In [1]:
```
pip install pandas
```

```
Requirement already satisfied: pandas in c:\programdata\anaconda3\lib\site-packages (1.3.
4)
Requirement already satisfied: python-dateutil>=2.7.3 in c:\programdata\anaconda3\lib\site
-packages (from pandas) (2.8.2)
Requirement already satisfied: numpy>=1.17.3 in c:\programdata\anaconda3\lib\site-packages
(from pandas) (1.20.3)
Requirement already satisfied: pytz>=2017.3 in c:\programdata\anaconda3\lib\site-packages
(from pandas) (2021.3)
Requirement already satisfied: six>=1.5 in c:\programdata\anaconda3\lib\site-packages (fro
m python-dateutil>=2.7.3->pandas) (1.16.0)
Note: you may need to restart the kernel to use updated packages.
```

In [2]:
```
pip install -U pandasql
```

```
Requirement already satisfied: pandasql in c:\programdata\anaconda3\lib\site-packages (0.
7.3)
Requirement already satisfied: sqlalchemy in c:\programdata\anaconda3\lib\site-packages (f
rom pandasql) (1.4.22)
Requirement already satisfied: pandas in c:\programdata\anaconda3\lib\site-packages (from
pandasql) (1.3.4)
Requirement already satisfied: numpy in c:\programdata\anaconda3\lib\site-packages (from p
andasql) (1.20.3)
Requirement already satisfied: pytz>=2017.3 in c:\programdata\anaconda3\lib\site-packages
(from pandas->pandasql) (2021.3)
Requirement already satisfied: python-dateutil>=2.7.3 in c:\programdata\anaconda3\lib\site
-packages (from pandas->pandasql) (2.8.2)
Requirement already satisfied: six>=1.5 in c:\programdata\anaconda3\lib\site-packages (fro
m python-dateutil>=2.7.3->pandas->pandasql) (1.16.0)
Requirement already satisfied: greenlet!=0.4.17 in c:\programdata\anaconda3\lib\site-packa
ges (from sqlalchemy->pandasql) (1.1.1)
Note: you may need to restart the kernel to use updated packages.
```

In [3]:
```
pip install plotly
```

```
Requirement already satisfied: plotly in c:\programdata\anaconda3\lib\site-packages (5.11.
0)Note: you may need to restart the kernel to use updated packages.

Requirement already satisfied: tenacity>=6.2.0 in c:\programdata\anaconda3\lib\site-packag
es (from plotly) (8.1.0)
```

In [4]:
```
#importing the required libraries
import pandas as pd
from pandasql import sqldf
from datetime import datetime
import seaborn as sns
from matplotlib import pyplot as plt
import calendar
import plotly.express as px
```

In [5]:
```
#Loading the covid_data data set into a dataframe
df = pd.read_csv(r'C:\Users\vkoyya\covid_data.csv')
print("Number of Columns :",len(df.columns))
print("Number of Records :",len(df))
```

```
Number of Columns : 33
Number of Records : 228993
```

In [6]:
```
#To check the information about the DataFrame.
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 228993 entries, 0 to 228992
Data columns (total 33 columns):
 #   Column                      Non-Null Count   Dtype  
---  ------                      --------------   -----  
 0   iso_code                    228993 non-null  object 
 1   continent                   216999 non-null  object 
 2   location                    228993 non-null  object 
 3   date                        228993 non-null  object 
 4   total_cases                 215930 non-null  float64
 5   new_cases                   215659 non-null  float64
 6   total_deaths                196743 non-null  float64
 7   new_deaths                  196680 non-null  float64
 8   reproduction_rate           170597 non-null  float64
 9   icu_patients                31376 non-null   float64
 10  hosp_patients               35176 non-null   float64
 11  weekly_icu_admissions       7827 non-null    float64
 12  weekly_hosp_admissions      18570 non-null   float64
 13  total_tests                 79387 non-null   float64
 14  new_tests                   75403 non-null   float64
 15  positive_rate               95927 non-null   float64
 16  tests_per_case              94348 non-null   float64
 17  total_vaccinations          65696 non-null   float64
 18  people_vaccinated           62903 non-null   float64
 19  people_fully_vaccinated     60195 non-null   float64
 20  total_boosters              35778 non-null   float64
 21  new_vaccinations            54442 non-null   float64
 22  stringency_index            168991 non-null  float64
 23  population_density          200842 non-null  float64
 24  median_age                  185830 non-null  float64
 25  aged_65_older               183869 non-null  float64
 26  aged_70_older               184858 non-null  float64
 27  gdp_per_capita              185239 non-null  float64
 28  handwashing_facilities      212932 non-null  float64
 29  hospital_beds_per_thousand  212932 non-null  float64
 30  life_expectancy             211374 non-null  float64
 31  human_development_index     180812 non-null  float64
 32  population                  228993 non-null  int64  
dtypes: float64(28), int64(1), object(4)
memory usage: 57.7+ MB
```

In [7]:
```
#Preprocessing the data
df_fil = df[~df["iso_code"].str.contains('OWID_')]
```

In [8]:
```
#Data cleaning removing all duplicates and filling null values to zeros
df_fil1 = df_fil.drop_duplicates(keep=False)
df_fil2 = df_fil1.fillna(0)
display(df_fil2)
```

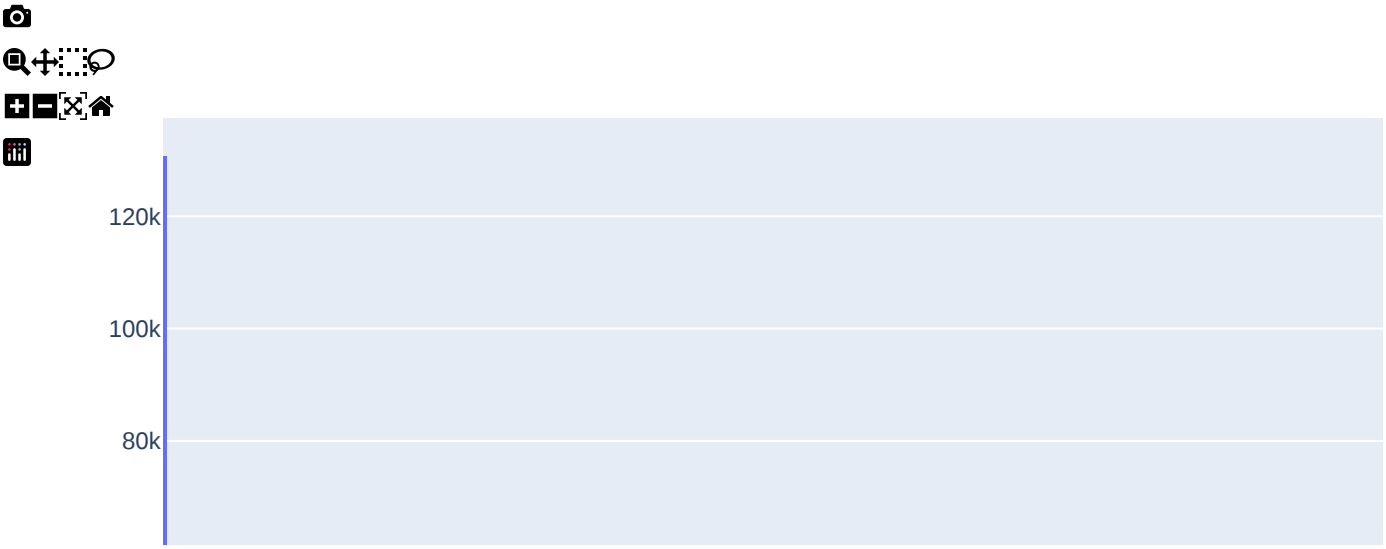
	iso_code	continent	location	date	total_cases	new_cases	total_deaths	new_deaths	reproduc
0	AFG	Asia	Afghanistan	2/24/2020	5.0	5.0	0.0	0.0	
1	AFG	Asia	Afghanistan	2/25/2020	5.0	0.0	0.0	0.0	
2	AFG	Asia	Afghanistan	2/26/2020	5.0	0.0	0.0	0.0	
3	AFG	Asia	Afghanistan	2/27/2020	5.0	0.0	0.0	0.0	
4	AFG	Asia	Afghanistan	2/28/2020	5.0	0.0	0.0	0.0	

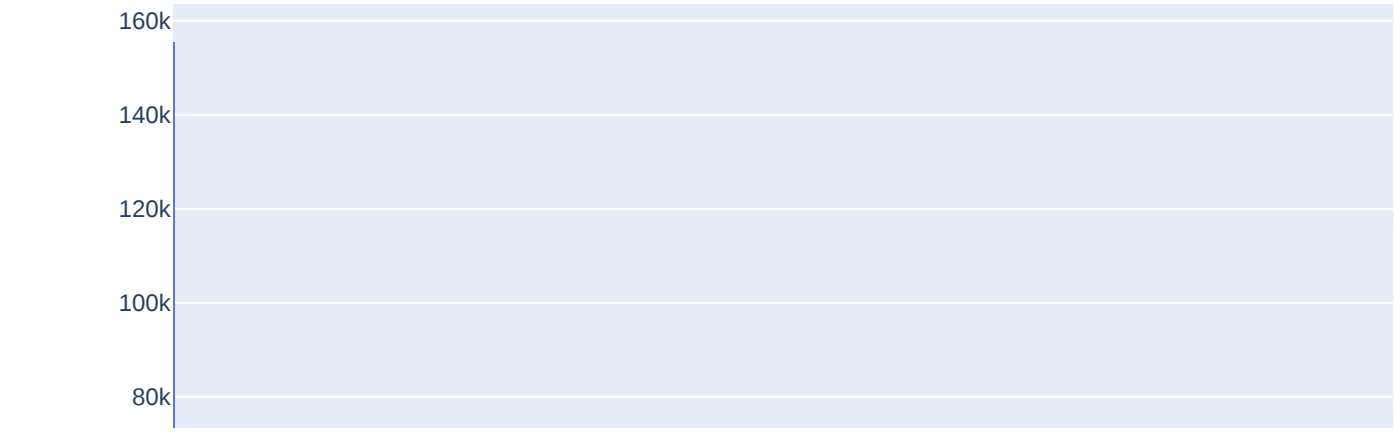
	iso_code	continent	location	date	total_cases	new_cases	total_deaths	new_deaths	reproduc
...	...	...	...	...	...	...	...	...	
228988	ZWE	Africa	Zimbabwe	10/20/2022	257893.0	0.0	5606.0	0.0	
228989	ZWE	Africa	Zimbabwe	10/21/2022	257893.0	0.0	5606.0	0.0	
228990	ZWE	Africa	Zimbabwe	10/22/2022	257893.0	0.0	5606.0	0.0	
228991	ZWE	Africa	Zimbabwe	10/23/2022	257893.0	0.0	5606.0	0.0	
228992	ZWE	Africa	Zimbabwe	10/24/2022	257893.0	0.0	5606.0	0.0	

211925 rows × 33 columns

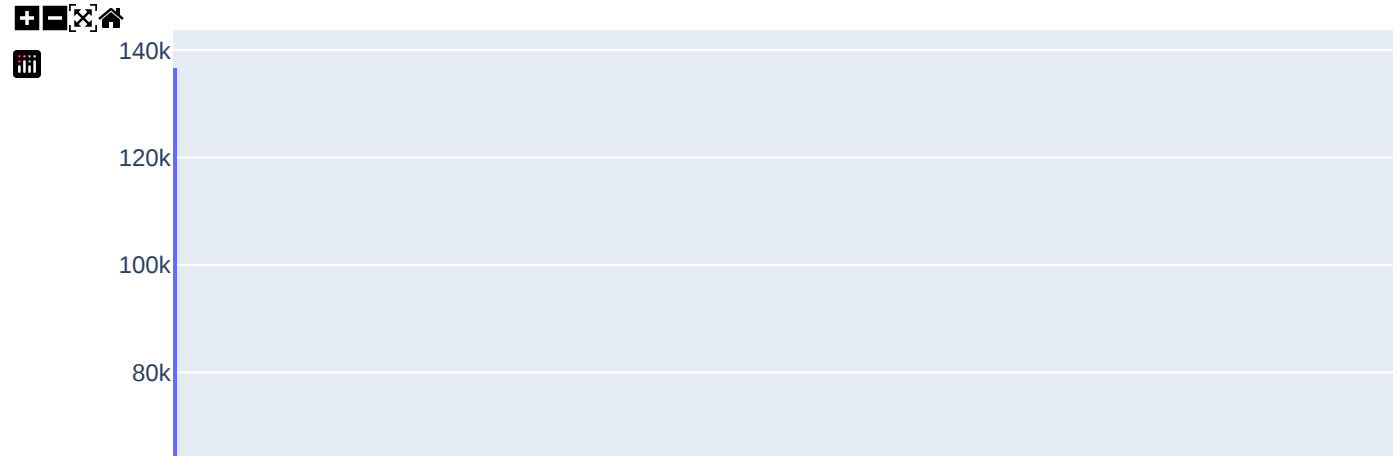
In [9]:

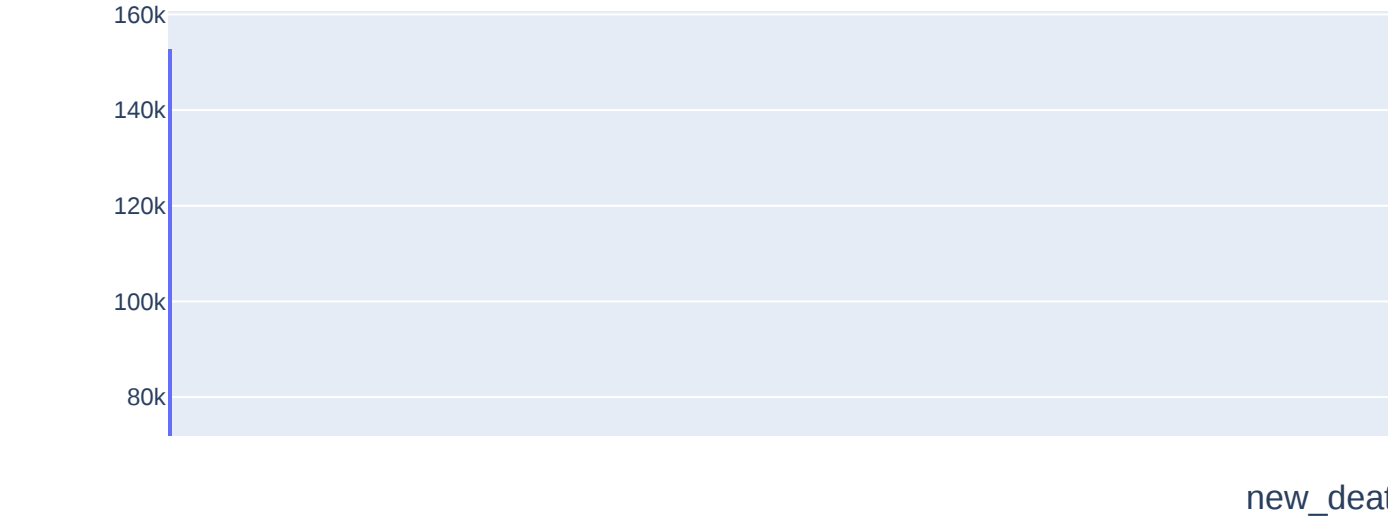
```
#Exploratory Data Analysis(EDA) of the dataset for numric values.
from typing import List
import numpy as np
int_columns: List[str] = df_fil2.select_dtypes(include=[np.number]).columns
for i in int_columns:
    fig = px.histogram(data_frame=df_fil2, x=i)
    fig.update_layout(title=dict(text=i,x=0.5))
    fig.show()
```





