**COVID19**

**> library(tidyverse)**

**-- Attaching packages --------------------------------------- tidyverse 1.3.0 --**

**v ggplot2 3.3.2 v purrr 0.3.4**

**v tibble 3.0.3 v dplyr 1.0.2**

**v tidyr 1.1.2 v stringr 1.4.0**

**v readr 1.3.1 v forcats 0.5.0**

**-- Conflicts ------------------------------------------ tidyverse\_conflicts() --**

**x dplyr::filter() masks stats::filter()**

**x dplyr::lag() masks stats::lag()**

**> library(tibble)**

**> library(ggplot2)**

**> getwd()**

**[1] "C:/Users/Admin/Documents"**

**> #setwd("C:\\Users\\Admin\\Desktop\\covid19")**

**> setwd("C:\\Users\\Admin\\Desktop\\covid19")**

**> getwd()**

**[1] "C:/Users/Admin/Desktop/covid19"**

**> covid=read.csv("owid-covid-data.csv")**

**> covid**

**iso\_code continent location date total\_cases new\_cases**

**1 AFG Asia Afghanistan 23-01-2020 NA 0**

**2 AFG Asia Afghanistan 24-01-2020 NA 0**

**3 AFG Asia Afghanistan 25-01-2020 NA 0**

**4 AFG Asia Afghanistan 26-01-2020 NA 0**

**5 AFG Asia Afghanistan 27-01-2020 NA 0**

**6 AFG Asia Afghanistan 28-01-2020 NA 0**

**7 AFG Asia Afghanistan 29-01-2020 NA 0**

**8 AFG Asia Afghanistan 30-01-2020 NA 0**

**9 AFG Asia Afghanistan 31-01-2020 NA 0**

**10 AFG Asia Afghanistan 01-02-2020 NA 0**

**11 AFG Asia Afghanistan 02-02-2020 NA 0**

**12 AFG Asia Afghanistan 03-02-2020 NA 0**

**13 AFG Asia Afghanistan 04-02-2020 NA 0**

**14 AFG Asia Afghanistan 05-02-2020 NA 0**

**15 AFG Asia Afghanistan 06-02-2020 NA 0**

**16 AFG Asia Afghanistan 07-02-2020 NA 0**

**17 AFG Asia Afghanistan 08-02-2020 NA 0**

**18 AFG Asia Afghanistan 09-02-2020 NA 0**

**19 AFG Asia Afghanistan 10-02-2020 NA 0**

**20 AFG Asia Afghanistan 11-02-2020 NA 0**

**new\_cases\_smoothed total\_deaths new\_deaths new\_deaths\_smoothed**

**1 NA NA 0 NA**

**2 NA NA 0 NA**

**3 NA NA 0 NA**

**4 NA NA 0 NA**

**5 NA NA 0 NA**

**6 0 NA 0 0**

**7 0 NA 0 0**

**8 0 NA 0 0**

**9 0 NA 0 0**

**10 0 NA 0 0**

**11 0 NA 0 0**

**12 0 NA 0 0**

**13 0 NA 0 0**

**14 0 NA 0 0**

**15 0 NA 0 0**

**16 0 NA 0 0**

**17 0 NA 0 0**

**18 0 NA 0 0**

**19 0 NA 0 0**

**20 0 NA 0 0**

**total\_cases\_per\_million new\_cases\_per\_million new\_cases\_smoothed\_per\_million**

**1 NA 0 NA**

**2 NA 0 NA**

**3 NA 0 NA**

**4 NA 0 NA**

**5 NA 0 NA**

**6 NA 0 0**

**7 NA 0 0**

**8 NA 0 0**

**9 NA 0 0**

**10 NA 0 0**

**11 NA 0 0**

**12 NA 0 0**

**13 NA 0 0**

**14 NA 0 0**

**15 NA 0 0**

**16 NA 0 0**

**17 NA 0 0**

**18 NA 0 0**

**19 NA 0 0**

**20 NA 0 0**

**total\_deaths\_per\_million new\_deaths\_per\_million new\_deaths\_smoothed\_per\_million**

**1 NA 0 NA**

**2 NA 0 NA**

**3 NA 0 NA**

**4 NA 0 NA**

**5 NA 0 NA**

**6 NA 0 0**

