Series Temporales

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Librerías de trabajo

Antes de comenzar a trabajar, debemos llamar a nuestras librerias de trabajo. Si no cuentas con alguna de estas librerias, puedes descargarla mediante la función *install.packages()*, y el nombre de la paquetería entre comillas. Por ejemplo, *install.packages('dplyr')*.

```
library(readr)
library(dplyr)
library(ggplot2)
library(ggpubr)
```

Dataset de trabajo

De la misma manera, llamaremos a nuestro conjunto de datos a utilizar en el desarrollo del proyecto. Este dataset contiene información de diferentes variables asociadas con la pandemia de COVID-19, tomando solo información de México. Presenta un rango del 01 de enero del 2020 al 02 de agosto del 2023. Para más información, puedes acceder al sitio de descarga de los datos crudos, *Our World in Data*.

```
covid_mexico <- readRDS('../data/covid_mexico.RDS')
```

```
min(covid_mexico$date)
```

```
## [1] "2020-01-01"
```

```
max(covid_mexico$date)
```

```
## [1] "2023-08-02"
```

```
summary(covid_mexico$date)
```

```
##         Min.      1st Qu.       Median         Mean      3rd Qu.         Max.
## "2020-01-01" "2020-11-23" "2021-10-16" "2021-10-16" "2022-09-08" "2023-08-02"
```

```
length(covid_mexico$date)
```

```
## [1] 1310
```

```
1310/365  #3.5 años
```

```
## [1] 3.589041
```

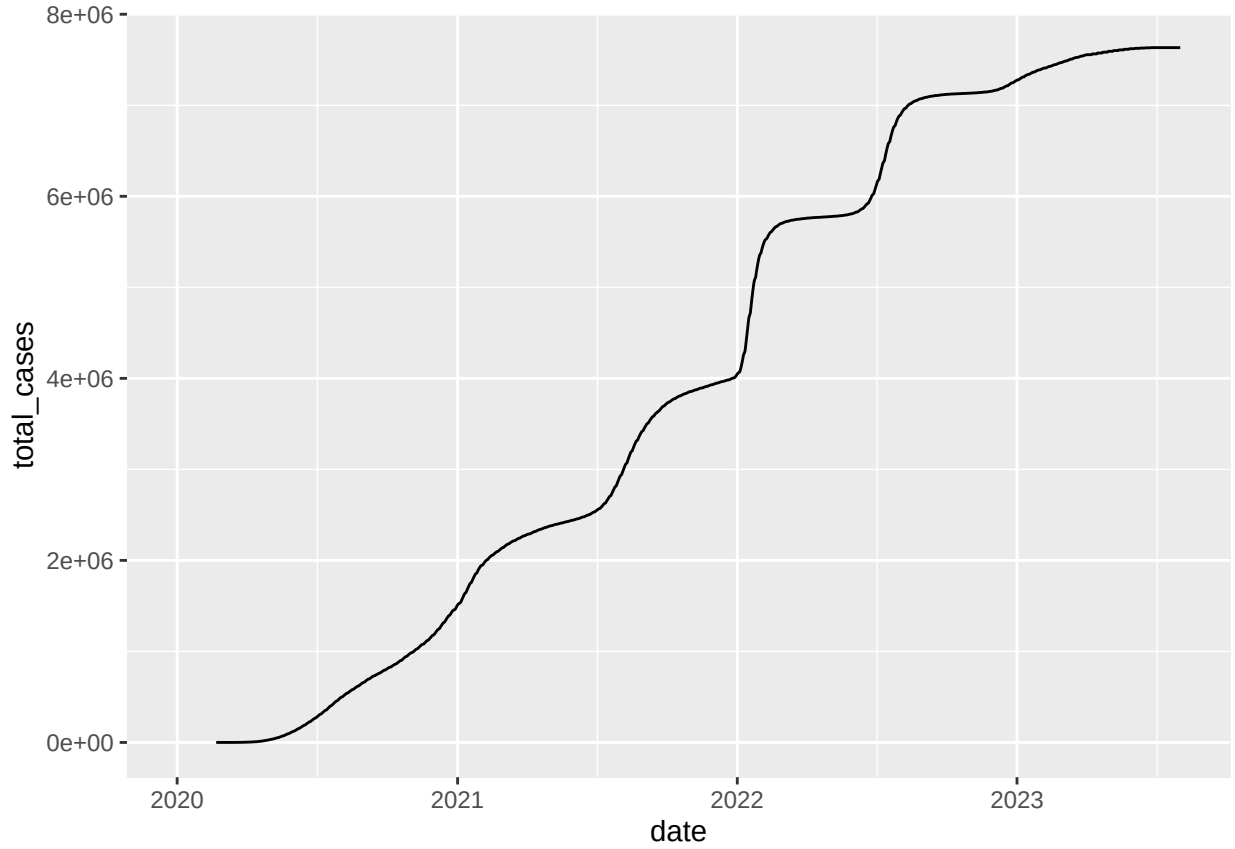
```
deltat(covid_mexico$date) # intervalo de fechas
```