new_cas

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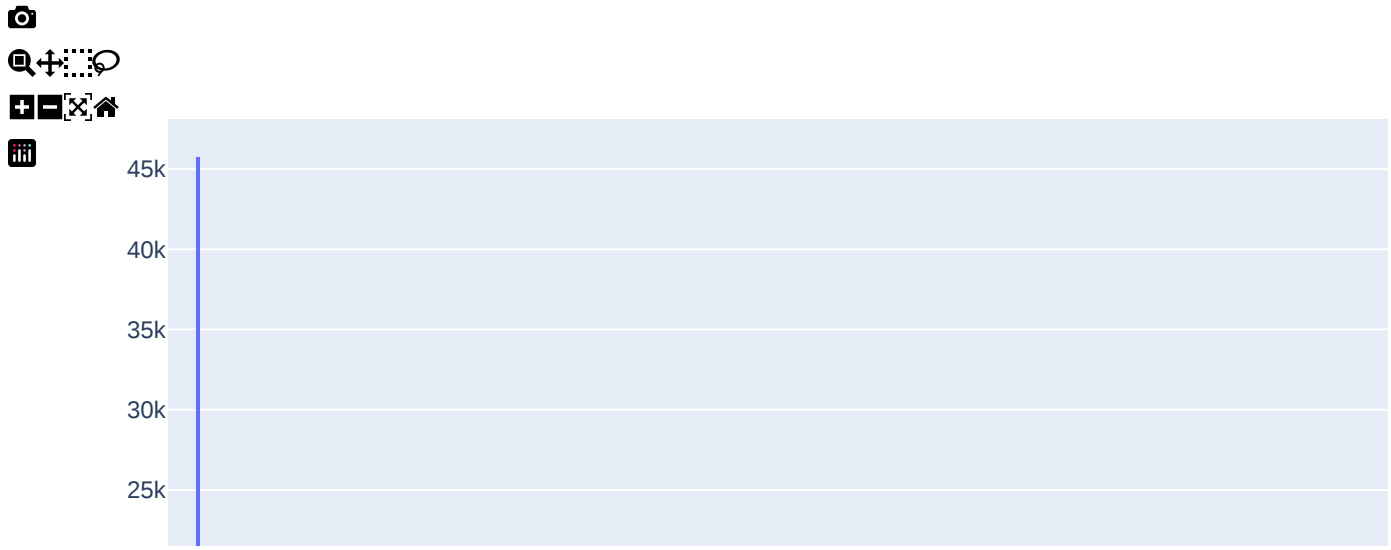
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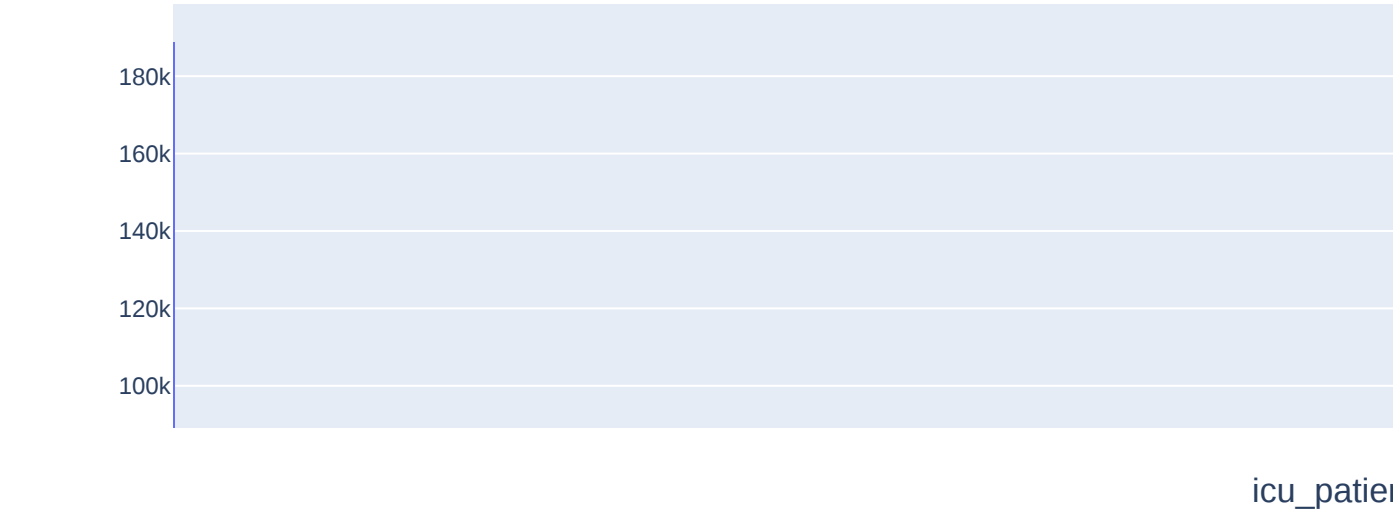
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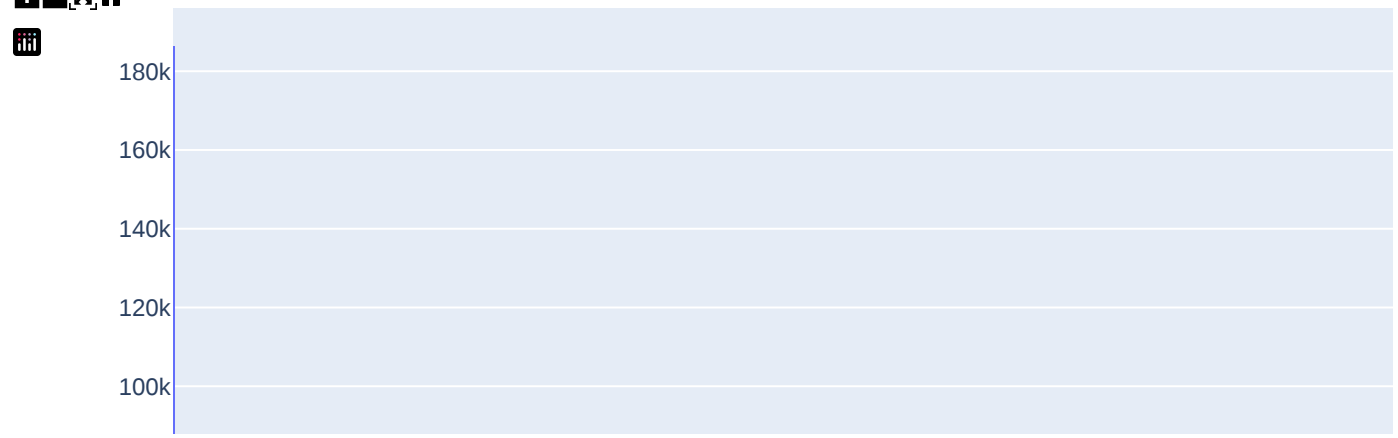
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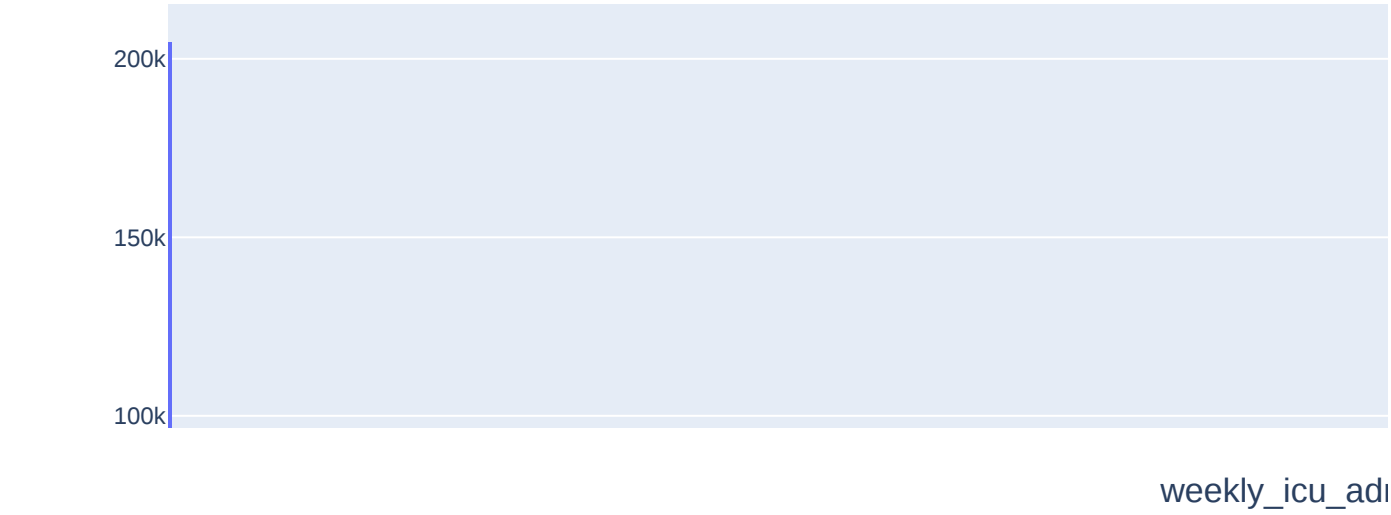
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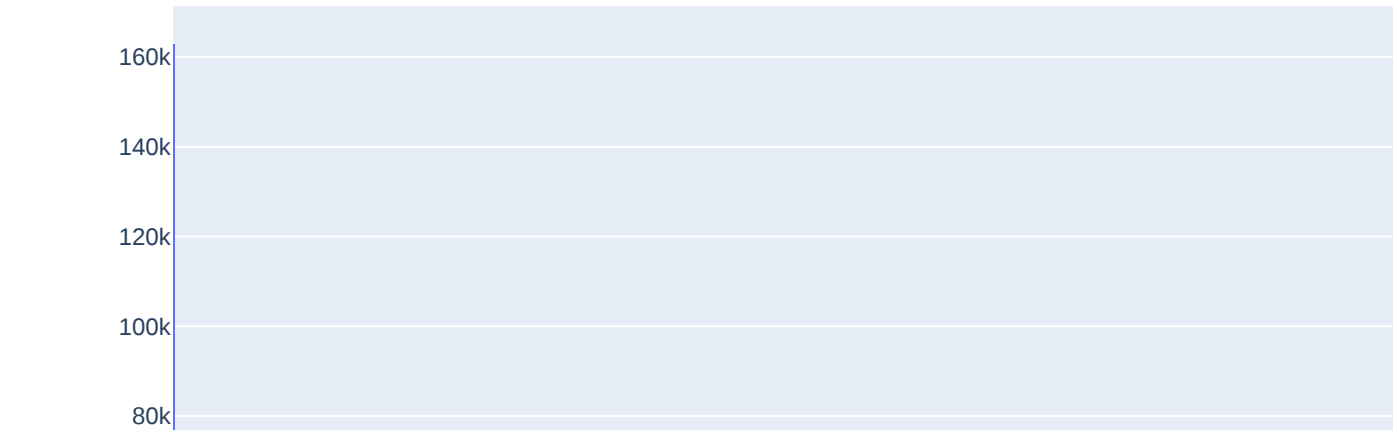
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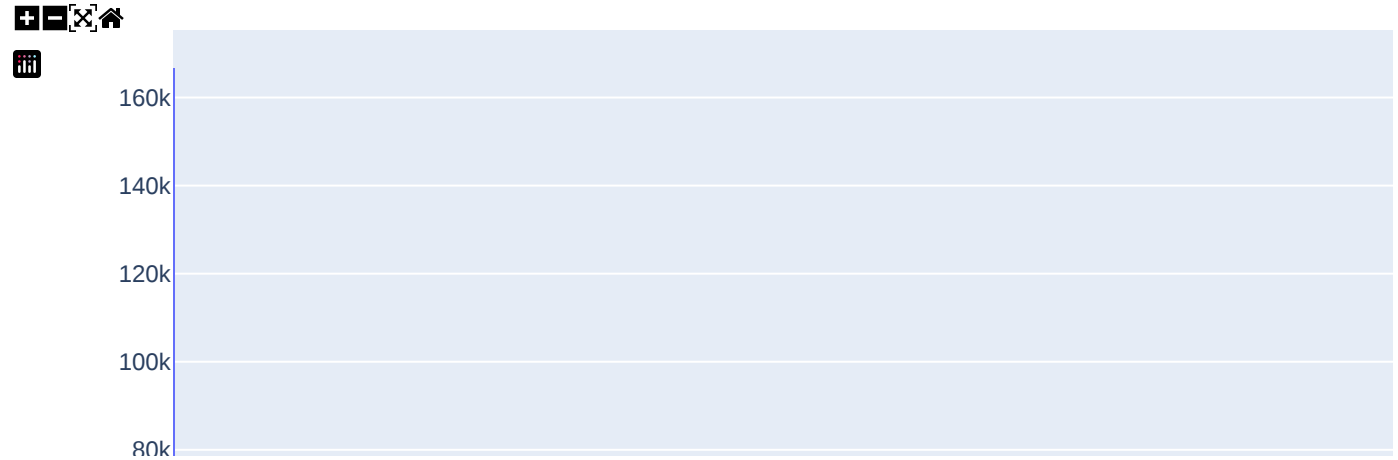
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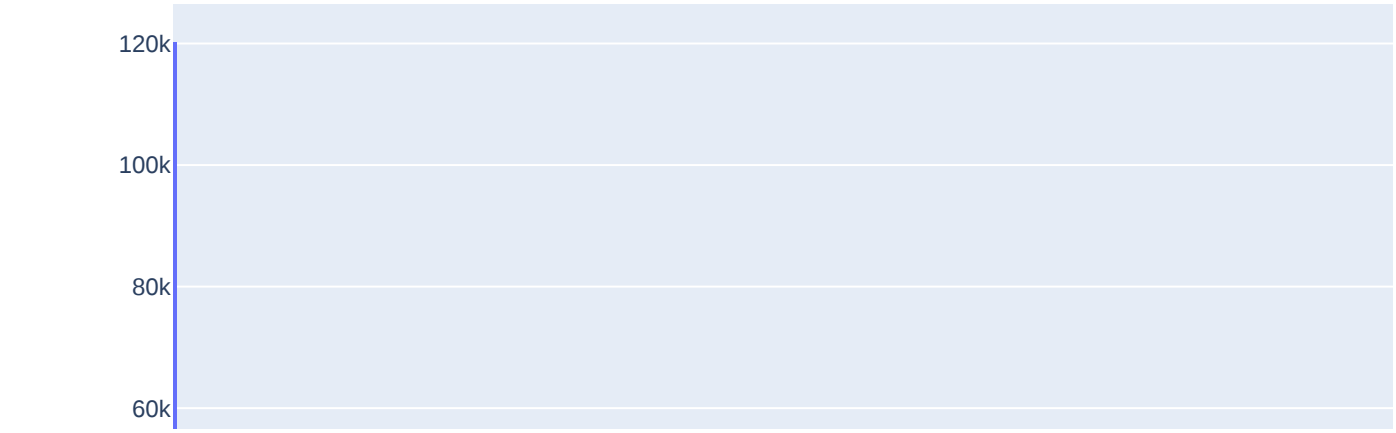
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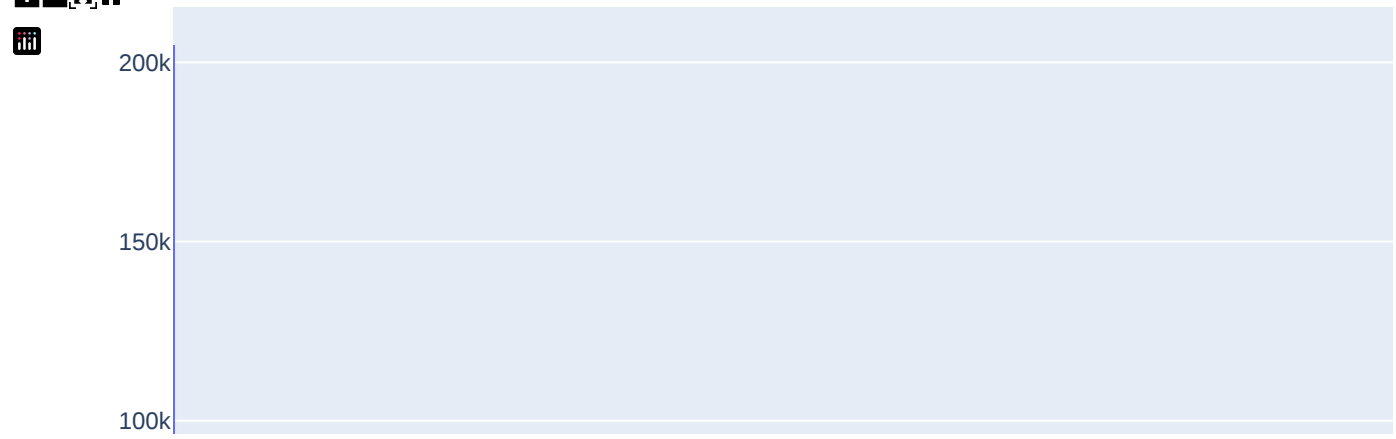
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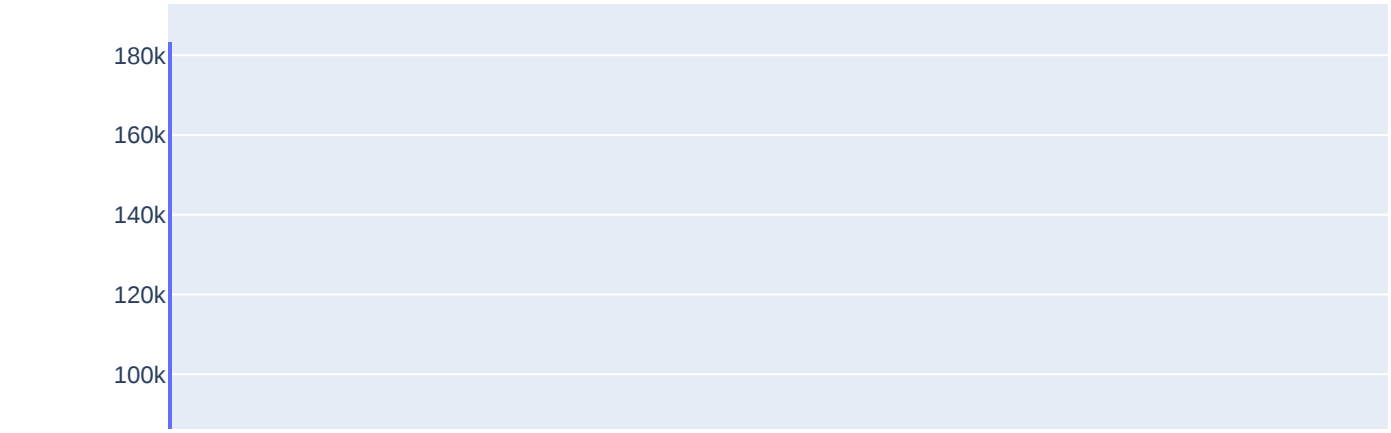
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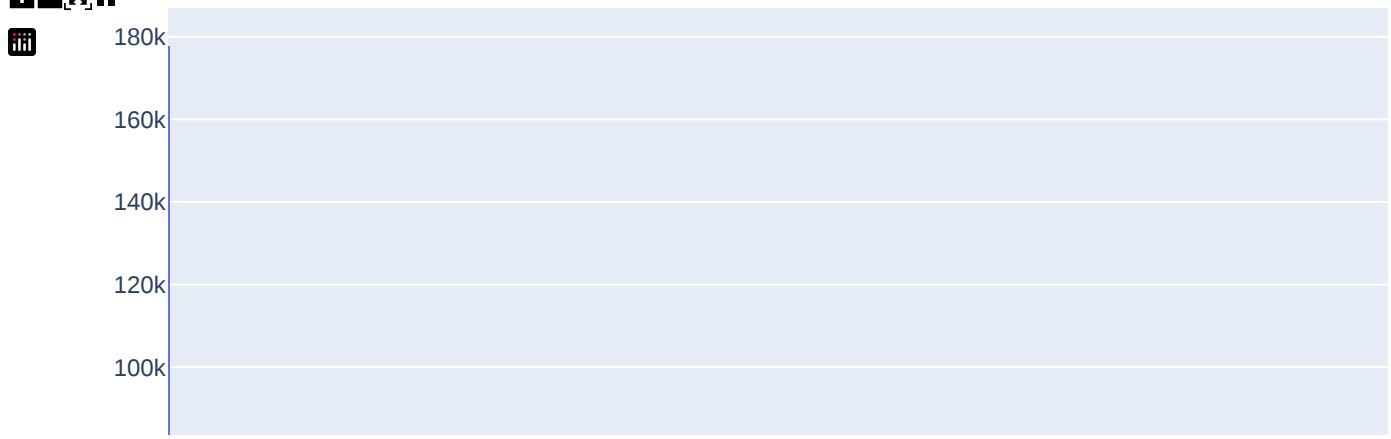
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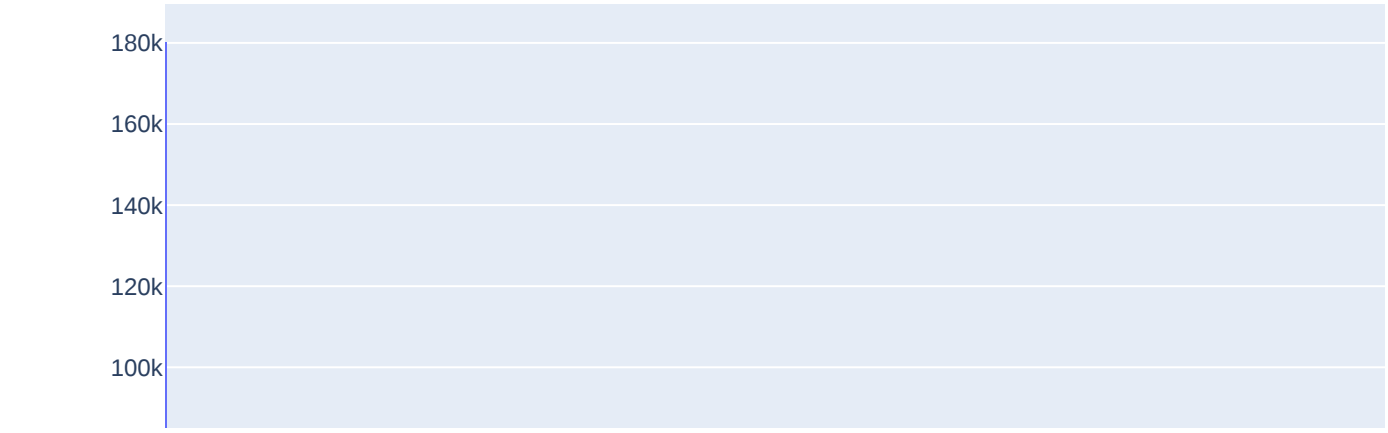
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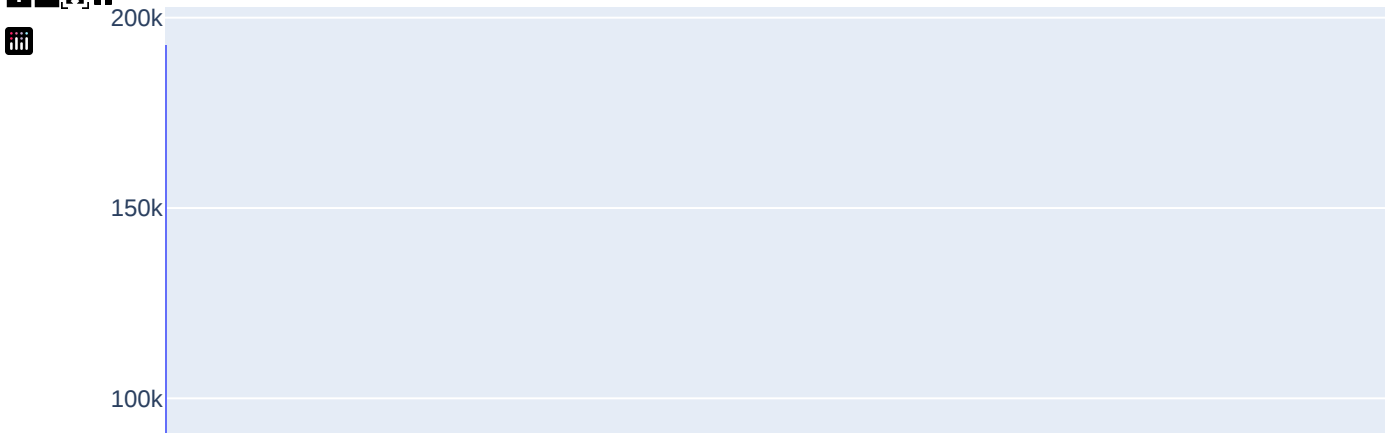