**7 NA 0 0**

**8 NA 0 0**

**9 NA 0 0**

**10 NA 0 0**

**11 NA 0 0**

**12 NA 0 0**

**13 NA 0 0**

**14 NA 0 0**

**15 NA 0 0**

**16 NA 0 0**

**17 NA 0 0**

**18 NA 0 0**

**19 NA 0 0**

**20 NA 0 0**

**reproduction\_rate icu\_patients icu\_patients\_per\_million hosp\_patients**

**1 NA NA NA NA**

**2 NA NA NA NA**

**3 NA NA NA NA**

**4 NA NA NA NA**

**5 NA NA NA NA**

**6 NA NA NA NA**

**7 NA NA NA NA**

**8 NA NA NA NA**

**9 NA NA NA NA**

**10 NA NA NA NA**

**11 NA NA NA NA**

**12 NA NA NA NA**

**13 NA NA NA NA**

**14 NA NA NA NA**

**15 NA NA NA NA**

**16 NA NA NA NA**

**17 NA NA NA NA**

**18 NA NA NA NA**

**19 NA NA NA NA**

**20 NA NA NA NA**

**hosp\_patients\_per\_million weekly\_icu\_admissions weekly\_icu\_admissions\_per\_million**

**1 NA NA NA**

**2 NA NA NA**

**3 NA NA NA**

**4 NA NA NA**

**5 NA NA NA**

**6 NA NA NA**

**7 NA NA NA**

**8 NA NA NA**

**9 NA NA NA**

**10 NA NA NA**

**11 NA NA NA**

**12 NA NA NA**

**13 NA NA NA**

**14 NA NA NA**

**15 NA NA NA**

**16 NA NA NA**

**17 NA NA NA**

**18 NA NA NA**

**19 NA NA NA**

**20 NA NA NA**

**weekly\_hosp\_admissions weekly\_hosp\_admissions\_per\_million new\_tests total\_tests**

**1 NA NA NA NA**

**2 NA NA NA NA**

**3 NA NA NA NA**

**4 NA NA NA NA**

**5 NA NA NA NA**

**6 NA NA NA NA**

**7 NA NA NA NA**

**8 NA NA NA NA**

**9 NA NA NA NA**

**10 NA NA NA NA**

**11 NA NA NA NA**

**12 NA NA NA NA**

**13 NA NA NA NA**

**14 NA NA NA NA**

**15 NA NA NA NA**

**16 NA NA NA NA**

**17 NA NA NA NA**

**18 NA NA NA NA**

**19 NA NA NA NA**

**20 NA NA NA NA**

**total\_tests\_per\_thousand new\_tests\_per\_thousand new\_tests\_smoothed**

**1 NA NA NA**

**2 NA NA NA**

**3 NA NA NA**

**4 NA NA NA**

**5 NA NA NA**

**6 NA NA NA**

**7 NA NA NA**

**8 NA NA NA**

**9 NA NA NA**

**10 NA NA NA**

**11 NA NA NA**

**12 NA NA NA**

**13 NA NA NA**

**14 NA NA NA**

**15 NA NA NA**

**16 NA NA NA**

**17 NA NA NA**

**18 NA NA NA**

**19 NA NA NA**

**20 NA NA NA**

**new\_tests\_smoothed\_per\_thousand positive\_rate tests\_per\_case tests\_units**

**1 NA NA NA**

**2 NA NA NA**

**3 NA NA NA**

**4 NA NA NA**

**5 NA NA NA**

**6 NA NA NA**

**7 NA NA NA**

**8 NA NA NA**

**9 NA NA NA**

**10 NA NA NA**

**11 NA NA NA**

**12 NA NA NA**

**13 NA NA NA**

**14 NA NA NA**

**15 NA NA NA**

**16 NA NA NA**

**17 NA NA NA**

**18 NA NA NA**

**19 NA NA NA**

**20 NA NA NA**

**stringency\_index population population\_density median\_age aged\_65\_older**

**1 0 38928341 54.422 18.6 2.581**

**2 0 38928341 54.422 18.6 2.581**

**3 0 38928341 54.422 18.6 2.581**

**4 0 38928341 54.422 18.6 2.581**

**5 0 38928341 54.422 18.6 2.581**

**6 0 