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

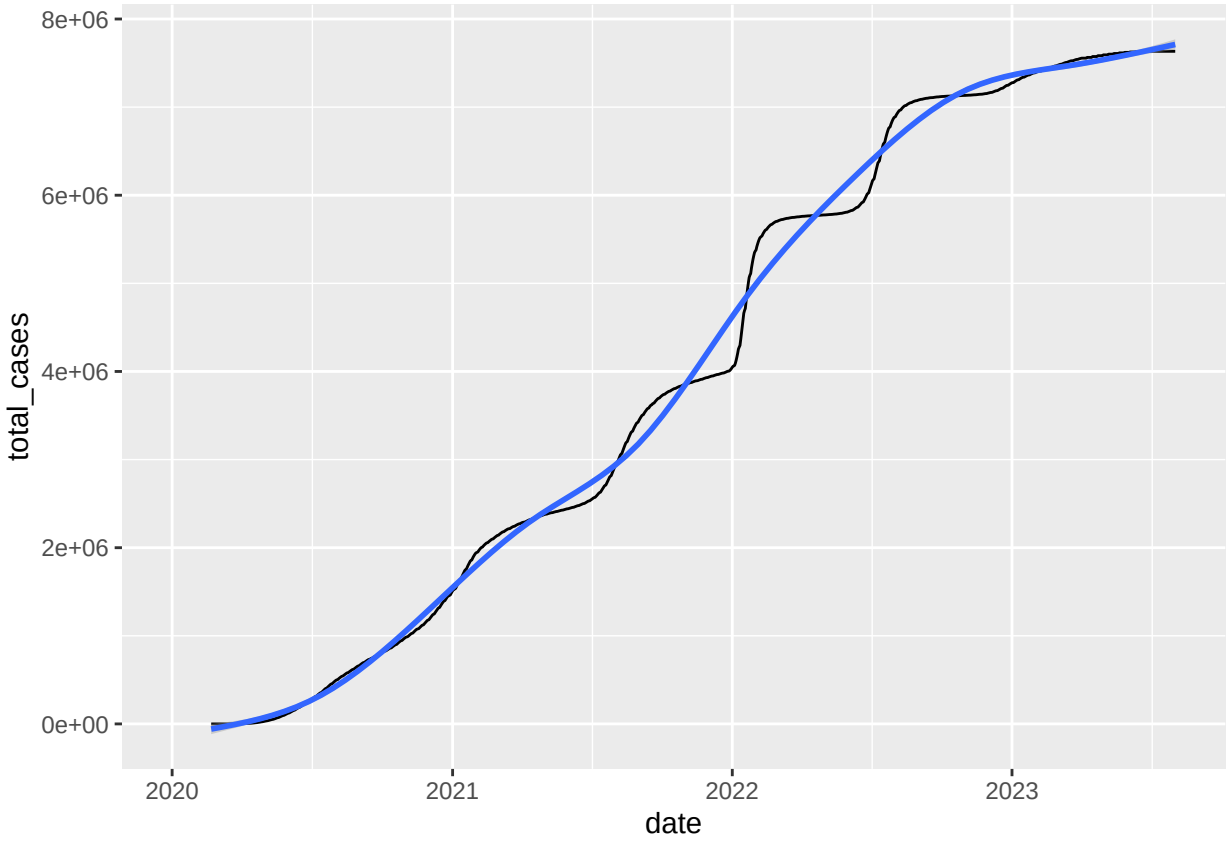
```
diferencia_casos <- diff(covid_mexico$total_cases) %>%
  na.omit()

head(diferencia_casos,20)
```

```
##  [1]  0  0  0  0  0  0  0  3  2  2  2  5  9 10 11  6  7  8  5 17
```

