

## 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
9	0.5	64.83	0.498
10	0.5	64.83	0.498
11	0.5	64.83	0.498
12	0.5	64.83	0.498
13	0.5	64.83	0.498
14	0.5	64.83	0.498
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`

	<code>iso_code</code>	<code>continent</code>	<code>location</code>	<code>date</code>	<code>total_cases</code>	<code>new_cases</code>	<code>new_cases_smoothed</code>
	<code>&lt;chr&gt;</code>	<code>&lt;chr&gt;</code>	<code>&lt;chr&gt;</code>	<code>&lt;chr&gt;</code>	<code>&lt;int&gt;</code>	<code>&lt;int&gt;</code>	<code>&lt;dbl&gt;</code>
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_smooth~
  <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>,

```

[illegible]

[illegible][illegible][illegible][illegible]

[419] 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

[illegible][illegible][illegible]

[illegible]

**[932] DZA**

**[951] DZA AND AND AND**

**[970] AND**

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

**[ reached getopt("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

[254] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia

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

[276] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia

[287] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia

[298] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia

[309] Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia Asia

[320] Asia Asia Asia Europe Europe Europe Europe Europe Europe Europe Europe

[331] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[342] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[353] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[364] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[375] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[386] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[397] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[408] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[419] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[430] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[441] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

[452] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe

**[463] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[474] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[485] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[496] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[507] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[518] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[529] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[540] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[551] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[562] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[573] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[584] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[595] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[606] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[617] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[628] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe**

**[639] Europe Europe Europe Europe Europe Europe Europe Africa Africa Africa Africa**

**[650] Africa Africa Africa Africa Africa Africa Africa Africa Africa Africa Africa**

**[661] Africa Africa Africa Africa Africa Africa Africa Africa Africa Africa Africa**

[illegible]

```
[991] Europe Europe Europe Europe Europe Europe Europe Europe Europe Europe
[ 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	0	0	0	0	0	0	0	0	0	0	0	0	0
BFA	0	0	0	0	0	0	0	0	0	0	0	0	0
BGD	0	0	0	0	0	0	0	0	0	0	0	0	0
Africa	0	0	322	0	0	0	0	0	0	0	0	322	0
Asia	0	322	0	0	0	322	0	322	0	0	0	0	322
Europe	0	0	0	322	322	0	0	0	0	322	0	0	322
North America	0	0	0	0	0	0	0	0	322	0	0	0	0

	BGR	BHR	BHS	BIH	BLR	BLZ	BOL	BRA	BRB	BRN	BTN	BWA	CAF	CAN
CHE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHL	0	0	0	0	0	0	0	0	0	0	0	322	322	0
CHN	0	322	0	0	0	0	0	0	0	322	322	0	0	0
Africa	0	0	0	0	0	0	0	0	0	0	0	322	322	0
Asia	0	322	0	0	0	0	0	0	0	322	322	0	0	0
Europe	322	0	0	322	322	0	0	0	0	0	0	0	0	322
North America	0	0	322	0	0	322	0	0	322	0	0	0	322	0

CIV CMR COD COG COL COM CPV CRI CUB CYP CZE DEU DJI DMA  
DNK DOM DZA

	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Africa	322	322	322	322	0	322	322	0	0	0	0	0	322	0	0	0	322
Asia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Europe	0	0	0	0	0	0	0	0	0	322	322	322	0	0	322	0	0
North America	0	0	0	0	0	0	0	0	322	322	0	0	0	0	322	0	322

ECU EGY ERI ESP EST ETH FIN FJI FRA GAB GBR GEO GHA GIN  
GMB GNB GNQ

	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Africa	0	322	322	0	0	322	0	0	0	322	0	0	322	322	322	322	322
Asia	0	0	0	0	0	0	0	0	0	0	0	322	0	0	0	0	0
Europe	0	0	0	322	322	0	322	0	322	0	322	0	0	0	0	0	0
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

