

# Series Temporales

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## Series Temporales

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

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)

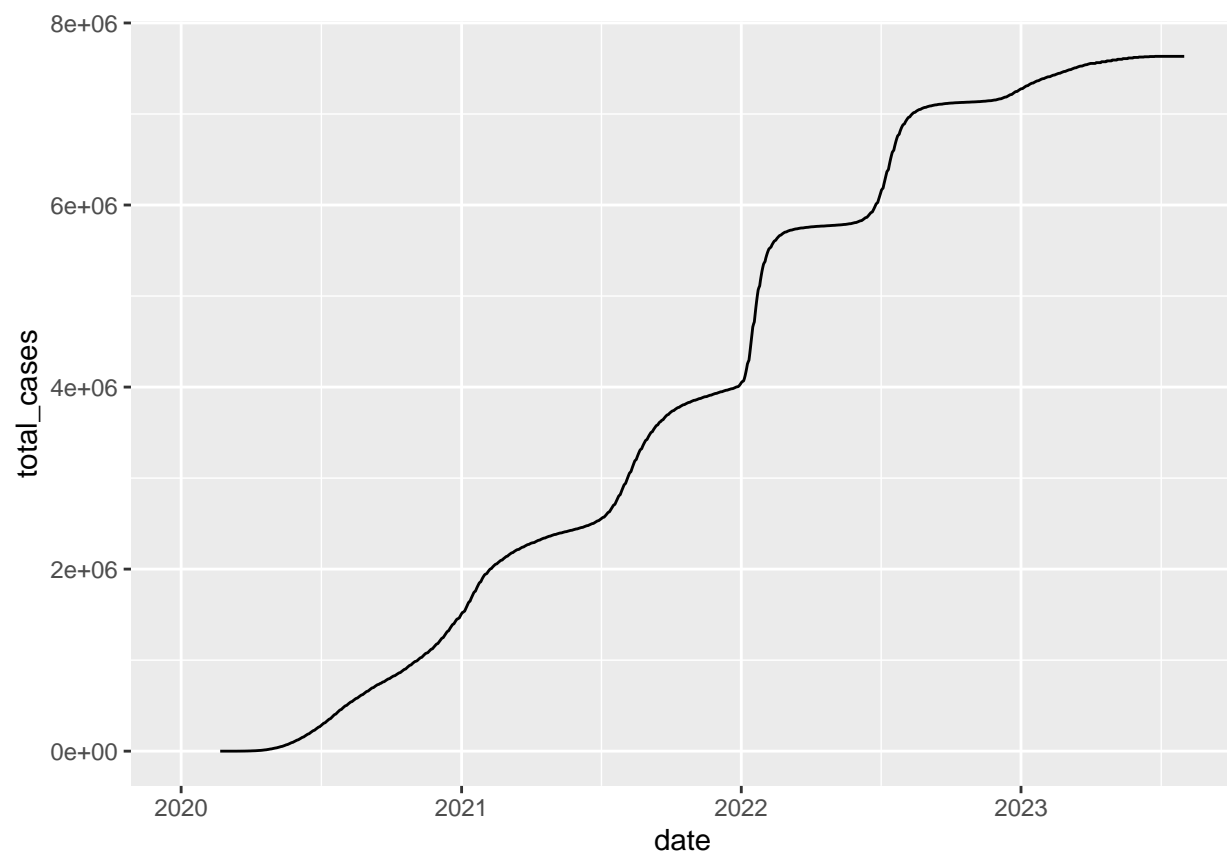
## [1] 1310
1310/365 #3.5 años

## [1] 3.589041
deltat(covid_mexico$date) # intervalo de fechas

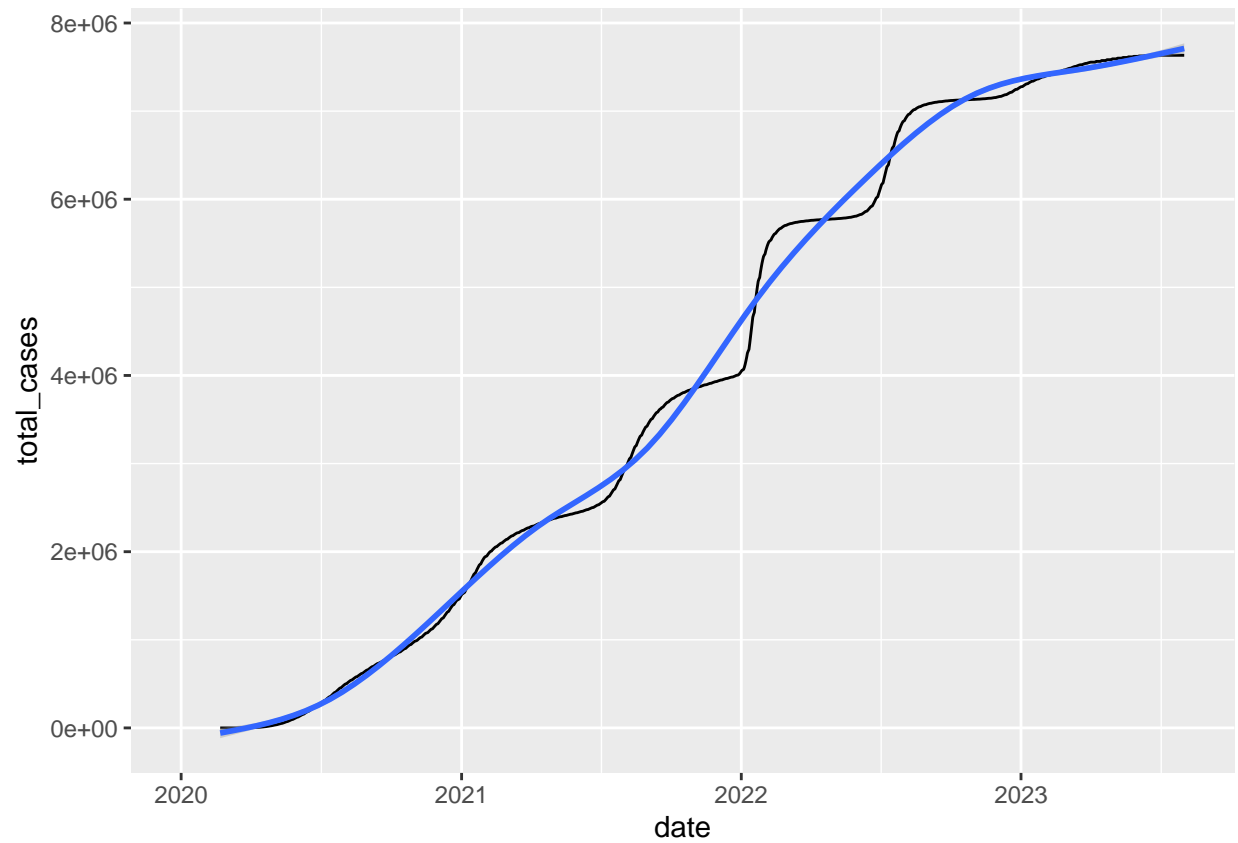
## [1] 1
diferencia_casos <- diff(covid_mexico$total_cases) %>%
  na.omit()

head(diferencia_casos,20)