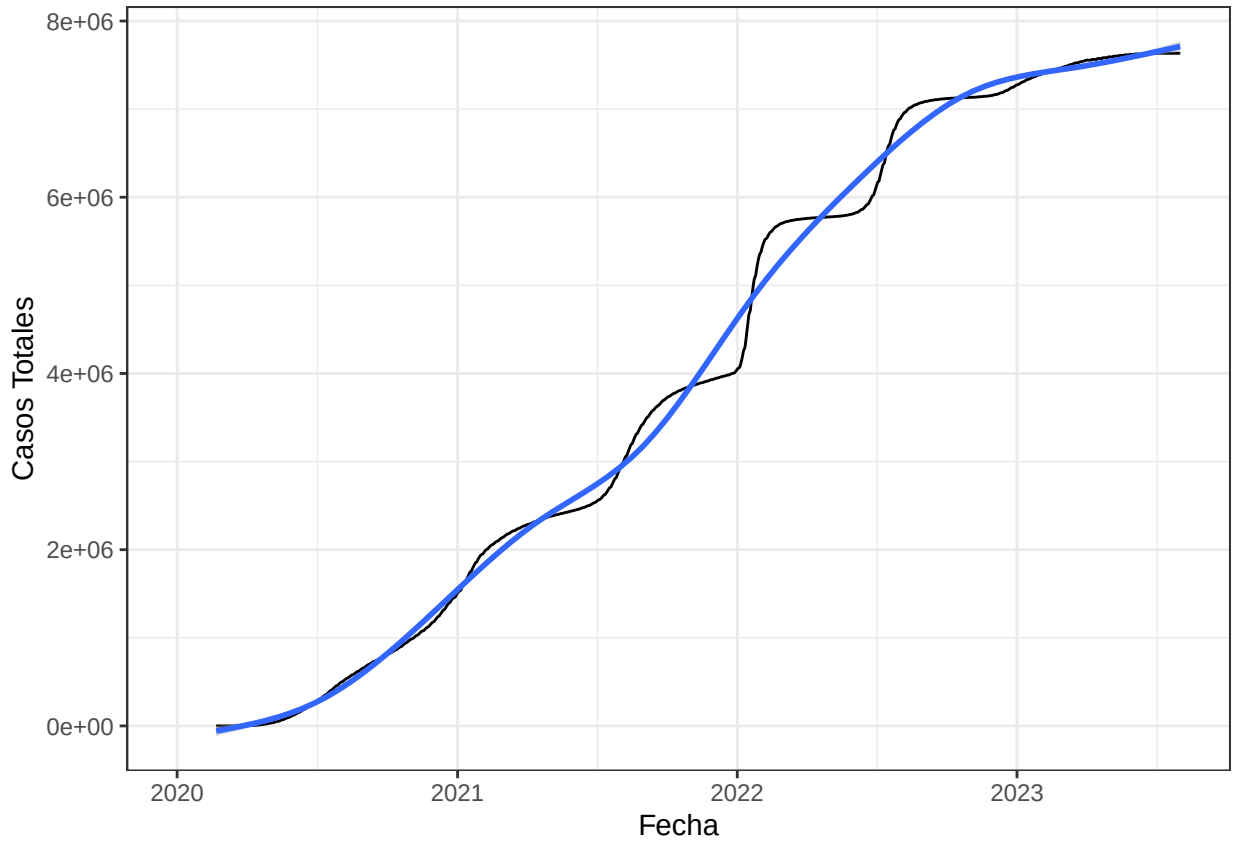
```
ggplot(covid_mexico, aes(x = date, y = total_cases)) +
  geom_line()
```




```
ggplot(covid_mexico, aes(x = date, y = total_cases)) +
  geom_line() +
  geom_smooth()
```




```
ggplot(covid_mexico, aes(x = date, y = total_cases)) +
  geom_line() +
  geom_smooth() +
  xlab('Fecha') +
  ylab('Casos Totales') +
  theme_bw()
```



