# Covid19

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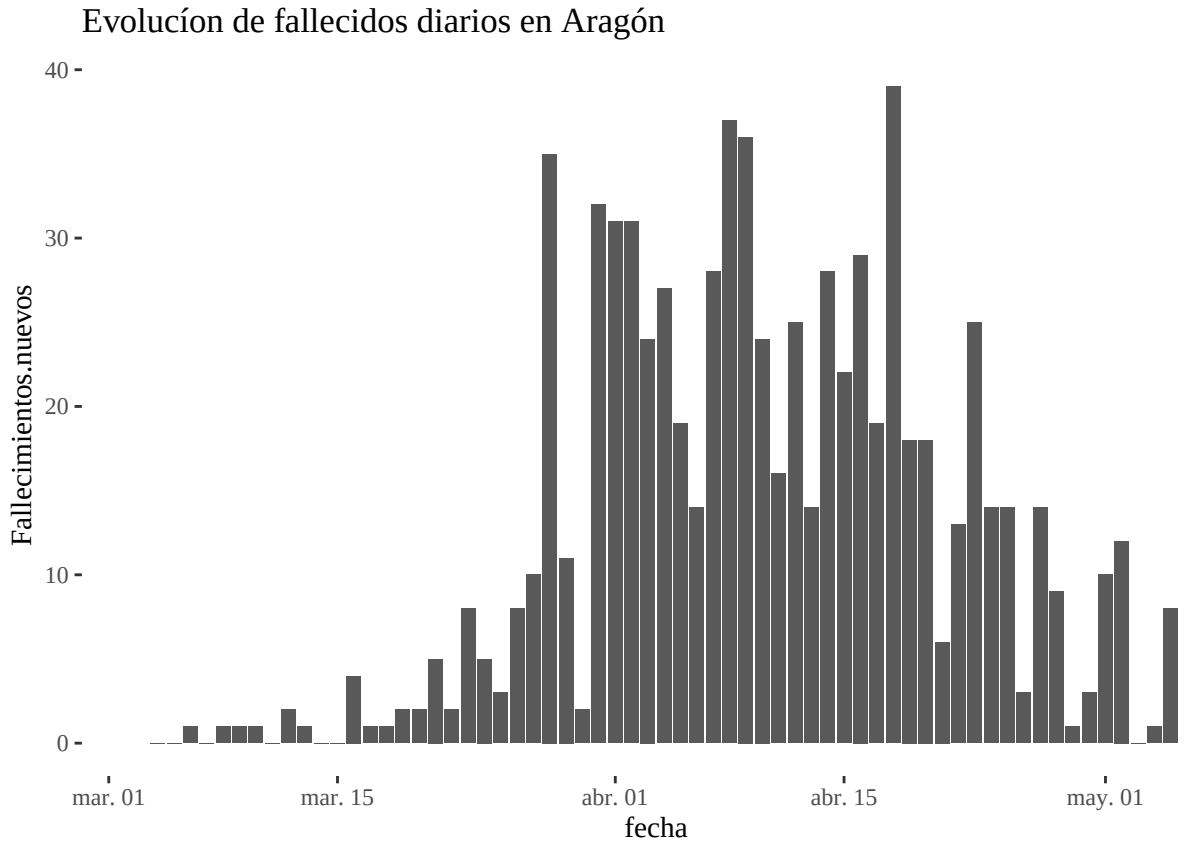
**En este estudio queremos tener una visión por escalas desde nuestra Comunidad Autónoma Aragón, pasando a nivel nacional para finalmente hacer un análisis internacional.**
**Queremos entender el virus, su comportamiento e incidencia por países y la visualización de datos de cada uno de ellos en el tiempo.**
**Lamentablemente nos centraremos en la mayor parte del estudio en los fallecidos que a pesar de proporcionar cifras con retraso, son más fiables que las de contagios detectados de los que se estima que se detecta a nivel nacional una fracción inferior debido a la falta de test y rastreo de la población.**
**Veamos la evolucíon de fallecidos diarios en Aragón.**

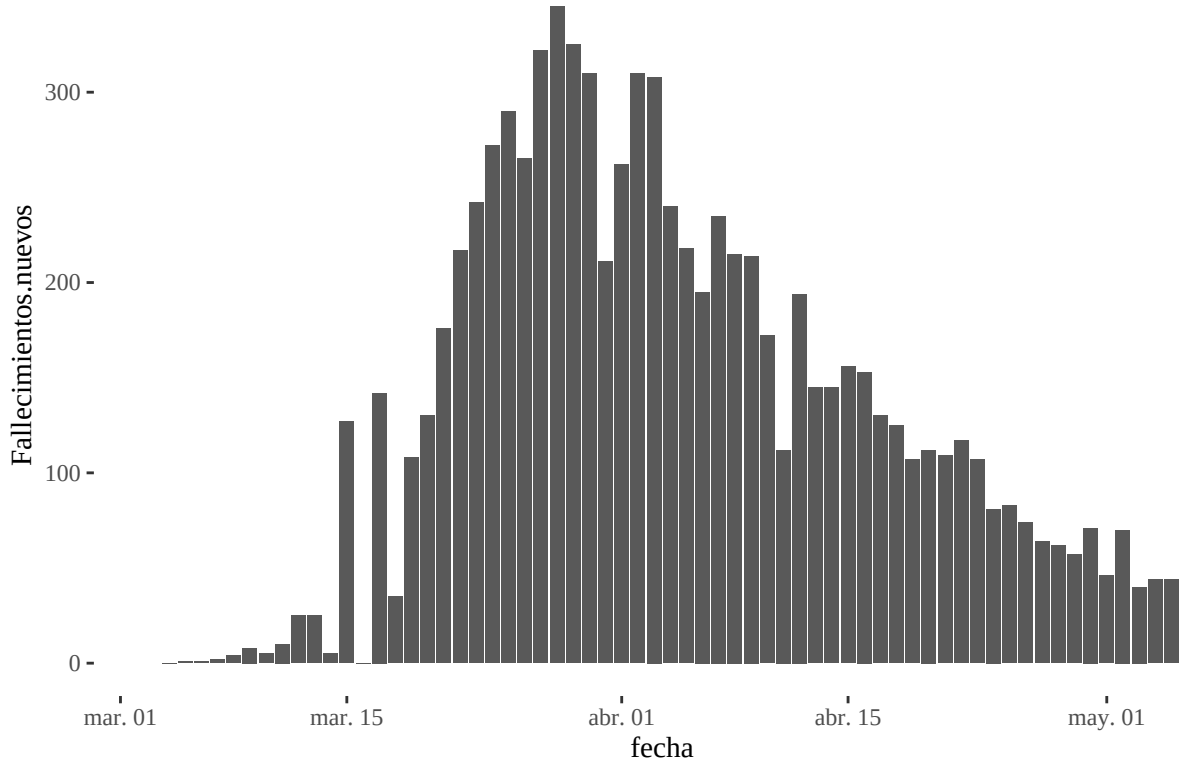
```
ggplot(covar,aes(x=fecha,y=Fallecimientos.nuevos),na.rm =TRUE)+geom_bar(stat="identity", position="dodg
  ggtitle( "Evolucíon de fallecidos diarios en Aragón")
```



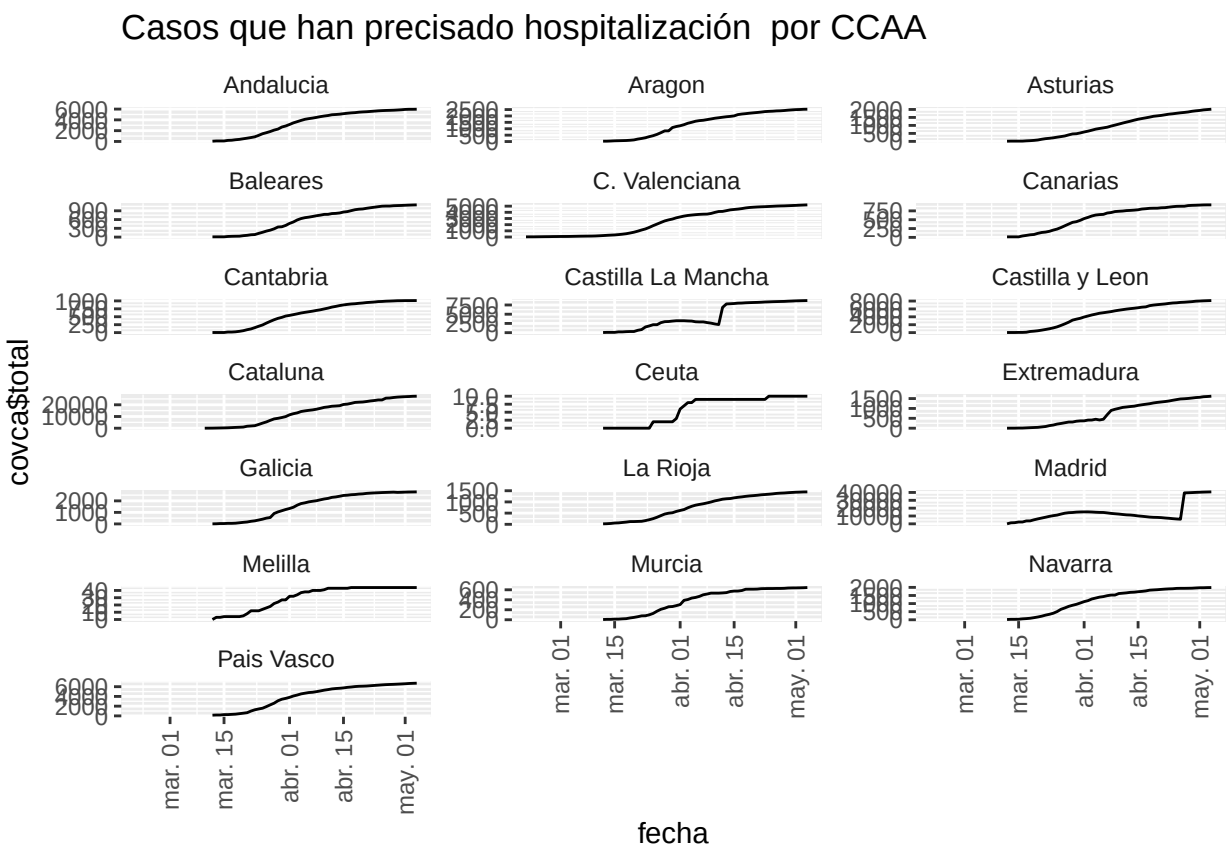

**Veamos a continuación la evolución fallecidos diarios en la Comunidad de Madrid.**

```
ggplot(covar,aes(x=fecha,y=Fallecimientos.nuevos),na.rm =TRUE)+geom_bar(stat="identity", position="dodg
  ggtitle( "Fallecimientos diarios nuevos en la Comunidad de Madrid")
```

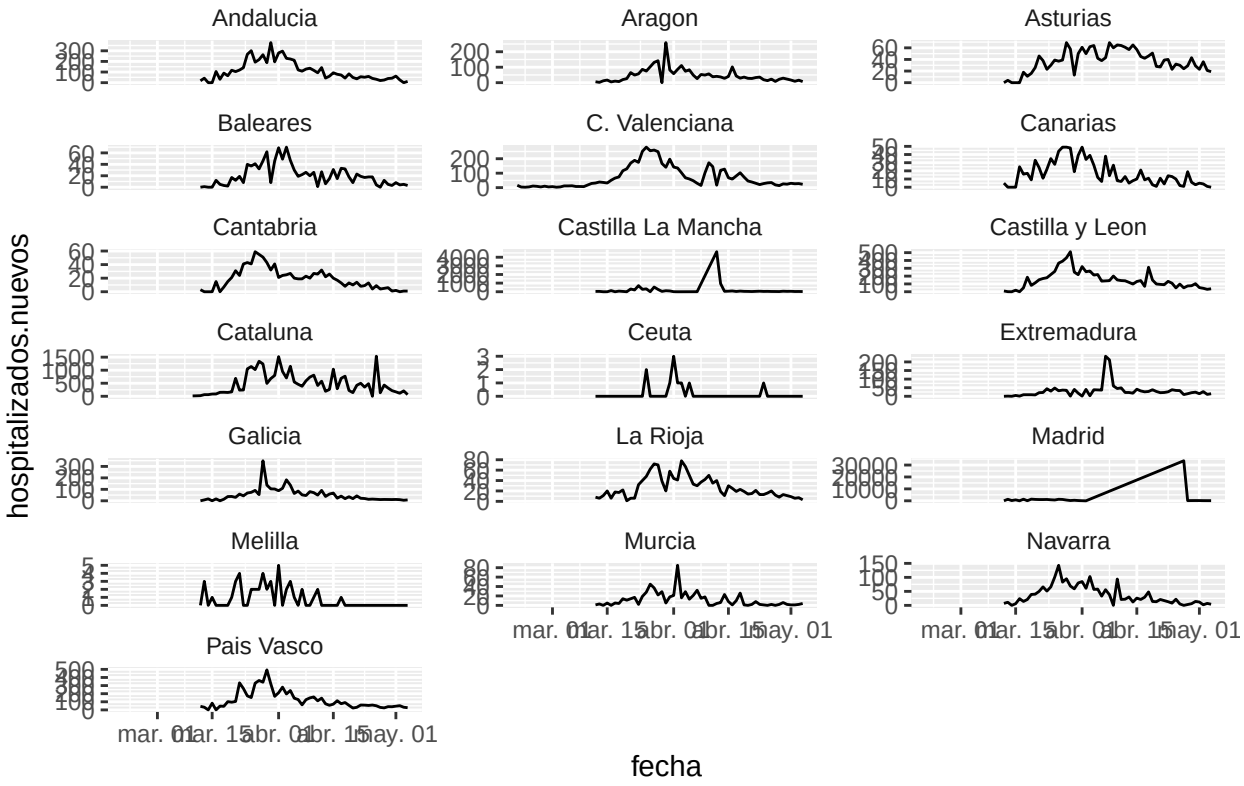
Fallecimientos diarios nuevos en la Comunidad de Madrid



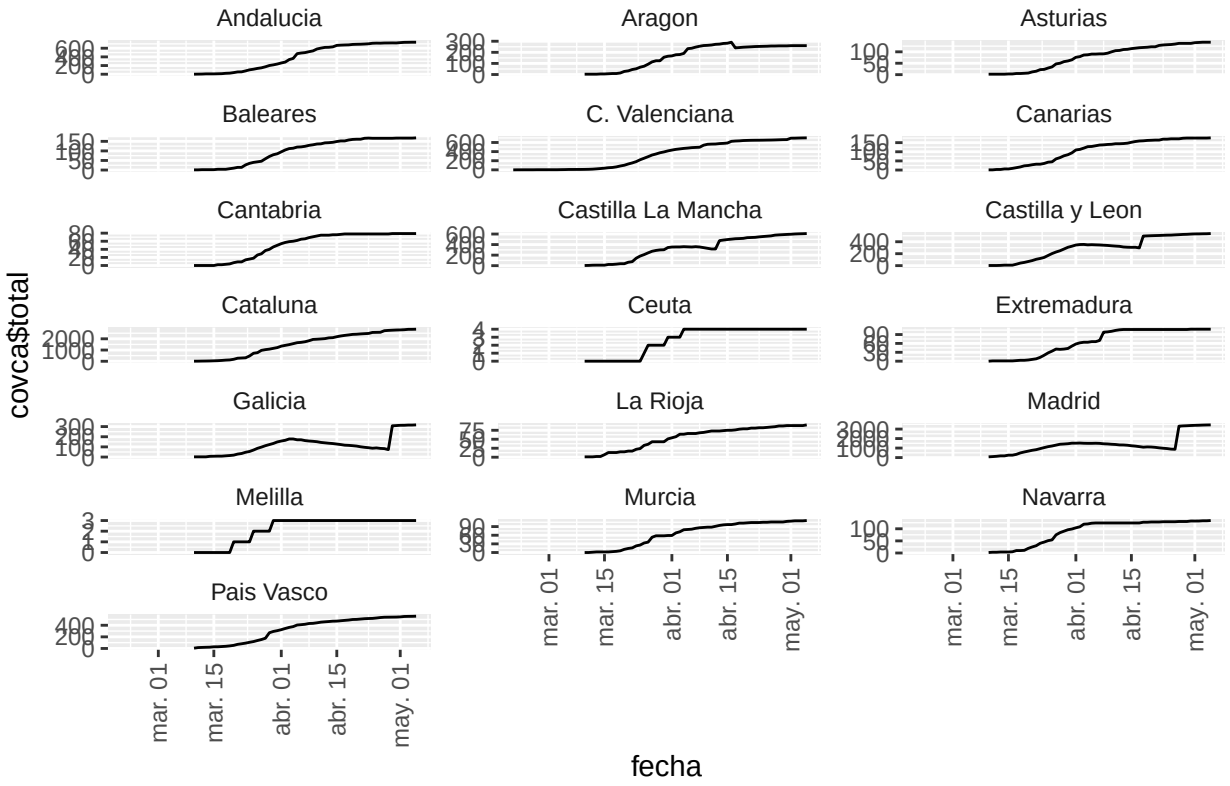

```
covca<-na.omit(covca)
ggplot(covca, aes(fecha,covca$total,group = 1)) +
  geom_line() +
  facet_wrap(vars(CCAA), scales = "free_y", ncol = 3, strip.position = "top") +
  theme(strip.background = element_blank(), strip.placement = "outside")+
  theme(axis.text.x=element_text(angle=90,hjust=1,vjust=0.5))+
  ggtitle( "Casos que han precisado hospitalización  por CCAA")
```



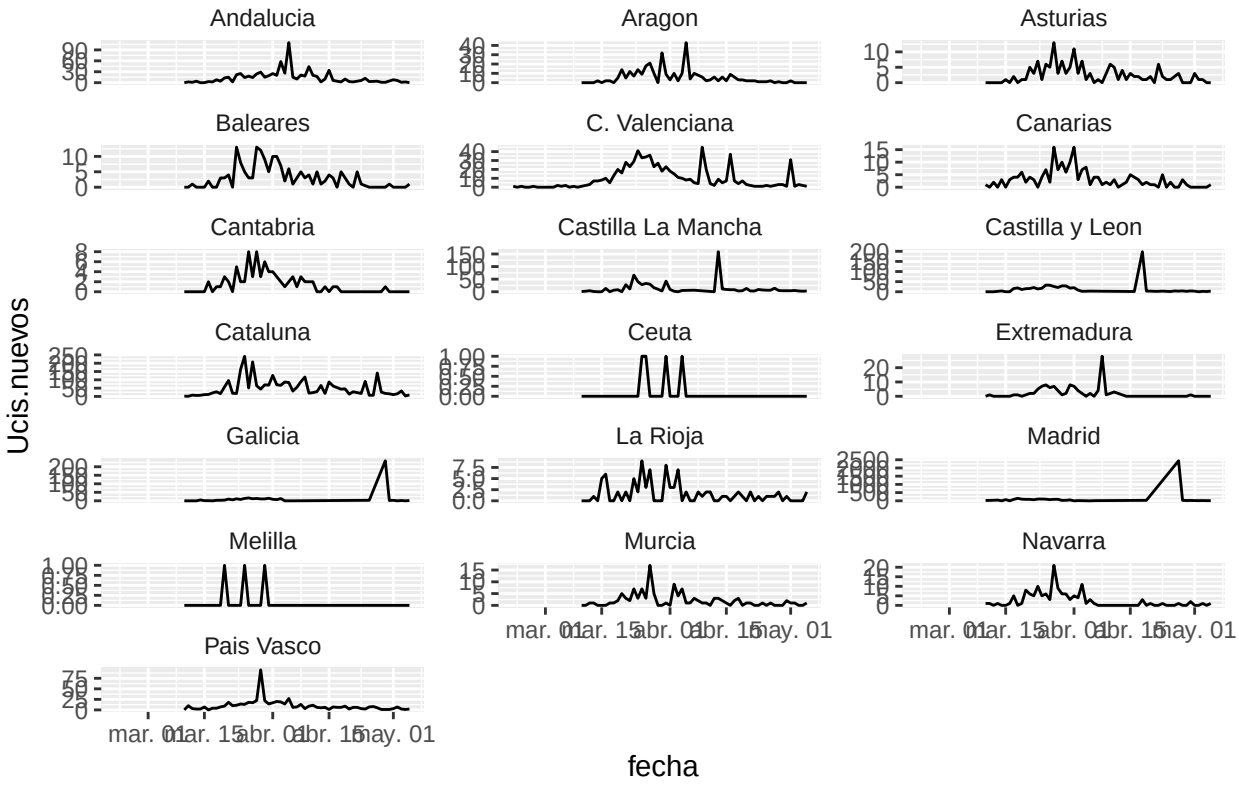

```
covca<-na.omit(covca)
ggplot(covca, aes(fecha,hospitalizados.nuevos,group = 1)) +
  geom_line() +
  facet_wrap(vars(CCAA), scales = "free_y", ncol = 3, strip.position = "top") +
  theme(strip.background = element_blank(), strip.placement = "outside")+
  ggtitle( "Hospitalizados nuevos comparativa por C. Autónomas")
```