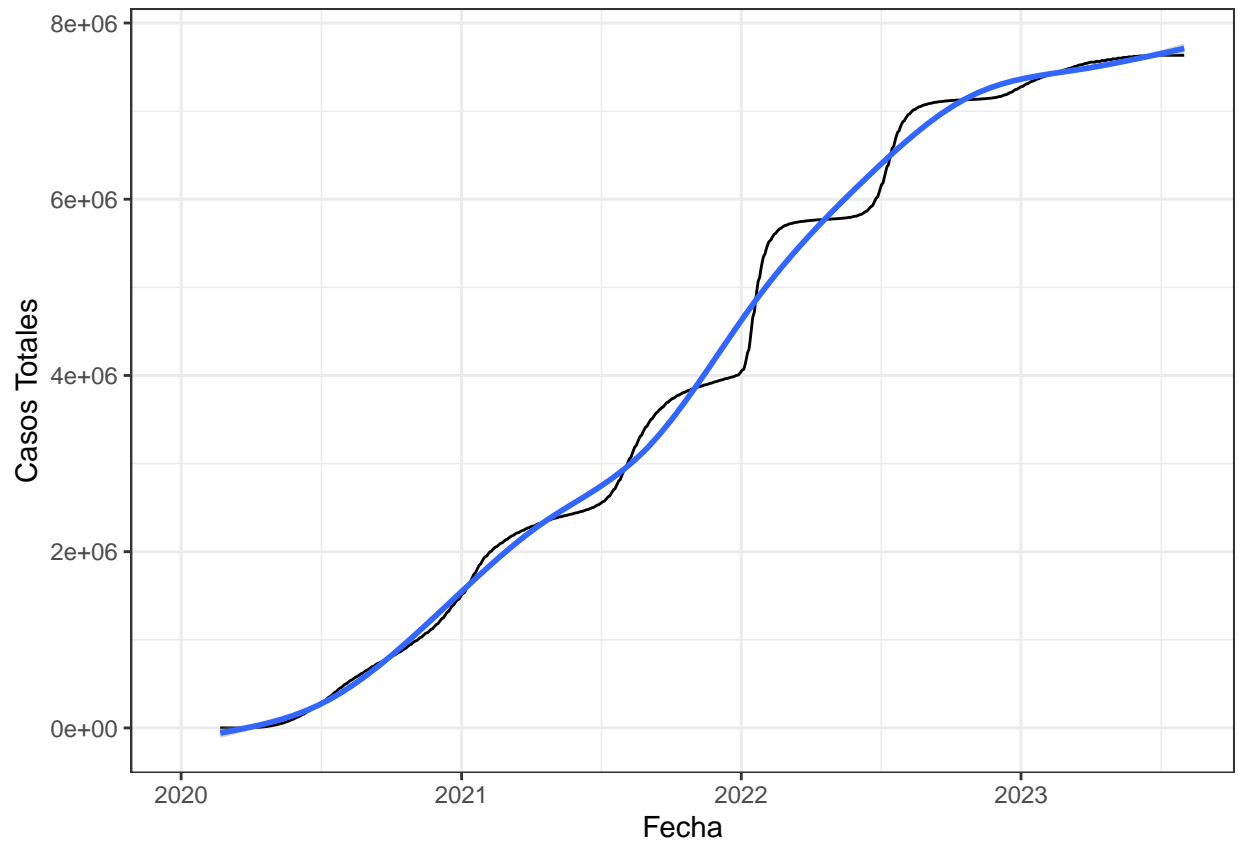
## [1] 0 0 0 0 0 0 0 0 3 2 2 2 5 9 10 11 6 7 8 5 17
ggplot(covid_mexico, aes(x = date, y = total_cases)) +
  geom_line()