scale_x_date() para darle formato a la fecha

%d: Day as a number between 0 and 31

%a: Abbreviated weekday (e.g. “Tue”)

%A: Unabbreviated weekday (e.g. “Tuesday”)

%m: Month between 0 and 12

%b: Abbreviated month (e.g. “Jan”)

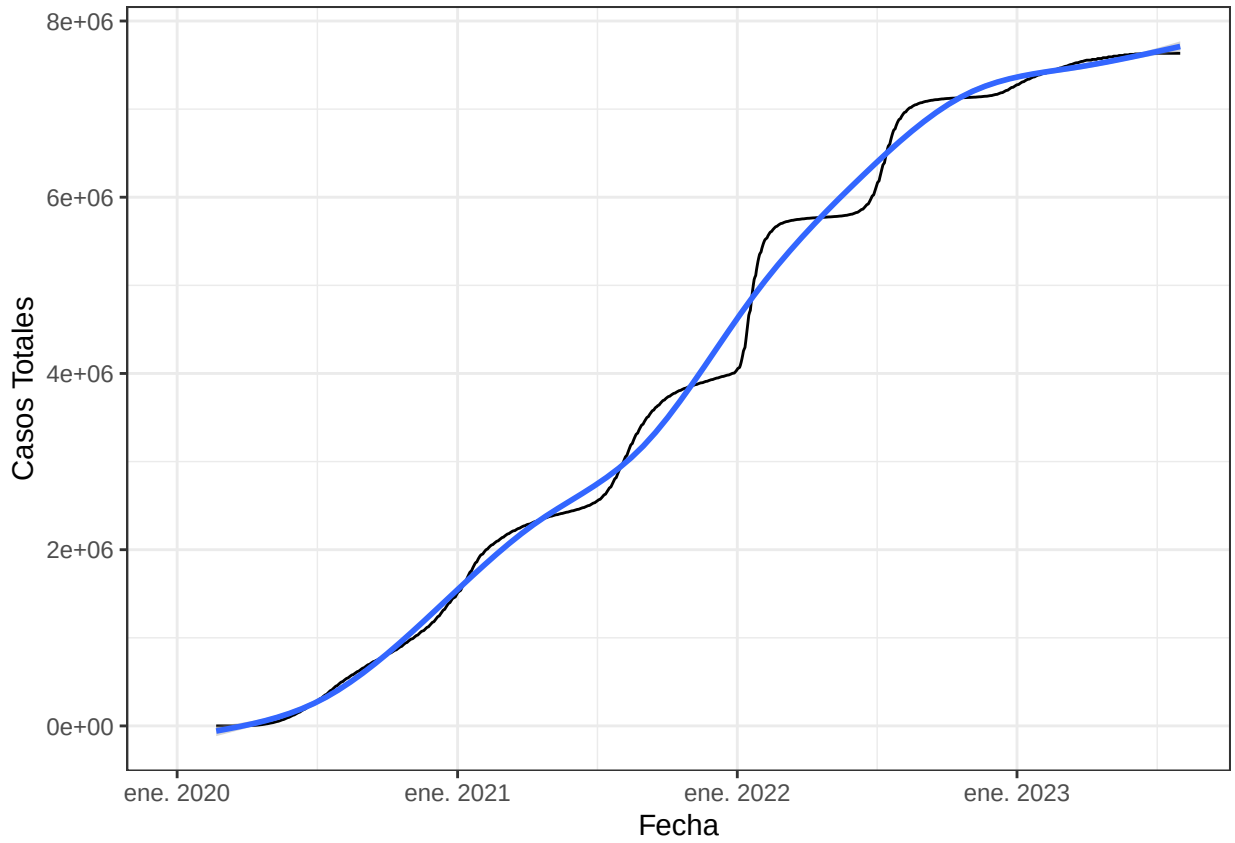
%B: Unabbreviated month (e.g. “January”)