38928341 54.422 18.6 2.581**

**7 0 38928341 54.422 18.6 2.581**

**8 0 38928341 54.422 18.6 2.581**

**9 0 38928341 54.422 18.6 2.581**

**10 0 38928341 54.422 18.6 2.581**

**11 0 38928341 54.422 18.6 2.581**

**12 0 38928341 54.422 18.6 2.581**

**13 0 38928341 54.422 18.6 2.581**

**14 0 38928341 54.422 18.6 2.581**

**15 0 38928341 54.422 18.6 2.581**

**16 0 38928341 54.422 18.6 2.581**

**17 0 38928341 54.422 18.6 2.581**

**18 0 38928341 54.422 18.6 2.581**

**19 0 38928341 54.422 18.6 2.581**

**20 0 38928341 54.422 18.6 2.581**

**aged\_70\_older gdp\_per\_capita extreme\_poverty cardiovasc\_death\_rate**

**1 1.337 1803.987 NA 597.029**

**2 1.337 1803.987 NA 597.029**

**3 1.337 1803.987 NA 597.029**

**4 1.337 1803.987 NA 597.029**

**5 1.337 1803.987 NA 597.029**

**6 1.337 1803.987 NA 597.029**

**7 1.337 1803.987 NA 597.029**

**8 1.337 1803.987 NA 597.029**

**9 1.337 1803.987 NA 597.029**

**10 1.337 1803.987 NA 597.029**

**11 1.337 1803.987 NA 597.029**

**12 1.337 1803.987 NA 597.029**

**13 1.337 1803.987 NA 597.029**

**14 1.337 1803.987 NA 597.029**

**15 1.337 1803.987 NA 597.029**

**16 1.337 1803.987 NA 597.029**

**17 1.337 1803.987 NA 597.029**

**18 1.337 1803.987 NA 597.029**

**19 1.337 1803.987 NA 597.029**

**20 1.337 1803.987 NA 597.029**

**diabetes\_prevalence female\_smokers male\_smokers handwashing\_facilities**

**1 9.59 NA NA 37.746**

**2 9.59 NA NA 37.746**

**3 9.59 NA NA 37.746**

**4 9.59 NA NA 37.746**

**5 9.59 NA NA 37.746**

**6 9.59 NA NA 37.746**

**7 9.59 NA NA 37.746**

**8 9.59 NA NA 37.746**

**9 9.59 NA NA 37.746**

**10 9.59 NA NA 37.746**

**11 9.59 NA NA 37.746**

**12 9.59 NA NA 37.746**

**13 9.59 NA NA 37.746**

**14 9.59 NA NA 37.746**

**15 9.59 NA NA 37.746**

**16 9.59 NA NA 37.746**

**17 9.59 NA NA 37.746**

**18 9.59 NA NA 37.746**

**19 9.59 NA NA 37.746**

**20 9.59 NA NA 37.746**

**hospital\_beds\_per\_thousand life\_expectancy human\_development\_index**

**1 0.5 64.83 0.498**

**2 0.5 64.83 0.498**

**3 0.5 64.83 0.498**

**4 0.5 64.83 0.498**

**5 0.5 64.83 0.498**

**6 0.5 64.83 0.498**

**7 0.5 64.83 0.498**

**8 0.5 64.83 0.498**

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**10 0.5 64.83 0.498**

**11 0.5 64.83 0.498**

**12 0.5 64.83 0.498**

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**15 0.5 64.83 0.498**