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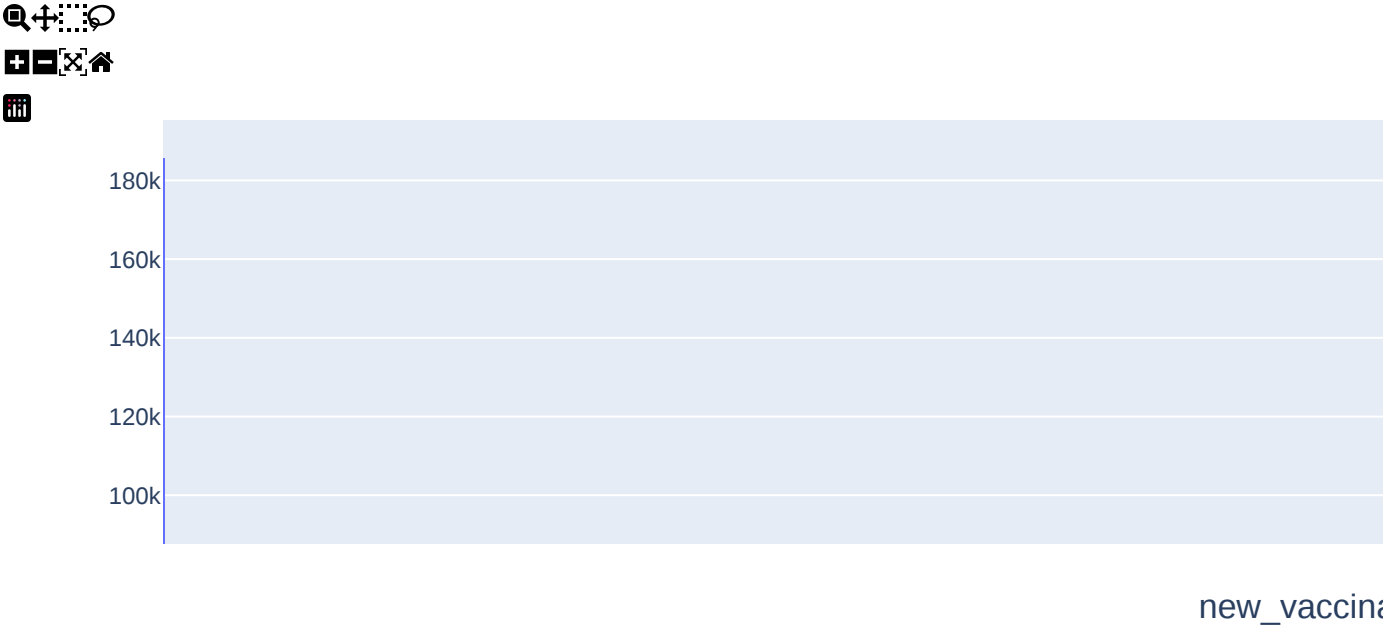
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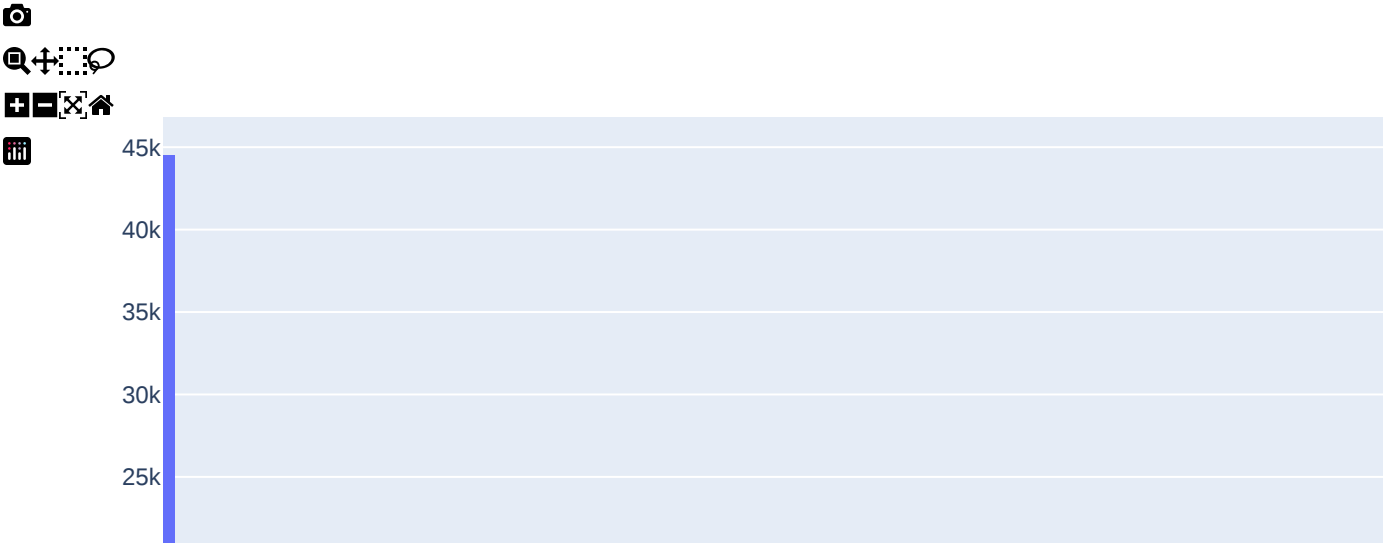
new_vaccina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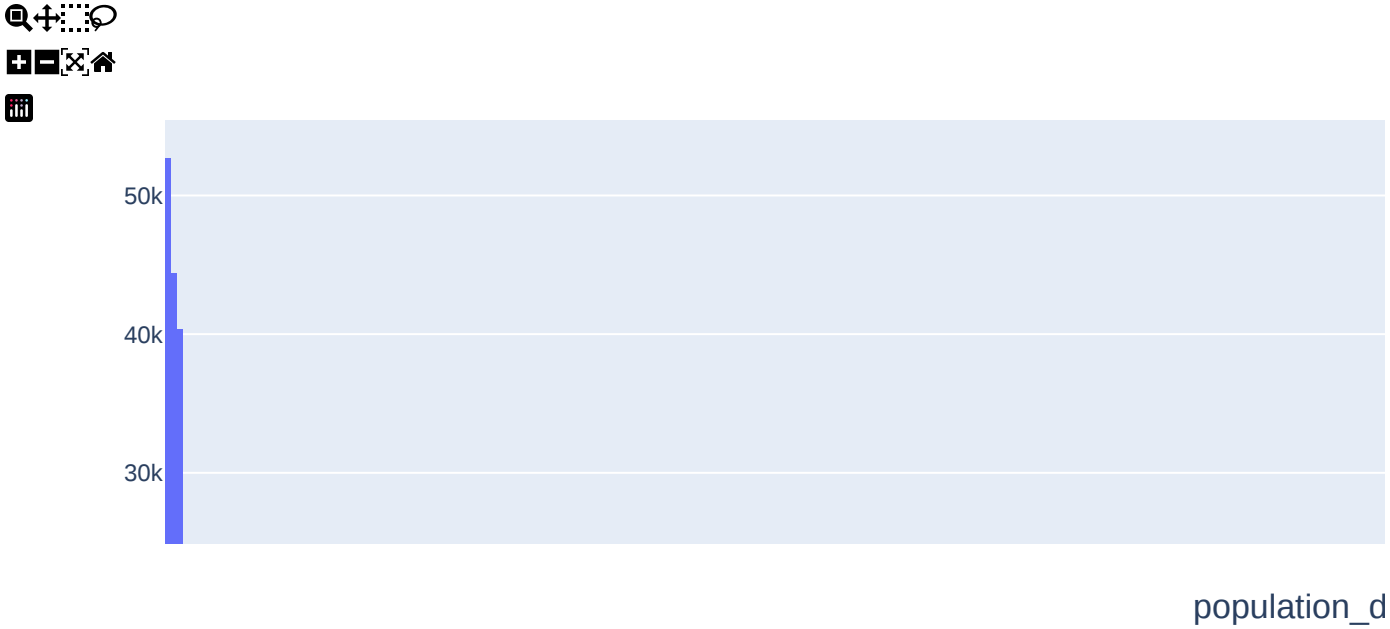
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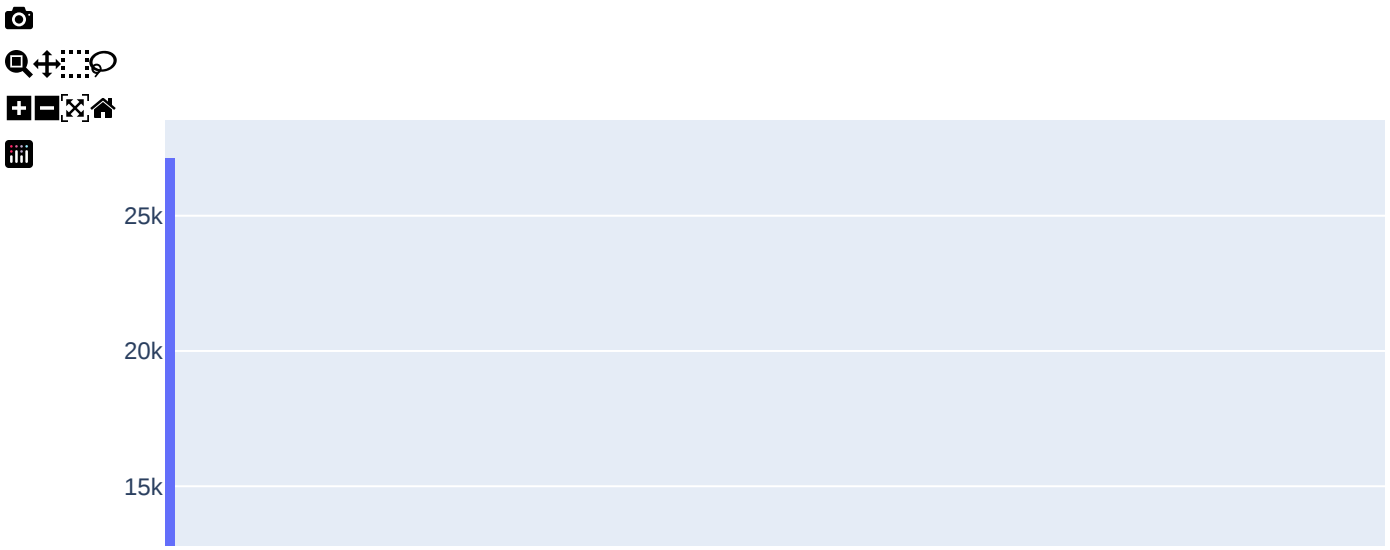
population_d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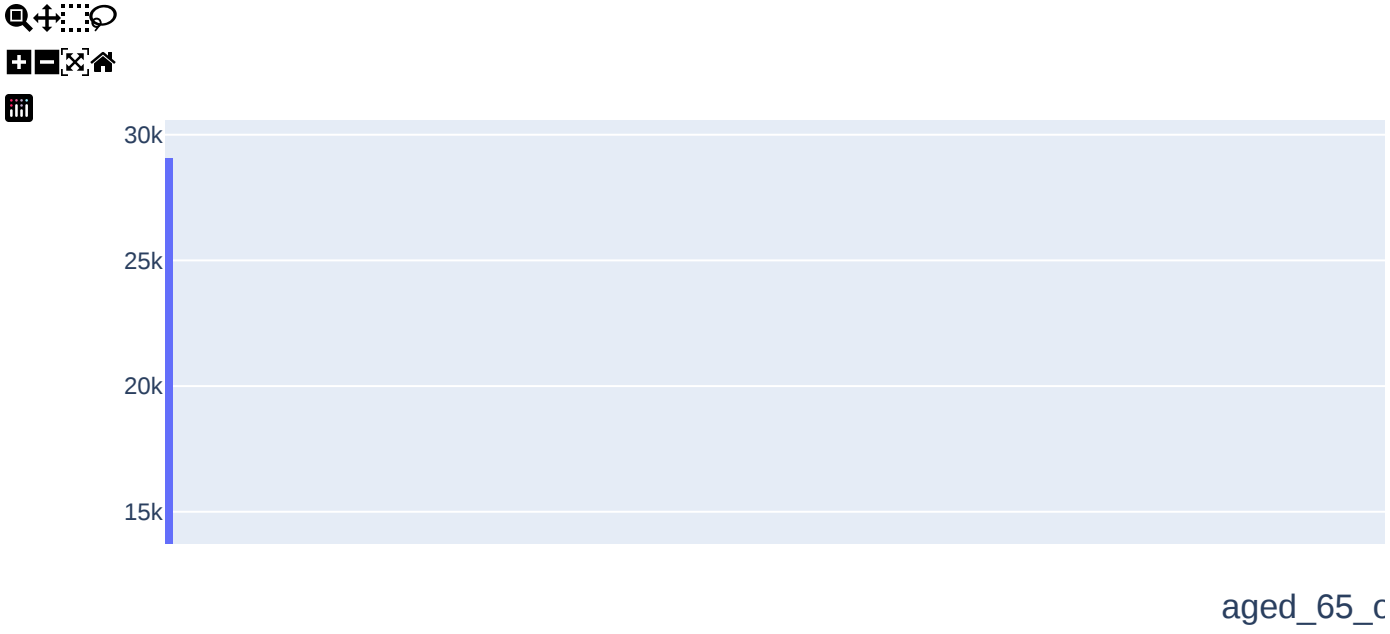
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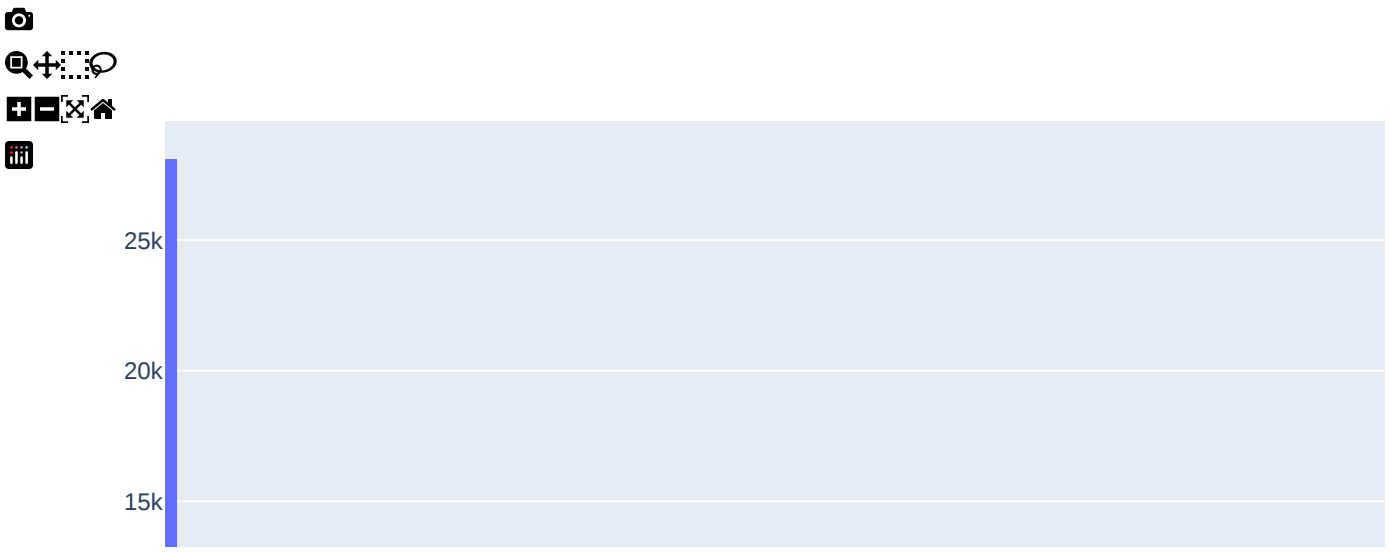
aged_65_c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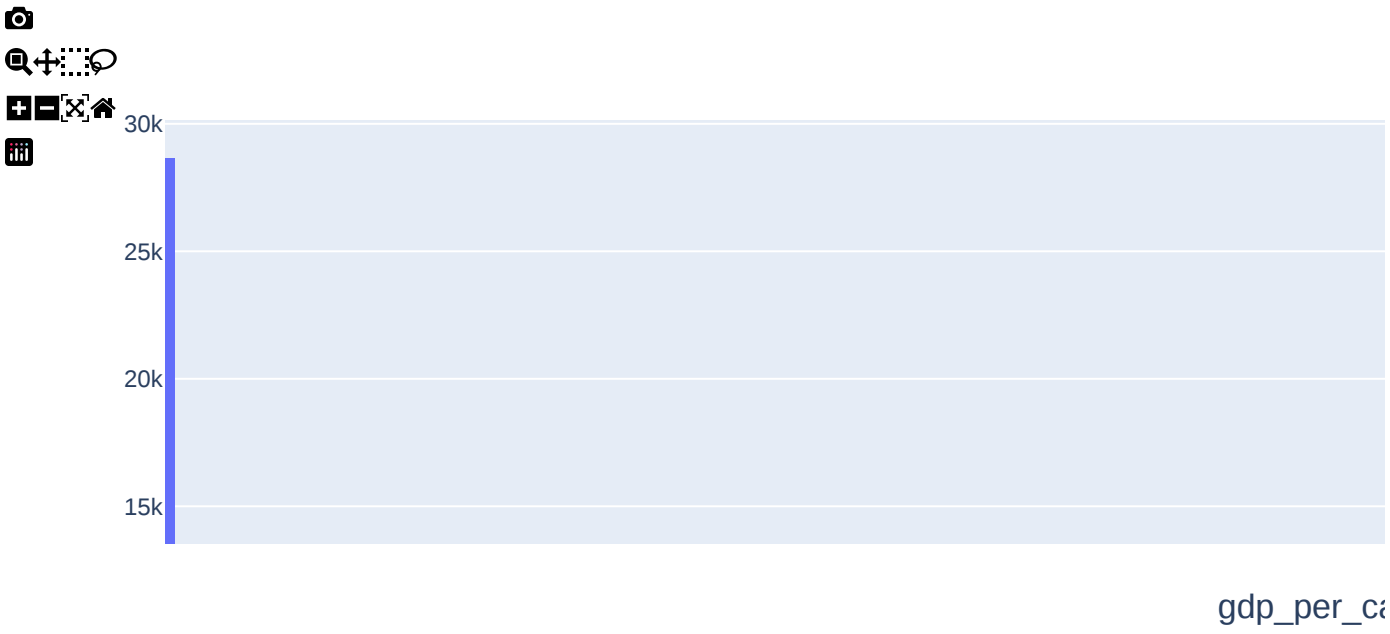
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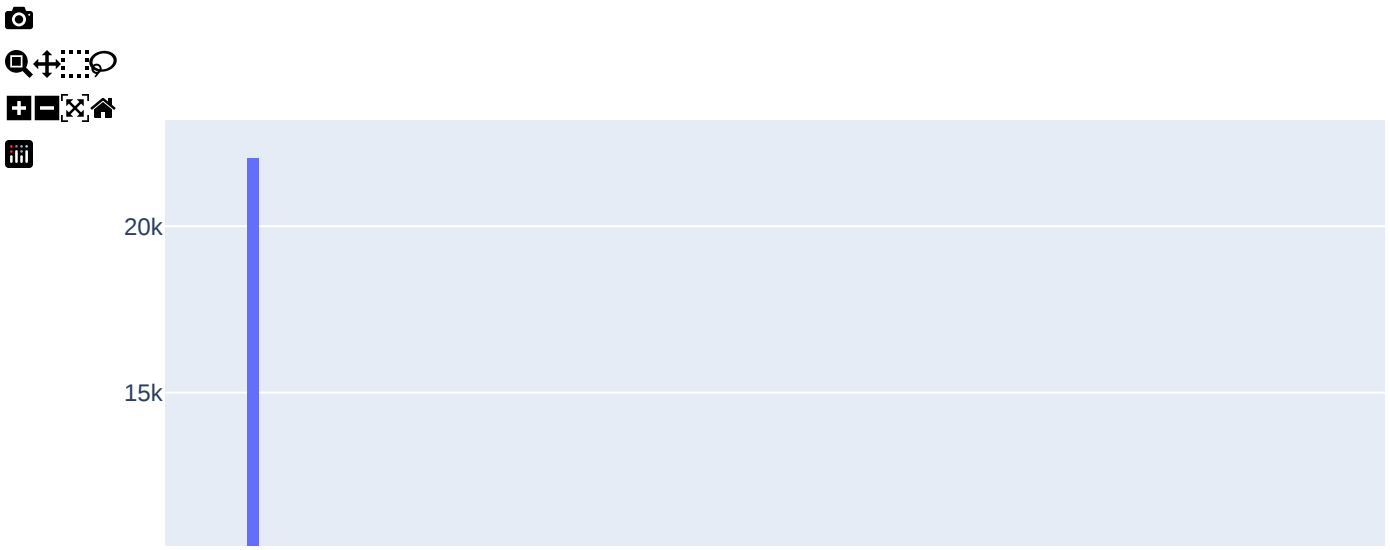
gdp_per_ca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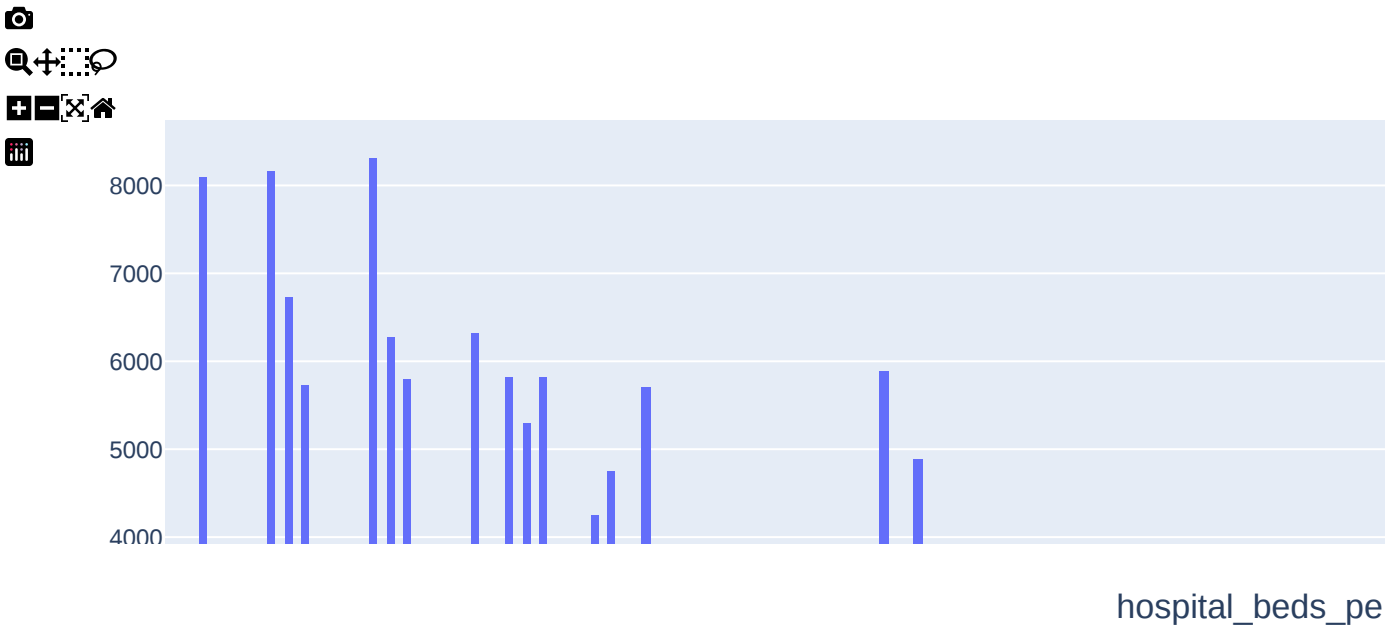
8000
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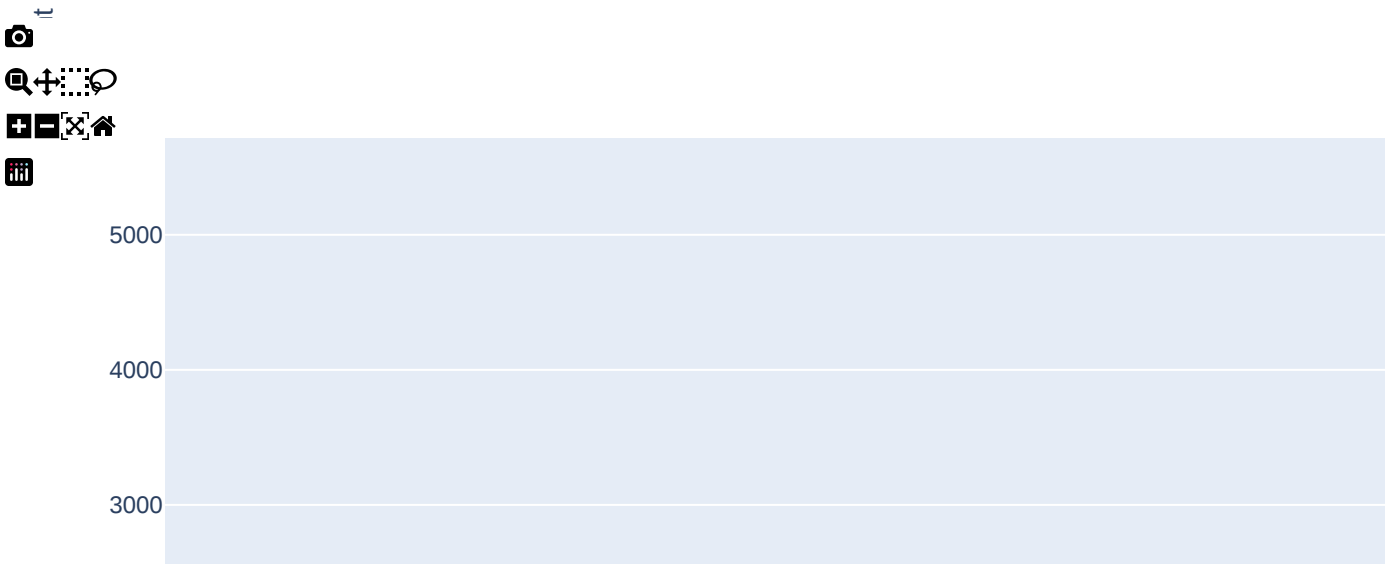
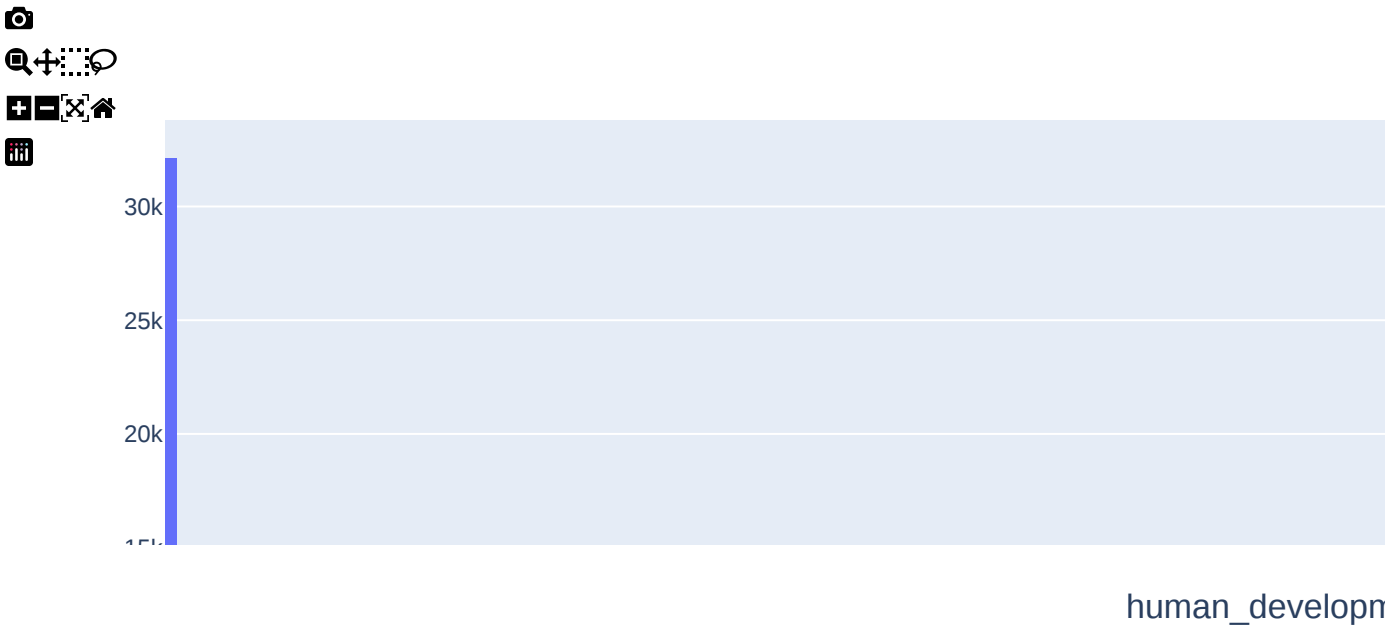
hospital_beds_pe