%y: 2-digit year (e.g. “21”)

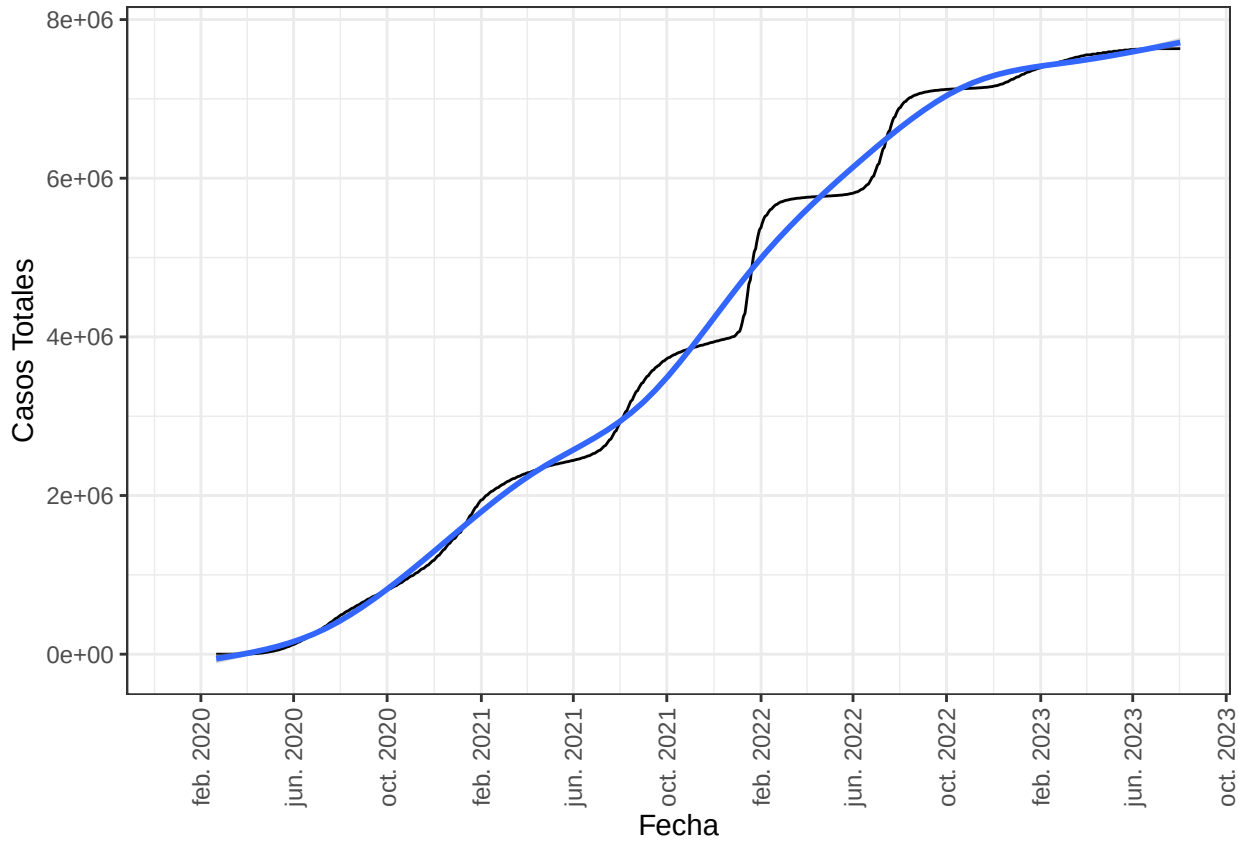
%Y: 4-digit year (e.g. “2021”)