**16 0.5 64.83 0.498**

**17 0.5 64.83 0.498**

**18 0.5 64.83 0.498**

**19 0.5 64.83 0.498**

**20 0.5 64.83 0.498**

**[ reached 'max' / getOption("max.print") -- omitted 61608 rows ]**

**> covid<-as.tibble(covid)**

**Warning message:**

**`as.tibble()` is deprecated as of tibble 2.0.0.**

**Please use `as\_tibble()` instead.**

**The signature and semantics have changed, see `?as\_tibble`.**

**This warning is displayed once every 8 hours.**

**Call `lifecycle::last\_warnings()` to see where this warning was generated.**

**> covid**

**# A tibble: 61,628 x 50**

**iso\_code continent location date total\_cases new\_cases new\_cases\_smoot~**

**<chr> <chr> <chr> <chr> <int> <int> <dbl>**

**1 AFG Asia Afghani~ 23-0~ NA 0 NA**

**2 AFG Asia Afghani~ 24-0~ NA 0 NA**

**3 AFG Asia Afghani~ 25-0~ NA 0 NA**

**4 AFG Asia Afghani~ 26-0~ NA 0 NA**

**5 AFG Asia Afghani~ 27-0~ NA 0 NA**

**6 AFG Asia Afghani~ 28-0~ NA 0 0**

**7 AFG Asia Afghani~ 29-0~ NA 0 0**

**8 AFG Asia Afghani~ 30-0~ NA 0 0**

**9 AFG Asia Afghani~ 31-0~ NA 0 0**

**10 AFG Asia Afghani~ 01-0~ NA 0 0**

**# ... with 61,618 more rows, and 43 more variables: total\_deaths <int>,**

**# new\_deaths <int>, 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 <int>, icu\_patients\_per\_million <dbl>, hosp\_patients <int>,**

**# hosp\_patients\_per\_million <dbl>, weekly\_icu\_admissions <dbl>,**

**# weekly\_icu\_admissions\_per\_million <dbl>, weekly\_hosp\_admissions <dbl>,**

**# weekly\_hosp\_admissions\_per\_million <dbl>, new\_tests <int>, total\_tests <int>,**

**# total\_tests\_per\_thousand <dbl>, new\_tests\_per\_thousand <dbl>,**

**# new\_tests\_smoothed <int>, new\_tests\_smoothed\_per\_thousand <dbl>,**

**# positive\_rate <dbl>, tests\_per\_case <dbl>, tests\_units <chr>,**

**# stringency\_index <dbl>, population <dbl>, population\_density <dbl>,**

**# median\_age <dbl>, aged\_65\_older <dbl>, aged\_70\_older <dbl>,**

**# gdp\_per\_capita <dbl>, extreme\_poverty <dbl>, cardiovasc\_death\_rate <dbl>,**

**# diabetes\_prevalence <dbl>, female\_smokers <dbl>, male\_smokers <dbl>,**

**# handwashing\_facilities <dbl>, hospital\_beds\_per\_thousand <dbl>,**

**# life\_expectancy <dbl>, human\_development\_index <dbl>**

**> df=covid**

**> df**

**# A tibble: 61,628 x 50**

**iso\_code continent location date total\_cases new\_cases new\_cases\_smoot~**

**<chr> <chr> <chr> <chr> <int> <int> <dbl>**

**1 AFG Asia Afghani~ 23-0~ NA 0 NA**

**2 AFG Asia Afghani~ 24-0~ NA 0 NA**

**3 AFG Asia Afghani~ 25-0~ NA 0 NA**

**4 AFG Asia Afghani~ 26-0~ NA 0 NA**

**5 AFG Asia Afghani~ 27-0~ NA 0 NA**

**6 AFG Asia Afghani~ 28-0~ NA 0 0**

**7 AFG Asia Afghani~ 29-0~ NA 0 0**

**8 AFG Asia Afghani~ 30-0~ NA 0 0**

**9 AFG Asia Afghani~ 31-0~ NA 0 0**

**10 AFG Asia Afghani~ 01-0~ NA 0 0**

**# ... with 61,618 more rows, and 43 more variables: total\_deaths <int>,**

**# new\_deaths <int>, 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 <int>, icu\_patients\_per\_million <dbl>, hosp\_patients <int>,**