5000
4000
3000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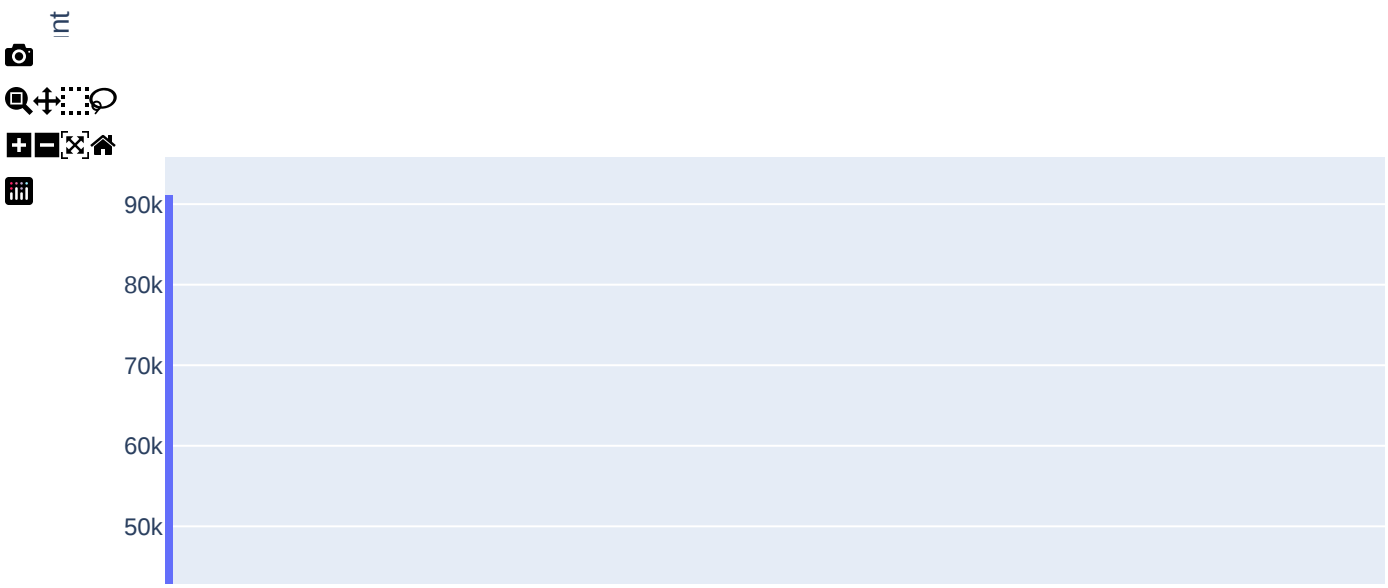
human_developm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In [10]:

```
#Selecting required columns for the and generated total_beds column which is need for furt
tran_df = sqldf("select iso_code,continent,location,date,total_cases, \
                new_cases,total_deaths,new_deaths,reproduction_rate,icu_patients, \
                hosp_patients,weekly_icu_admissions,weekly_hosp_admissions,total_tests,new_
                positive_rate,tests_per_case,total_vaccinations,people_vaccinated,people_fu
                total_boosters,new_vaccinations,stringency_index,population_density,median_
                aged_70_older,gdp_per_capita,handwashing_facilities, \
                hospital_beds_per_thousand,life_expectancy,human_development_index,\
                population, (round((population/1000) * hospital_beds_per_thousand)) as tota

#To check the information about the DataFrame.
tran_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 211925 entries, 0 to 211924
Data columns (total 34 columns):
 #   Column                      Non-Null Count   Dtype
---  ------                      --------------   -----
 0   iso_code                    211925 non-null  object
 1   continent                   211925 non-null  object
 2   location                    211925 non-null  object
 3   date                        211925 non-null  object
 4   total_cases                 211925 non-null  float64
 5   new_cases                   211925 non-null  float64
 6   total_deaths                211925 non-null  float64
 7   new_deaths                  211925 non-null  float64
 8   reproduction_rate           211925 non-null  float64
 9   icu_patients                211925 non-null  float64
 10  hosp_patients               211925 non-null  float64
 11  weekly_icu_admissions       211925 non-null  float64
 12  weekly_hosp_admissions      211925 non-null  float64
 13  total_tests                 211925 non-null  float64
 14  new_tests                   211925 non-null  float64
 15  positive_rate               211925 non-null  float64
 16  tests_per_case              211925 non-null  float64
 17  total_vaccinations          211925 non-null  float64
 18  people_vaccinated           211925 non-null  float64
 19  people_fully_vaccinated     211925 non-null  float64
 20  total_boosters              211925 non-null  float64
 21  new_vaccinations            211925 non-null  float64
 22  stringency_index            211925 non-null  float64
 23  population_density          211925 non-null  float64
 24  median_age                  211925 non-null  float64
 25  aged_65_older               211925 non-null  float64
 26  aged_70_older               211925 non-null  float64
 27  gdp_per_capita              211925 non-null  float64
 28  handwashing_facilities      211925 non-null  float64
 29  hospital_beds_per_thousand  211925 non-null  float64
 30  life_expectancy             211925 non-null  float64
 31  human_development_index     211925 non-null  float64
 32  population                  211925 non-null  int64
 33  total_beds                  211925 non-null  float64
dtypes: float64(29), int64(1), object(4)
memory usage: 55.0+ MB
```

