_rec1$day, sep = "-"))

# Aggregate the data to daily

df\_rec2 <- df\_rec1 %>%  
 dplyr::group\_by(Province.State, Country.Region, Lat, Long, date) %>%  
 dplyr::summarise(cases = sum(cases\_temp)) %>%  
 dplyr::ungroup() %>%  
 dplyr::mutate(type = "recovered",  
 Country.Region = trimws(Country.Region),  
 Province.State = trimws(Province.State))  
  
head(df\_rec2)

## # A tibble: 6 x 7  
## Province.State Country.Region Lat Long date cases type   
## <chr> <chr> <dbl> <dbl> <date> <int> <chr>   
## 1 "" Afghanistan 33 65 2020-01-22 0 recovered  
## 2 "" Afghanistan 33 65 2020-01-23 0 recovered  
## 3 "" Afghanistan 33 65 2020-01-24 0 recovered  
## 4 "" Afghanistan 33 65 2020-01-25 0 recovered  
## 5 "" Afghanistan 33 65 2020-01-26 0 recovered  
## 6 "" Afghanistan 33 65 2020-01-27 0 recovered

tail(df\_rec2)

## # A tibble: 6 x 7  
## Province.State Country.Region Lat Long date cases type   
## <chr> <chr> <dbl> <dbl> <date> <int> <chr>   
## 1 Zhejiang China 29.2 120. 2020-04-22 1 recovered  
## 2 Zhejiang China 29.2 120. 2020-04-23 4 recovered  
## 3 Zhejiang China 29.2 120. 2020-04-24 0 recovered  
## 4 Zhejiang China 29.2 120. 2020-04-25 1 recovered  
## 5 Zhejiang China 29.2 120. 2020-04-26 1 recovered  
## 6 Zhejiang China 29.2 120. 2020-04-27 3 recovered

#—————- Aggregate all cases —————-

coronavirus <- dplyr::bind\_rows(df\_conf2, df\_death2, df\_rec2) %>% as.data.frame()

if(ncol(coronavirus) != 7){  
 stop("The number of columns is invalid")  
 } else if(nrow(coronavirus)< 69000){  
 stop("The number of raws does not match the minimum number of rows")  
 } else if(min(coronavirus$date) != as.Date("2020-01-22")){  
 stop("The starting date is invalid")  
 }

#—————- Exporting files —————-

write.csv(coronavirus, "C:/Users/uganda/Documents/COVID-19/COVID-19\_Data/coronavirus.csv", row.names = FALSE)  
  
writexl::write\_xlsx(x = coronavirus, path = "C:/Users/uganda/Documents/COVID-19/COVID-19\_Data/coronavirus.xlsx", col\_names = TRUE)