	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asia	0	0	0	0	71	0	0	0	0	322	322	0	322	322	0	322	0
Europe	322	0	0	0	0	0	322	0	322	0	0	322	0	0	322	0	322
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

	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Africa	0	0	0	0	322	0	0	0	0	0	0	0	322	322	0	0	0
Asia	0	322	323	322	0	322	322	0	324	322	322	322	0	0	0	0	322
Europe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	322	0
North America	322	0	0	0	0	0	0	0	322	0	0	0	0	0	0	322	0



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

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0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Africa    322 322 0 0 0 0 322 0 0 322 322 0 0 0 0 0 0
Asia      0 0 341 322 322 0 0 322 329 0 0 0 0 0 322 0 0
Europe    0 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 0 323 0 0 322

```

VEN VNM VUT WSM YEM ZAF ZMB ZWE

```

0 0 0 0 0 0 0 0
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

```

[ reachedgetOption("max.print") -- omitted 2 rows ]

> chisq.test(tbl)

Pearson's Chi-squared test

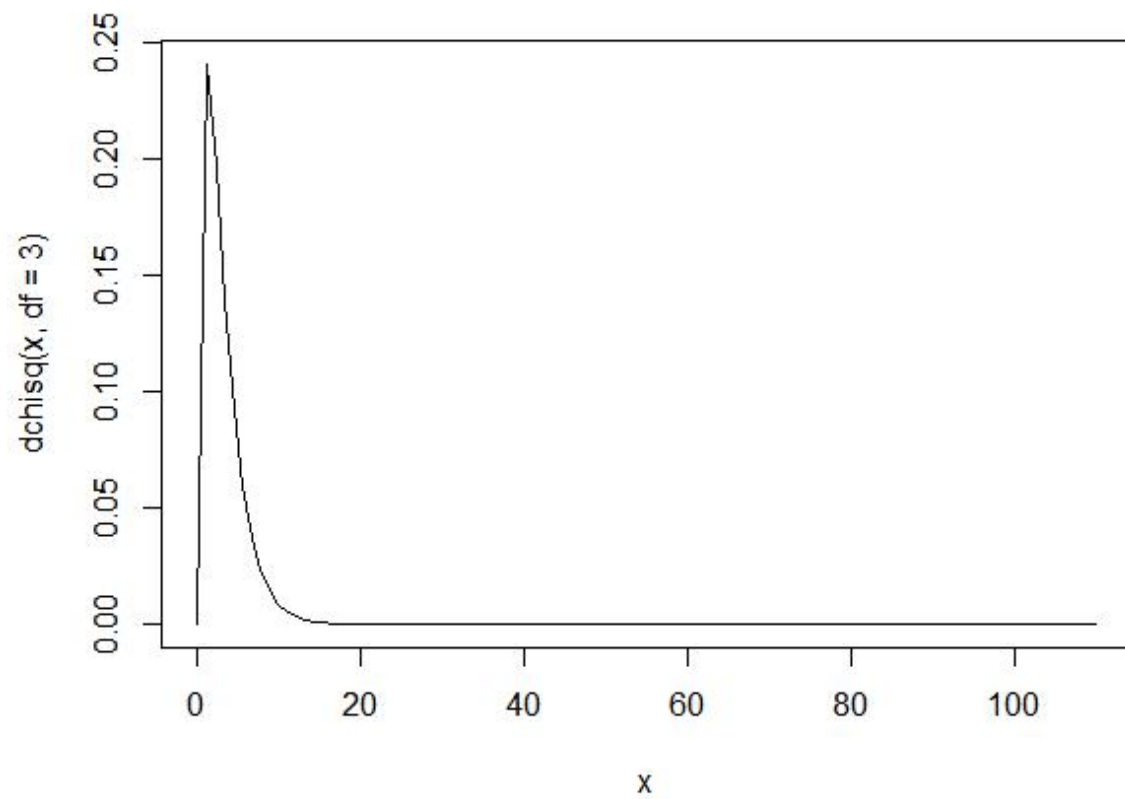
data: tbl

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

Warning message:

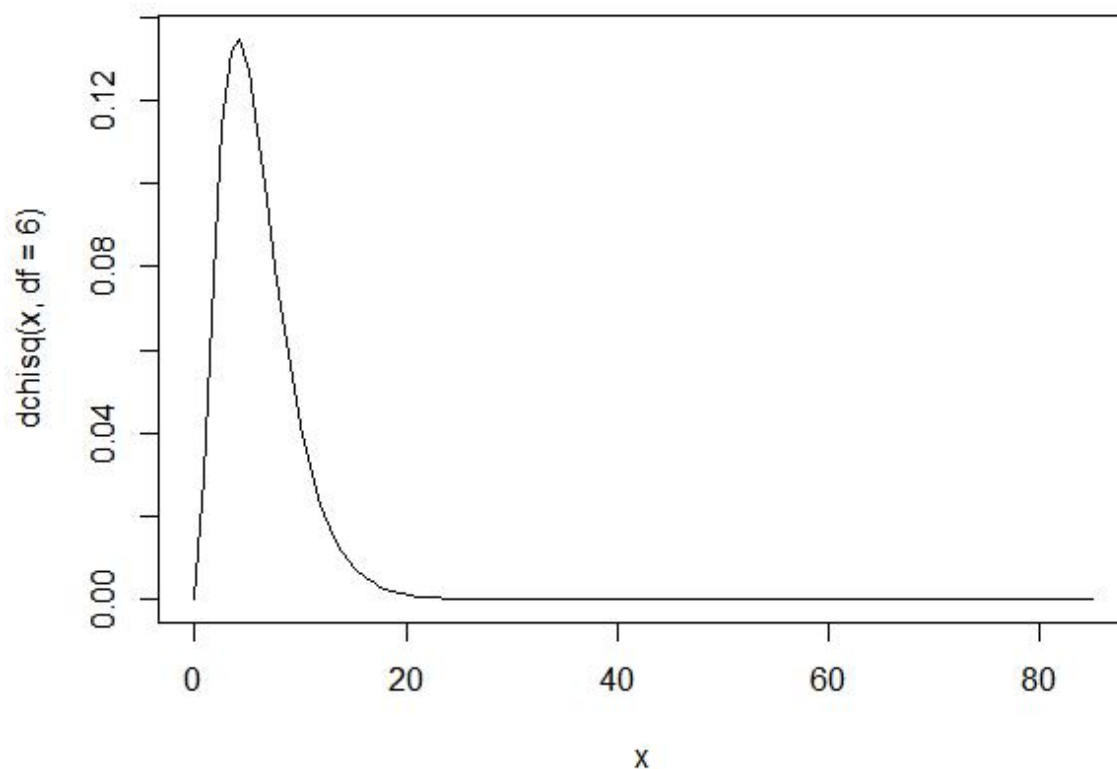
In chisq.test(tbl) : Chi-squared approximation may be incorrect

> 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

<b>Median :</b>	<b>60.0</b>	<b>Median :</b>	<b>7.22</b>	<b>Median :</b>	<b>249</b>
<b>Mean :</b>	<b>874.4</b>	<b>Mean :</b>	<b>17.31</b>	<b>Mean :</b>	<b>4523</b>