In [11]:

```
#Below logic generate descriptive statistics.
tran_df1 = sqldf("select location,total_cases, \
                new_cases,total_deaths,new_deaths,total_vaccinations,people_vaccinated,peop
                total_boosters,new_vaccinations,\
                population,total_beds from tran_df ")
with pd.option_context('display.max_colwidth', None,'display.max_columns', None, 'display.
    display((tran_df1.groupby('location').describe().apply(lambda s: s.apply('{0:.5f}'.for
```

location	count	mean	std	min	25%	50%	
Afghanistan	974.00000	104549.42813	68155.80456	5.00000	40707.25000	110562.00000	172854.7
Albania	973.00000	144060.36896	112997.34127	0.00000	19157.00000	132506.00000	270734.0
Algeria	973.00000	149905.06166	95944.16162	1.00000	56143.00000	137772.00000	264488.0
Andorra	967.00000	18711.07859	16332.87235	1.00000	4616.00000	13882.00000	37978.5
Angola	949.00000	48255.97998	39527.71399	1.00000	13053.00000	39491.00000	98746.0
Anguilla	941.00000	1120.17641	1432.33280	2.00000	3.00000	111.00000	2555.0
Antigua and Barbuda	956.00000	3213.22071	3427.26048	1.00000	130.75000	1264.00000	7437.0
Argentina	1028.00000	4163860.39202	3599751.48909	0.00000	562968.75000	3717342.50000	8681604.5
Armenia	995.00000	225972.42814	155678.33140	0.00000	54780.00000	223723.00000	412586.5
Aruba	956.00000	16834.67469	14981.28680	2.00000	4586.25000	11144.00000	33678.0
Australia	1003.00000	2007382.35394	3436942.33684	4.00000	27128.00000	30228.00000	2968603.0
Austria	973.00000	1477418.57246	1777209.42532	1.00000	79352.00000	645479.00000	2530015.0
Azerbaijan	968.00000	393791.50310	303401.91453	3.00000	52898.25000	335855.00000	781840.5
Bahamas	953.00000	17214.95488	13364.25185	1.00000	6964.00000	12808.00000	33135.0
Bahrain	974.00000	269295.98871	226547.50107	1.00000	80045.00000	264549.00000	500891.5
Bangladesh	961.00000	1074235.90010	732667.22071	3.00000	412647.00000	921559.00000	1941816.0
Barbados	952.00000	26626.93067	35522.95334	2.00000	243.00000	4091.00000	55220.0
Belarus	970.00000	472641.30412	361217.39310	1.00000	94843.00000	415034.50000	900816.0
Belgium	994.00000	1655552.40543	1617450.34038	1.00000	150968.50000	1076833.00000	3491796.7
Belize	946.00000	26078.62791	24672.59950	1.00000	4802.50000	13497.00000	56805.2
Benin	953.00000	13747.62225	11220.89382	1.00000	2781.00000	8199.00000	26567.0
Bermuda	950.00000	5714.36737	6364.64080	2.00000	215.50000	2521.00000	11561.0
Bhutan	963.00000	14356.93043	23662.15349	1.00000	355.00000	2100.00000	11594.5
Bolivia	958.00000	468649.21712	363283.04906	2.00000	142236.50000	443487.00000	893179.2
Bonaire Sint Eustatius and Saba	936.00000	3579.32372	4209.00070	2.00000	158.00000	1661.00000	7616.0
Bosnia and Herzegovina	964.00000	200257.54461	142507.21710	2.00000	51151.25000	205013.00000	370652.0
Botswana	939.00000	134778.33333	127335.65688	3.00000	9594.00000	80153.00000	263950.0
Brazil	972.00000	16744955.11214	11695732.09132	1.00000	5410554.25000	18362825.50000	28517310.7
British Virgin Islands	941.00000	2602.56642	2872.47592	2.00000	71.00000	821.00000	6091.0
Brunei	960.00000	46153.32292	76875.46155	1.00000	148.00000	261.00000	56475.5
Bulgaria	961.00000	528697.69303	455620.62158	4.00000	60537.00000	421902.00000	1087796.0
Burkina Faso	959.00000	12073.61418	7781.51025	1.00000	2544.50000	13488.00000	20751.0
Burundi	938.00000	17139.57249	18439.57579	2.00000	650.75000	5696.00000	38146.0
Cambodia	1002.00000	60469.38323	60753.57617	1.00000	278.00000	36993.50000	124292.0

location	count	mean	std	min	25%	50%	
Cameroon	963.00000	69057.63032	44893.51053	1.00000	22103.00000	80858.00000	119240.0
Canada	1006.00000	1639702.53976	1491491.68090	2.00000	163031.00000	1401397.50000	3223928.0
Cape Verde	949.00000	30517.61328	22227.59615	1.00000	9694.00000	32827.00000	55887.0
Cayman Islands	956.00000	8061.06695	11238.76069	1.00000	248.75000	614.00000	19373.0
Central African Republic	954.00000	8655.92348	4895.84715	1.00000	4879.25000	7141.00000	14215.5
Chad	950.00000	4384.21368	2576.75828	1.00000	1568.25000	4952.00000	7256.5
Chile	975.00000	1714545.39077	1452714.60091	2.00000	499724.00000	1531872.00000	2908531.0
China	1007.00000	256027.16286	320332.19436	547.00000	90388.50000	100701.00000	121641.0
Colombia	963.00000	3482270.37383	2362479.38738	1.00000	1088288.50000	4240982.00000	6059754.0
Comoros	908.00000	4307.87665	3061.31010	1.00000	628.00000	4024.00000	8060.0
Congo	954.00000	13333.34696	8700.74228	1.00000	5379.00000	12742.50000	24006.7
Cook Islands	522.00000	2287.63985	2808.84437	1.00000	1.00000	2.00000	5727.0
Costa Rica	963.00000	434595.83904	362806.80866	1.00000	110614.00000	367938.00000	802472.0
Cote d'Ivoire	958.00000	48098.93319	29155.36303	1.00000	20792.00000	48445.50000	81467.0
Croatia	973.00000	489472.41213	448190.75959	1.00000	36380.00000	359521.00000	1047108.0
Cuba	957.00000	496310.21735	491034.62161	3.00000	7228.00000	200728.00000	1069387.0
Curacao	955.00000	17888.38743	17248.94348	1.00000	1087.00000	12349.00000	38938.5
Cyprus	960.00000	175383.53958	205834.83784	0.00000	4890.50000	77603.50000	319119.7
Czechia	968.00000	1803335.43079	1479710.33795	3.00000	306804.25000	1666918.50000	3551999.2
Democratic Republic of Congo	958.00000	45836.00104	33598.70833	1.00000	11466.75000	41865.00000	85999.0
Denmark	996.00000	986420.35442	1295772.91694	0.00000	31044.50000	289992.50000	2492313.5
Djibouti	951.00000	10195.68349	4925.96846	1.00000	5634.00000	11609.00000	15547.0
Dominica	947.00000	4734.64414	5929.36864	1.00000	68.00000	197.00000	11108.0
Dominican Republic	968.00000	321124.47417	214712.64808	1.00000	125827.25000	323214.00000	573537.5
Ecuador	968.00000	458310.22831	326536.12115	6.00000	165953.50000	455039.50000	827760.0
Egypt	984.00000	268771.95224	178637.84009	1.00000	105262.50000	277022.00000	469957.7
El Salvador	950.00000	90657.15579	62676.70039	1.00000	35904.00000	80235.00000	156364.0
Equatorial Guinea	954.00000	9549.33438	5526.22436	1.00000	5092.00000	8759.00000	15882.2
Eritrea	948.00000	5115.72468	3919.87582	1.00000	493.00000	6233.00000	9704.2
Estonia	995.00000	208890.89749	227374.35162	0.00000	3784.50000	130538.00000	445303.5
Eswatini	955.00000	34473.25340	28715.59681	1.00000	5996.00000	19084.00000	69145.0
Ethiopia	956.00000	265299.40377	179931.72858	1.00000	99087.25000	276401.50000	468687.2
Faeroe Islands	965.00000	10344.39067	14819.54523	1.00000	495.00000	775.00000	33590.0