%W: Week of the year between 0 and 52

```
ggplot(covid_mexico, aes(x = date, y = total_cases)) +
  geom_line() +
  geom_smooth() +
  xlab('Fecha') +
  ylab('Casos Totales') +
  scale_x_date(date_labels = '%b %Y') +
  theme_bw()
```




```
ggplot(covid_mexico, aes(x = date, y = total_cases)) +
  geom_line() +
  geom_smooth() +
  xlab('Fecha') +
  ylab('Casos Totales') +
  theme_bw() +
  scale_x_date(date_labels = '%b %Y',
               date_breaks = '4 month') +
  theme(axis.text.x = element_text(angle = 90,
vjust = 0.5, hjust=1))
```




```
min(covid_mexico$date)
```

```
## [1] "2020-01-01"
```

```
max(covid_mexico$date)
```

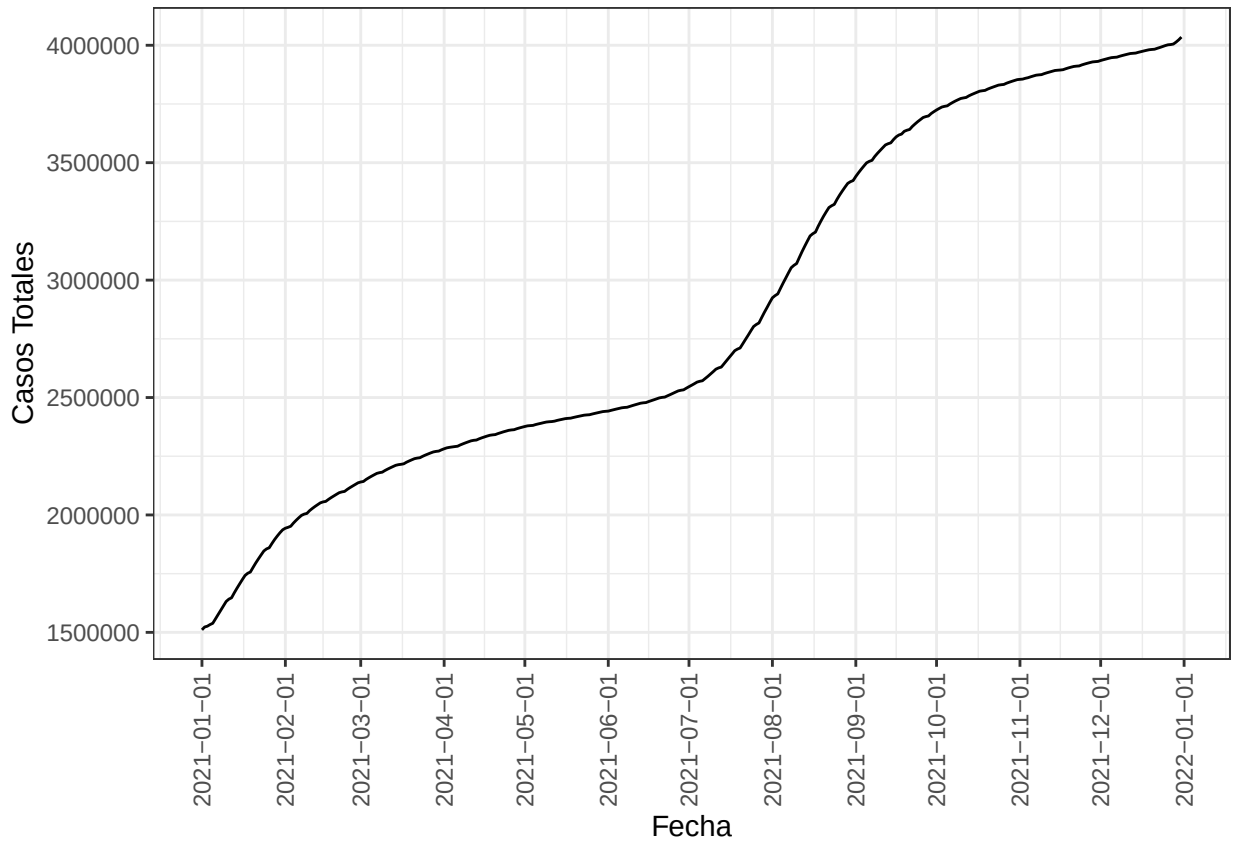
```
## [1] "2023-08-02"
```

```
covid_mexico %>%
  filter(date >= '2021-01-01',
         date <= '2021-12-31')
```

```
## # A tibble: 365 x 67
##    iso_code continent locat~1 date       total~2 new_c~3 new_c~4 total~5 new_d~6
##    <chr>    <chr>     <chr>   <date>       <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
##  1 MEX      North Am~ Mexico  2021-01-01 1510795   14728  10085.  148569     946
##  2 MEX      North Am~ Mexico  2021-01-02 1522878   12083  10314.  149455     886
##  3 MEX      North Am~ Mexico  2021-01-03 1526291    3413  10411   150442     987
##  4 MEX      North Am~ Mexico  2021-01-04 1533239    6948  10556   151435     993
##  5 MEX      North Am~ Mexico  2021-01-05 1538513    5274  10681.  152472    1037
##  6 MEX      North Am~ Mexico  2021-01-06 1557069   18556  11014.  153584    1112
##  7 MEX      North Am~ Mexico  2021-01-07 1575890   18821  11403.  154653    1069
##  8 MEX      North Am~ Mexico  2021-01-08 1594299   18409  11929.  155813    1160
##  9 MEX      North Am~ Mexico  2021-01-09 1613065   18766  12884.  156877    1064
## 10 MEX      North Am~ Mexico  2021-01-10 1631666   18601  15054.  158074    1197
## # ... with 355 more rows, 58 more variables: new_deaths_smoothed <dbl>,
## #   total_cases_per_million <dbl>, new_cases_per_million <dbl>,
## #   new_cases_smoothed_per_million <dbl>, total_deaths_per_million <dbl>,
```