**# hosp\_patients\_per\_million <dbl>, weekly\_icu\_admissions <dbl>,**

**# weekly\_icu\_admissions\_per\_million <dbl>, weekly\_hosp\_admissions <dbl>,**

**# weekly\_hosp\_admissions\_per\_million <dbl>, new\_tests <int>, total\_tests <int>,**

**# total\_tests\_per\_thousand <dbl>, new\_tests\_per\_thousand <dbl>,**

**# new\_tests\_smoothed <int>, new\_tests\_smoothed\_per\_thousand <dbl>,**

**# positive\_rate <dbl>, tests\_per\_case <dbl>, tests\_units <chr>,**

**# stringency\_index <dbl>, population <dbl>, population\_density <dbl>,**

**# median\_age <dbl>, aged\_65\_older <dbl>, aged\_70\_older <dbl>,**

**# gdp\_per\_capita <dbl>, extreme\_poverty <dbl>, cardiovasc\_death\_rate <dbl>,**

**# diabetes\_prevalence <dbl>, female\_smokers <dbl>, male\_smokers <dbl>,**

**# handwashing\_facilities <dbl>, hospital\_beds\_per\_thousand <dbl>,**

**# life\_expectancy <dbl>, human\_development\_index <dbl>**

**> df$iso\_code<-as.factor(df$iso\_code)**

**> df$iso\_code**

**[1] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[20] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[39] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[58] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[77] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[96] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[115] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[134] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[153] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[172] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[191] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[210] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[229] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[248] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[267] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[286] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG**

**[305] AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG AFG ALB**

**[324] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[343] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[362] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[381] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[400] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[419] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[438] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[457] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[476] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[495] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[514] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[533] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[552] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[571] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[590] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[609] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB**

**[628] ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB ALB DZA DZA**

**[647] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[666] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[685] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[704] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[723] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[742] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[761] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[780] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[799] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[818] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[837] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[856] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[875] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[894] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[913] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[932] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA**

**[951] DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA DZA AND AND AND**

**[970] AND AND AND AND AND AND AND AND AND AND AND AND AND AND AND AND AND AND AND**

**[989] AND AND AND AND AND AND AND AND AND AND AND AND**

**[ reached getOption("max.print") -- omitted 60628 entries ]**

**192 Levels: AFG AGO ALB AND ARE ARG ARM ATG AUS AUT AZE BDI BEL BEN BFA BGD ... ZWE**

**> df$continent<-as.factor(df$continent)**

**> df$continent**

**[1] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[12] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[23] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[34] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[45] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[56] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[67] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[78] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[89] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[100] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[111] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[122] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[133] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[144] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[155] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[166] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[177] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[188] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[199] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[210] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[221] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[232] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

**[243] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

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**[265] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia**

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**[ reached getOption("max.print") -- omitted 60628 entries ]**

**Levels: Africa Asia Europe North America Oceania South America**

**> library(MASS)**

**Attaching package: ‘MASS’**

**The following object is masked from ‘package:dplyr’:**

**select**

**> tbl=table(df$continent,df$iso\_code)**

**> tbl**

**AFG AGO ALB AND ARE ARG ARM ATG AUS AUT AZE BDI BEL BEN BFA BGD**

**322 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

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**Asia 0 322 0 0 0 322 0 322 0 0 0 322 0 0 0 0 322**

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**North America 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0**

**GRC GRD GTM GUY HKG HND HRV HTI HUN IDN IND IRL IRN IRQ ISL ISR ITA**

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**North America 0 322 322 0 0 322 0 322 0 0 0 0 0 0 0 0 0**

**JAM JOR JPN KAZ KEN KGZ KHM KNA KOR KWT LAO LBN LBR LBY LCA LIE LKA**

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**North America 322 0 0 0 0 0 0 322 0 0 0 0 0 0 322 0 0**

**LSO LTU LUX LVA MAR MCO MDA MDG MDV MEX MHL MKD MLI MLT MMR MNE MNG**

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**MOZ MRT MUS MWI MYS NAM NER NGA NIC NLD NOR NPL NZL OMN OWID\_KOS**

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**OWID\_WRL PAK PAN PER PHL PNG POL PRT PRY PSE QAT ROU RUS RWA SAU SDN**

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**North America 0 0 322 0 0 0 0 0 0 0 0 0 0 0 0 0**

**SEN SGP SLB SLE SLV SMR SOM SRB SSD STP SUR SVK SVN SWE SWZ SYC SYR**

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**North America 0 0 0 0 322 0 0 0 0 0 0 0 0 0 0 0 0**

**TCD TGO THA TJK TLS TTO TUN TUR TWN TZA UGA UKR URY USA UZB VAT VCT**

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**Europe 0 0 0 0 0 0 0 0 0 0 0 322 0 0 0 322 0**