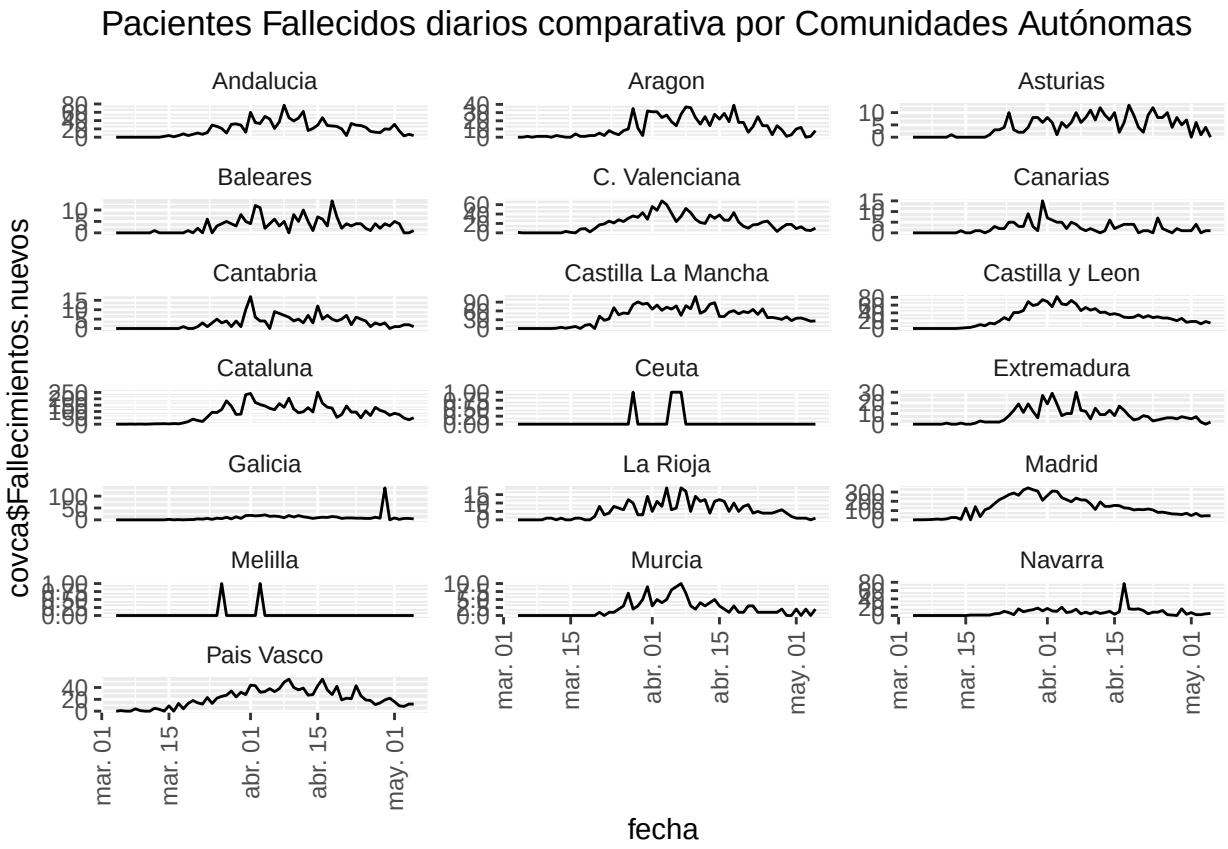

```
covca<-na.omit(covca)
ggplot(covca, aes(fecha,covca$total,group = 1)) +
  geom_line() +
  facet_wrap(vars(CCAA), scales = "free_y", ncol = 3, strip.position = "top") +
  theme(strip.background = element_blank(), strip.placement = "outside")+
  theme(axis.text.x=element_text(angle=90,hjust=1,vjust=0.5))+
  ggtitle( "Ingresos totales en Ucis comparativa por Comunidades Autónomas")
```




```
covca<-na.omit(covca)
ggplot(covca, aes(fecha,Ucis.nuevos,group = 1)) +
  geom_line() +
  facet_wrap(vars(CCAA), scales = "free_y", ncol = 3, strip.position = "top") +
  theme(strip.background = element_blank(), strip.placement = "outside")+
  ggtitle( "Ingresos Ucis diarios comparativa por Comunidades Autónomas")
```



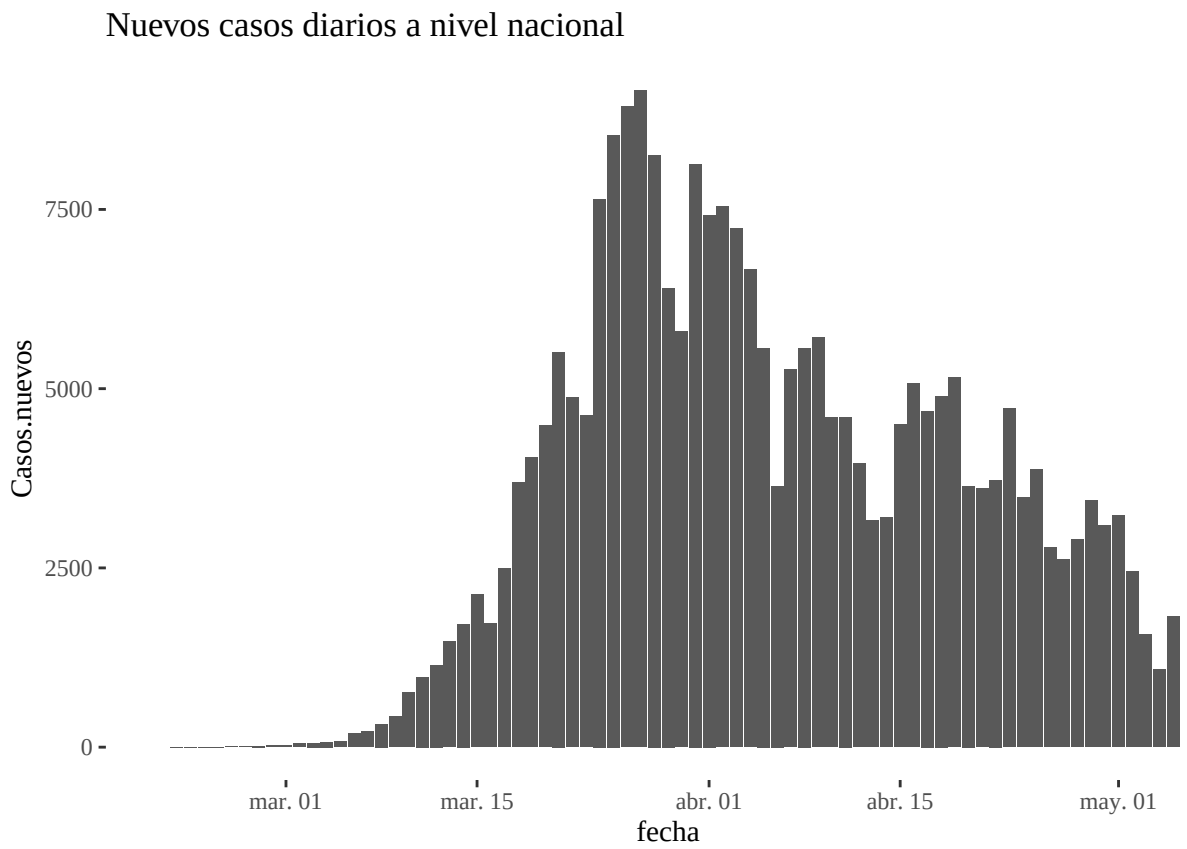

```
covca<-na.omit(covca)
ggplot(covca, aes(fecha,covca$Fallecimientos.nuevos,group = 1)) +
  geom_line() +
  facet_wrap(vars(CCAA), scales = "free_y", ncol = 3, strip.position = "top") +
  theme(strip.background = element_blank(), strip.placement = "outside")+
  theme(axis.text.x=element_text(angle=90,hjust=1,vjust=0.5))+
  ggtitle( "Pacientes Fallecidos diarios comparativa por Comunidades Autónomas")
```




## Ahora continuaremos con el analisis a nivel nacional.

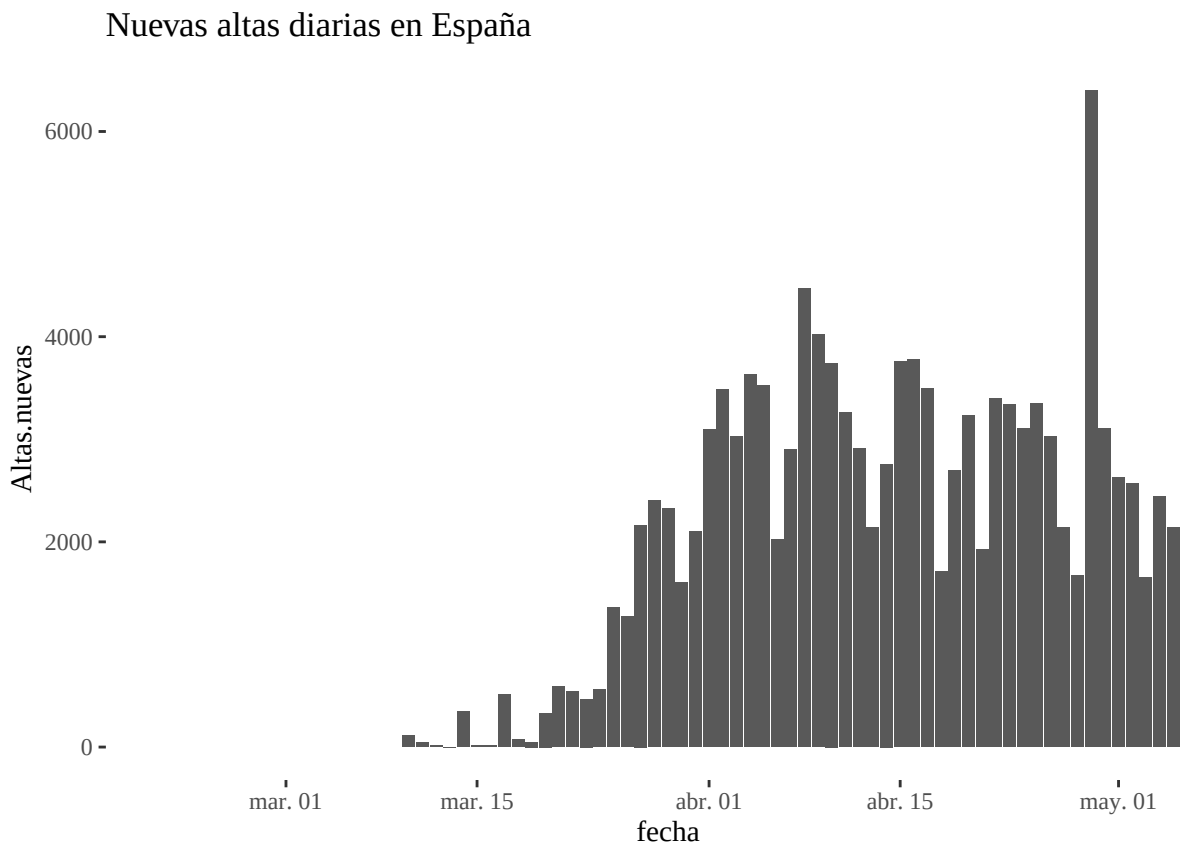
### Nuevos casos diarios a nivel nacional.

```
ggplot(covsp,aes(x=fecha,y=Casos.nuevos),na.rm = TRUE)+geom_bar(stat="identity", position="dodge")+theme
  ggtitle( "Nuevos casos diarios a nivel nacional")
```




**Las nuevas altas diarias en España.**

```
ggplot(covsp,aes(x=fecha,y=Altas.nuevas),na.rm = TRUE)+geom_bar(stat="identity", position="dodge")+theme
  ggtitle( "Nuevas altas diarias en España")
```




```
total_cases <- sum(corona_latest$Confirmed)
```

**Confirmados totales a nivel mundial.**

```
confirmados <- sum(corona_latest$Confirmed) #computeContactRate()
confirmados
```

```
## [1] 3583055
```

**Recuperados mundiales totales.**

```
recuperados <- sum(corona_latest$Recovered)  #computeAverageRating()
recuperados
```

```
## [1] 1162724
```

**% Recuperados mundiales totales.**

```
porcentaje_recuperados <- (recuperados/confirmados)*100
porcentaje_recuperados
```

```
## [1] 32.45063
```

**Fallecidos totales a nivel mundial.**

```
muertos <- sum(corona_latest$Deaths)
muertos
```

```
## [1] 251537
```

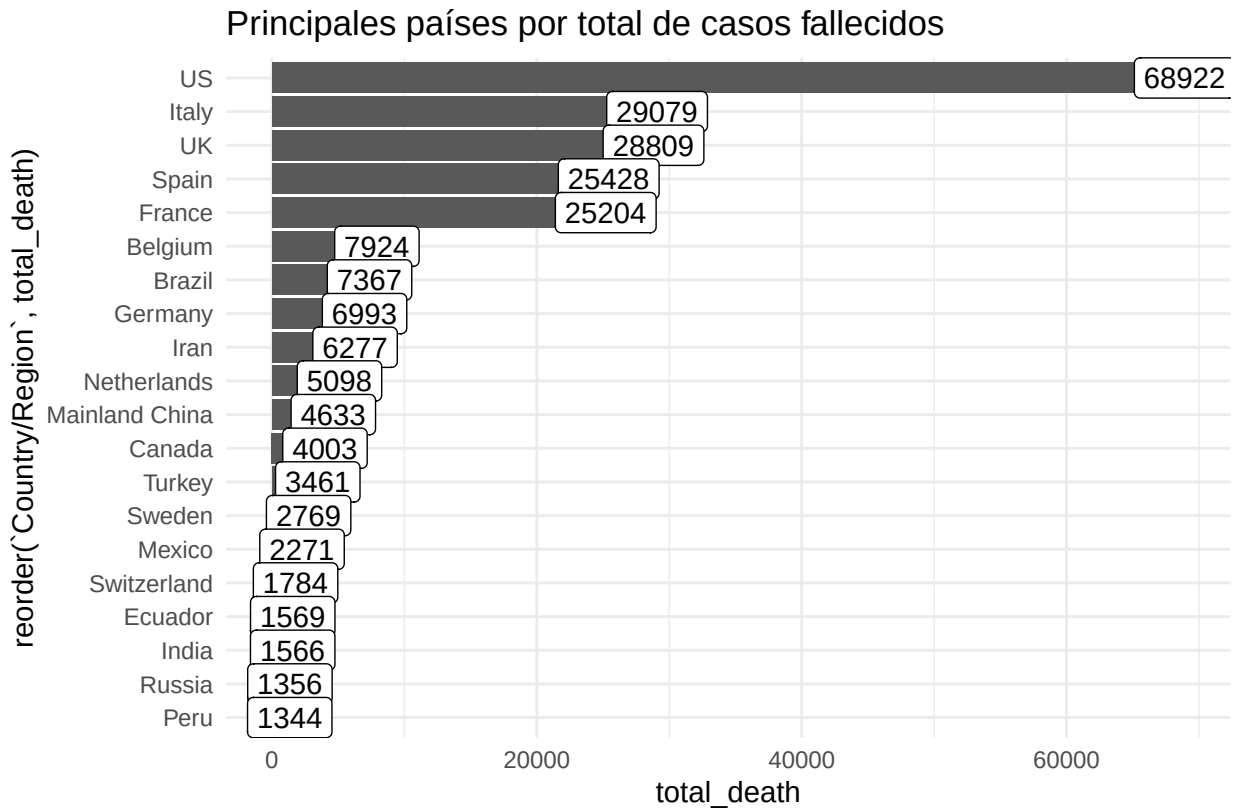
**% Letalidad mundial.**

```
porcentaje_letalidad <- (muertos/confirmados)*100
porcentaje_letalidad
```

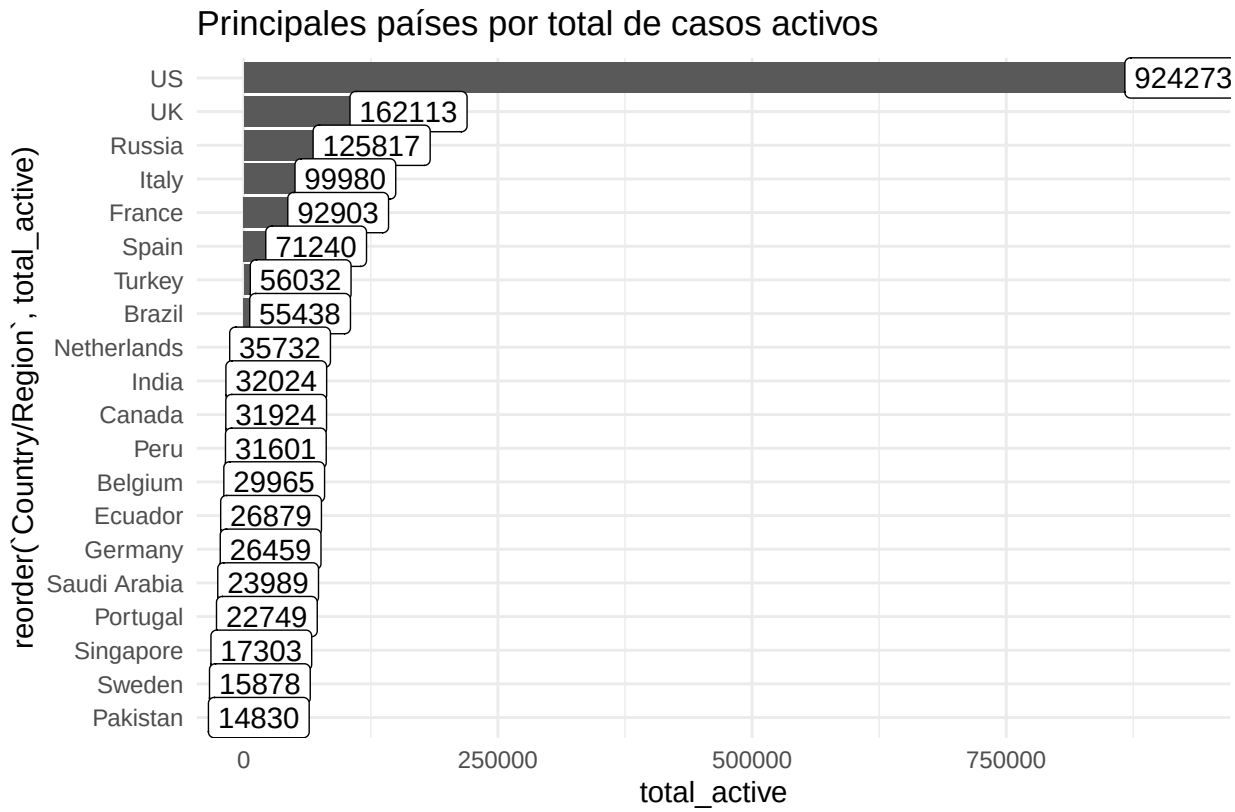
```
## [1] 7.020182
```

**Fallecidos por países.**

```
 corona28 <- corona_latest
corona28_country <- corona28  %>%
group_by(`Country/Region`)  %>%
summarize(total_death = sum(Deaths),
          total_recovered = sum(Recovered),
          total_confirmed = sum(Confirmed), total_active=sum(Confirmed)-sum(Recovered)-sum(Deaths))  %>%
mutate(recovery_rate = round(total_recovered / total_confirmed,2))



corona28_country  %>%
filter(!`Country/Region` %in% 'Others')  %>%
arrange(desc(total_death)) %>%
head(20)  %>%
ggplot() + geom_bar(aes(x=reorder(`Country/Region`, total_death),y= total_death), stat = "identity") +
geom_label(aes(`Country/Region`, total_death, label = total_death)) +
coord_flip() +
theme_minimal() +
labs(title =  "Principales países por total de casos fallecidos", caption = "Fuente: Kaggle")
```




```
corona28_country  %>%
filter(!`Country/Region` %in% 'Others')  %>%
arrange(desc(total_active)) %>%
head(20)  %>%
ggplot() + geom_bar(aes(x=reorder(`Country/Region`, total_active),y= total_active), stat = "identity") +
geom_label(aes(`Country/Region`, total_active, label = total_active)) +
coord_flip() +
theme_minimal() +
labs(title =  "Principales países por total de casos activos", caption = "Fuente: Kaggle")
```




Fuente: Kaggle

**Letalidad descendente en paises con más de 136 fallecidos.**

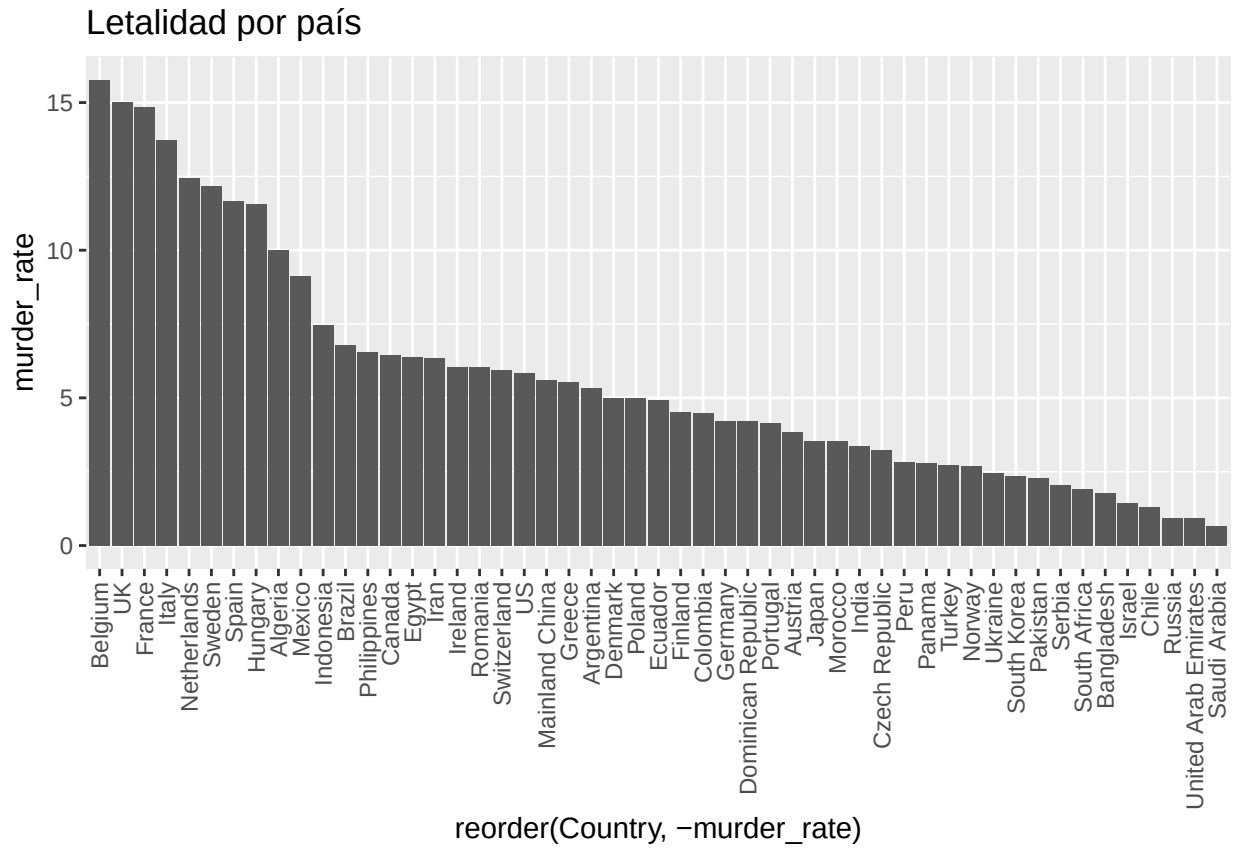
```
filtered <- filter(df, df$Date==max(df$Date)) %>% group_by(Country) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths) , Recovered = sum(Recovered))
murder_rate <- filtered$Deaths / filtered$Confirmed * 100
filtered$murder_rate <- murder_rate
filtered<- filtered%>% filter (Deaths >= 136)
filtered <- filtered[order(filtered$murder_rate,decreasing = TRUE),]
filtered[0:10,]
```

```
## # A tibble: 10 x 5
##    Country     Confirmed Deaths Recovered murder_rate
##    <fct>           <dbl>  <dbl>     <dbl>       <dbl>
##  1 Belgium         50267   7924     12378        15.8
##  2 UK             191832  28809       910        15.0
##  3 France         169583  25204     51476        14.9
##  4 Italy          211938  29079     82879        13.7
##  5 Netherlands     40968   5098       138        12.4
##  6 Sweden          22721   2769      4074        12.2
##  7 Spain          218011  25428    121343        11.7
##  8 Hungary          3035    351       630        11.6
##  9 Algeria          4648    465      1998        10.0
## 10 Mexico          24905   2271     13447         9.12
```

```
filtered <- filtered[order(filtered$murder_rate),]
filtered[0:10,]
```