location	count	mean	std	min	25%	50%	
Falkland Islands	934.00000	366.54176	673.17043	1.00000	16.00000	63.00000	115.0
Fiji	999.00000	27488.17618	29937.38135	0.00000	32.00000	1014.00000	63543.0
Finland	1000.00000	335225.59400	453634.79433	1.00000	11074.00000	93872.00000	594753.2
France	1005.00000	10711069.63881	12231358.10046	2.00000	617023.00000	5800228.00000	21787839.0
French Polynesia	956.00000	33446.20711	28050.91384	3.00000	9995.00000	19011.00000	65862.0
Gabon	955.00000	26081.58115	17408.42594	1.00000	9022.00000	25076.00000	47538.5
Gambia	952.00000	7053.01681	4386.65008	1.00000	3696.00000	6116.00000	11939.0
Georgia	972.00000	671766.79012	664257.91966	1.00000	29835.00000	362560.00000	1578112.7
Germany	1002.00000	8647384.18563	11181732.30481	1.00000	297527.75000	3710349.00000	12745322.0
Ghana	955.00000	98974.48377	55623.77464	3.00000	49003.00000	96317.00000	159399.0
Gibraltar	965.00000	7426.96062	7252.82821	1.00000	697.00000	4348.00000	15313.0
Greece	975.00000	1253985.18462	1612614.61887	0.00000	29524.50000	419909.00000	2345096.0
Greenland	953.00000	3712.56873	5285.94218	1.00000	17.00000	51.00000	11725.0
Grenada	947.00000	5777.02429	7449.43707	1.00000	32.00000	161.00000	13690.0
Guam	829.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
Guatemala	981.00000	424369.24975	368165.88616	0.00000	101599.00000	280854.00000	758303.0
Guernsey	535.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
Guinea	956.00000	22895.15063	12461.37860	1.00000	12390.75000	23807.00000	36394.0
Guinea-Bissau	944.00000	4850.09640	2737.34183	2.00000	2419.00000	3937.00000	8027.0
Guyana	957.00000	28824.11599	26693.76091	1.00000	4457.00000	20305.00000	62891.0
Haiti	949.00000	18496.68282	10712.27331	2.00000	9152.00000	19374.00000	30353.0
Honduras	958.00000	249945.87370	160826.99620	2.00000	99404.25000	266046.00000	411212.0
Hong Kong	1006.00000	321798.73857	578081.91083	2.00000	5089.50000	11870.00000	26265.2
Hungary	966.00000	876600.60145	747363.56727	0.00000	72390.00000	808059.00000	1778049.5
Iceland	970.00000	55761.21959	79846.20216	1.00000	4598.25000	6637.00000	117823.2
India	999.00000	23078097.09309	17120455.12158	1.00000	6721106.50000	29439989.00000	42767275.0
Indonesia	967.00000	2879172.79317	2405120.77707	2.00000	405496.50000	2135998.00000	5433051.5
Iran	979.00000	3660828.69356	2908788.87548	2.00000	542478.00000	3117336.00000	6972598.5
Iraq	974.00000	1307924.07700	923470.26191	1.00000	449791.50000	1313755.50000	2296231.0
Ireland	969.00000	589545.05676	624453.35716	1.00000	59434.00000	271260.00000	1287908.0
Isle of Man	949.00000	11667.49104	14176.31402	1.00000	363.00000	1650.00000	22969.0
Israel	978.00000	1611023.62577	1671201.74468	0.00000	307827.00000	840152.00000	3574389.2
Italy	998.00000	6716813.35972	7338879.47242	2.00000	331182.25000	4244177.00000	12308884.2
Jamaica	958.00000	64500.06889	55424.54215	1.00000	9386.25000	50242.00000	127949.7
Japan	1007.00000	3427411.39623	5636922.25283	2.00000	83291.00000	765414.00000	4028314.5

location	count	mean	std	min	25%	50%	
Jersey	582.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
Jordan	966.00000	780164.38302	648778.51526	1.00000	70131.25000	750637.50000	1612732.7
Kazakhstan	956.00000	692682.96339	557401.50718	4.00000	154127.50000	491277.00000	1390498.2
Kenya	963.00000	181523.48494	124696.32814	0.00000	56239.00000	184161.00000	322887.5
Kiribati	525.00000	1595.96952	1594.20460	1.00000	2.00000	1037.00000	3215.0
Kuwait	974.00000	331709.84086	230910.39312	1.00000	121104.00000	347411.00000	616156.0
Kyrgyzstan	951.00000	124020.42376	73284.09666	3.00000	64360.00000	133303.00000	200527.0
Laos	945.00000	66328.64868	87080.33759	2.00000	24.00000	2537.00000	143240.0
Latvia	972.00000	288302.30658	338062.43341	0.00000	4737.25000	137149.50000	615692.0
Lebanon	977.00000	541700.01228	432815.36152	1.00000	67027.00000	543865.00000	1053252.0
Lesotho	895.00000	17077.35642	13056.84060	1.00000	2635.50000	13603.00000	32775.0
Liberia	952.00000	4129.72374	2832.09372	3.00000	1448.00000	4719.00000	7384.0
Libya	965.00000	248580.15026	194185.48448	0.00000	61095.00000	193238.00000	492154.0
Liechtenstein	965.00000	6316.65803	6998.95520	1.00000	576.00000	3128.00000	11671.0
Lithuania	950.00000	456026.72421	453661.28794	1.00000	29328.50000	279349.00000	970066.2
Luxembourg	975.00000	101957.81846	97412.54689	0.00000	12851.00000	70586.00000	179840.5
Macao	1007.00000	137.29096	227.26515	1.00000	46.00000	51.00000	79.0
Madagascar	949.00000	36840.72181	22764.43307	3.00000	17223.00000	42358.00000	63659.0
Malawi	940.00000	45377.89574	33912.67543	0.00000	6001.25000	39302.00000	85386.2
Malaysia	1005.00000	1684912.96219	1841089.60305	0.00000	11484.00000	633891.00000	3083683.0
Maldives	961.00000	77293.94485	70521.04746	4.00000	11796.00000	73931.00000	169148.0
Mali	944.00000	15682.26059	11429.22945	2.00000	3936.00000	14459.00000	30391.2
Malta	964.00000	41634.64212	38355.56158	0.00000	6147.00000	30620.50000	71107.0
Marshall Islands	901.00000	1135.21421	3910.86824	0.00000	4.00000	4.00000	7.0
Mauritania	955.00000	30021.49215	22561.65356	1.00000	7817.00000	21076.00000	58632.5
Mauritius	951.00000	69636.02734	98812.89037	3.00000	467.00000	2047.00000	168720.0
Mexico	1028.00000	2876170.74027	2334804.48111	0.00000	670882.25000	2410140.50000	5192008.0
Micronesia (country)	642.00000	1558.02025	4398.23288	1.00000	1.00000	1.00000	7.0
Moldova	961.00000	272011.69199	195625.25455	1.00000	77487.00000	256816.00000	500812.0
Monaco	969.00000	4726.34469	5068.20939	1.00000	337.00000	2571.00000	9331.0
Mongolia	959.00000	366609.16893	409708.78787	1.00000	351.00000	120339.00000	905968.0
Montenegro	952.00000	120352.83613	95431.82076	2.00000	24017.50000	100350.00000	230246.0
Montserrat	951.00000	235.17771	420.62475	1.00000	13.00000	20.00000	164.0
Morocco	991.00000	635913.52170	460646.17907	0.00000	153082.50000	524975.00000	1158407.0
Mozambique	947.00000	111312.27244	91441.55848	1.00000	14283.50000	84922.00000	225071.5
Myanmar	942.00000	306293.14650	248777.96269	8.00000	72128.00000	190482.50000	593503.2

location	count	mean	std	min	25%	50%	
Namibia	955.00000	85453.94450	67017.07259	2.00000	13190.50000	95703.00000	157217.5
Nauru	565.00000	958.29912	1829.72444	0.00000	0.00000	0.00000	3.0
Nepal	1004.00000	515344.01494	393712.50996	1.00000	81769.50000	600250.00000	974152.5
Netherlands	971.00000	2980065.16581	3160938.71772	1.00000	316730.50000	1685872.00000	6223905.0
New Caledonia	950.00000	19442.29579	28283.32113	2.00000	29.25000	129.00000	54686.2
New Zealand	970.00000	316402.36186	594219.91507	1.00000	1944.50000	2733.50000	54491.0
Nicaragua	950.00000	8437.86211	5132.51663	1.00000	4533.00000	6711.50000	13958.0
Niger	949.00000	5296.17281	3136.78921	1.00000	1282.00000	5526.00000	8756.0
Nigeria	970.00000	156776.29588	92128.38369	1.00000	62260.75000	167466.00000	254409.0
Niue	408.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
North Korea	893.00000	0.18365	0.38742	0.00000	0.00000	0.00000	0.0
North Macedonia	972.00000	159873.52058	119493.16739	1.00000	27137.75000	155666.00000	295239.5
Northern Mariana Islands	610.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
Norway	973.00000	458891.47379	588075.31048	0.00000	17909.00000	130342.00000	1186422.0
Oman	974.00000	225025.83470	137654.57067	2.00000	112110.75000	256542.00000	378678.5
Pakistan	973.00000	889493.64543	552435.09923	2.00000	328602.00000	953842.00000	1505328.0
Palau	429.00000	2976.70163	2363.49166	1.00000	8.00000	3976.00000	5269.0
Palestine	964.00000	328749.00000	255066.89643	4.00000	53925.00000	314009.00000	640214.0
Panama	960.00000	437798.38646	315027.05704	0.00000	135916.00000	405498.00000	754994.2
Papua New Guinea	949.00000	19691.13488	18378.50350	1.00000	599.00000	17292.00000	41290.0
Paraguay	962.00000	342154.73701	262716.79812	0.00000	64274.00000	424140.00000	639078.0
Peru	963.00000	1977402.23676	1307004.49552	1.00000	902503.00000	2052065.00000	3510523.0
Philippines	999.00000	1732153.76777	1510705.32119	1.00000	325797.50000	1308352.00000	3645695.0
Pitcairn	441.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
Poland	965.00000	2877862.23109	2280374.10399	1.00000	362731.00000	2879811.00000	5637646.0
Portugal	968.00000	1705319.98244	1893324.41462	0.00000	131560.00000	874998.00000	3342388.7
Puerto Rico	840.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
Qatar	969.00000	223267.51806	124686.54643	1.00000	131939.00000	221692.00000	355740.0
Romania	972.00000	1348274.52160	1130057.16509	1.00000	211781.00000	1080553.00000	2700253.2
Russia	998.00000	7669869.74248	6940685.93345	2.00000	1234022.25000	5141218.50000	14579741.7
Rwanda	955.00000	62435.63455	55085.88813	1.00000	5217.50000	42585.00000	129495.5
Saint Helena	778.00000	80.45116	358.65342	2.00000	4.00000	4.00000	4.0
Saint Kitts and Nevis	944.00000	2211.25212	2611.54058	2.00000	19.00000	522.50000	5530.2
Saint Lucia	955.00000	10403.65026	10702.79093	1.00000	127.00000	5326.00000	22680.5

location	count	mean	std	min	25%	50%	
Saint Pierre and Miquelon	933.00000	756.88960	1201.63756	1.00000	16.00000	26.00000	1102.0
Saint Vincent and the Grenadines	955.00000	3733.04921	3645.45201	1.00000	76.00000	2233.00000	8316.0
Samoa	706.00000	3932.57790	6395.58856	1.00000	3.00000	3.00000	9592.0
San Marino	969.00000	7312.43034	6908.64792	1.00000	883.00000	5091.00000	14291.0
Sao Tome and Principe	932.00000	3111.05794	2166.81589	4.00000	981.75000	2403.00000	5937.2
Saudi Arabia	967.00000	479638.58738	237731.71527	1.00000	346681.00000	484539.00000	742873.0
Senegal	970.00000	49052.38247	32865.05540	0.00000	15573.75000	42877.50000	85632.5
Serbia	972.00000	922527.46914	817236.87227	0.00000	39741.75000	716205.00000	1897504.5
Seychelles	954.00000	18290.50000	18008.28150	6.00000	154.00000	16204.00000	39314.7
Sierra Leone	938.00000	4910.81130	2547.74632	1.00000	2400.50000	6060.00000	7665.0
Singapore	1006.00000	423471.96421	620439.80844	1.00000	57769.75000	62221.00000	493142.0
Sint Maarten (Dutch part)	519.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
Slovakia	963.00000	1031393.83593	970659.40209	1.00000	64209.50000	775011.00000	2093191.5
Slovenia	996.00000	397223.76305	412442.91712	0.00000	7410.25000	256455.00000	869094.2
Solomon Islands	743.00000	6056.14132	8853.13557	2.00000	19.50000	20.00000	12437.0
Somalia	953.00000	14849.72508	10035.55891	1.00000	4301.00000	14977.00000	26313.0
South Africa	991.00000	2081286.99294	1459813.04444	0.00000	692915.00000	1774312.00000	3655957.5
South Korea	1007.00000	4544448.86395	8198459.20667	1.00000	23850.50000	145692.00000	1507636.0
South Sudan	933.00000	10156.05359	6254.11372	1.00000	3047.00000	10917.00000	16999.0
Spain	997.00000	5228923.94283	4742468.37339	1.00000	835901.00000	3733600.00000	10778607.0
Sri Lanka	1002.00000	302390.83433	284358.21072	1.00000	3396.75000	217250.00000	631511.7
Sudan	956.00000	35854.16632	20747.95135	0.00000	14075.75000	36658.00000	61396.5
Suriname	955.00000	34723.36440	32515.18861	1.00000	5236.50000	22380.00000	78169.5
Sweden	997.00000	1112244.32798	957082.94760	1.00000	96677.00000	1083456.00000	2418560.0
Switzerland	973.00000	1356039.87975	1470652.43421	1.00000	103653.00000	702507.00000	2730037.0
Syria	947.00000	28933.21859	21845.75707	1.00000	6582.50000	25753.00000	54704.0
Taiwan	1013.00000	745560.50148	1804079.75855	0.00000	510.00000	10956.00000	19567.0
Tajikistan	907.00000	14167.98787	4369.89872	15.00000	12885.00000	15245.00000	17786.0
Tanzania	953.00000	14167.11857	16395.73433	1.00000	509.00000	509.00000	33620.0
Thailand	1025.00000	1418782.87707	1783314.97662	0.00000	3490.00000	154307.00000	2545873.0
Timor	947.00000	10813.02640	10196.56280	1.00000	30.00000	9657.00000	22712.5
Togo	965.00000	18012.04145	15102.15059	0.00000	2331.00000	13881.00000	36782.0
Tokelau	491.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
Tonga	553.00000	4954.47016	6314.30823	0.00000	0.00000	1.00000	11909.0

location	count	mean	std	min	25%	50%	
Trinidad and Tobago	955.00000	61008.92461	66160.81487	2.00000	5843.50000	33428.00000	127585.5
Tunisia	965.00000	505929.58549	426350.74873	1.00000	59813.00000	414182.00000	994543.0
Turkey	958.00000	6817643.23486	6028918.29628	1.00000	387429.00000	5438099.50000	14012733.0
Turkmenistan	554.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
Turks and Caicos Islands	941.00000	2946.22317	2292.02256	4.00000	720.00000	2436.00000	5867.0
Tuvalu	546.00000	3.23993	6.49002	0.00000	0.00000	0.00000	3.0
Uganda	948.00000	84880.04536	66795.51117	1.00000	15355.75000	85280.00000	163342.0
Ukraine	966.00000	2505971.71532	2006799.78311	1.00000	392536.50000	2298768.50000	5049266.0
United Arab Emirates	1000.00000	511245.15500	365130.06473	4.00000	99500.00000	594955.50000	871538.7
United Kingdom	999.00000	8748366.77978	8769023.51336	0.00000	522842.00000	4558494.00000	18473382.0
United States	1007.00000	39847309.82522	32704081.00667	1.00000	7226724.00000	33505572.00000	78171469.5
United States Virgin Islands	818.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.0
Uruguay	956.00000	377761.65900	374475.53393	4.00000	3423.25000	372443.50000	840998.7
Uzbekistan	954.00000	132427.84906	86349.01299	1.00000	68804.25000	112834.50000	236378.5
Vanuatu	714.00000	3012.07843	4788.50370	1.00000	4.00000	6.00000	7285.2
Vatican	963.00000	23.74143	7.54685	1.00000	27.00000	27.00000	29.0
Venezuela	955.00000	278997.62408	201809.24194	2.00000	94790.50000	277635.00000	514719.5
Vietnam	1006.00000	2731430.40656	4386966.87927	2.00000	1094.25000	9428.50000	2564133.5
Wallis and Futuna	736.00000	400.06114	221.08733	1.00000	447.75000	454.00000	454.0
Western Sahara	1.00000	0.00000	nan	0.00000	0.00000	0.00000	0.0
Yemen	928.00000	6740.26401	4366.38735	1.00000	2074.00000	6979.00000	11778.0
Zambia	951.00000	157857.16614	129658.94237	2.00000	17016.50000	167132.00000	312860.0
Zimbabwe	949.00000	110616.18124	103247.32319	1.00000	8696.00000	60227.00000	236871.0