```
## #   new_deaths_per_million <dbl>, new_deaths_smoothed_per_million <dbl>,
## #   reproduction_rate <dbl>, icu_patients <dbl>,
## #   icu_patients_per_million <dbl>, hosp_patients <dbl>,
## #   hosp_patients_per_million <dbl>, weekly_icu_admissions <dbl>, ...
```

```
covid_mexico %>%
  filter(date >= '2021-01-01',
         date <= '2021-12-31') %>%
  ggplot(aes(x = date, y = total_cases)) +
  geom_line() +
  scale_x_date(date_breaks = '1 month') +
  theme_bw()+
  theme(axis.text.x = element_text(angle = 90,
                                   vjust = 0.5, hjust=1))+
  xlab('Fecha') +
  ylab('Casos Totales')
```




```
a <- covid_mexico %>%
  filter(date >= '2021-01-01',
         date <= '2021-12-31') %>%
  select(total_cases, date) %>%
  ggplot(aes(y = total_cases, x = date)) +
  geom_line() +
  geom_smooth() +
  theme(axis.text.x = element_text(angle = 90,
vjust = 0.5, hjust=1))
```

```
b <- covid_mexico %>%
  filter(date >= '2021-01-01',
         date <= '2021-12-31') %>%
  select(total_deaths, date) %>%
  ggplot(aes(y = total_deaths, x = date)) +
  geom_line() +
  geom_smooth()+
  theme(axis.text.x = element_text(angle = 90,
vjust = 0.5, hjust=1))

c <- covid_mexico %>%
  filter(date >= '2021-01-01',
         date <= '2021-12-31') %>%
  select(total_tests, date) %>%
  ggplot(aes(y = total_tests, x = date)) +
  geom_line() +
  geom_smooth()+
  theme(axis.text.x = element_text(angle = 90,
vjust = 0.5, hjust=1))
```

```
ggarrange(a, b, c,
          labels = c('CASOS', 'MUERTES', 'PRUEBAS'),
          ncol = 3, nrow = 1,
          font.label = list(size = 10),
          hjust = 0, vjust = 2.2)
```