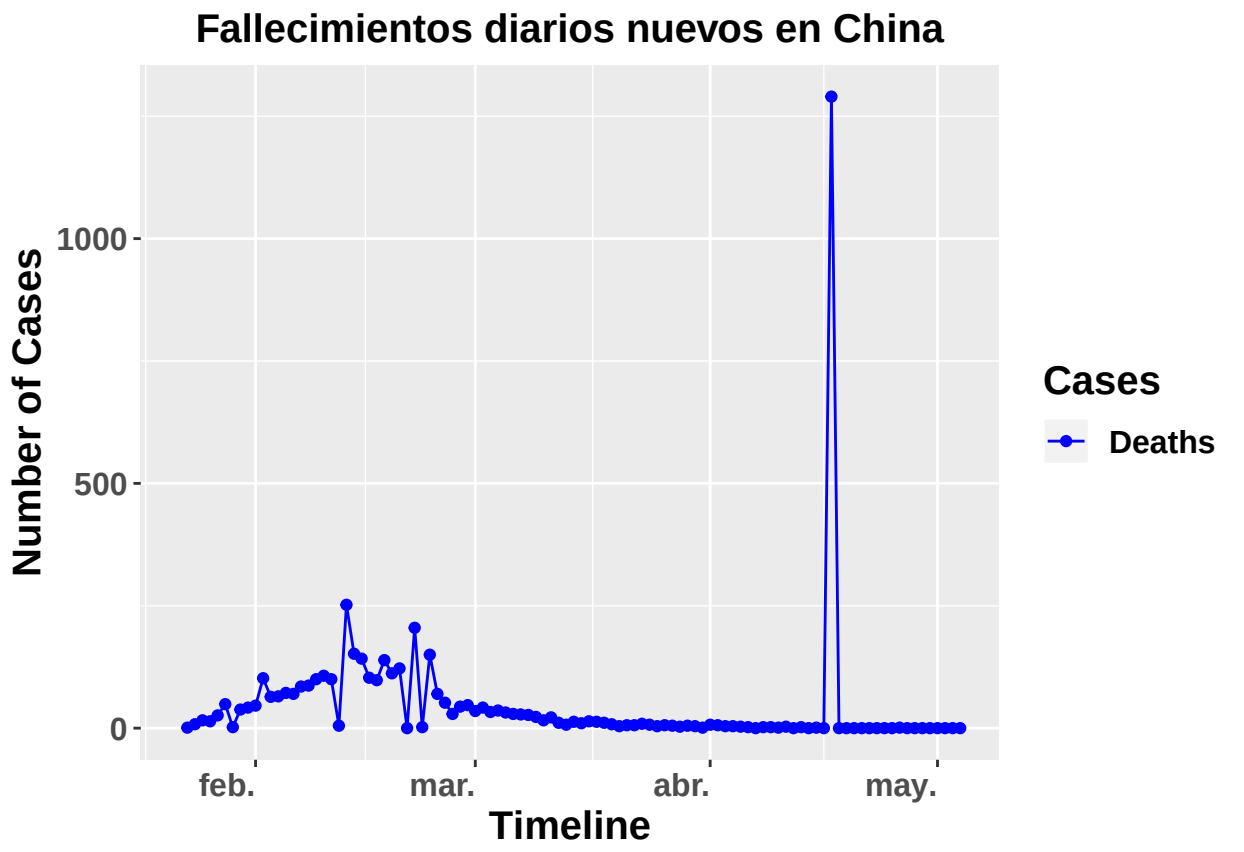
```
## # A tibble: 10 x 5
##    Country              Confirmed Deaths Recovered murder_rate
##    <fct>                    <dbl>  <dbl>     <dbl>       <dbl>
##  1 Saudi Arabia             28656    191      4476       0.667
##  2 United Arab Emirates     14730    137      2966       0.930
##  3 Russia                  145268   1356     18095       0.933
##  4 Chile                    20643    270     10415       1.31
##  5 Israel                   16246    235     10064       1.45
##  6 Bangladesh               10143    182      1209       1.79
##  7 South Africa              7220    138      2746       1.91
##  8 Serbia                    9557    197      1574       2.06
##  9 Pakistan                 20941    476      5635       2.27
## 10 South Korea              10804    254      9283       2.35
```

```
ggplot(data=filtered, aes(x=reorder(Country,-murder_rate), y=murder_rate)) +
    geom_bar(stat="identity", position="dodge")+ theme(axis.text.x=element_text(angle=90,hjust=1,vjust=0
 ggtitle("Letalidad por país")
```



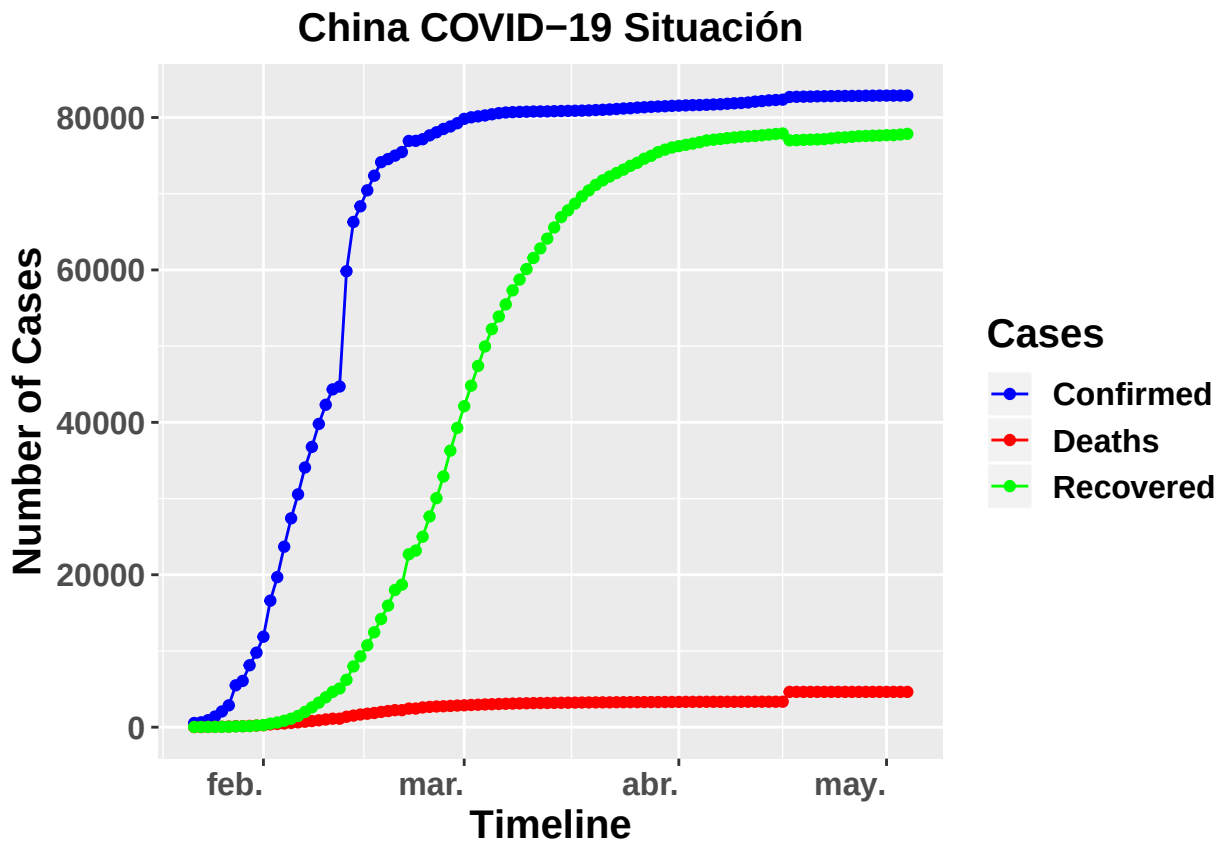

```
China <- filter(df,Country == "Mainland China") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
China2 <- filter(China, Cases =="Deaths",)
China2$Fallecimientos.nuevos <- c( NA, diff(China2$Count))

China_plot2<- ggplot(China2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , group=
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en China", fill
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

China_plot2
```



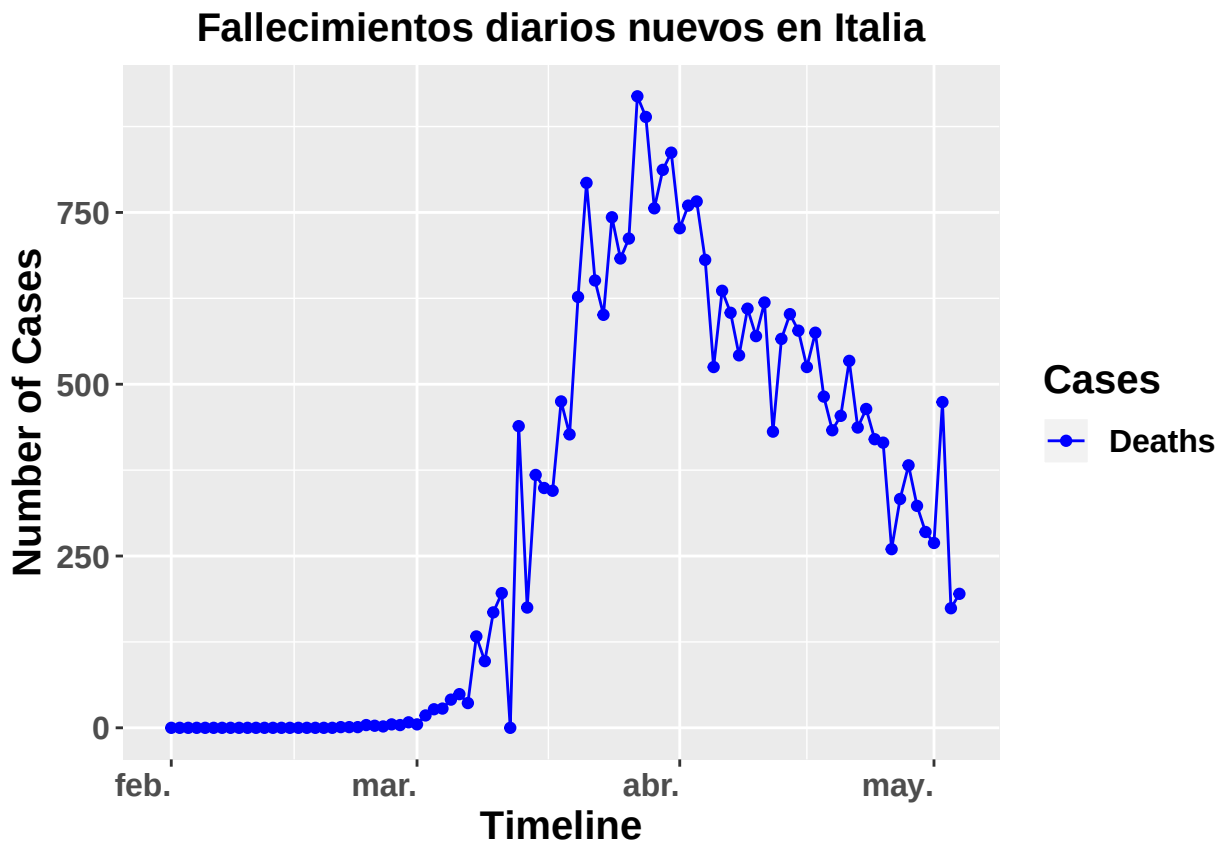

```
#Line Plot

China_plot<- ggplot(China, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "China COVID-19 Situación", fill = 'Cases')+
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))
```

```
China_plot
```

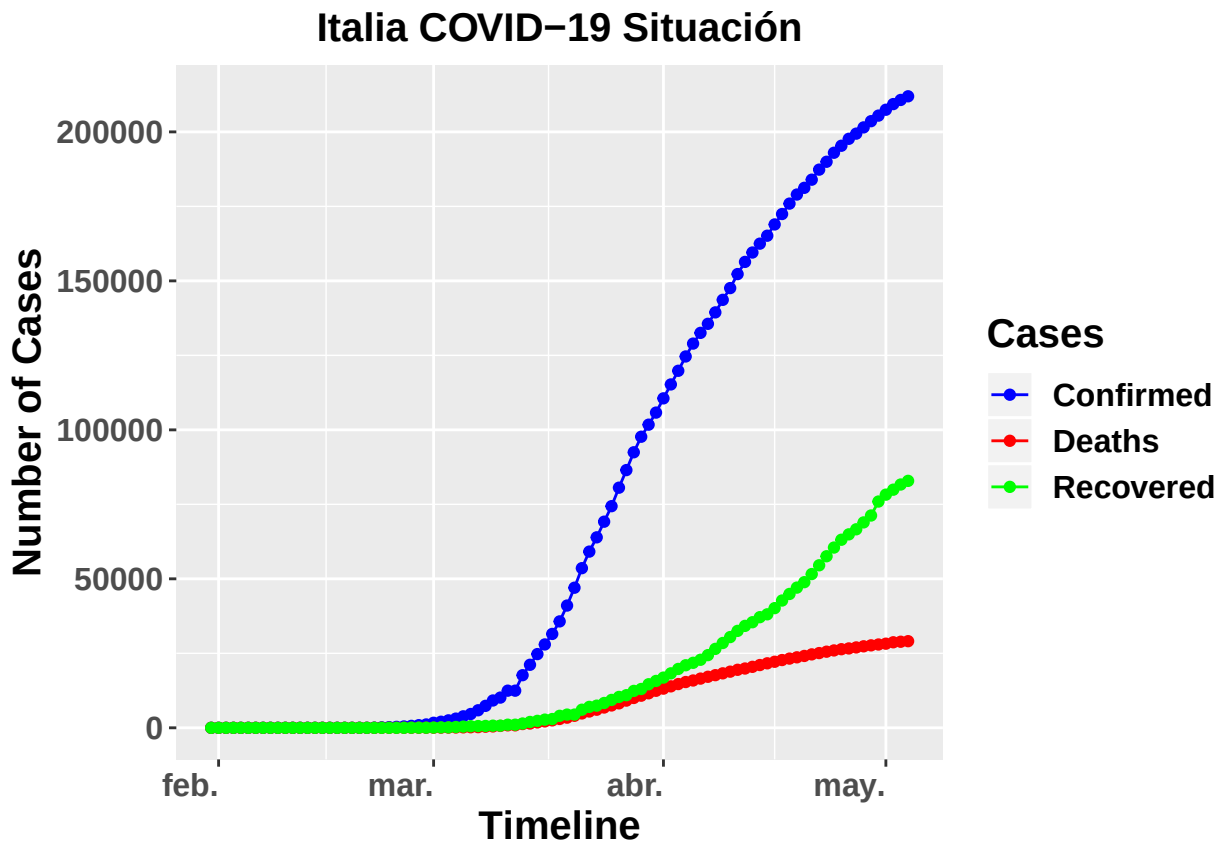



```
italy <- filter(df,Country == "Italy") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
italy2 <- filter(italy, Cases =="Deaths",)
italy2$Fallecimientos.nuevos <- c( NA, diff(italy2$Count))

italy_plot2<- ggplot(italy2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , group=
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en Italia", fi
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

italy_plot2
```

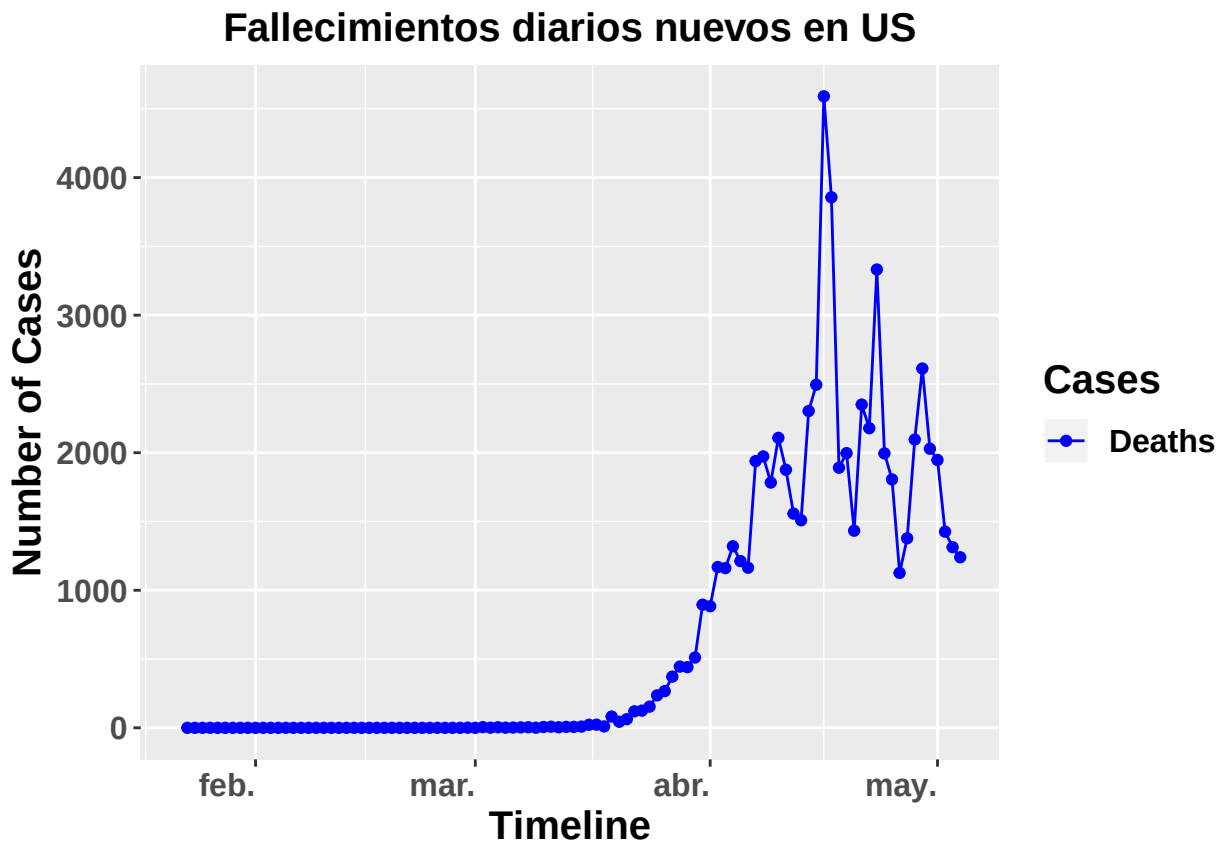



```
#Line Plot
Italy_plot <- ggplot(italy, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Italia COVID-19 Situación", fill = 'Cases')+
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Italy_plot
```