In [12]:

```
#Applying the transformation to find out the the total_days with out cases and deaths.

total_days = sqldf(" select a.location,a.Total_days,a.[Num_days | % without_cases], c.Num_
round(cast(c.Num_days_without_deaths * 1.0 / a.Total_days as  float)*100) || '%' as [Num_c
(select a.location,a.Total_days, b.Num_days_without_cases || ' | ' || round(cast(Num_days_
/ Total_days as float)*100) || '%' as [Num_days | % without_cases] from (select location,c
Total_days from tran_df group by location) a left join \
(select location,count(date) as Num_days_without_cases from tran_df where new_cases = 0 gr
a.location = b.location) a left join (select location,count(date) as Num_days_without_deat
total_deaths = 0 group by location) c on a.location = c.location")

with pd.option_context('display.max_colwidth', None,'display.max_columns', None, 'display.
```

	location	Total_days	Num_days | % without_cases	Num_days | % without_deaths
0	Afghanistan	974	72 | 7.0%	28 | 3.0%
1	Albania	973	51 | 5.0%	15 | 2.0%
2	Algeria	973	27 | 3.0%	16 | 2.0%
3	Andorra	967	465 | 48.0%	20 | 2.0%
4	Angola	949	268 | 28.0%	9 | 1.0%
5	Anguilla	941	817 | 87.0%	542 | 58.0%
6	Antigua and Barbuda	956	621 | 65.0%	25 | 3.0%
7	Argentina	1028	234 | 23.0%	67 | 7.0%
8	Armenia	995	186 | 19.0%	52 | 5.0%
9	Aruba	956	315 | 33.0%	33 | 3.0%
10	Australia	1003	32 | 3.0%	35 | 3.0%
11	Austria	973	44 | 5.0%	18 | 2.0%
12	Azerbaijan	968	71 | 7.0%	12 | 1.0%
13	Bahamas	953	361 | 38.0%	16 | 2.0%
14	Bahrain	974	8 | 1.0%	21 | 2.0%
15	Bangladesh	961	11 | 1.0%	10 | 1.0%
16	Barbados	952	221 | 23.0%	19 | 2.0%
17	Belarus	970	189 | 19.0%	32 | 3.0%
18	Belgium	994	273 | 27.0%	36 | 4.0%
19	Belize	946	386 | 41.0%	14 | 1.0%
20	Benin	953	781 | 82.0%	21 | 2.0%
21	Bermuda	950	626 | 66.0%	18 | 2.0%
22	Bhutan	963	460 | 48.0%	308 | 32.0%
23	Bolivia	958	122 | 13.0%	18 | 2.0%
24	Bonaire Sint Eustatius and Saba	936	563 | 60.0%	167 | 18.0%
25	Bosnia and Herzegovina	964	239 | 25.0%	16 | 2.0%
26	Botswana	939	721 | 77.0%	1 | 0.0%
27	Brazil	972	63 | 6.0%	20 | 2.0%
28	British Virgin Islands	941	845 | 90.0%	22 | 2.0%
29	Brunei	960	535 | 56.0%	19 | 2.0%
30	Bulgaria	961	12 | 1.0%	3 | 0.0%
31	Burkina Faso	959	429 | 45.0%	8 | 1.0%
32	Burundi	938	443 | 47.0%	13 | 1.0%
33	Cambodia	1002	330 | 33.0%	409 | 41.0%
34	Cameroon	963	761 | 79.0%	19 | 2.0%
35	Canada	1006	31 | 3.0%	46 | 5.0%
36	Cape Verde	949	102 | 11.0%	4 | 0.0%
37	Cayman Islands	956	664 | 69.0%	3 | 0.0%
38	Central African Republic	954	725 | 76.0%	69 | 7.0%

	location	Total_days	Num_days | % without_cases	Num_days | % without_deaths
39	Chad	950	453 | 48.0%	40 | 4.0%
40	Chile	975	23 | 2.0%	28 | 3.0%
41	China	1007	4 | 0.0%	0
42	Colombia	963	156 | 16.0%	16 | 2.0%
43	Comoros	908	475 | 52.0%	6 | 1.0%
44	Congo	954	783 | 82.0%	18 | 2.0%
45	Cook Islands	522	411 | 79.0%	339 | 65.0%
46	Costa Rica	963	376 | 39.0%	13 | 1.0%
47	Cote d'Ivoire	958	99 | 10.0%	18 | 2.0%
48	Croatia	973	23 | 2.0%	23 | 2.0%
49	Cuba	957	8 | 1.0%	6 | 1.0%
50	Curacao	955	362 | 38.0%	5 | 1.0%
51	Cyprus	960	220 | 23.0%	16 | 2.0%
52	Czechia	968	36 | 4.0%	21 | 2.0%
53	Democratic Republic of Congo	958	346 | 36.0%	10 | 1.0%
54	Denmark	996	103 | 10.0%	41 | 4.0%
55	Djibouti	951	376 | 40.0%	23 | 2.0%
56	Dominica	947	746 | 79.0%	518 | 55.0%
57	Dominican Republic	968	153 | 16.0%	16 | 2.0%
58	Ecuador	968	212 | 22.0%	13 | 1.0%
59	Egypt	984	246 | 25.0%	23 | 2.0%
60	El Salvador	950	466 | 49.0%	12 | 1.0%
61	Equatorial Guinea	954	663 | 69.0%	38 | 4.0%
62	Eritrea	948	441 | 47.0%	276 | 29.0%
63	Estonia	995	200 | 20.0%	51 | 5.0%
64	Eswatini	955	106 | 11.0%	33 | 3.0%
65	Ethiopia	956	25 | 3.0%	23 | 2.0%
66	Faeroe Islands	965	606 | 63.0%	308 | 32.0%
67	Falkland Islands	934	856 | 92.0%	934 | 100.0%
68	Fiji	999	667 | 67.0%	183 | 18.0%
69	Finland	1000	223 | 22.0%	38 | 4.0%
70	France	1005	83 | 8.0%	22 | 2.0%
71	French Polynesia	956	572 | 60.0%	182 | 19.0%
72	Gabon	955	596 | 62.0%	6 | 1.0%
73	Gambia	952	632 | 66.0%	6 | 1.0%
74	Georgia	972	170 | 17.0%	38 | 4.0%
75	Germany	1002	50 | 5.0%	42 | 4.0%
76	Ghana	955	428 | 45.0%	7 | 1.0%
77	Gibraltar	965	384 | 40.0%	252 | 26.0%

	location	Total_days	Num_days | % without_cases	Num_days | % without_deaths
78	Greece	975	119 | 12.0%	17 | 2.0%
79	Greenland	953	736 | 77.0%	651 | 68.0%
80	Grenada	947	690 | 73.0%	287 | 30.0%
81	Guam	829	829 | 100.0%	829 | 100.0%
82	Guatemala	981	42 | 4.0%	28 | 3.0%
83	Guernsey	535	535 | 100.0%	535 | 100.0%
84	Guinea	956	421 | 44.0%	33 | 3.0%
85	Guinea-Bissau	944	543 | 58.0%	32 | 3.0%
86	Guyana	957	114 | 12.0%	0
87	Haiti	949	183 | 19.0%	18 | 2.0%
88	Honduras	958	336 | 35.0%	15 | 2.0%
89	Hong Kong	1006	60 | 6.0%	12 | 1.0%
90	Hungary	966	258 | 27.0%	12 | 1.0%
91	Iceland	970	379 | 39.0%	22 | 2.0%
92	India	999	37 | 4.0%	41 | 4.0%
93	Indonesia	967	15 | 2.0%	9 | 1.0%
94	Iran	979	0	0
95	Iraq	974	71 | 7.0%	9 | 1.0%
96	Ireland	969	188 | 19.0%	11 | 1.0%
97	Isle of Man	949	531 | 56.0%	12 | 1.0%
98	Israel	978	35 | 4.0%	29 | 3.0%
99	Italy	998	20 | 2.0%	21 | 2.0%
100	Jamaica	958	90 | 9.0%	8 | 1.0%
101	Japan	1007	11 | 1.0%	22 | 2.0%
102	Jersey	582	582 | 100.0%	582 | 100.0%
103	Jordan	966	250 | 26.0%	24 | 2.0%
104	Kazakhstan	956	85 | 9.0%	14 | 1.0%
105	Kenya	963	24 | 2.0%	20 | 2.0%
106	Kiribati	525	442 | 84.0%	267 | 51.0%
107	Kuwait	974	179 | 18.0%	40 | 4.0%
108	Kyrgyzstan	951	223 | 23.0%	16 | 2.0%
109	Laos	945	389 | 41.0%	411 | 43.0%
110	Latvia	972	84 | 9.0%	37 | 4.0%
111	Lebanon	977	56 | 6.0%	18 | 2.0%
112	Lesotho	895	591 | 66.0%	57 | 6.0%
113	Liberia	952	602 | 63.0%	19 | 2.0%
114	Libya	965	271 | 28.0%	29 | 3.0%
115	Liechtenstein	965	280 | 29.0%	31 | 3.0%
116	Lithuania	950	5 | 1.0%	5 | 1.0%

	location	Total_days	Num_days | % without_cases	Num_days | % without_deaths
117	Luxembourg	975	267 | 27.0%	20 | 2.0%
118	Macao	1007	920 | 91.0%	893 | 89.0%
119	Madagascar	949	526 | 55.0%	58 | 6.0%
120	Malawi	940	116 | 12.0%	9 | 1.0%
121	Malaysia	1005	25 | 2.0%	53 | 5.0%
122	Maldives	961	224 | 23.0%	52 | 5.0%
123	Mali	944	50 | 5.0%	4 | 0.0%
124	Malta	964	47 | 5.0%	34 | 4.0%
125	Marshall Islands	901	853 | 95.0%	824 | 91.0%
126	Mauritania	955	112 | 12.0%	16 | 2.0%
127	Mauritius	951	577 | 61.0%	7 | 1.0%
128	Mexico	1028	192 | 19.0%	78 | 8.0%
129	Micronesia (country)	642	590 | 92.0%	550 | 86.0%
130	Moldova	961	159 | 17.0%	10 | 1.0%
131	Monaco	969	285 | 29.0%	29 | 3.0%
132	Mongolia	959	289 | 30.0%	283 | 30.0%
133	Montenegro	952	57 | 6.0%	6 | 1.0%
134	Montserrat	951	849 | 89.0%	37 | 4.0%
135	Morocco	991	31 | 3.0%	32 | 3.0%
136	Mozambique	947	81 | 9.0%	64 | 7.0%
137	Myanmar	942	78 | 8.0%	4 | 0.0%
138	Namibia	955	258 | 27.0%	118 | 12.0%
139	Nauru	565	537 | 95.0%	450 | 80.0%
140	Nepal	1004	84 | 8.0%	112 | 11.0%
141	Netherlands	971	57 | 6.0%	8 | 1.0%
142	New Caledonia	950	676 | 71.0%	540 | 57.0%
143	New Zealand	970	203 | 21.0%	30 | 3.0%
144	Nicaragua	950	812 | 85.0%	9 | 1.0%
145	Niger	949	347 | 37.0%	5 | 1.0%
146	Nigeria	970	195 | 20.0%	24 | 2.0%
147	Niue	408	408 | 100.0%	408 | 100.0%
148	North Korea	893	892 | 100.0%	729 | 82.0%
149	North Macedonia	972	74 | 8.0%	25 | 3.0%
150	Northern Mariana Islands	610	610 | 100.0%	610 | 100.0%
151	Norway	973	8 | 1.0%	18 | 2.0%
152	Oman	974	375 | 39.0%	36 | 4.0%
153	Pakistan	973	104 | 11.0%	22 | 2.0%
154	Palau	429	330 | 77.0%	173 | 40.0%
155	Palestine	964	308 | 32.0%	21 | 2.0%

	location	Total_days	Num_days | % without_cases	Num_days | % without_deaths
156	Panama	960	142 | 15.0%	2 | 0.0%
157	Papua New Guinea	949	541 | 57.0%	131 | 14.0%
158	Paraguay	962	245 | 25.0%	13 | 1.0%
159	Peru	963	123 | 13.0%	0
160	Philippines	999	37 | 4.0%	3 | 0.0%
161	Pitcairn	441	441 | 100.0%	441 | 100.0%
162	Poland	965	2 | 0.0%	8 | 1.0%
163	Portugal	968	74 | 8.0%	16 | 2.0%
164	Puerto Rico	840	840 | 100.0%	840 | 100.0%
165	Qatar	969	11 | 1.0%	28 | 3.0%
166	Romania	972	36 | 4.0%	25 | 3.0%
167	Russia	998	35 | 4.0%	48 | 5.0%
168	Rwanda	955	54 | 6.0%	77 | 8.0%
169	Saint Helena	778	751 | 97.0%	778 | 100.0%
170	Saint Kitts and Nevis	944	588 | 62.0%	449 | 48.0%
171	Saint Lucia	955	423 | 44.0%	241 | 25.0%
172	Saint Pierre and Miquelon	933	823 | 88.0%	667 | 71.0%
173	Saint Vincent and the Grenadines	955	558 | 58.0%	307 | 32.0%
174	Samoa	706	622 | 88.0%	499 | 71.0%
175	San Marino	969	449 | 46.0%	0
176	Sao Tome and Principe	932	472 | 51.0%	25 | 3.0%
177	Saudi Arabia	967	56 | 6.0%	22 | 2.0%
178	Senegal	970	78 | 8.0%	33 | 3.0%
179	Serbia	972	27 | 3.0%	23 | 2.0%
180	Seychelles	954	554 | 58.0%	296 | 31.0%
181	Sierra Leone	938	387 | 41.0%	23 | 2.0%
182	Singapore	1006	29 | 3.0%	58 | 6.0%
183	Sint Maarten (Dutch part)	519	519 | 100.0%	519 | 100.0%
184	Slovakia	963	72 | 7.0%	26 | 3.0%
185	Slovenia	996	64 | 6.0%	41 | 4.0%
186	Solomon Islands	743	672 | 90.0%	470 | 63.0%
187	Somalia	953	633 | 66.0%	23 | 2.0%
188	South Africa	991	82 | 8.0%	49 | 5.0%
189	South Korea	1007	16 | 2.0%	29 | 3.0%
190	South Sudan	933	467 | 50.0%	40 | 4.0%
191	Spain	997	387 | 39.0%	31 | 3.0%
192	Sri Lanka	1002	70 | 7.0%	61 | 6.0%
193	Sudan	956	491 | 51.0%	0
194	Suriname	955	270 | 28.0%	20 | 2.0%

	location	Total_days	Num_days | % without_cases	Num_days | % without_deaths
195	Sweden	997	473 | 47.0%	38 | 4.0%
196	Switzerland	973	352 | 36.0%	10 | 1.0%
197	Syria	947	118 | 12.0%	7 | 1.0%
198	Taiwan	1013	186 | 18.0%	31 | 3.0%
199	Tajikistan	907	548 | 60.0%	2 | 0.0%
200	Tanzania	953	881 | 92.0%	15 | 2.0%
201	Thailand	1025	96 | 9.0%	57 | 6.0%
202	Timor	947	468 | 49.0%	380 | 40.0%
203	Togo	965	142 | 15.0%	23 | 2.0%
204	Tokelau	491	491 | 100.0%	491 | 100.0%
205	Tonga	553	464 | 84.0%	326 | 59.0%
206	Trinidad and Tobago	955	150 | 16.0%	11 | 1.0%
207	Tunisia	965	265 | 27.0%	15 | 2.0%
208	Turkey	958	132 | 14.0%	6 | 1.0%
209	Turkmenistan	554	554 | 100.0%	554 | 100.0%
210	Turks and Caicos Islands	941	549 | 58.0%	8 | 1.0%
211	Tuvalu	546	542 | 99.0%	546 | 100.0%
212	Uganda	948	184 | 19.0%	125 | 13.0%
213	Ukraine	966	49 | 5.0%	10 | 1.0%
214	United Arab Emirates	1000	44 | 4.0%	51 | 5.0%
215	United Kingdom	999	155 | 16.0%	0
216	United States	1007	28 | 3.0%	38 | 4.0%
217	United States Virgin Islands	818	818 | 100.0%	818 | 100.0%
218	Uruguay	956	172 | 18.0%	15 | 2.0%
219	Uzbekistan	954	48 | 5.0%	12 | 1.0%
220	Vanuatu	714	569 | 80.0%	162 | 23.0%
221	Vatican	963	950 | 99.0%	963 | 100.0%
222	Venezuela	955	120 | 13.0%	13 | 1.0%
223	Vietnam	1006	141 | 14.0%	190 | 19.0%
224	Wallis and Futuna	736	683 | 93.0%	153 | 21.0%
225	Western Sahara	1	1 | 100.0%	1 | 100.0%
226	Yemen	928	333 | 36.0%	20 | 2.0%
227	Zambia	951	177 | 19.0%	15 | 2.0%
228	Zimbabwe	949	144 | 15.0%	3 | 0.0%