**North America 0 0 0 0 0 322 0 0 0 0 0 0 0 323 0 0 322**

**VEN VNM VUT WSM YEM ZAF ZMB ZWE**

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**Africa 0 0 0 0 0 322 322 322**

**Asia 0 322 0 0 322 0 0 0**

**Europe 0 0 0 0 0 0 0 0**

**North America 0 0 0 0 0 0 0 0**

**[ reached getOption("max.print") -- omitted 2 rows ]**

**> chisq.test(tbl)**

**Pearson's Chi-squared test**

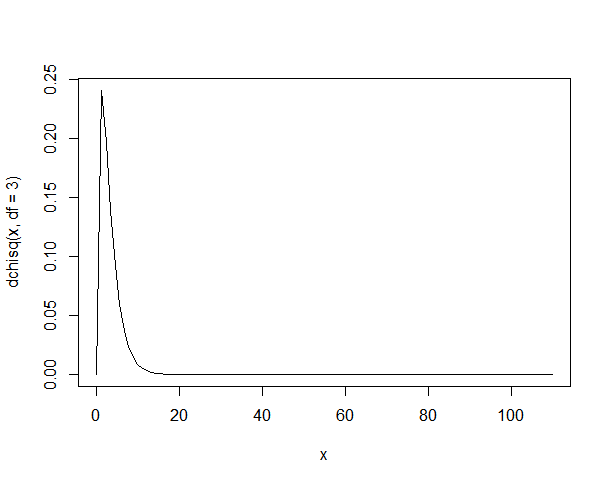
**data: tbl**

**X-squared = 369768, df = 1146, p-value < 2.2e-16**

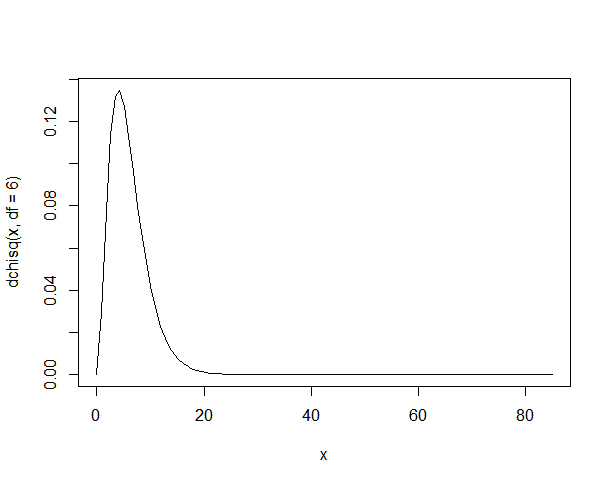
**Warning message:**

**In chisq.test(tbl) : Chi-squared approximation may be incorrect**

**> curve(dchisq(x,df=3),from=0, to=110)**

****

**> curve(dchisq(x,df=6),from=0, to=85)**

****

**> summary(df)**

**iso\_code continent location date**

**MEX : 344 : 645 Length:61628 Length:61628**

**THA : 341 Africa :17388 Class :character Class :character**

**TWN : 329 Asia :14913 Mode :character Mode :character**

**KOR : 324 Europe :14812**

**ARG : 323 North America: 7429**

**CHN : 323 Oceania : 2576**

**(Other):59644 South America: 3865**

**total\_cases new\_cases new\_cases\_smoothed total\_deaths**

**Min. : 1 Min. :-10034 Min. : -525.0 Min. : 1**

**1st Qu.: 376 1st Qu.: 0 1st Qu.: 0.4 1st Qu.: 22**

**Median : 3812 Median : 14 Median : 19.6 Median : 124**

**Mean : 225401 Mean : 2240 Mean : 2215.2 Mean : 8310**

**3rd Qu.: 37546 3rd Qu.: 260 3rd Qu.: 281.8 3rd Qu.: 1057**

**Max. :68894596 Max. :690539 Max. :623438.7 Max. :1569374**

**NA's :8968 NA's :125 NA's :1081 NA's :16886**

**new\_deaths new\_deaths\_smoothed total\_cases\_per\_million**

**Min. :-1918.00 Min. : -232.143 Min. : 0.00**

**1st Qu.: 0.00 1st Qu.: 0.000 1st Qu.: 77.78**

**Median : 0.00 Median : 0.286 Median : 599.03**

**Mean : 51.03 Mean : 50.777 Mean : 3753.44**

**3rd Qu.: 4.00 3rd Qu.: 4.571 3rd Qu.: 3808.96**

**Max. :12848.00 Max. :10897.857 Max. :92693.98**

**NA's :125 NA's :1081 NA's :9275**

**new\_cases\_per\_million new\_cases\_smoothed\_per\_million total\_deaths\_per\_million**

**Min. :-2153.437 Min. :-276.825 Min. : 0.001**

**1st Qu.: 0.000 1st Qu.: 0.079 1st Qu.: 3.908**

**Median : 1.737 Median : 2.864 Median : 19.842**

**Mean : 40.924 Mean : 40.372 Mean : 105.066**

**3rd Qu.: 24.273 3rd Qu.: 27.101 3rd Qu.: 95.527**

**Max. : 8652.658 