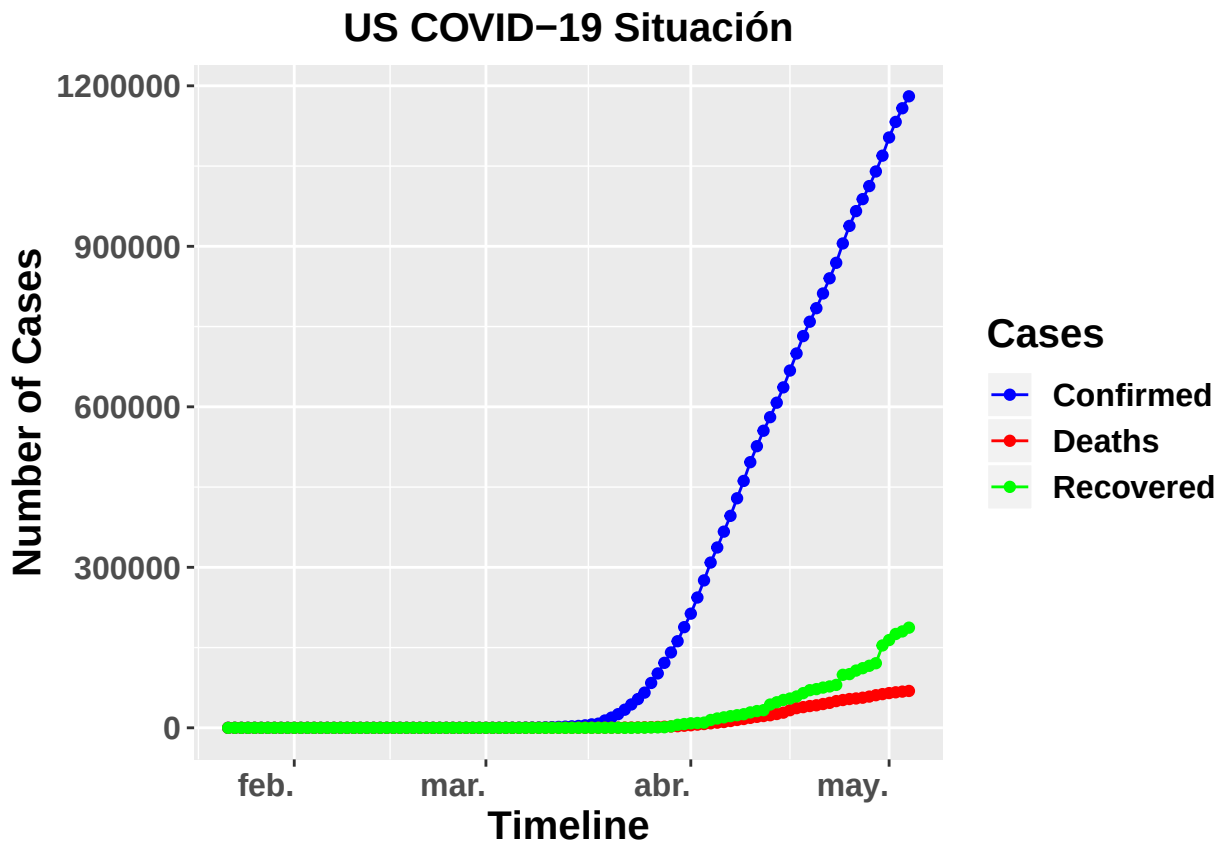



```
US <- filter(df,Country == "US") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
US2 <- filter(US, Cases =="Deaths",)
US2$Fallecimientos.nuevos <- c( NA, diff(US2$Count))

US_plot2<- ggplot(US2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , group=Cases
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en US", fill =
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

US_plot2
```




```
#Line Plot
US_plot <- ggplot(US, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "US COVID-19 Situación", fill = 'Cases')+
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

US_plot
```




```
Spain <- filter(df,Country == "Spain") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered),Active=sum(Con
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered,Active))
```

**Media incrementos porcentuales diario confirmados semana antes confinamiento**

```
Spain2.1 <- filter(Spain, Cases =="Confirmed",)
Spain2.1$Confirmados.nuevos <- c( NA, diff(Spain2.1$Count))
Spain2.1<- Spain2.1 %>%
 mutate(pct_change = ((Confirmados.nuevos/lag(Count))) * 100)
sp <- subset(Spain2.1, Date>= "2020-03-08" & Date <= "2020-03-14")
ac<-sum(sp$pct_change)/7
ac
```

```
## [1] 48.32402
```

**Media incrementos porcentuales diario confirmados ultima semana**

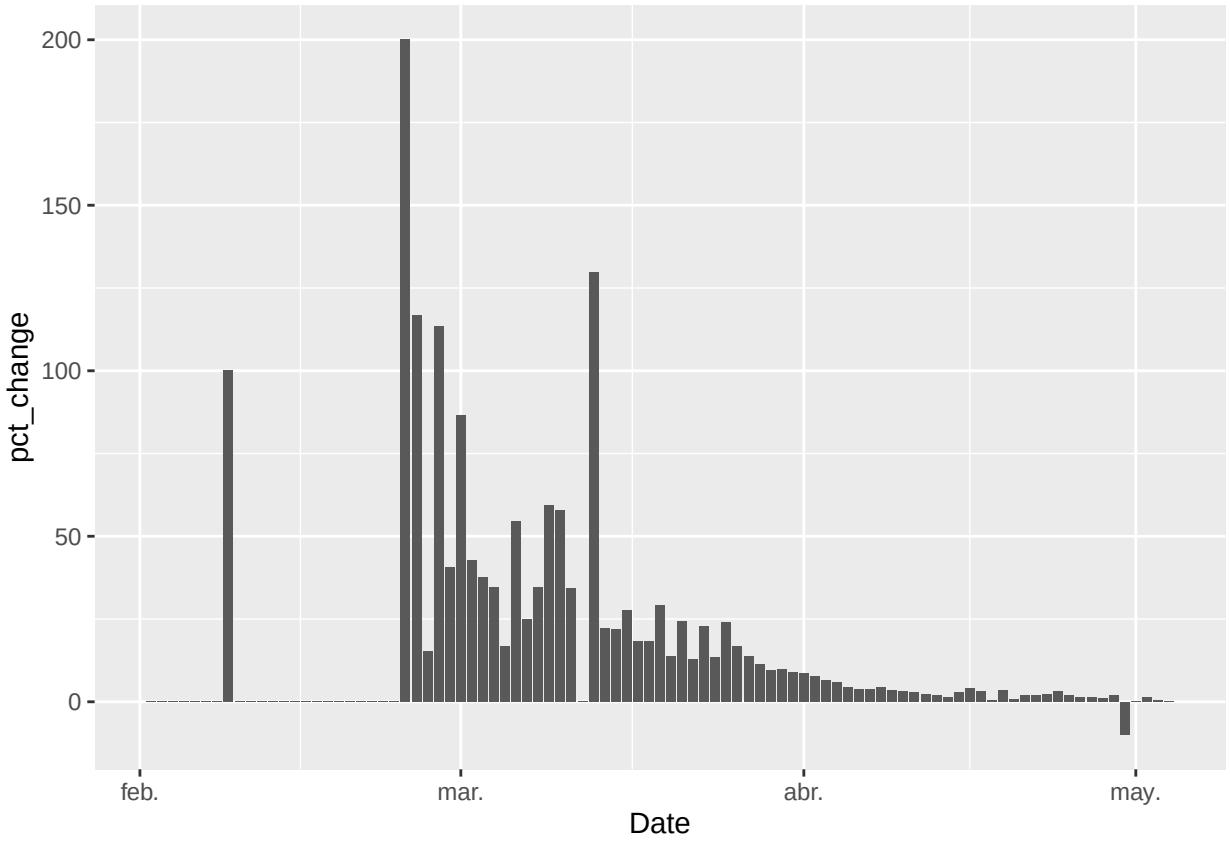
```
Spain2.1 <- filter(Spain, Cases =="Confirmed",)
Spain2.1$Confirmados.nuevos <- c( NA, diff(Spain2.1$Count))
Spain2.1<- Spain2.1 %>%
```

```
 mutate(pct_change = ((Confirmados.nuevos/lag(Count))) * 100)
sp <- subset(Spain2.1, Date>= "2020-04-29" & Date <= "2020-05-05")
ac<-sum(sp$pct_change)/7
ac
```

```
## [1] -0.8165835
```

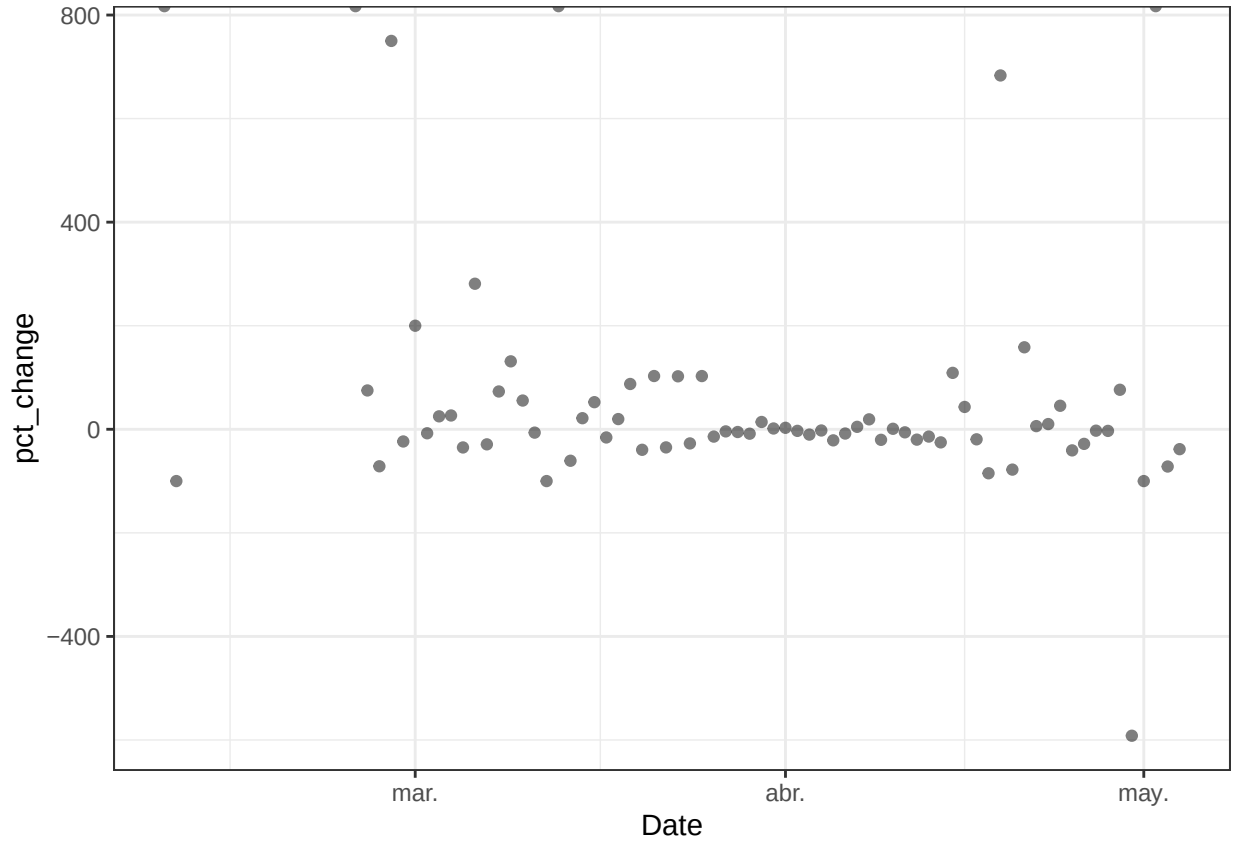
**Incrementos porcentuales casos confirmados diarios**

```
Spain2.3 <- filter(Spain, Cases =="Confirmed",)
Spain2.3$Casos.nuevos <- c( NA, diff(Spain2.3$Count))
Spain2.3<- Spain2.3 %>%
 mutate(pct_change = ((Casos.nuevos/lag(Count)*100)))

Spain2.3 <- na.omit(Spain2.3)


p1 <- ggplot(Spain2.3, aes(x=Date,y=pct_change)) +geom_bar(stat="identity", position="dodge")
p1
```




### Incrementos porcentuales casos confirmados diarios

```
Spain2.3 <- filter(Spain, Cases =="Confirmed",)
Spain2.3$Casos.nuevos <- c( NA, diff(Spain2.3$Count))
Spain2.3<- Spain2.3 %>%
 mutate(pct_change = ((Casos.nuevos/lag(Casos.nuevos)) - 1) * 100)

Spain2.3 <- na.omit(Spain2.3)



p1 <- ggplot(Spain2.3, aes(x=Date,y=pct_change)) + geom_point(alpha=0.5) + theme_bw()
p1
```




### Media incrementos porcentuales diario fallecidos semana antes confinamiento

```
Spain2.1 <- filter(Spain, Cases =="Deaths",)
Spain2.1$Fallecimientos.nuevos <- c( NA, diff(Spain2.1$Count))
Spain2.1<- Spain2.1 %>%
 mutate(pct_change = ((Fallecimientos.nuevos/lag(Count))) * 100)
sp <- subset(Spain2.1, Date>= "2020-03-08" & Date <= "2020-03-14")
ac<-sum(sp$pct_change)/7
ac
```

```
## [1] 57.75402
```

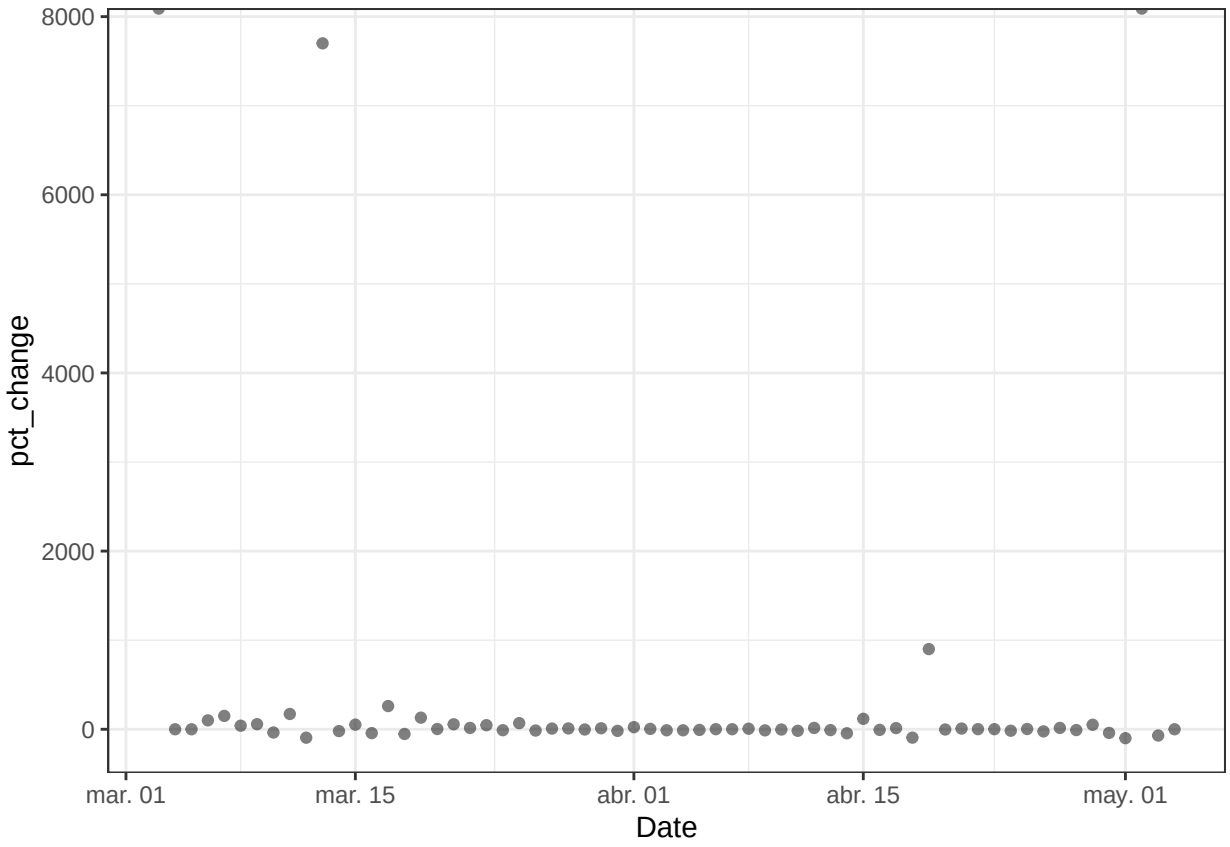
**Media incrementos porcentuales diario fallecidos ultima semana**

```
Spain2.1 <- filter(Spain, Cases =="Deaths",)
Spain2.1$Fallecimientos.nuevos <- c( NA, diff(Spain2.1$Count))
Spain2.1<- Spain2.1 %>%
 mutate(pct_change = ((Fallecimientos.nuevos/lag(Count))) * 100)
sp <- subset(Spain2.1, Date>= "2020-04-29" & Date <= "2020-05-05")
ac<-sum(sp$pct_change)/7
ac
```

```
## [1] 0.9396625
```

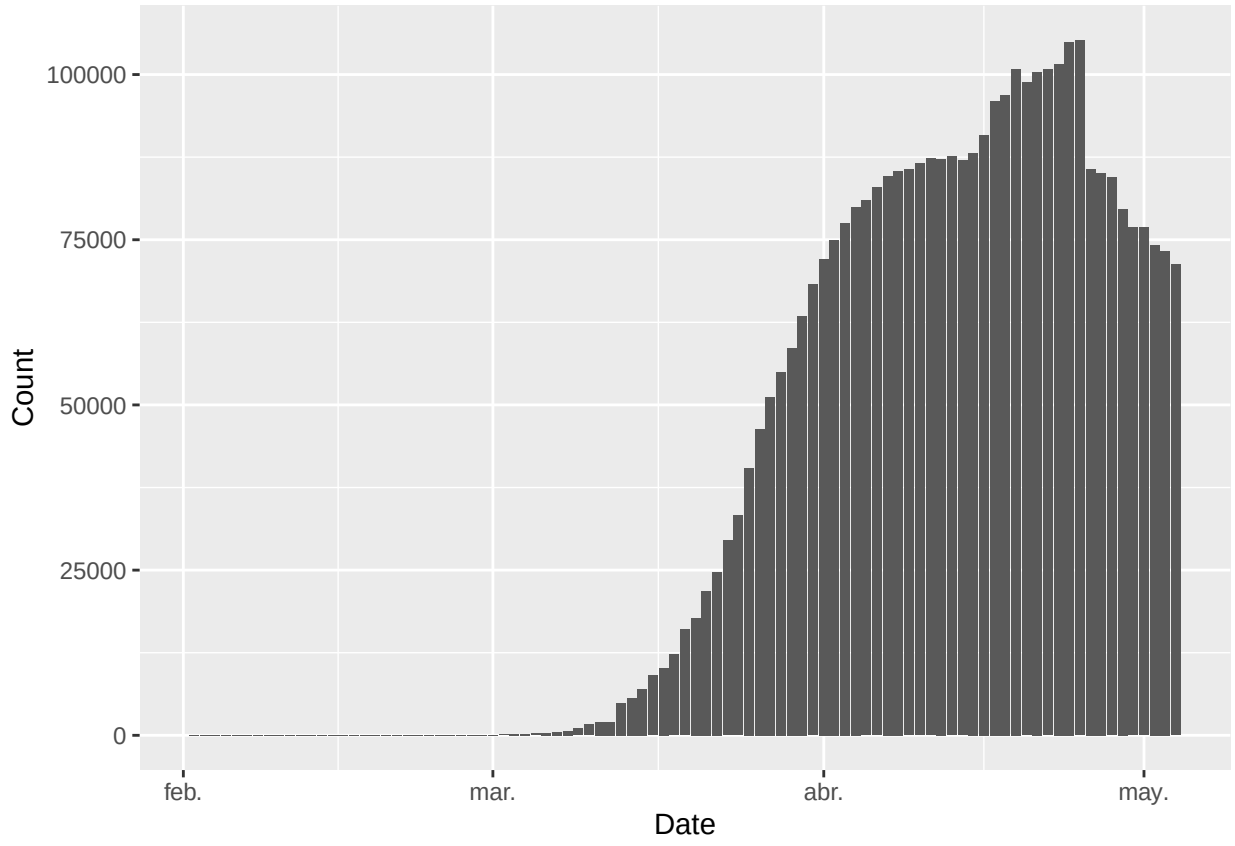
**incrementos porcentuales diarios fallecidos**

```
Spain2 <- filter(Spain, Cases =="Deaths",)
Spain2$Fallecimientos.nuevos <- c( NA, diff(Spain2$Count))
Spain2<- Spain2 %>%
 mutate(pct_change = ((Fallecimientos.nuevos/lag(Fallecimientos.nuevos)) - 1) * 100)

Spain2 <- na.omit(Spain2)


p1 <- ggplot(Spain2, aes(x=Date,y=pct_change)) + geom_point(alpha=0.5) + theme_bw()
p1
```