<b>3rd Qu.:</b>	<b>475.2</b>	<b>3rd Qu.:</b>	<b>23.24</b>	<b>3rd Qu.:</b>	<b>2099</b>
<b>Max. :</b>	<b>20922.0</b>	<b>Max. :</b>	<b>127.18</b>	<b>Max. :</b>	<b>106688</b>
<b>NA's :</b>	<b>56808</b>	<b>NA's :</b>	<b>56808</b>	<b>NA's :</b>	<b>55849</b>
<b>hosp_patients_per_million weekly_icu_admissions weekly_icu_admissions_per_million</b>					
<b>Min. :</b>	<b>0.00</b>	<b>Min. :</b>	<b>0.00</b>	<b>Min. :</b>	<b>0.00</b>
<b>1st Qu.:</b>	<b>11.32</b>	<b>1st Qu.:</b>	<b>3.90</b>	<b>1st Qu.:</b>	<b>0.97</b>
<b>Median :</b>	<b>42.02</b>	<b>Median :</b>	<b>19.89</b>	<b>Median :</b>	<b>2.30</b>
<b>Mean :</b>	<b>105.49</b>	<b>Mean :</b>	<b>242.39</b>	<b>Mean :</b>	<b>9.42</b>
<b>3rd Qu.:</b>	<b>117.15</b>	<b>3rd Qu.:</b>	<b>180.08</b>	<b>3rd Qu.:</b>	<b>8.29</b>
<b>Max. :</b>	<b>1007.42</b>	<b>Max. :</b>	<b>4378.33</b>	<b>Max. :</b>	<b>189.77</b>
<b>NA's :</b>	<b>55849</b>	<b>NA's :</b>	<b>61158</b>	<b>NA's :</b>	<b>61158</b>
<b>weekly_hosp_admissions weekly_hosp_admissions_per_million new_tests</b>					
<b>Min. :</b>	<b>0.00</b>	<b>Min. :</b>	<b>0.00</b>	<b>Min. :</b>	<b>-3743</b>
<b>1st Qu.:</b>	<b>16.25</b>	<b>1st Qu.:</b>	<b>4.57</b>	<b>1st Qu.:</b>	<b>1081</b>
<b>Median :</b>	<b>146.81</b>	<b>Median :</b>	<b>18.25</b>	<b>Median :</b>	<b>4066</b>
<b>Mean :</b>	<b>2498.59</b>	<b>Mean :</b>	<b>80.81</b>	<b>Mean :</b>	<b>30098</b>
<b>3rd Qu.:</b>	<b>1191.36</b>	<b>3rd Qu.:</b>	<b>52.98</b>	<b>3rd Qu.:</b>	<b>15121</b>
<b>Max. :</b>	<b>50887.39</b>	<b>Max. :</b>	<b>2645.19</b>	<b>Max. :</b>	<b>2011508</b>
<b>NA's :</b>	<b>60859</b>	<b>NA's :</b>	<b>60859</b>	<b>NA's :</b>	<b>36749</b>