Max. :2648.773 Max. :1518.860**

**NA's :447 NA's :1398 NA's :17180**

**new\_deaths\_per\_million new\_deaths\_smoothed\_per\_million reproduction\_rate**

**Min. :-76.4450 Min. :-10.9210 Min. :0.000**

**1st Qu.: 0.0000 1st Qu.: 0.0000 1st Qu.:0.880**

**Median : 0.0000 Median : 0.0260 Median :1.050**

**Mean : 0.7334 Mean : 0.7227 Mean :1.043**

**3rd Qu.: 0.3150 3rd Qu.: 0.4140 3rd Qu.:1.210**

**Max. :218.3290 Max. : 63.1400 Max. :6.720**

**NA's :447 NA's :1398 NA's :20369**

**icu\_patients icu\_patients\_per\_million hosp\_patients**

**Min. : 0.0 Min. : 0.00 Min. : 0**

**1st Qu.: 11.0 1st Qu.: 2.26 1st Qu.: 40**

**Median : 60.0 Median : 7.22 Median : 249**

**Mean : 874.4 Mean : 17.31 Mean : 4523**

**3rd Qu.: 475.2 3rd Qu.: 23.24 3rd Qu.: 2099**

**Max. :20922.0 Max. :127.18 Max. :106688**

**NA's :56808 NA's :56808 NA's :55849**

**hosp\_patients\_per\_million weekly\_icu\_admissions weekly\_icu\_admissions\_per\_million**

**Min. : 0.00 Min. : 0.00 Min. : 0.00**

**1st Qu.: 11.32 1st Qu.: 3.90 1st Qu.: 0.97**

**Median : 42.02 Median : 19.89 Median : 2.30**

**Mean : 105.49 Mean : 242.39 Mean : 9.42**

**3rd Qu.: 117.15 3rd Qu.: 180.08 3rd Qu.: 8.29**

**Max. :1007.42 Max. :4378.33 Max. :189.77**

**NA's :55849 NA's :61158 NA's :61158**

**weekly\_hosp\_admissions weekly\_hosp\_admissions\_per\_million new\_tests**

**Min. : 0.00 Min. : 0.00 Min. : -3743**

**1st Qu.: 16.25 1st Qu.: 4.57 1st Qu.: 1081**

**Median : 146.81 Median : 18.25 Median : 4066**

**Mean : 2498.59 Mean : 80.81 Mean : 30098**

**3rd Qu.: 1191.36 3rd Qu.: 52.98 3rd Qu.: 15121**

**Max. :50887.39 Max. :2645.19 Max. :2011508**

**NA's :60859 NA's :60859 NA's :36749**

**total\_tests total\_tests\_per\_thousand new\_tests\_per\_thousand**

**Min. : 1 Min. : 0.00 Min. :-0.40**

**1st Qu.: 69527 1st Qu.: 4.66 1st Qu.: 0.08**

**Median : 319853 Median : 24.27 Median : 0.37**

**Mean : 2693672 Mean : 94.03 Mean : 1.00**

**3rd Qu.: 1270302 3rd Qu.: 99.60 3rd Qu.: 1.16**

**Max. :198479985 Max. :2309.65 Max. :25.94**

**NA's :36803 NA's :36803 NA's :36749**

**new\_tests\_smoothed new\_tests\_smoothed\_per\_thousand positive\_rate**

**Min. : 0 Min. : 0.00 Min. :0.00**

**1st Qu.: 1136 1st Qu.: 0.08 1st Qu.:0.01**

**Median : 4305 Median : 0.38 Median :0.04**

**Mean : 29366 Mean : 0.98 Mean :0.07**

**3rd Qu.: 16815 3rd Qu.: 1.20 3rd Qu.:0.10**

**Max. :1748614 Max. :19.08 Max. :0.73**

**NA's :33889 NA's :33889 NA's :35827**

**tests\_per\_case tests\_units stringency\_index population**

**Min. : 1.4 Length:61628 Min. : 0.00 Min. :8.090e+02**

**1st Qu.: 9.4 Class :character 1st Qu.: 34.26 1st Qu.:2.226e+06**

**Median : 25.5 Mode :character Median : 57.41 Median :9.449e+06**

**Mean : 177.2 Mean : 53.32 Mean :8.187e+07**

**3rd Qu.: 82.0 3rd Qu.: 75.93 3rd Qu.:3.107e+07**

**Max. :44258.7 Max. :100.00 Max. :7.795e+09**

**NA's :36435 NA's :7639 NA's :322**

**population\_density median\_age aged\_65\_older aged\_70\_older**

**Min. : 1.98 Min. :15.10 Min. : 1.144 Min. : 0.526**

**1st Qu.: 35.88 1st Qu.:21.70 1st Qu.: 3.402 1st Qu.: 2.034**

**Median : 82.60 Median :29.40 Median : 6.211 Median : 3.564**

**Mean : 312.32 Mean :30.19 Mean : 8.584 Mean : 5.434**

**3rd Qu.: 207.57 3rd Qu.:38.70 3rd Qu.:13.928 3rd Qu.: 8.643**

**Max. :19347.50 Max. :48.20 Max. :27.049 Max. :18.493**

**NA's :1617 NA's :3220 NA's :3871 NA's :3542**

**gdp\_per\_capita extreme\_poverty cardiovasc\_death\_rate diabetes\_prevalence**

**Min. : 661.2 Min. : 0.1 Min. : 79.37 Min. : 0.990**

**1st Qu.: 3823.2 1st Qu.: 0.6 1st Qu.:170.05 1st Qu.: 5.290**

**Median : 11840.9 Median : 2.2 Median :243.96 Median : 7.110**

**Mean : 18355.9 Mean :13.9 Mean :262.44 Mean : 7.899**

**3rd Qu.: 26382.3 3rd Qu.:21.4 3rd Qu.:331.43 3rd Qu.:10.080**

**Max. :116935.6 Max. :77.6 Max. :724.42 Max. :30.530**

**NA's :2905 NA's :21653 NA's :2325 NA's :1617**

**female\_smokers male\_smokers handwashing\_facilities hospital\_beds\_per\_thousand**

**Min. : 0.1 Min. : 7.70 Min. : 1.188 Min. : 0.100**

**1st Qu.: 1.9 1st Qu.:21.60 1st Qu.:19.351 1st Qu.: 1.300**

**Median : 6.2 Median :31.40 Median :49.542 Median : 2.397**

**Mean :10.4 Mean :32.69 Mean :50.323 Mean : 2.999**

**3rd Qu.:19.1 3rd Qu.:41.10 3rd Qu.:82.502 3rd Qu.: 3.861**

**Max. :44.0 Max. :78.10 Max. :98.999 Max. :13.800**

**NA's :15534 NA's :16178 NA's :30996 NA's :7806**

**life\_expectancy human\_development\_index**

**Min. :53.28 Min. :0.3540**

**1st Qu.:67.27 1st Qu.:0.5880**

**Median :74.25 Median :0.7360**

**Mean :72.86 Mean :0.7088**

**3rd Qu.:77.97 3rd Qu.:0.8250**

**Max. :86.75 Max. :0.9530**

**NA's :644 NA's :2584**