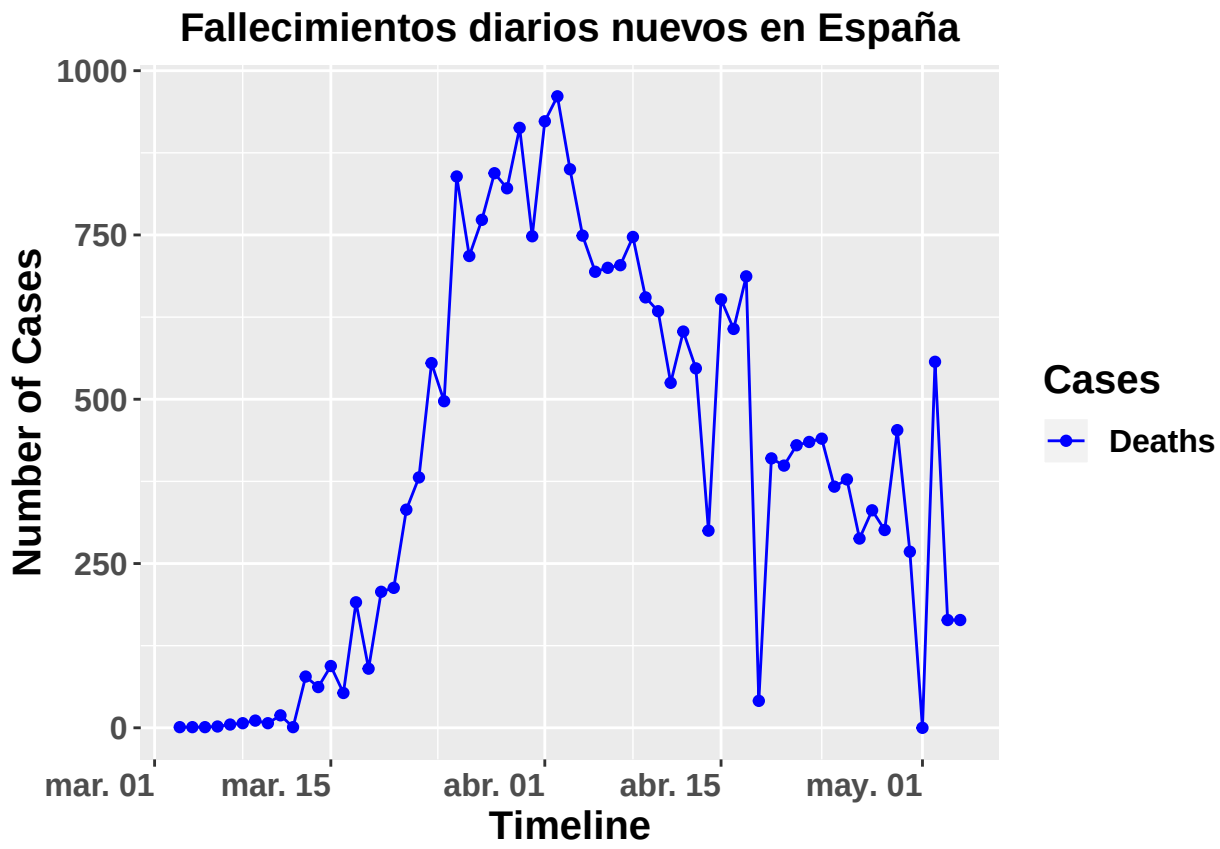


**Evolución activos diarios**

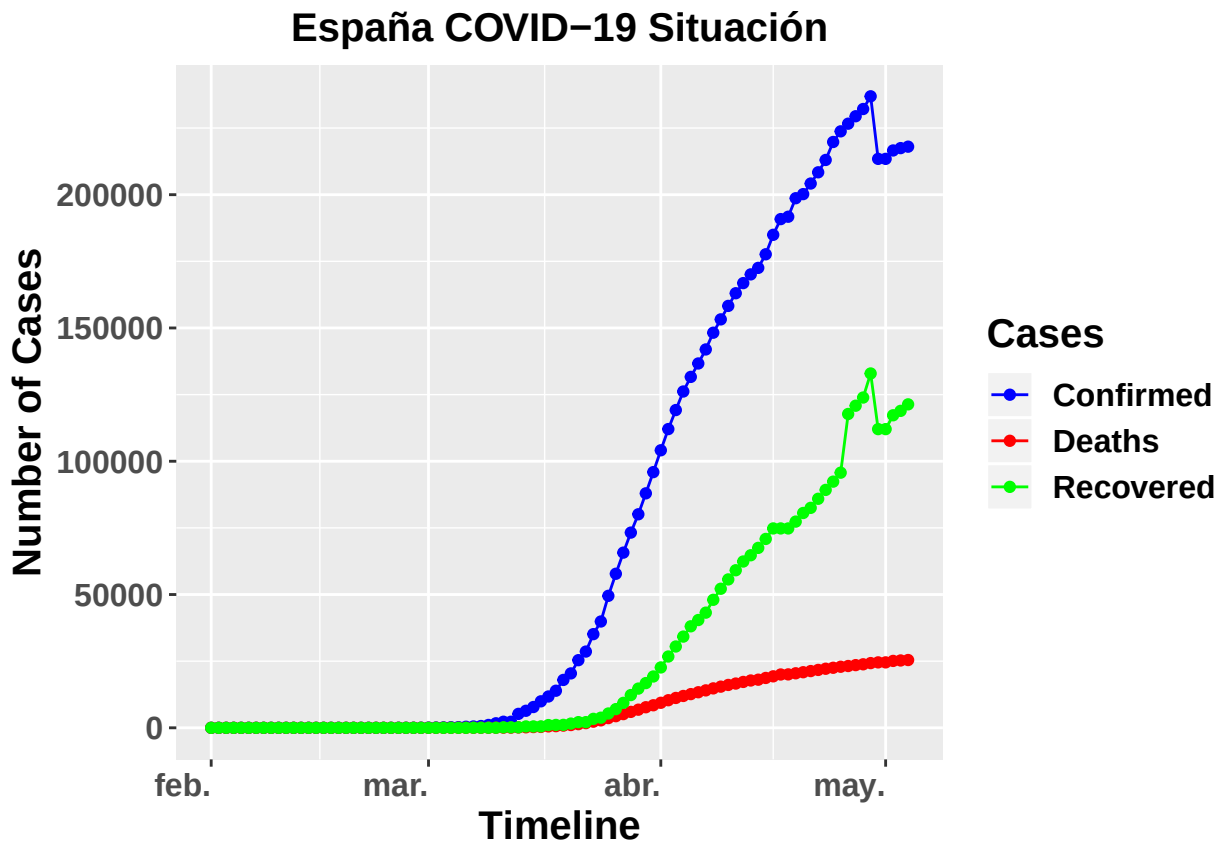
```
Spain2.2 <- filter(Spain, Cases =="Active",)
Spain2.2$Activos.nuevos <- c( NA, diff(Spain2.2$Count))


Spain2.2 <- na.omit(Spain2.2)

p1 <- ggplot (Spain2.2, aes(x=Date,y=Count)) +geom_bar(stat="identity", position="dodge")
p1
```




```
Spain_plot2<- ggplot(Spain2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , group=
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en España", fil
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Spain_plot2
```

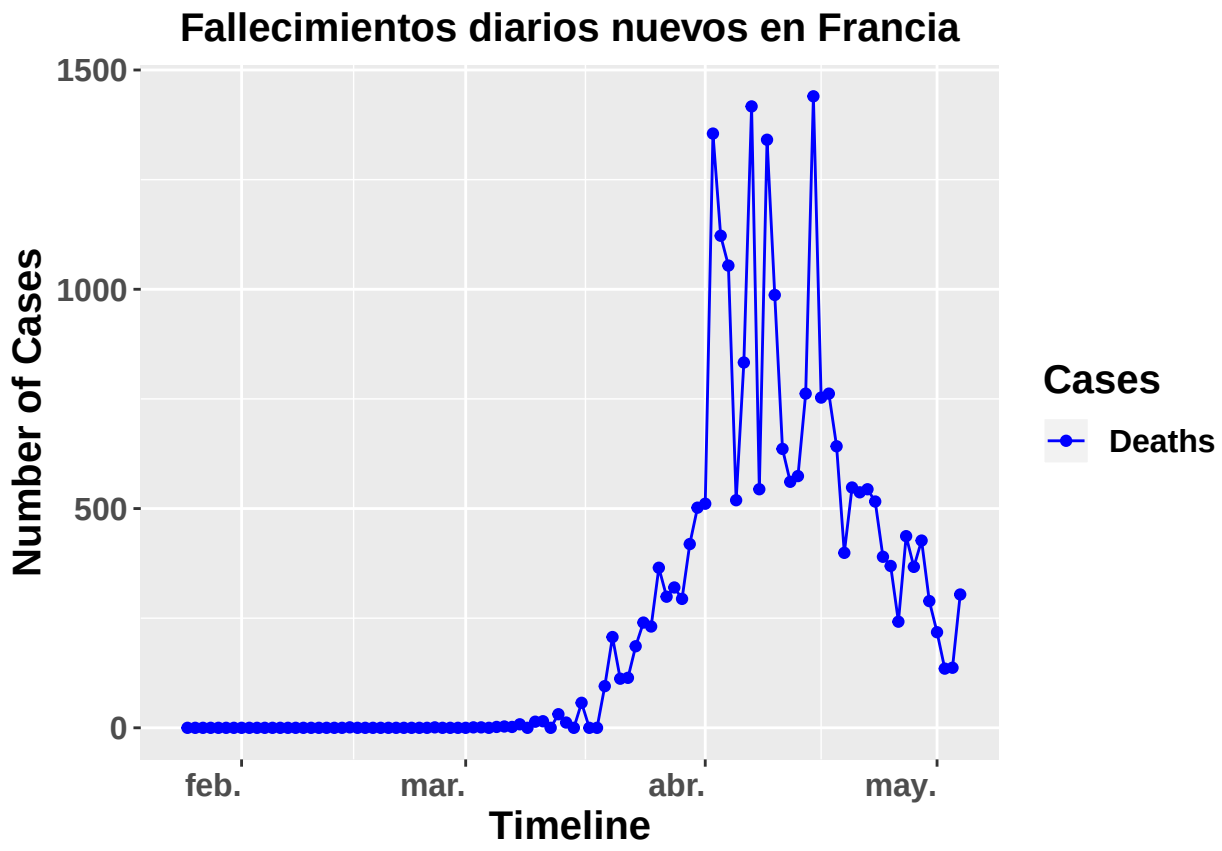



```
#Line Plot
Spain <- filter(df,Country == "Spain") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
Spain_plot <- ggplot(Spain, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "España COVID-19 Situación", fill = 'Cases')+
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Spain_plot
```

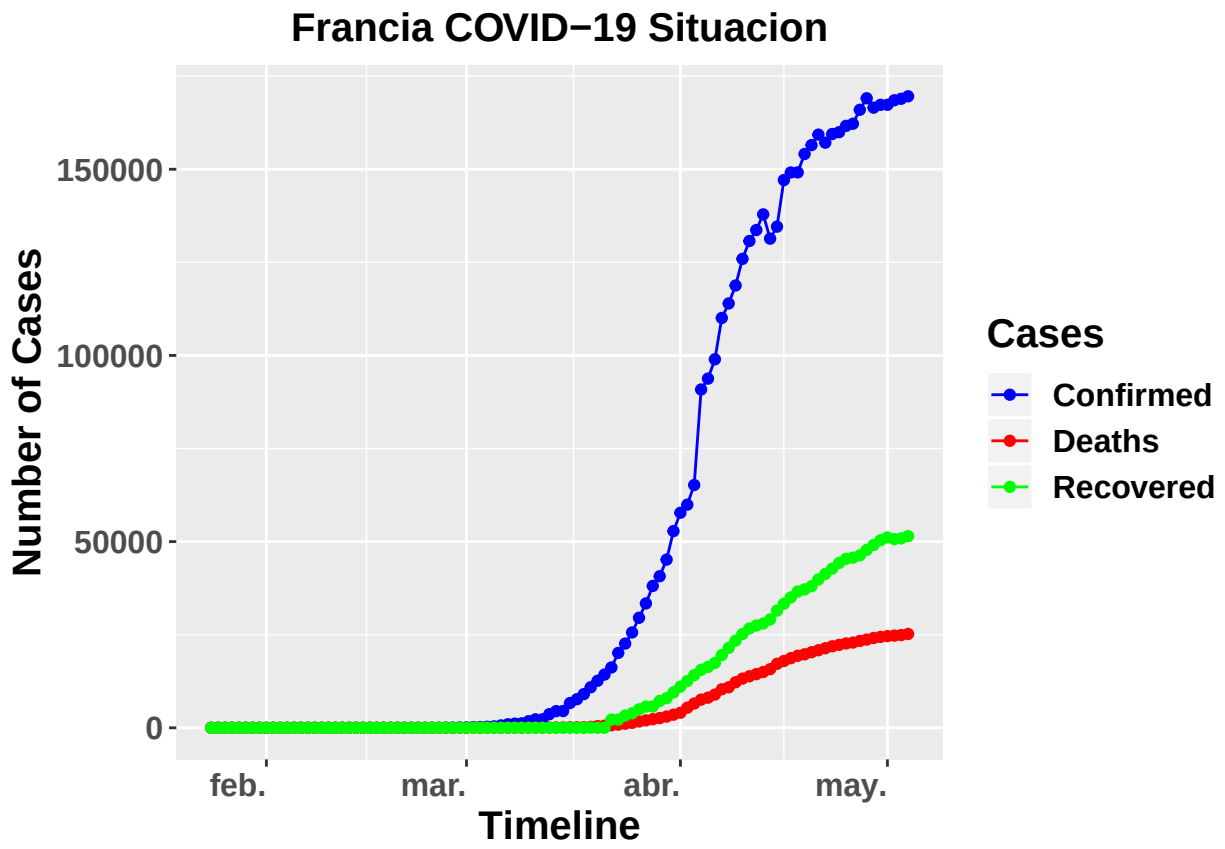



```
France <- filter(df,Country == "France") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
France2 <- filter(France, Cases =="Deaths",)
France2$Fallecimientos.nuevos <- c( NA, diff(France2$Count))
France_plot2<- ggplot(France2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , grou
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en Francia", fi
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

France_plot2
```

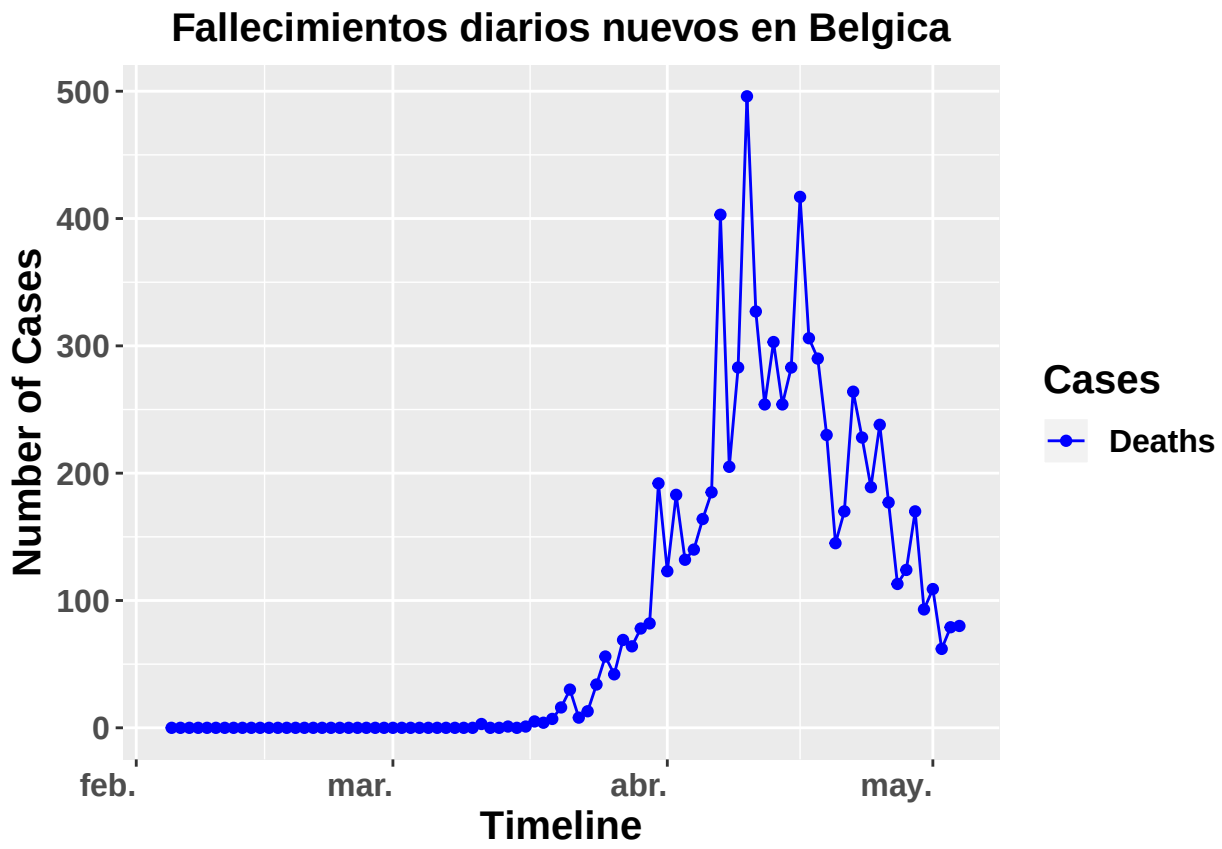



```
#Line Plot
France_plot <- ggplot(France, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Francia COVID-19 Situacion", fill = 'Cases')
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

France_plot
```

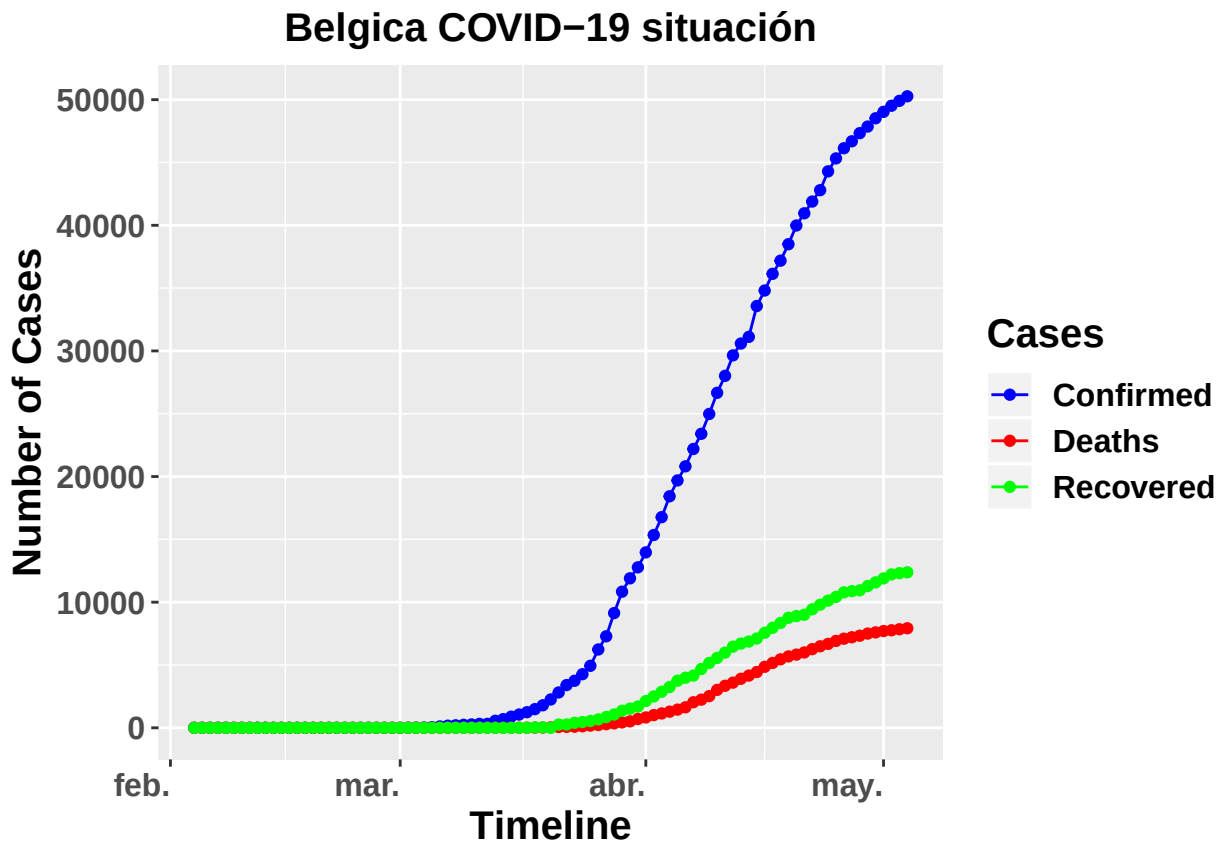



```
Belgium <- filter(df,Country == "Belgium") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
Belgium2 <- filter(Belgium, Cases =="Deaths",)
Belgium2$Fallecimientos.nuevos <- c( NA, diff(Belgium2$Count))
Belgium_plot2<- ggplot(Belgium2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , gr
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en Belgica", fi
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Belgium_plot2
```

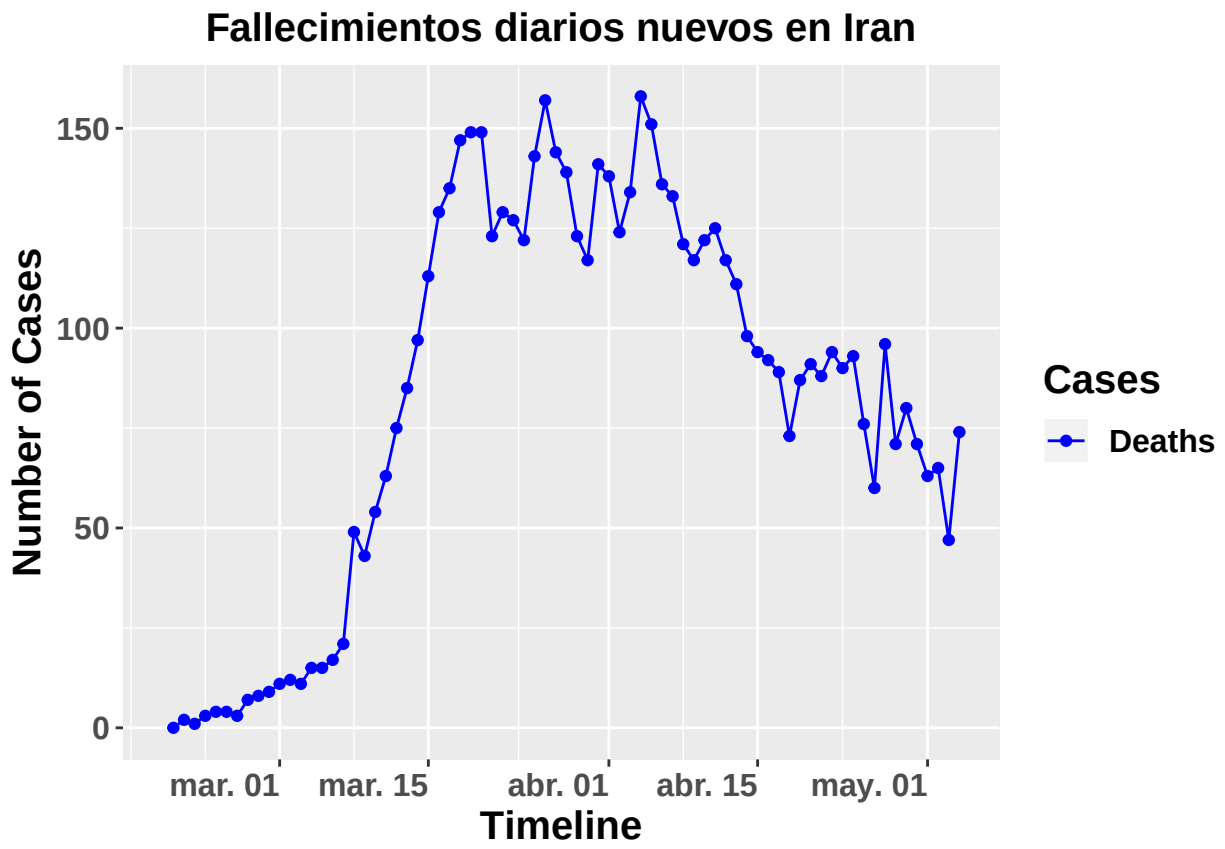



```
#Line Plot
Belgium_plot <- ggplot(Belgium, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Belgica COVID-19 situación", fill = 'Cases')+
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Belgium_plot
```