```



```
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”)

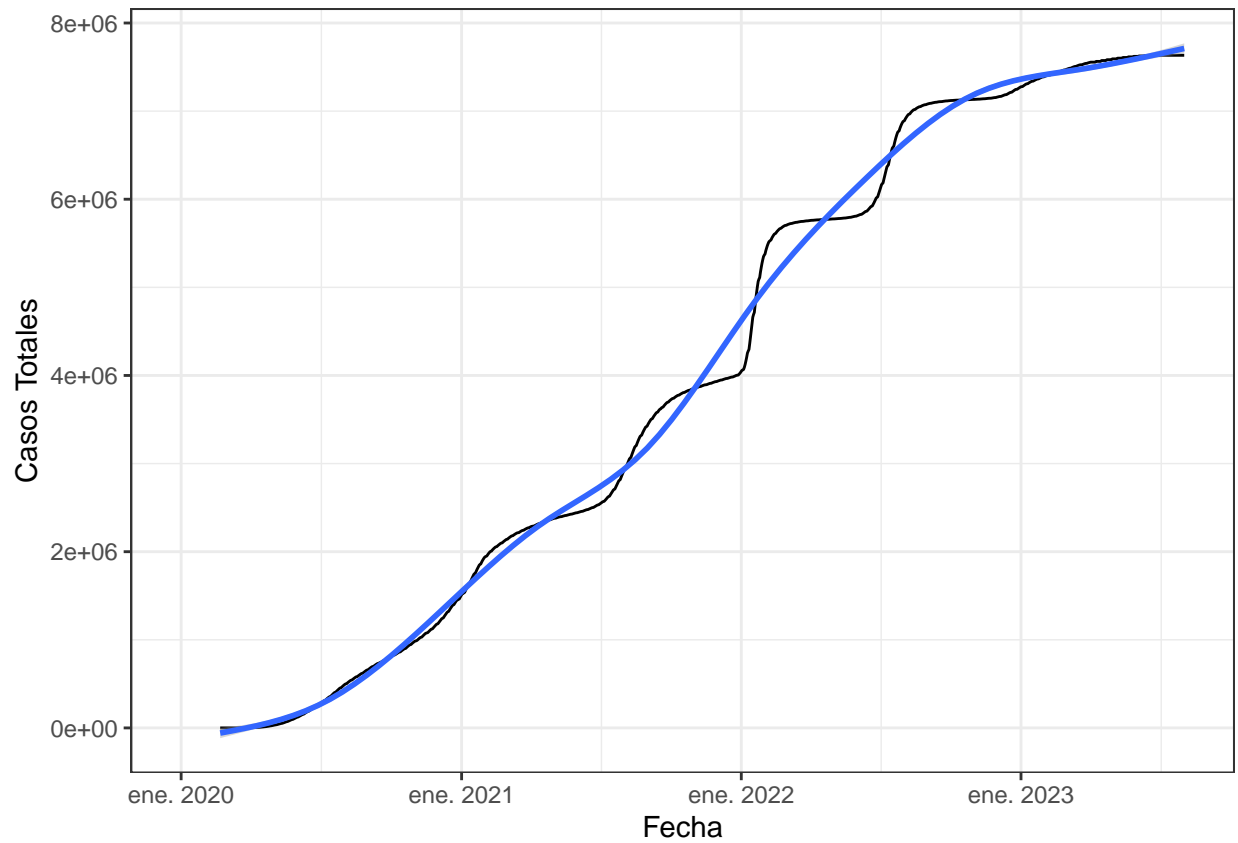
`%B`: Unabbreviated month (e.g. “January”)