<b>total_tests total_tests_per_thousand new_tests_per_thousand</b>					
<b>Min. :</b>	<b>1</b>	<b>Min. :</b>	<b>0.00</b>	<b>Min. :</b>	<b>-0.40</b>
<b>1st Qu.:</b>	<b>69527</b>	<b>1st Qu.:</b>	<b>4.66</b>	<b>1st Qu.:</b>	<b>0.08</b>
<b>Median :</b>	<b>319853</b>	<b>Median :</b>	<b>24.27</b>	<b>Median :</b>	<b>0.37</b>
<b>Mean :</b>	<b>2693672</b>	<b>Mean :</b>	<b>94.03</b>	<b>Mean :</b>	<b>1.00</b>
<b>3rd Qu.:</b>	<b>1270302</b>	<b>3rd Qu.:</b>	<b>99.60</b>	<b>3rd Qu.:</b>	<b>1.16</b>
<b>Max. :</b>	<b>198479985</b>	<b>Max. :</b>	<b>2309.65</b>	<b>Max. :</b>	<b>25.94</b>
<b>NA's :</b>	<b>36803</b>	<b>NA's :</b>	<b>36803</b>	<b>NA's :</b>	<b>36749</b>
<b>new_tests_smoothed new_tests_smoothed_per_thousand positive_rate</b>					

<b>Min. : 0</b>	<b>Min. : 0.00</b>	<b>Min. : 0.00</b>	
<b>1st Qu.: 1136</b>	<b>1st Qu.: 0.08</b>	<b>1st Qu.: 0.01</b>	
<b>Median : 4305</b>	<b>Median : 0.38</b>	<b>Median : 0.04</b>	
<b>Mean : 29366</b>	<b>Mean : 0.98</b>	<b>Mean : 0.07</b>	
<b>3rd Qu.: 16815</b>	<b>3rd Qu.: 1.20</b>	<b>3rd Qu.: 0.10</b>	
<b>Max. : 1748614</b>	<b>Max. : 19.08</b>	<b>Max. : 0.73</b>	
<b>NA's : 33889</b>	<b>NA's : 33889</b>	<b>NA's : 35827</b>	
<b>tests_per_case</b>	<b>tests_units</b>	<b>stringency_index</b>	<b>population</b>
<b>Min. : 1.4</b>	<b>Length: 61628</b>	<b>Min. : 0.00</b>	<b>Min. : 8.090e+02</b>
<b>1st Qu.: 9.4</b>	<b>Class : character</b>	<b>1st Qu.: 34.26</b>	<b>1st Qu.: 2.226e+06</b>
<b>Median : 25.5</b>	<b>Mode : character</b>	<b>Median : 57.41</b>	<b>Median : 9.449e+06</b>
<b>Mean : 177.2</b>		<b>Mean : 53.32</b>	<b>Mean : 8.187e+07</b>