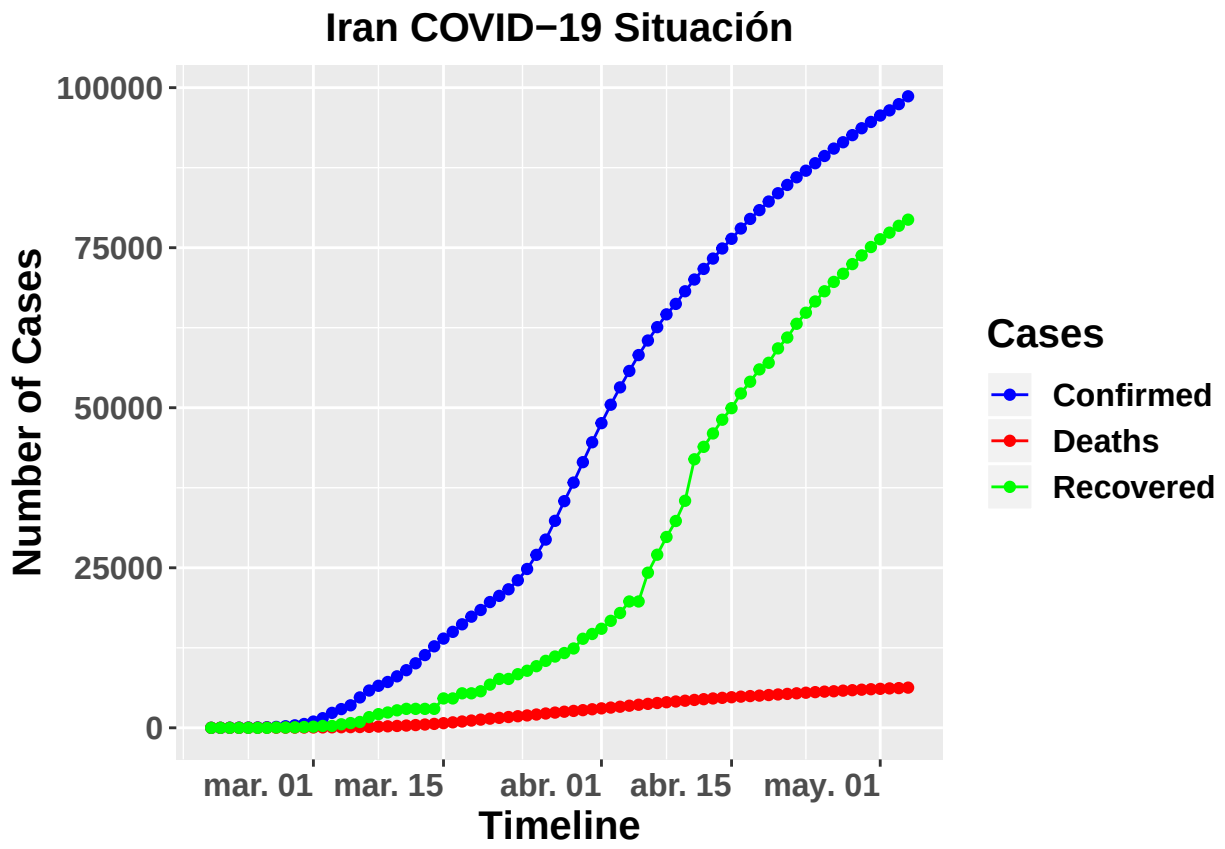



```
Iran <- filter(df,Country == "Iran") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
Iran2 <- filter(Iran, Cases =="Deaths",)
Iran2$Fallecimientos.nuevos <- c( NA, diff(Iran2$Count))

Iran_plot2<- ggplot(Iran2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , group=Ca
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en Iran", fill
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Iran_plot2
```

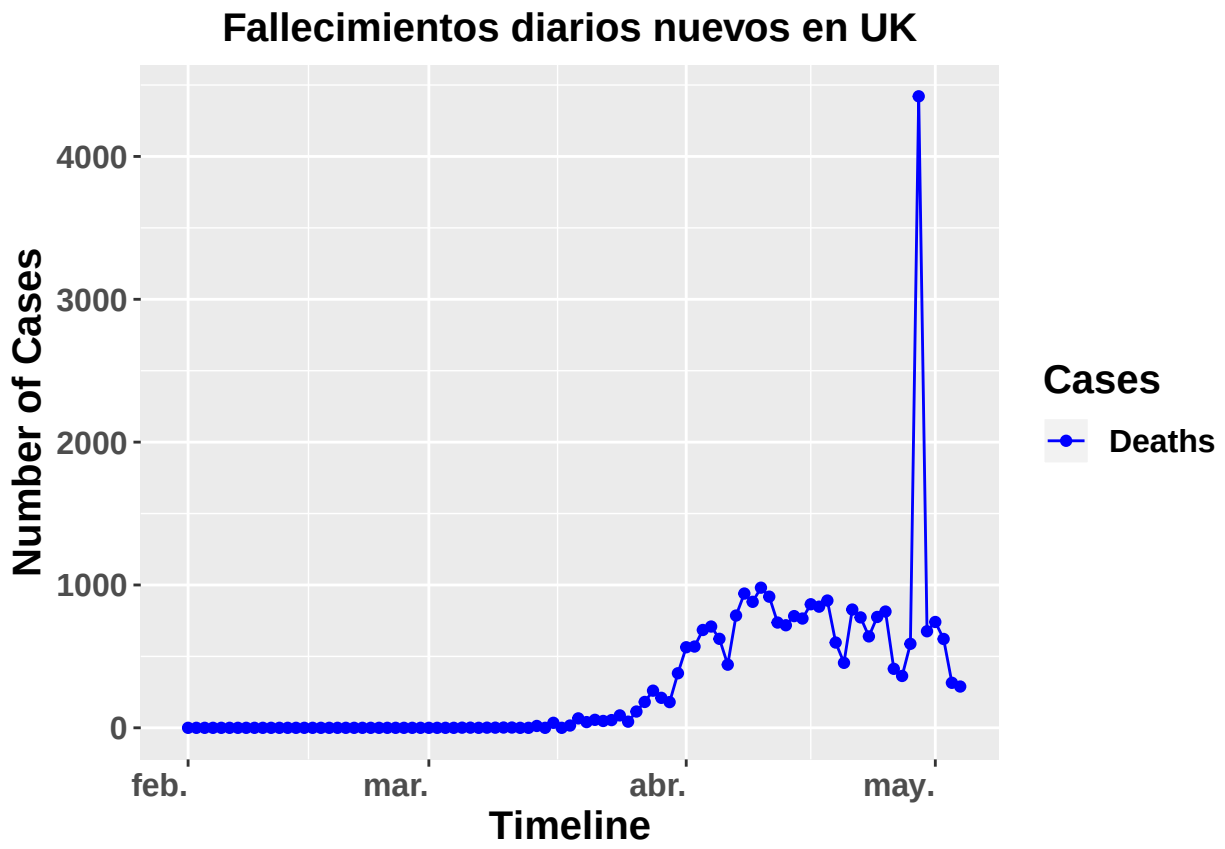



```
#Line Plot
Iran_plot <- ggplot(Iran, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
            geom_line(aes(colour = Cases))+geom_point()+
            scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
            labs(x="Timeline", y="Number of Cases",title = "Iran COVID-19 Situación", fill = 'Cases')+
            theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                  text = element_text(hjust = 1,face = "bold", size = 15),
                  axis.title.x = element_text(hjust = 0.5),
                  axis.title.y = element_text(hjust = 0.5))

Iran_plot
```

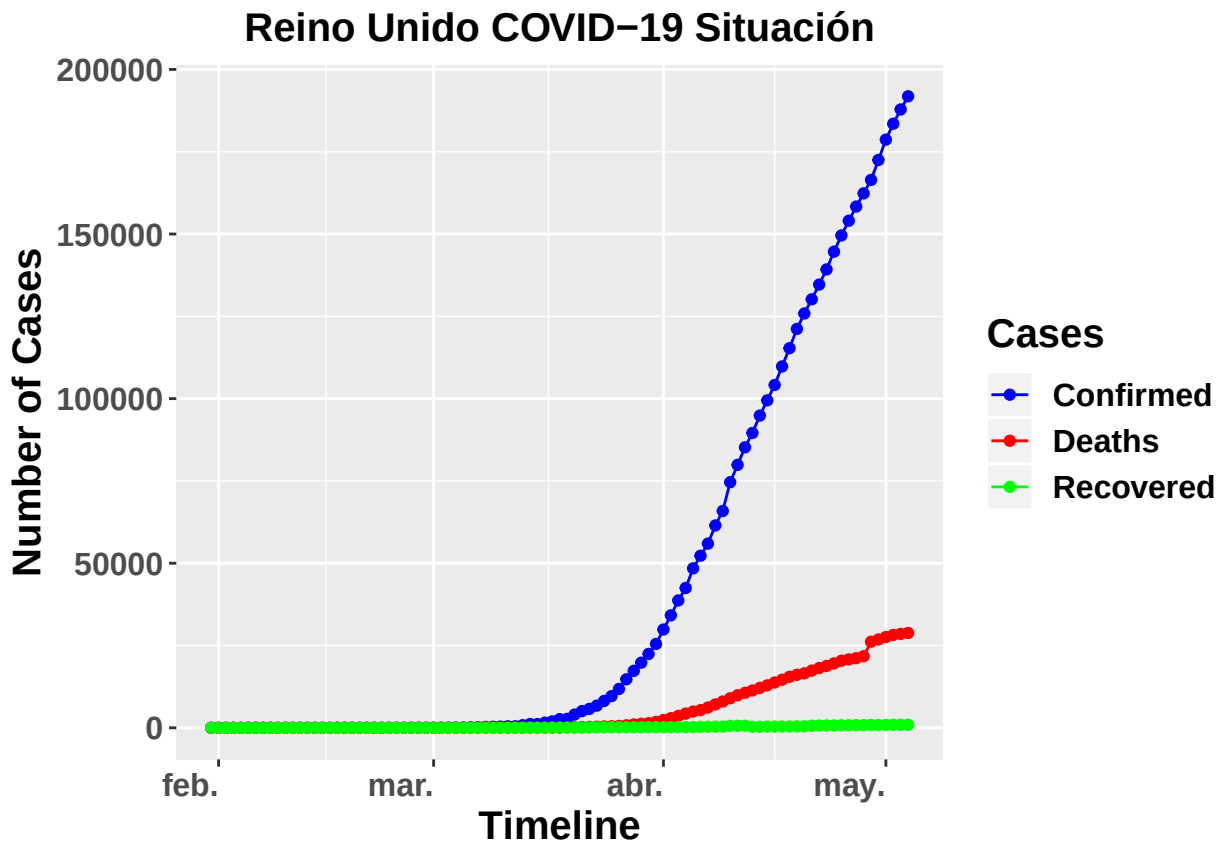



```
UK <- filter(df,Country == "UK") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
UK2 <- filter(UK, Cases =="Deaths",)
UK2$Fallecimientos.nuevos <- c( NA, diff(UK2$Count))

UK_plot2<- ggplot(UK2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , group=Cases
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en UK", fill =
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

UK_plot2
```

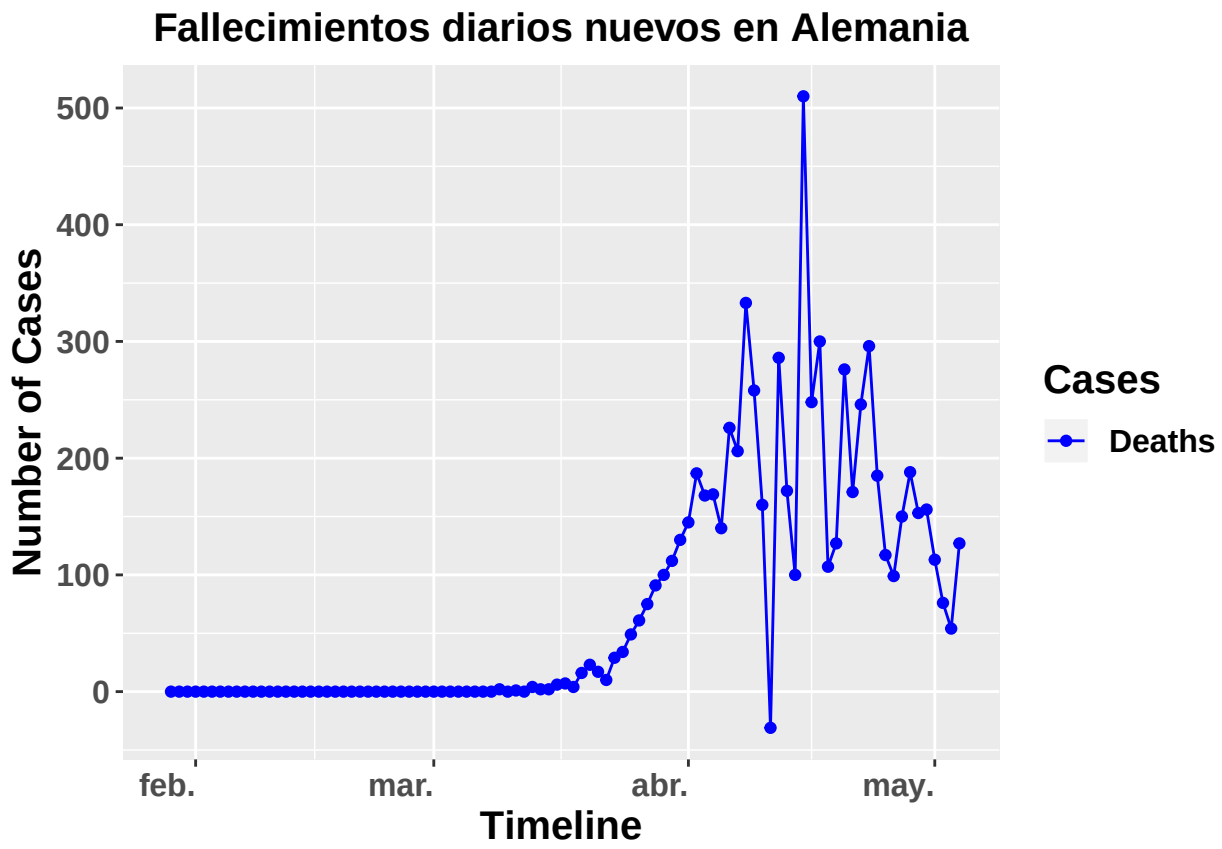



```
#Line Plot
UK_plot <- ggplot(UK, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Reino Unido COVID-19 Situación", fill = 'Cas
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

UK_plot
```

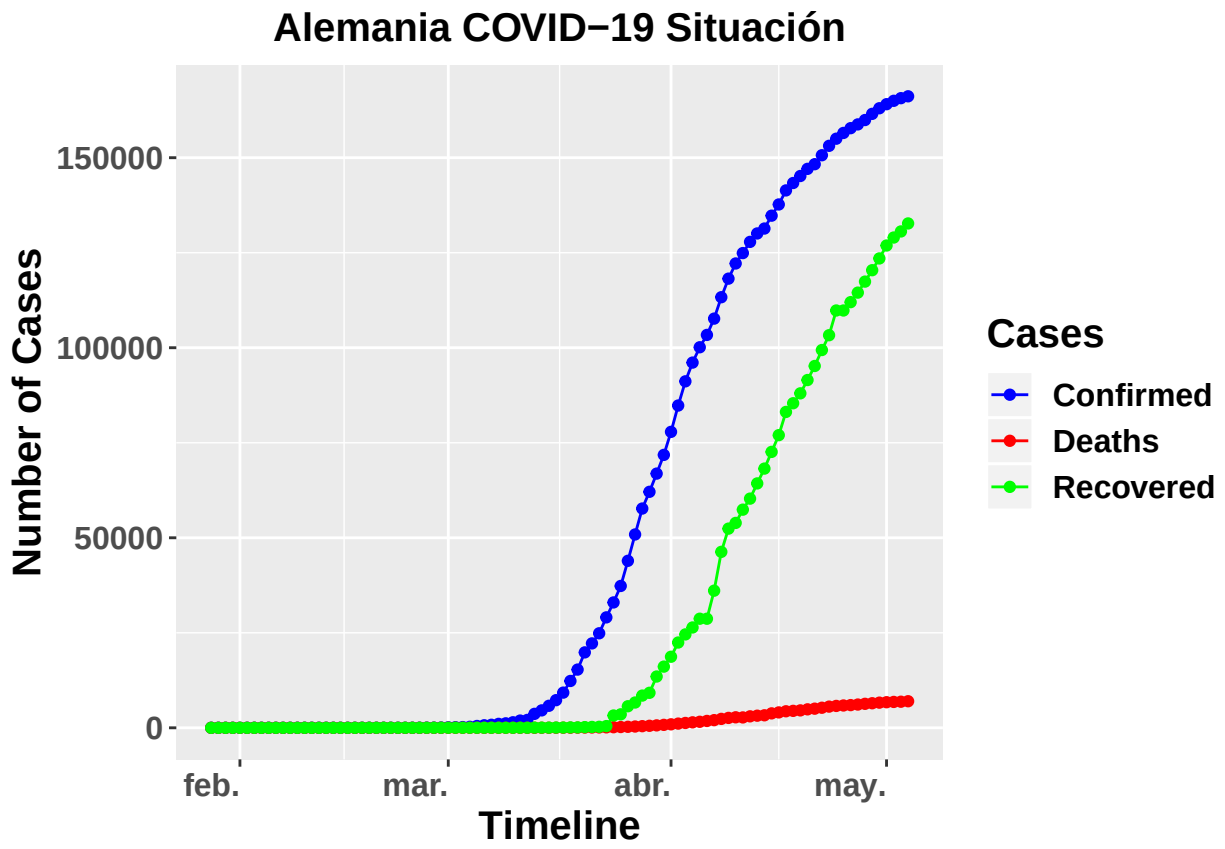



```
Germany <- filter(df,Country == "Germany") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
Germany2 <- filter(Germany, Cases =="Deaths",)
Germany2$Fallecimientos.nuevos <- c( NA, diff(Germany2$Count))
Germany_plot2<- ggplot(Germany2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , gr
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en Alemania", s
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Germany_plot2
```

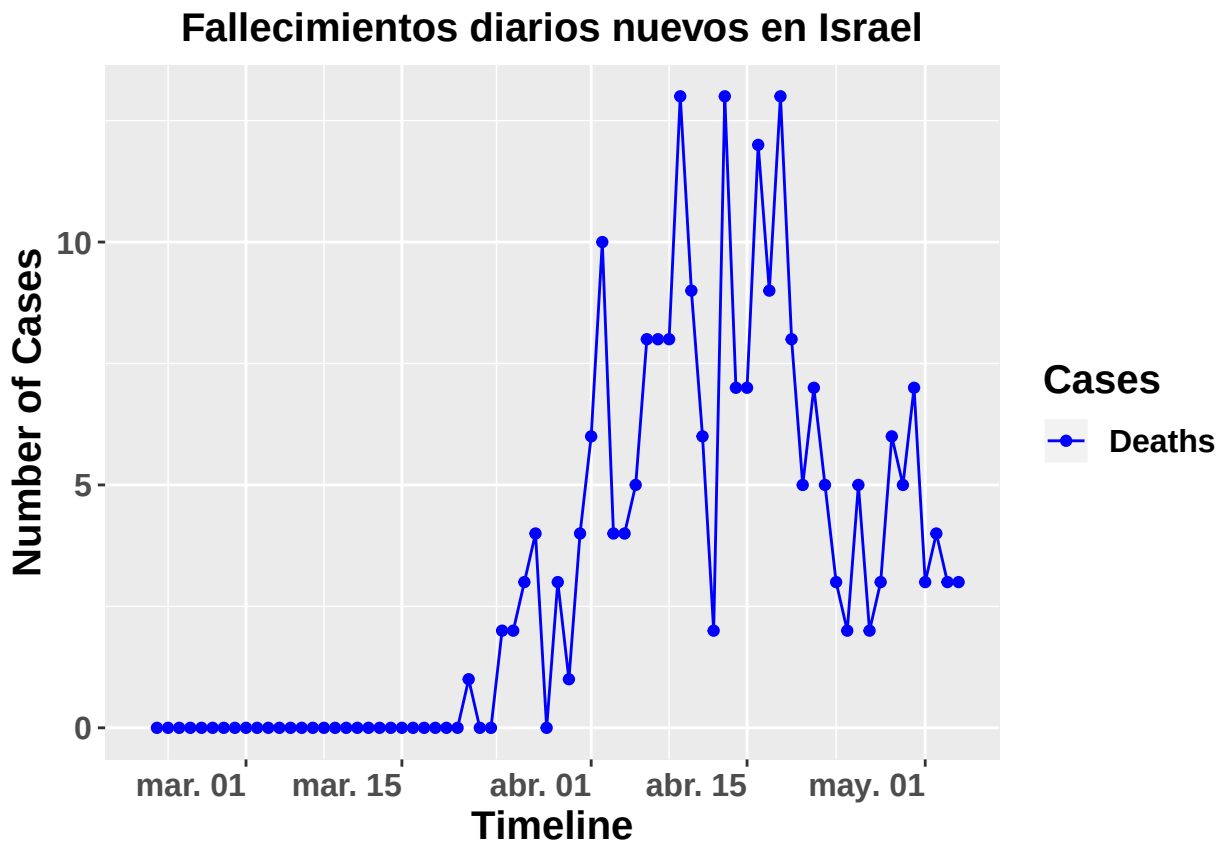



```
#Line Plot
Germany_plot <- ggplot(Germany, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Alemania COVID-19 Situación", fill = 'Cases'
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Germany_plot
```