`%y`: 2-digit year (e.g. “21”)

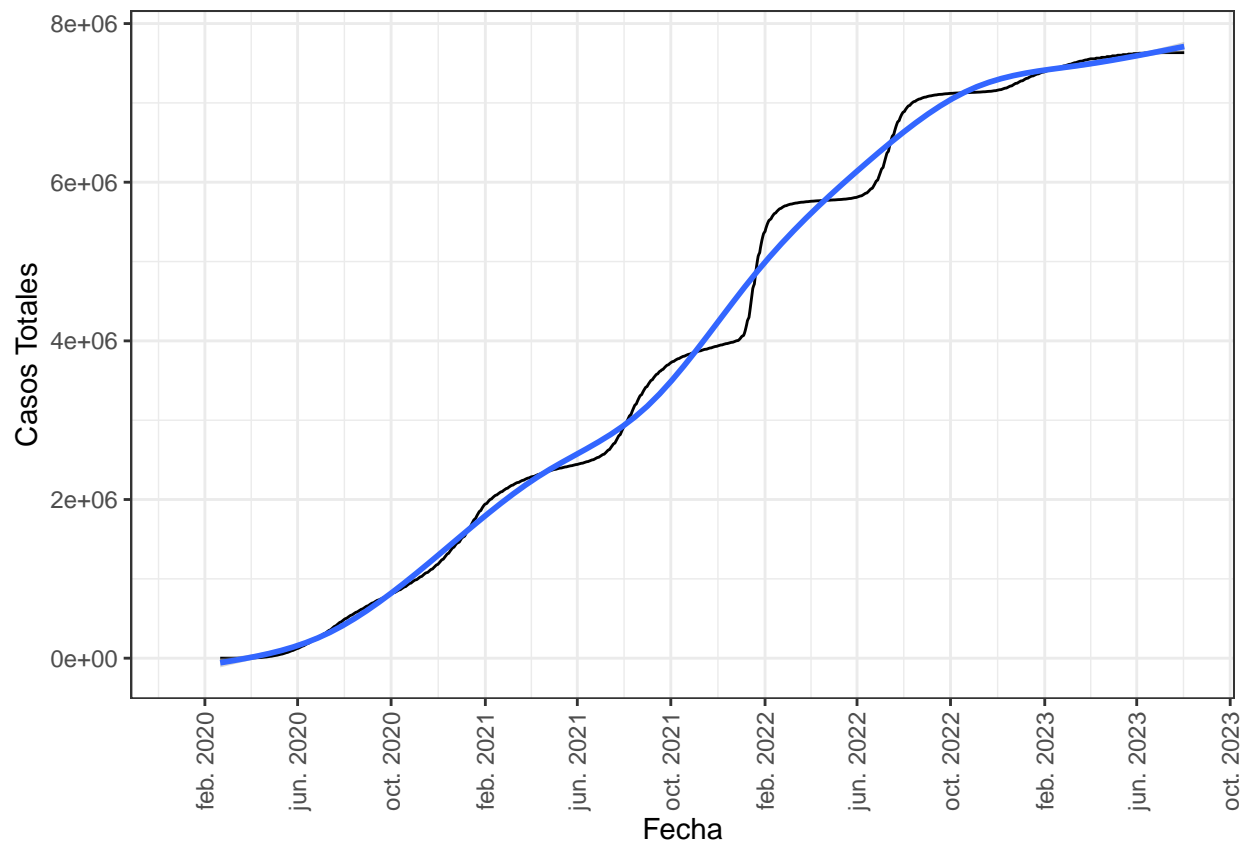
`%Y`: 4-digit year (e.g. “2021”)