<b>3rd Qu.: 82.0</b>		<b>3rd Qu.: 75.93</b>	<b>3rd Qu.: 3.107e+07</b>
<b>Max. : 44258.7</b>		<b>Max. : 100.00</b>	<b>Max. : 7.795e+09</b>
<b>NA's : 36435</b>		<b>NA's : 7639</b>	<b>NA's : 322</b>
<b>population_density</b>	<b>median_age</b>	<b>aged_65_older</b>	<b>aged_70_older</b>
<b>Min. : 1.98</b>	<b>Min. : 15.10</b>	<b>Min. : 1.144</b>	<b>Min. : 0.526</b>
<b>1st Qu.: 35.88</b>	<b>1st Qu.: 21.70</b>	<b>1st Qu.: 3.402</b>	<b>1st Qu.: 2.034</b>
<b>Median : 82.60</b>	<b>Median : 29.40</b>	<b>Median : 6.211</b>	<b>Median : 3.564</b>
<b>Mean : 312.32</b>	<b>Mean : 30.19</b>	<b>Mean : 8.584</b>	<b>Mean : 5.434</b>
<b>3rd Qu.: 207.57</b>	<b>3rd Qu.: 38.70</b>	<b>3rd Qu.: 13.928</b>	<b>3rd Qu.: 8.643</b>
<b>Max. : 19347.50</b>	<b>Max. : 48.20</b>	<b>Max. : 27.049</b>	<b>Max. : 18.493</b>
<b>NA's : 1617</b>	<b>NA's : 3220</b>	<b>NA's : 3871</b>	<b>NA's : 3542</b>
<b>gdp_per_capita</b>	<b>extreme_poverty</b>	<b>cardiovasc_death_rate</b>	<b>diabetes_prevalence</b>
<b>Min. : 661.2</b>	<b>Min. : 0.1</b>	<b>Min. : 79.37</b>	<b>Min. : 0.990</b>
<b>1st Qu.: 3823.2</b>	<b>1st Qu.: 0.6</b>	<b>1st Qu.: 170.05</b>	<b>1st Qu.: 5.290</b>
<b>Median : 11840.9</b>	<b>Median : 2.2</b>	<b>Median : 243.96</b>	<b>Median : 7.110</b>
<b>Mean : 18355.9</b>	<b>Mean : 13.9</b>	<b>Mean : 262.44</b>	<b>Mean : 7.899</b>
<b>3rd Qu.: 26382.3</b>	<b>3rd Qu.: 21.4</b>	<b>3rd Qu.: 331.43</b>	<b>3rd Qu.: 10.080</b>
<b>Max. : 116935.6</b>	<b>Max. : 77.6</b>	<b>Max. : 724.42</b>	<b>Max. : 30.530</b>

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