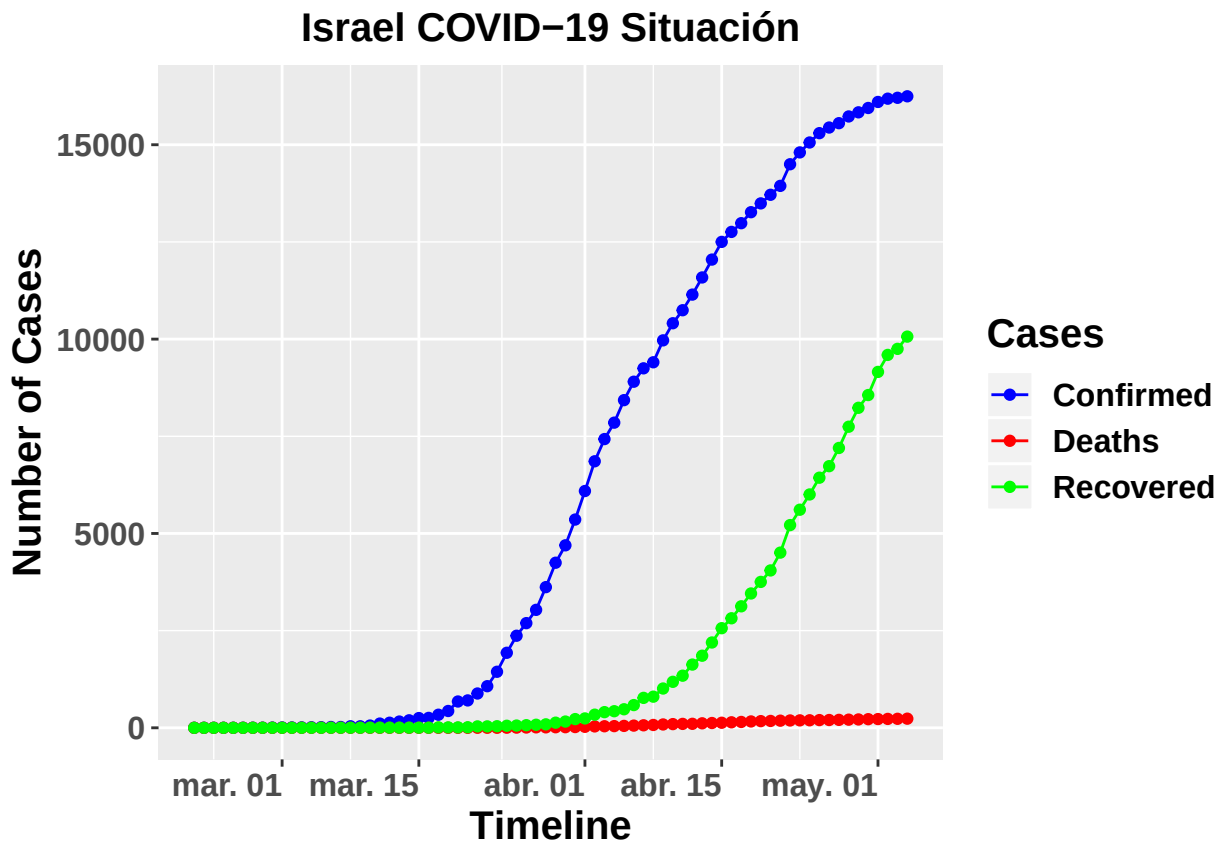



```
Israel <- filter(df,Country == "Israel") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
Israel2 <- filter(Israel, Cases =="Deaths",)
Israel2$Fallecimientos.nuevos <- c( NA, diff(Israel2$Count))

Israel_plot2<- ggplot(Israel2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , grou
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en Israel", fi
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Israel_plot2
```

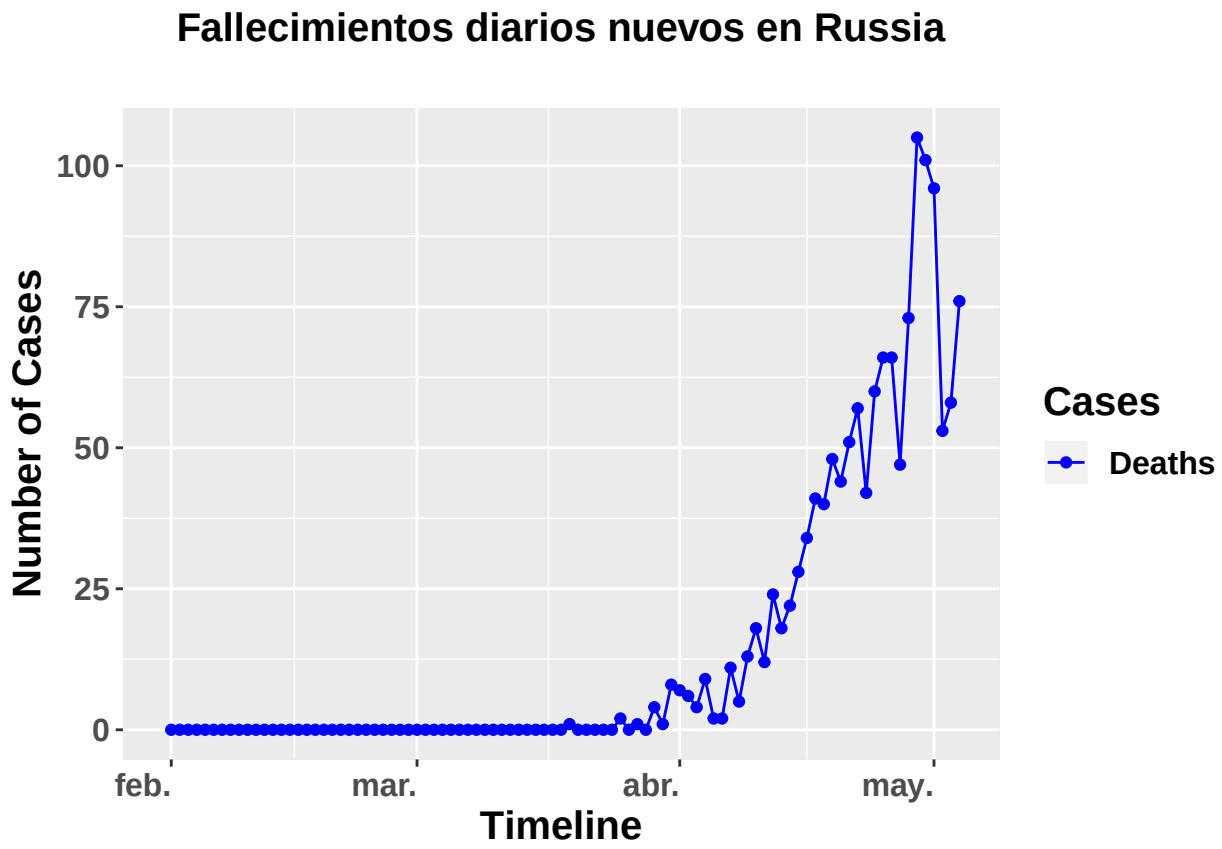



```
#Line Plot
Israel_plot <- ggplot(Israel, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Israel COVID-19 Situación", fill = 'Cases')+
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Israel_plot
```

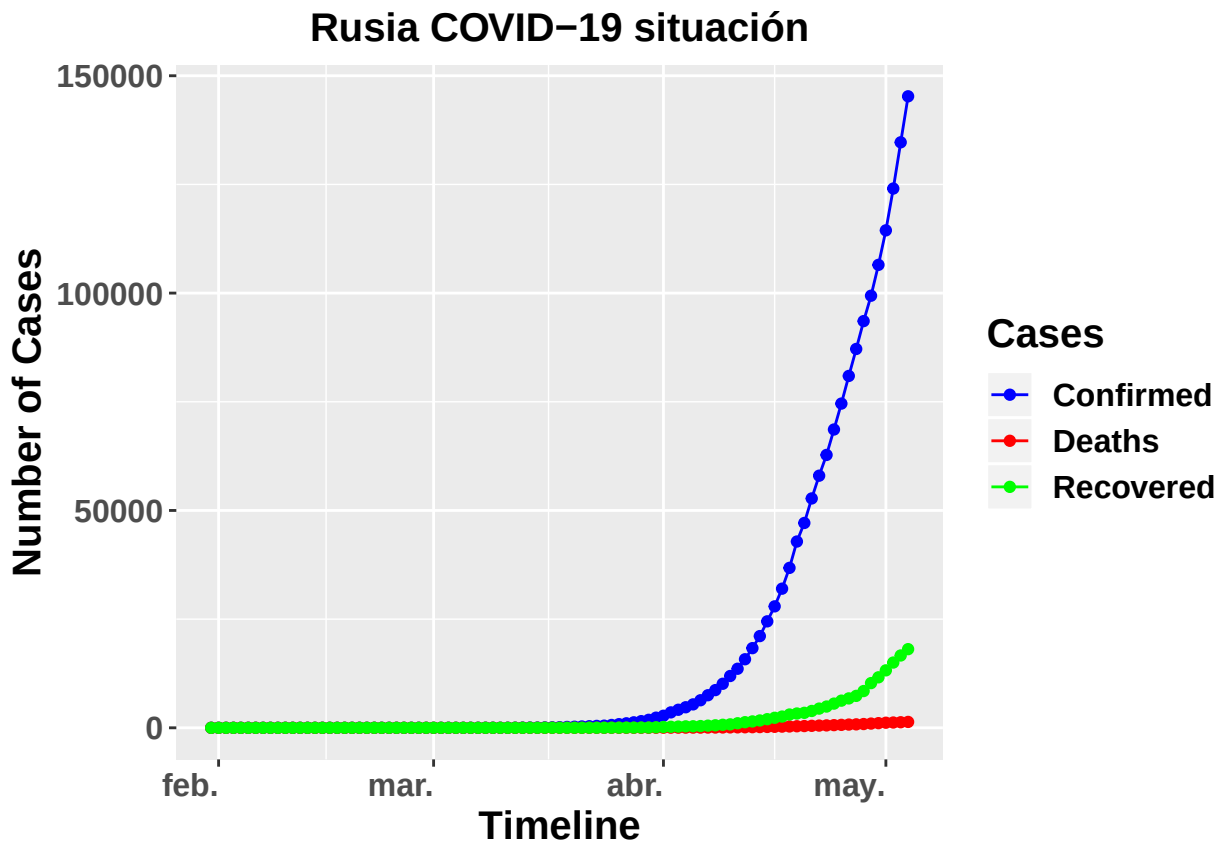



```
Russia <- filter(df,Country == "Russia") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
Russia2 <- filter(Russia, Cases =="Deaths",)
Russia2$Fallecimientos.nuevos <- c( NA, diff(Russia2$Count))
Russia_plot2<- ggplot(Russia2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , grou
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en Russia
                ", fill = 'Cases')+
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                  text = element_text(hjust = 1,face = "bold", size = 15),
                  axis.title.x = element_text(hjust = 0.5),
                  axis.title.y = element_text(hjust = 0.5))

Russia_plot2
```

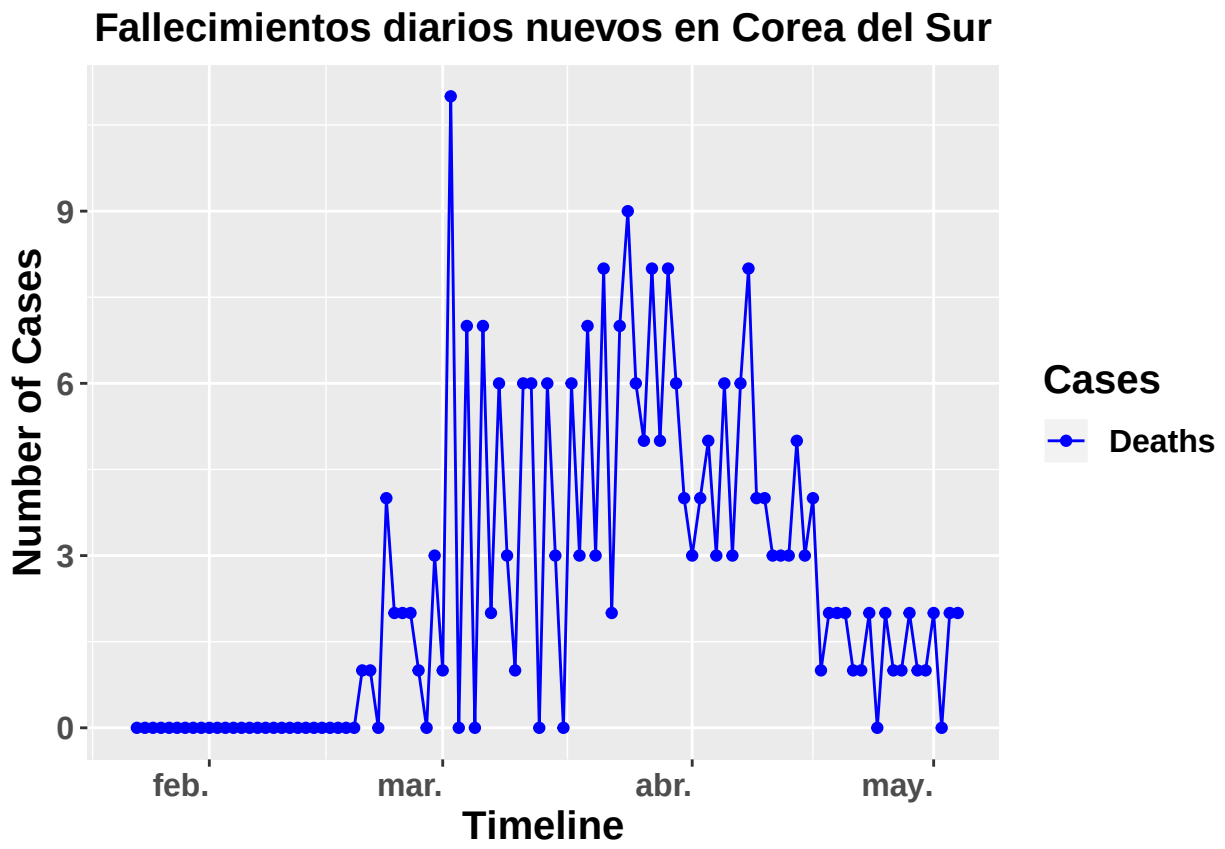



```
#Line Plot
Russia_plot <- ggplot(Russia, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Rusia COVID-19 situación", fill = 'Cases')+
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

Russia_plot
```

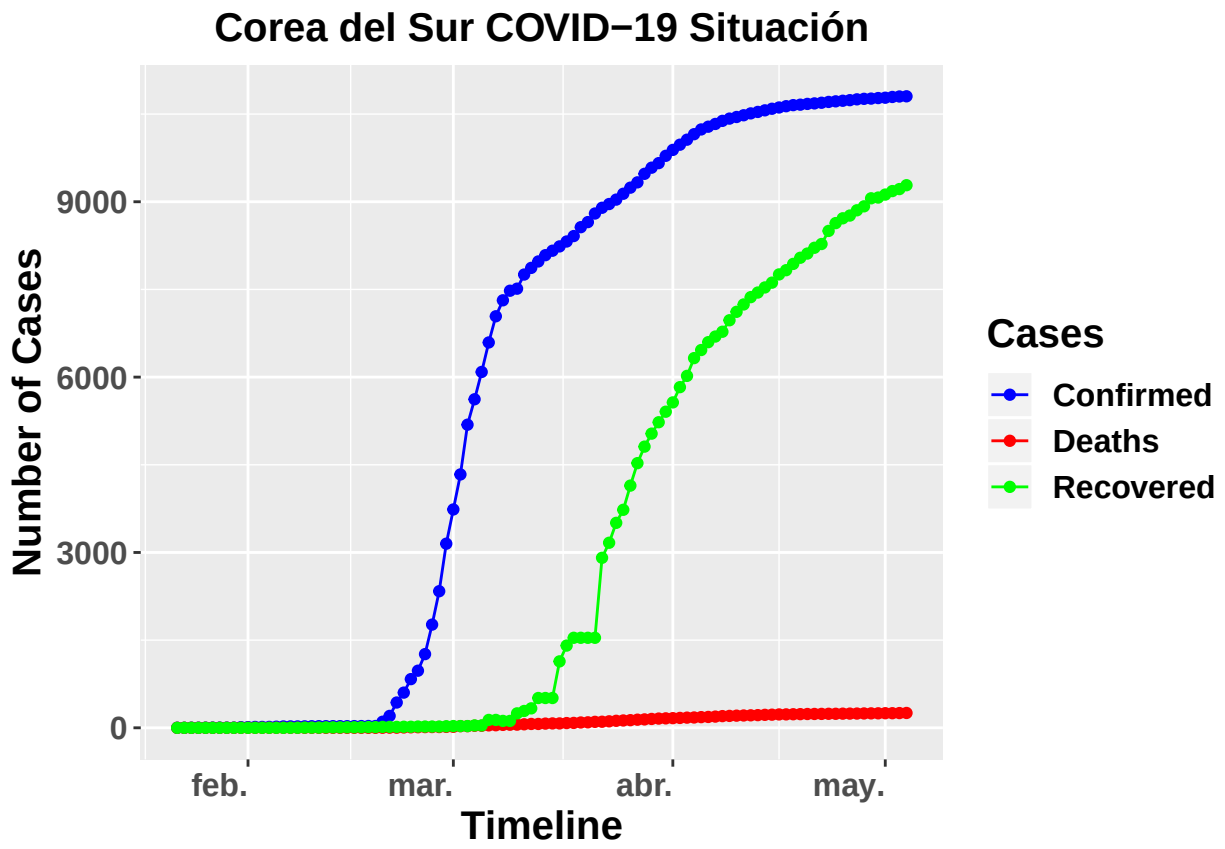



```
South_Korea <- filter(df,Country == "South Korea") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

```
South_Korea2 <- filter(South_Korea, Cases =="Deaths",)
South_Korea2$Fallecimientos.nuevos <- c( NA, diff(South_Korea2$Count))

South_Korea_plot2<- ggplot(South_Korea2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Ca
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en Corea del Su
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

South_Korea_plot2
```




```
#Line Plot
South_Korea_plot <- ggplot(South_Korea, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Corea del Sur COVID-19 Situación", fill = 'Ca
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

South_Korea_plot
```

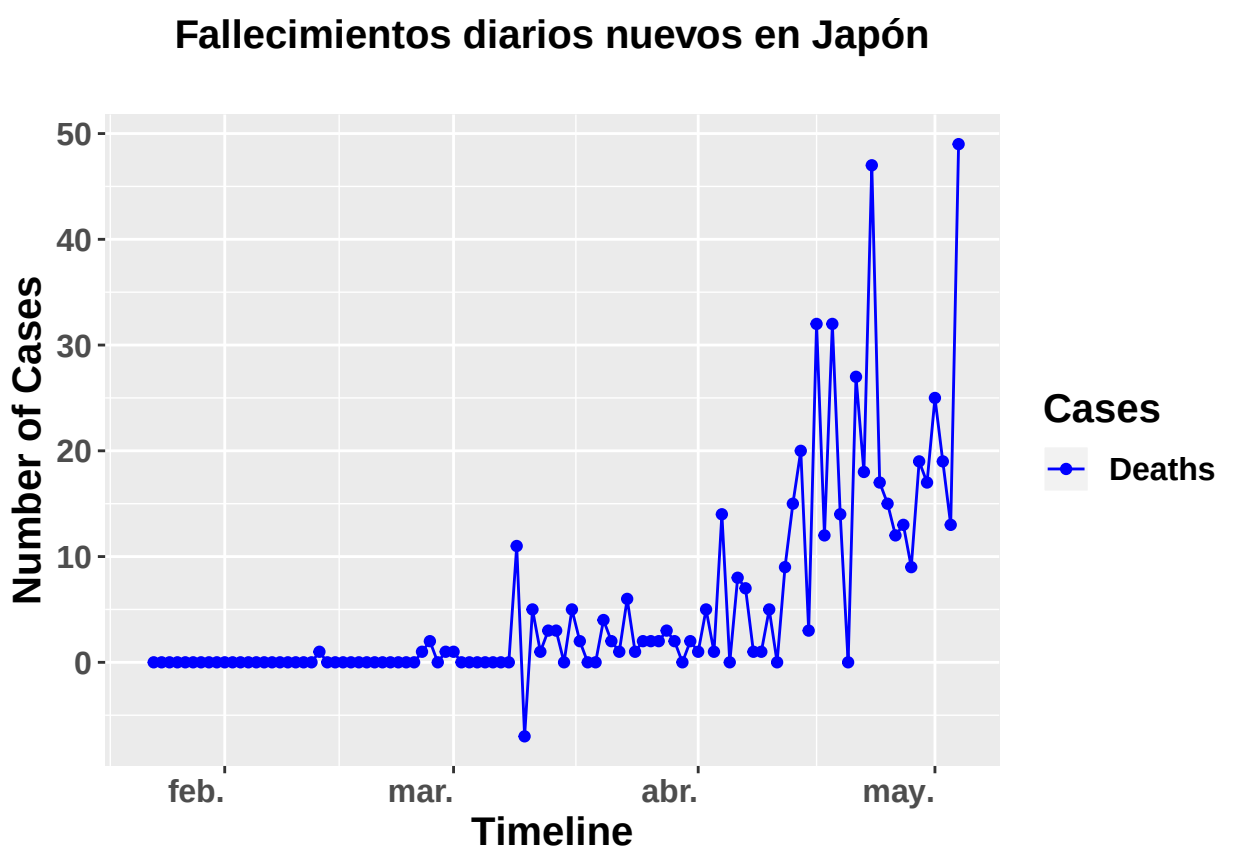



```
Japan <- filter(df,Country == "Japan") %>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