`%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

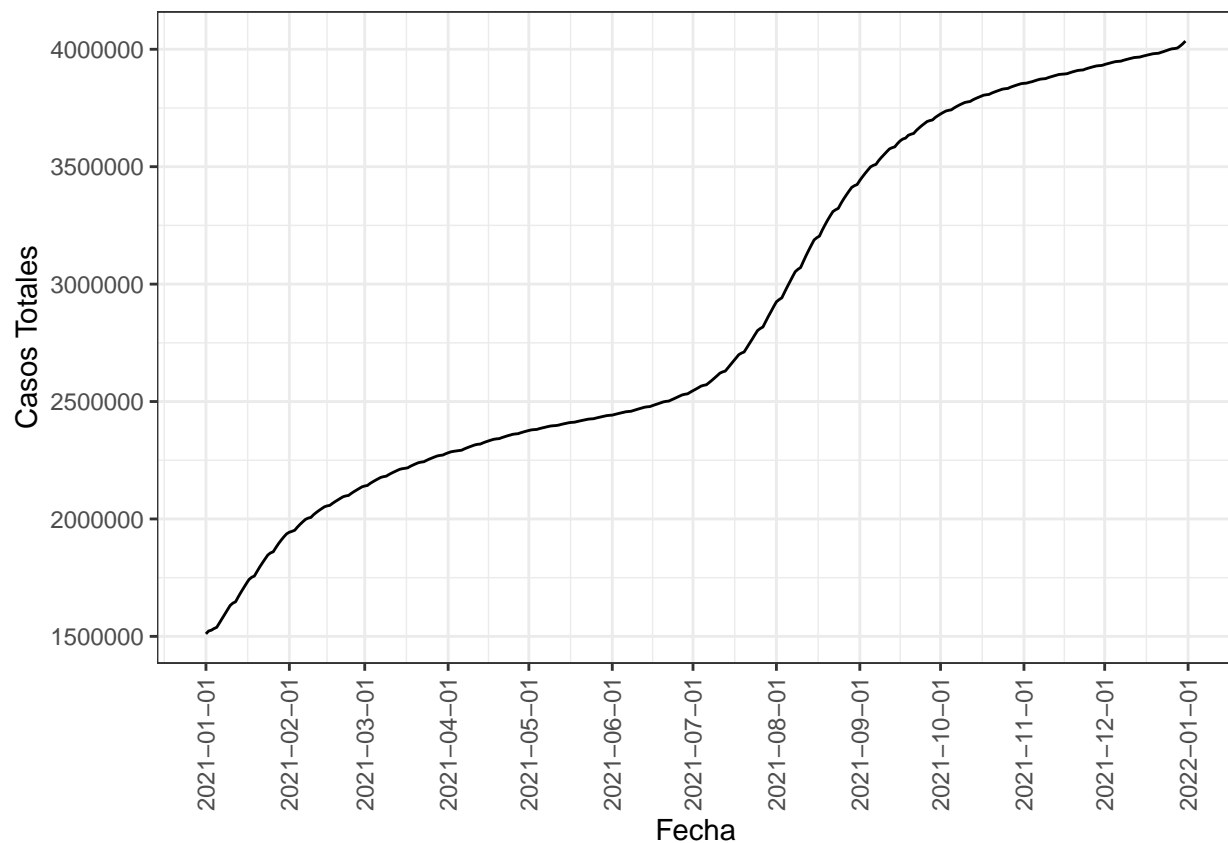
```
## # ... with 355 more rows, 58 more variables: new_deaths_smoothed <dbl>,
```

```
## #   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)

```