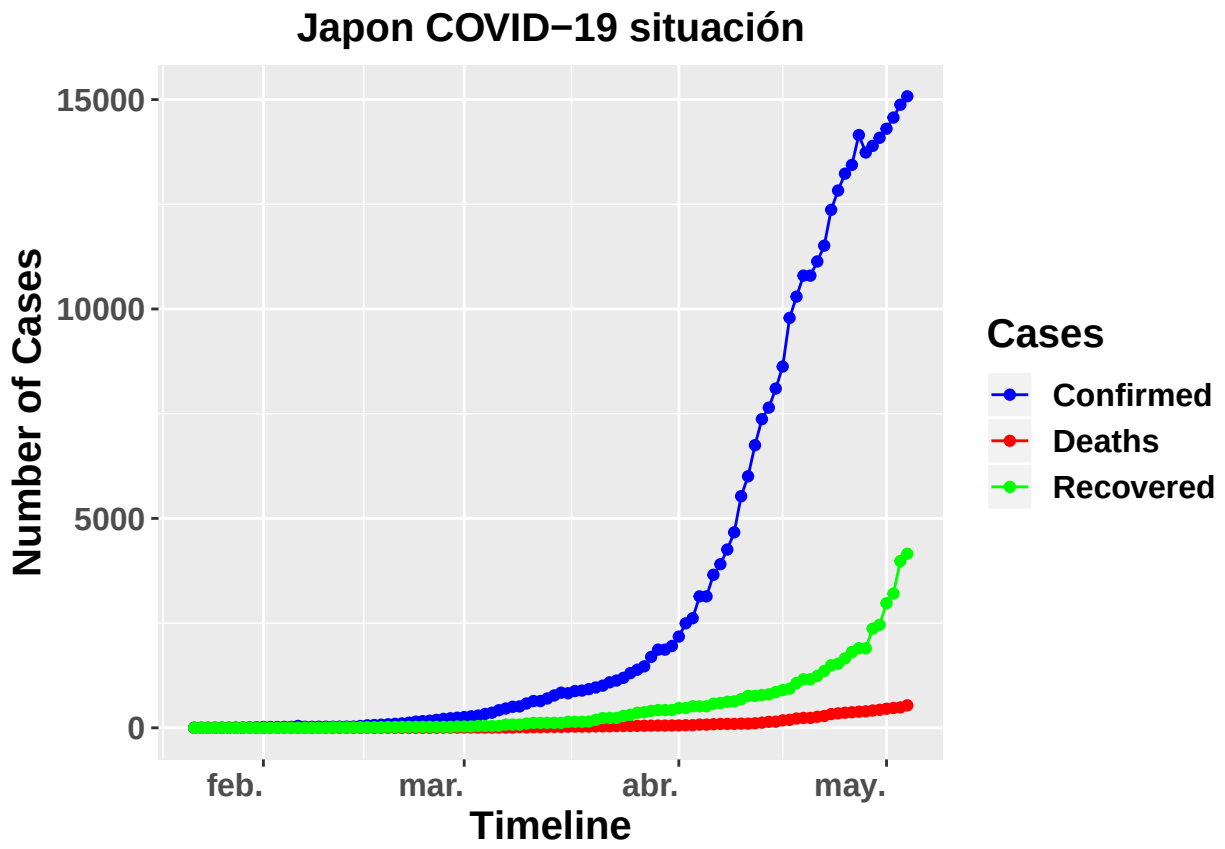
```
Japan2 <- filter(Japan, Cases =="Deaths",)
Japan2$Fallecimientos.nuevos <- c( NA, diff(Japan2$Count))

Japan2 %>%
 mutate(pct_change = (Fallecimientos.nuevos/lag(Fallecimientos.nuevos) - 1) * 100)
```

```
## # A tibble: 104 x 5
##    Date       Cases  Count Fallecimientos.nuevos pct_change
##    <date>     <chr>  <dbl>                 <dbl>      <dbl>
##  1 2020-01-22 Deaths     0                    NA         NA
##  2 2020-01-23 Deaths     0                     0         NA
##  3 2020-01-24 Deaths     0                     0        NaN
##  4 2020-01-25 Deaths     0                     0        NaN
##  5 2020-01-26 Deaths     0                     0        NaN
##  6 2020-01-27 Deaths     0                     0        NaN
##  7 2020-01-28 Deaths     0                     0        NaN
##  8 2020-01-29 Deaths     0                     0        NaN
##  9 2020-01-30 Deaths     0                     0        NaN
## 10 2020-01-31 Deaths     0                     0        NaN
## # ... with 94 more rows
```

```
Japan_plot2<- ggplot(Japan2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , group=
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en Japón
                ", fill = 'Cases')+
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                  text = element_text(hjust = 1,face = "bold", size = 15),
                  axis.title.x = element_text(hjust = 0.5),
                  axis.title.y = element_text(hjust = 0.5))

Japan_plot2
```

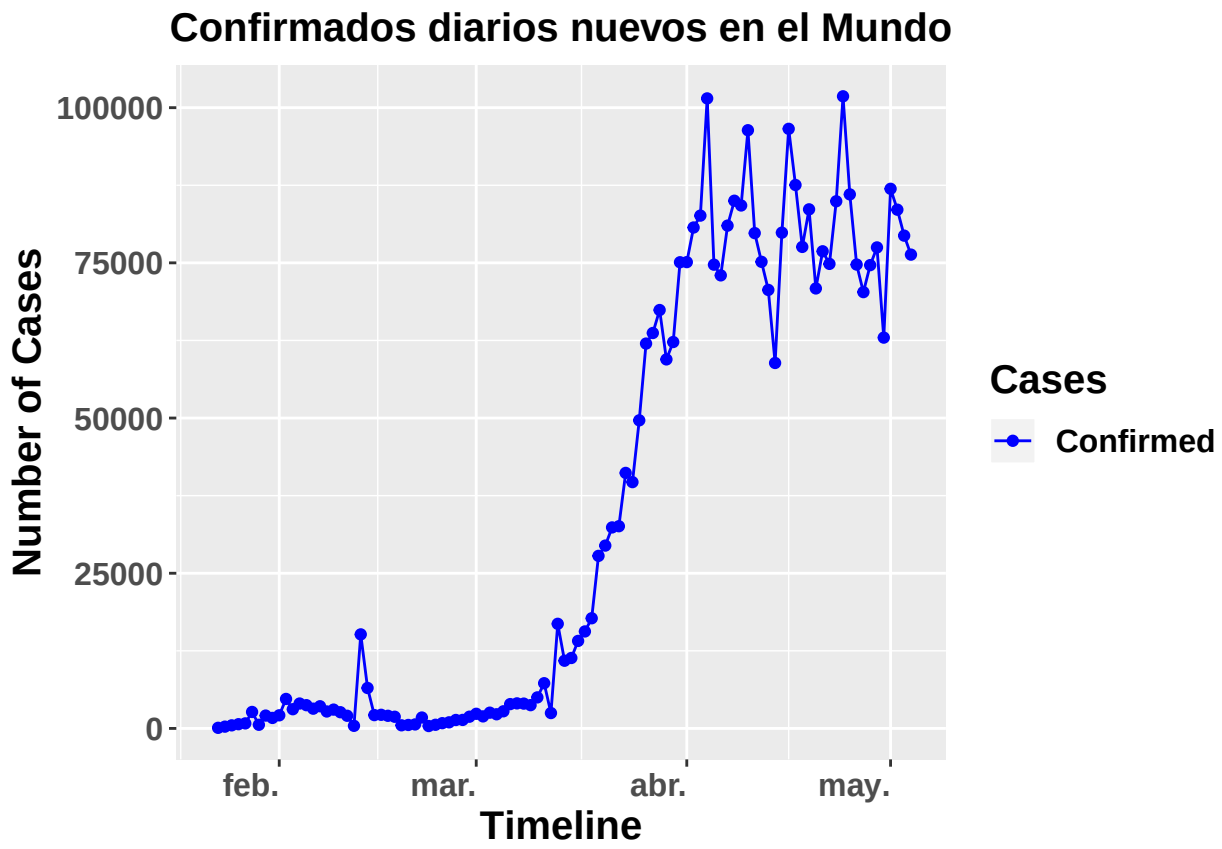



```
#Line Plot
Japan_plot <- ggplot(Japan, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Japon COVID-19 situación", fill = 'Cases')+
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                  text = element_text(hjust = 1,face = "bold", size = 15),
                  axis.title.x = element_text(hjust = 0.5),
                  axis.title.y = element_text(hjust = 0.5))

Japan_plot
```

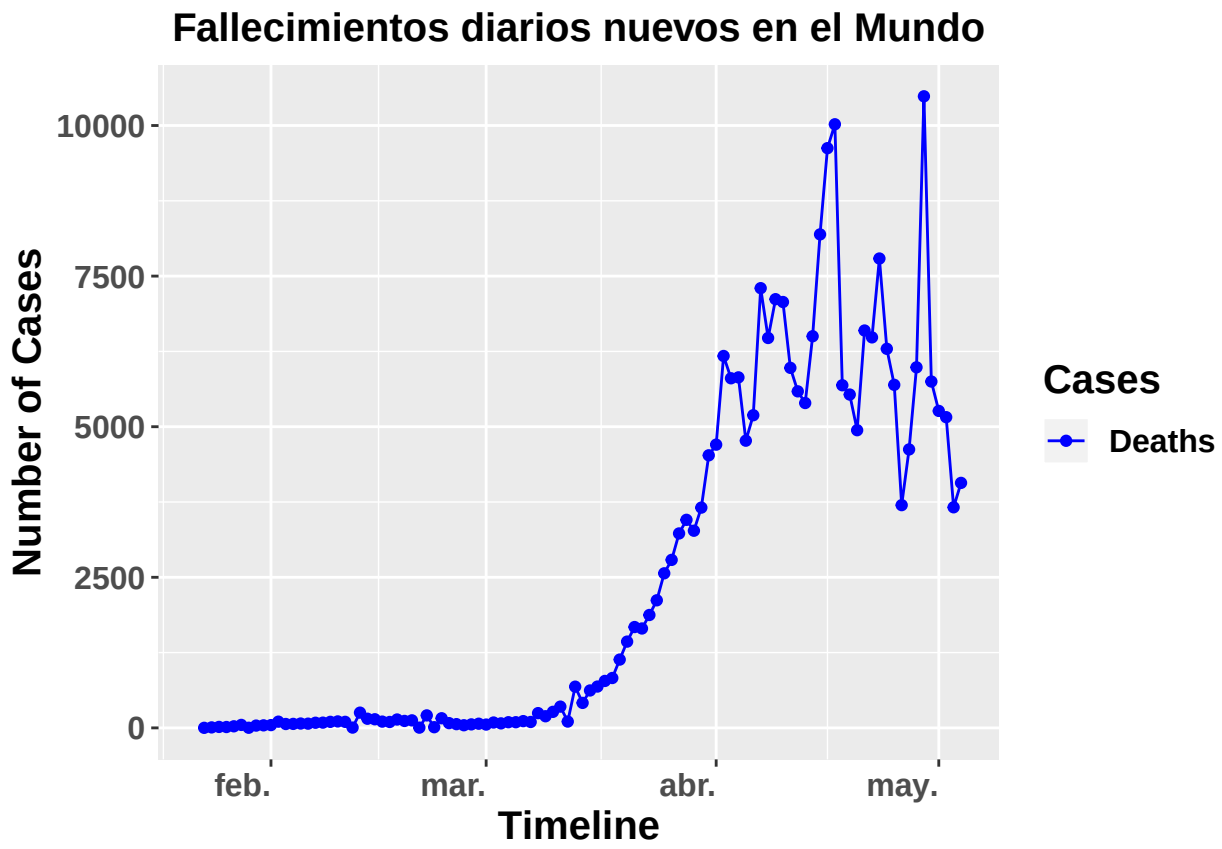



```
World <- df%>% group_by(Date) %>%
summarise(Confirmed =  sum(Confirmed) , Deaths = sum(Deaths), Recovered = sum(Recovered)) %>%
gather(key = Cases, value = Count, c(Confirmed,Deaths,Recovered))
```

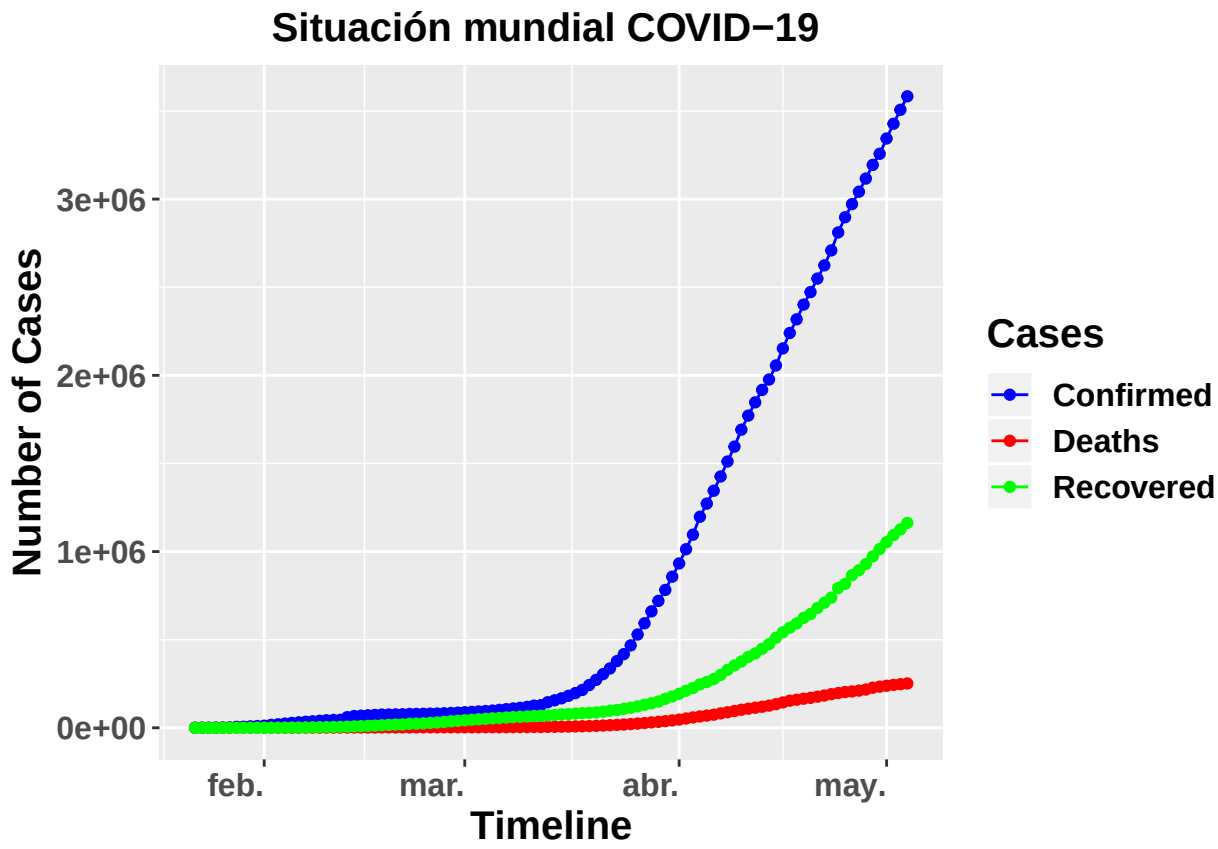
```
World1 <- filter(World, Cases =="Confirmed",)
World1$Confirmados.nuevos <- c( NA, diff(World1$Count))
World_plot<- ggplot(World1, aes(x= Date, y= Confirmados.nuevos ,fill = Cases, color = Cases, group=Cases
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Confirmados diarios nuevos en el Mundo", fil
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

World_plot
```



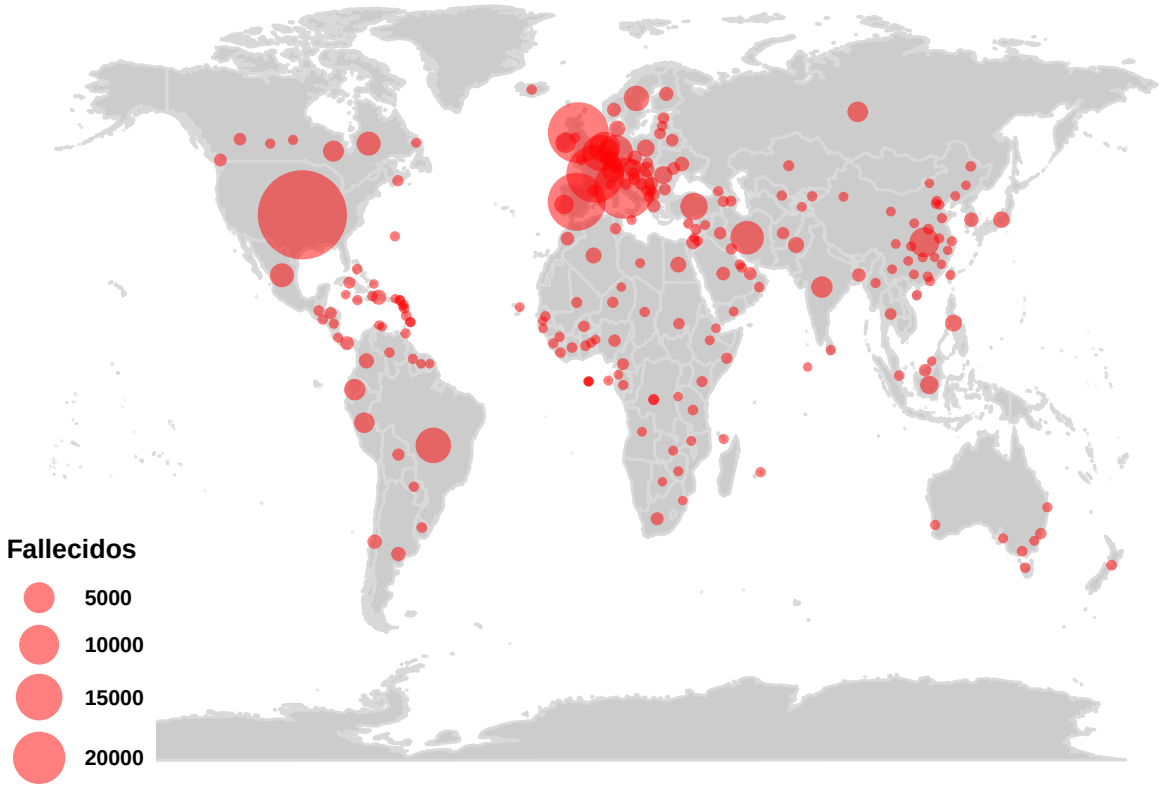

```
World2 <- filter(World, Cases =="Deaths",)
World2$Fallecimientos.nuevos <- c( NA, diff(World2$Count))
World_plot2<- ggplot(World2, aes(x= Date, y= Fallecimientos.nuevos ,fill = Cases, color = Cases , group=
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","re
           labs(x="Timeline", y="Number of Cases",title = "Fallecimientos diarios nuevos en el Mundo", s
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

World_plot2
```




```
#Line Plot
World_plot <- ggplot(World, aes(x= Date, y= Count ,fill = Cases, color = Cases , group=Cases ))+
           geom_line(aes(colour = Cases))+geom_point()+
           scale_fill_manual(values = c("blue","red","green"))+scale_colour_manual(values = c("blue","r
           labs(x="Timeline", y="Number of Cases",title = "Situación mundial COVID-19 ", fill = 'Cases'
           theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 15),
                 text = element_text(hjust = 1,face = "bold", size = 15),
                 axis.title.x = element_text(hjust = 0.5),
                 axis.title.y = element_text(hjust = 0.5))

World_plot
```




```
data <- filter(df_deaths,df_deaths[,ncol(df_deaths)]>0)
world <- ggplot() +
  borders("world", colour = "gray85", fill = "gray80") +theme_map()
map_death <- world +
  geom_point(aes(x = data$Long, y = data$Lat, size = as.integer(unlist(data[,ncol(df_deaths)]))),
             data = data,
             colour = 'red', alpha = .5) +
  scale_size_continuous(range = c(1, 15),
                        breaks = c(5000, 10000, 15000, 20000)) +
  labs(size = 'Fallecidos')+   theme( plot.title = element_text(hjust = 0.5 , face = "bold", size = 10)
        text = element_text(hjust = 1,face = "bold", size = 10))
map_death
```


Fallecidos
5000
10000
15000
20000

# Links

**Gracias especialmente a datadista por mantener base de datos actualizada del**

**Ministerio de Sanidad.**

**Enlaces a bases de datos.**

**https://www.kaggle.com/sudalairajkumar/novel-corona-virus-2019-dataset/download/uMF6QnlPB7ScS6BxTw1I%2Fversions%2FXDJvWcErFIHv3R7zGrDD%2Ffiles%2Fcovid_19_data.csv?datasetVersionNumber=56**

**https://www.kaggle.com/sudalairajkumar/novel-corona-virus-2019-dataset/download/uMF6QnlPB7ScS6BxTw1I%2Fversions%2FXDJvWcErFIHv3R7zGrDD%2Ffiles%2Ftime_series_covid_19_confirmed.csv?datasetVersionNumber=56**

**https://www.kaggle.com/sudalairajkumar/novel-corona-virus-2019-dataset/download/uMF6QnlPB7ScS6BxTw1I%2Fversions%2FXDJvWcErFIHv3R7zGrDD%2Ffiles%2Ftime_series_covid_19_deaths.csv?datasetVersionNumber=56**

**https://www.kaggle.com/sudalairajkumar/novel-corona-virus-2019-dataset/download/uMF6QnlPB7ScS6BxTw1I%2Fversions%2FXDJvWcErFIHv3R7zGrDD%2Ffiles%2Ftime_series_covid_19_recovered.csv?datasetVersionNumber=56**

**https://raw.githubusercontent.com/datadista/datasets/master/COVID%2019/ccaa_covid19_fallecidos_long.csv**

**https://raw.githubusercontent.com/datadista/datasets/master/COVID%2019/nacional_covid19.csv**

**https://raw.githubusercontent.com/datadista/datasets/master/COVID%2019/ccaa_covid19_uci_long.csv**

- Map tracks coronavirus outbreak in near real time
- Coronavirus COVID-19 Global Cases by Johns Hopkins CSSE
- Coronavirus disease (COVID-19) outbreak - WHO
- coronavirus R package provides a tidy format dataset
- An AI Epidemiologist Sent the First Warnings of the Wuhan Virus