In [13]:

```
#Logic to capture total cases, deaths and beds in each continent.
plt_df = sqldf("select continent,sum(total_cases)/count(total_cases) as total_cases,sum(to
               sum(population)/count(population) as population,sum(total_beds)/count(total
               sum(people_vaccinated)/count(people_vaccinated) as people_vaccinated,sum(pe
               sum(total_boosters)/count(total_boosters) as total_boosters from tran_df gr
```

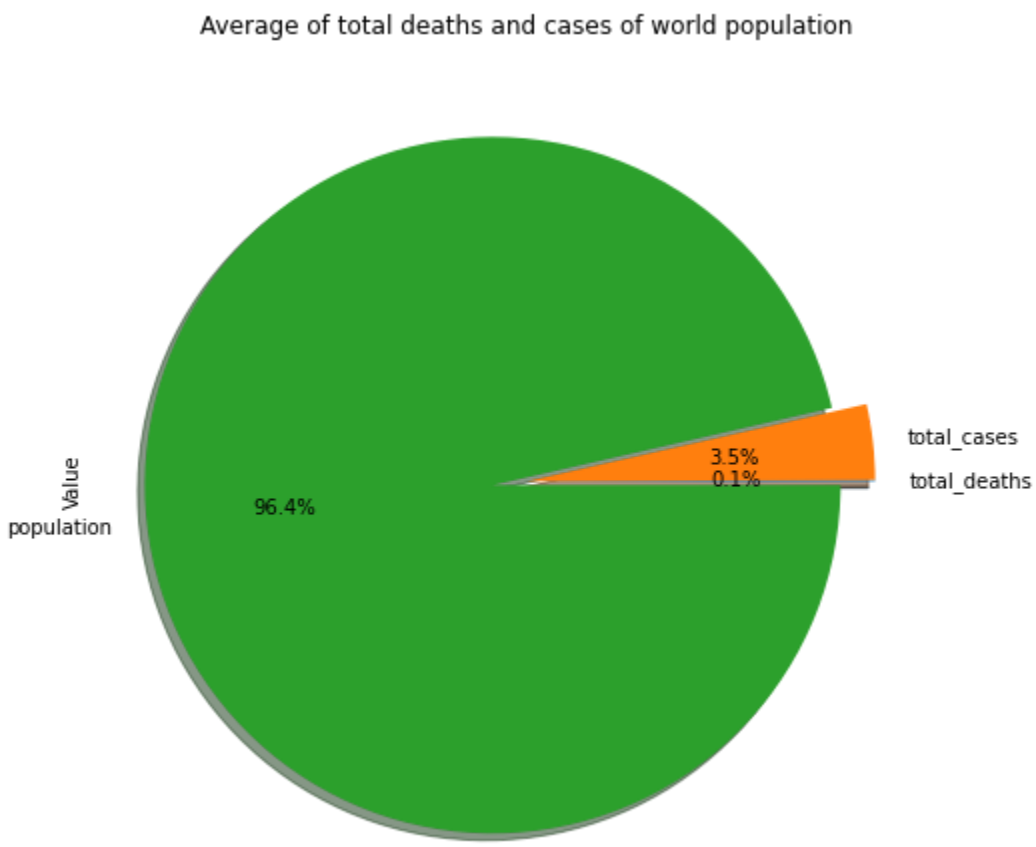
```
plt_df[['total_cases','total_vaccinations','people_vaccinated','people_fully_vaccinated',
display(plt_df)
```

	continent	total_cases	total_deaths	population	total_beds	total_vaccinations	people_vaccinated	people_
0	Africa	114939	2655.771983	25628132	39824.992495	742351	438696	
1	Asia	1360637	15477.619584	96369625	266690.252700	57288820	15606749	
2	Europe	1594990	21202.446834	15538361	91315.198927	8985729	3974006	
3	North America	1364619	23733.229106	17226894	39382.303613	10814317	5119585	
4	Oceania	150435	285.598283	2687298	8811.645540	1383048	615227	
5	South America	2343083	61495.026064	33697479	75612.454248	22005978	10236717	

In [14]:

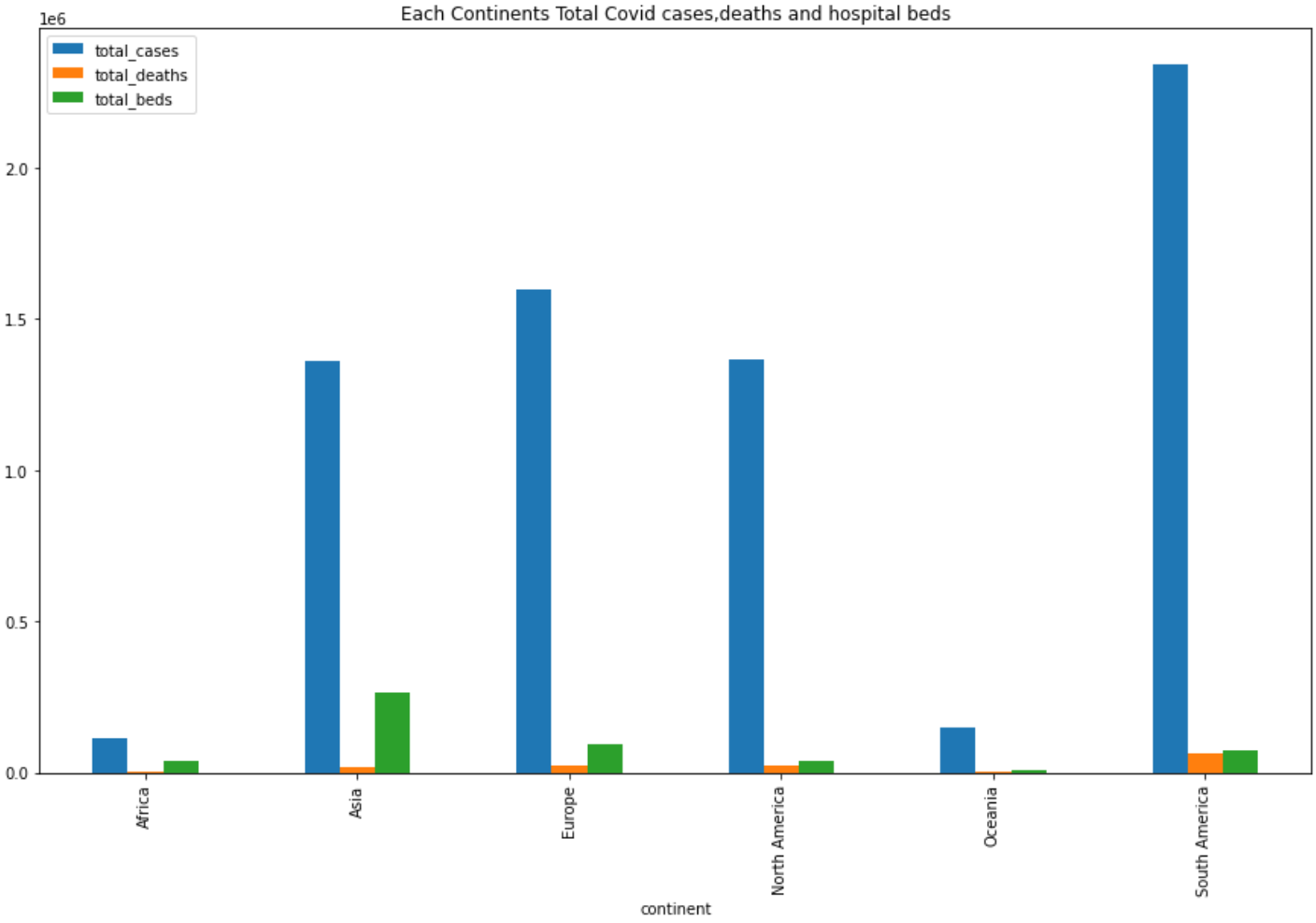
```
#Average of total deaths and cases of world population
plt_2 = sqldf("select sum(total_deaths)/count(total_deaths) as total_deaths,sum(total_case

wrld_df = plt_2.melt( var_name="Type", value_name="Value")

wrld_df['Value'] = wrld_df['Value'].astype('int64')
display(wrld_df)
wrld_df.set_index('Type', inplace=True)
plot = wrld_df.plot.pie(y='Value', title="Average of total deaths and cases of world popul
                    autopct='%1.1f%%', explode=(0, 0, 0.1), \
                    shadow=True, startangle=0, figsize=(10,8))
```

	Type	Value
0	total_deaths	20808
1	total_cases	1154783
2	population	31857964



In [15]:
```
plt_df.plot(x='continent', y=["total_cases", "total_deaths","total_beds"], kind='bar',figs
```

Out[15]:
```
<AxesSubplot:title={'center':'Each Continents Total Covid cases,deaths and hospital bed
s'}, xlabel='continent'>
```

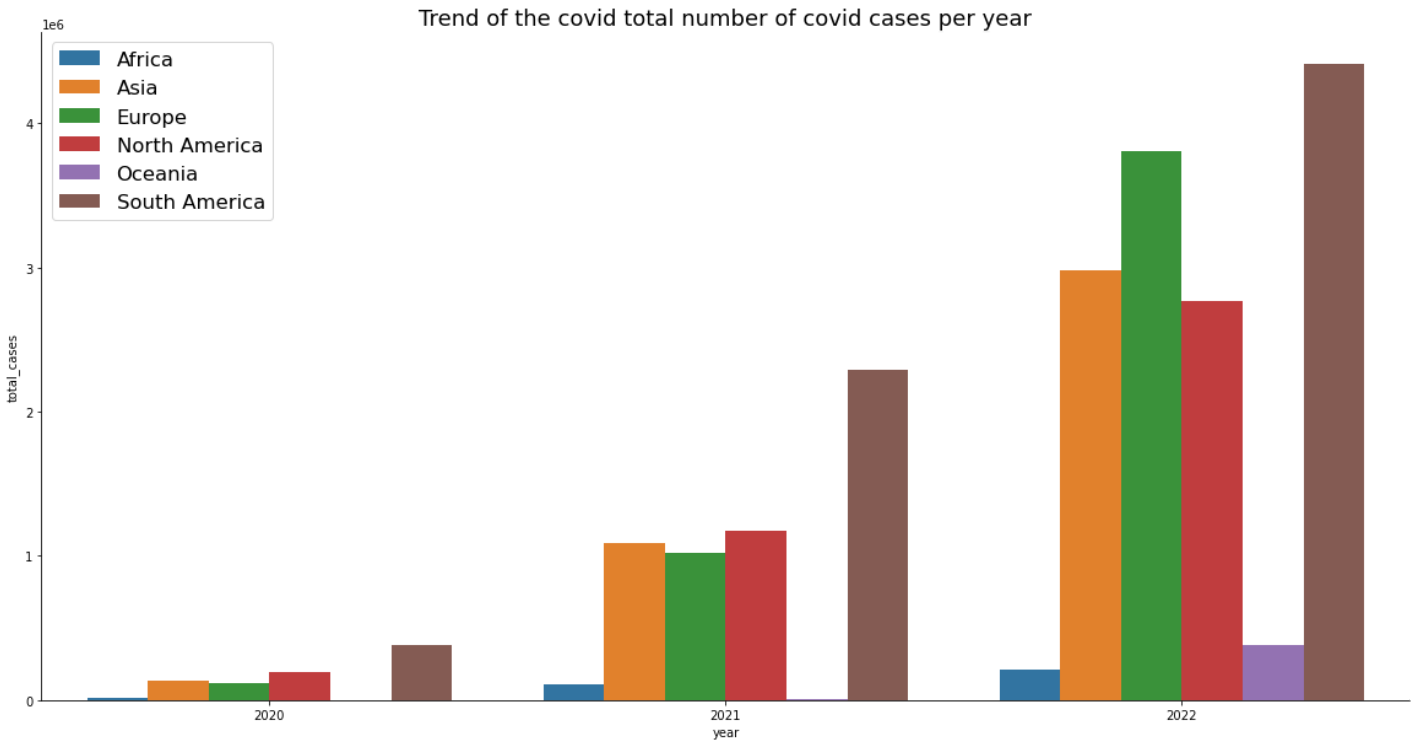


In [16]:

```
#Logic to capture total cases and deaths in each year.
plt1_df = sqldf("select * from tran_df ")
plt1_df["date"] = pd.to_datetime(plt1_df["date"])
plt1_df['year'] = pd.DatetimeIndex(plt1_df['date']).year
plt1_df['month'] = pd.DatetimeIndex(plt1_df['date']).month
plt1_df['monthabb'] = plt1_df['month'].apply(lambda x: calendar.month_abbr[x])
pltf_df = sqldf("select continent,year,sum(total_cases)/count(total_cases) as total_cases,
```

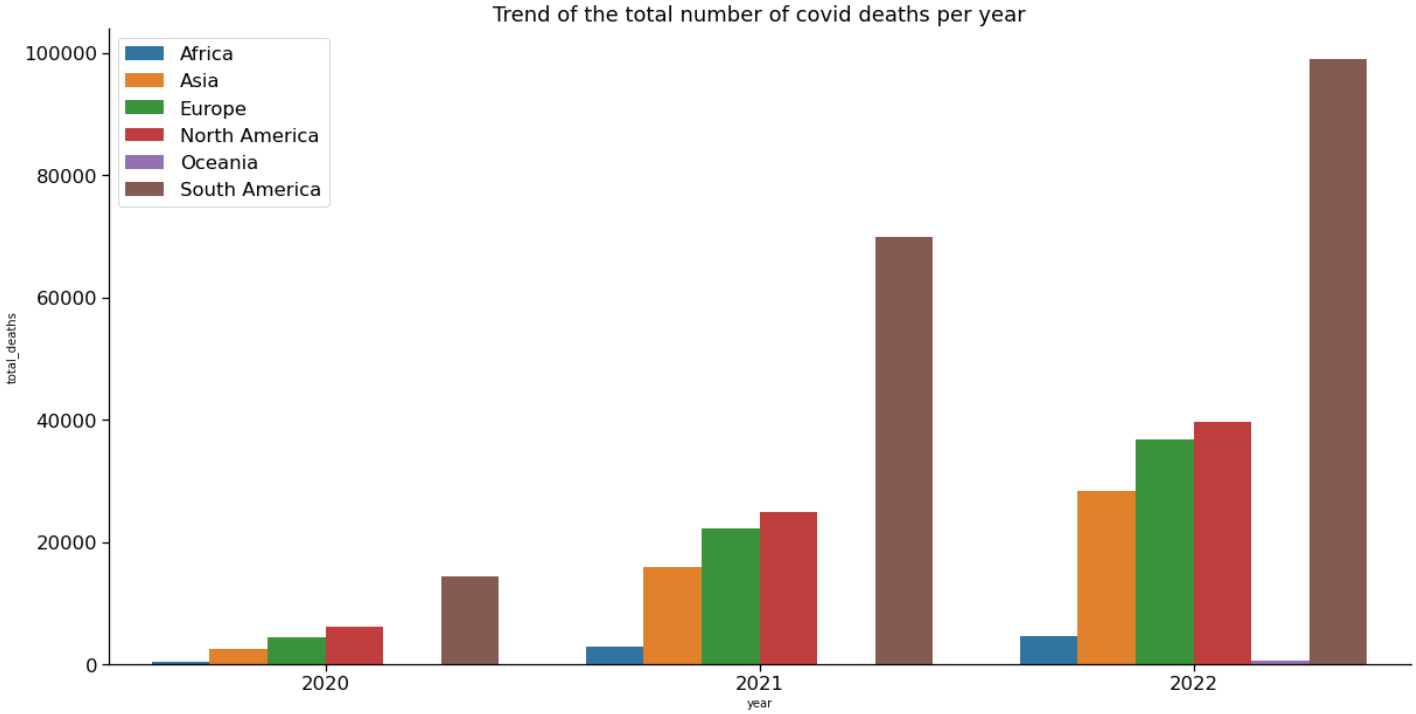
In [17]:

```
#Plot logic for total number of covid cases per year
fig,ax = plt.subplots(figsize=(20, 10))
sns.despine()
sns.set_context("notebook", font_scale=1.5, rc={"lines.linewidth": 2})

sns.barplot(x="year", y="total_cases", data=pltf_df, hue='continent')
ax.set_ylabel(ylabel = 'total_cases', fontsize = 10)
ax.set_xlabel(xlabel = 'year', fontsize = 10)
ax.set_title('Trend of the covid total number of covid cases per year')
ax.legend();
```



In [18]:

```
#Plot logic for total number of covid deaths per year
fig,ax = plt.subplots(figsize=(20, 10))
sns.despine()
sns.set_context("notebook", font_scale=1.5, rc={"lines.linewidth": 2})

sns.barplot(x="year", y="total_deaths", data=pltf_df, hue='continent')
ax.set_ylabel(ylabel = 'total_deaths', fontsize = 10)
ax.set_xlabel(xlabel = 'year', fontsize = 10)
ax.set_title('Trend of the total number of covid deaths per year')
ax.legend();
```

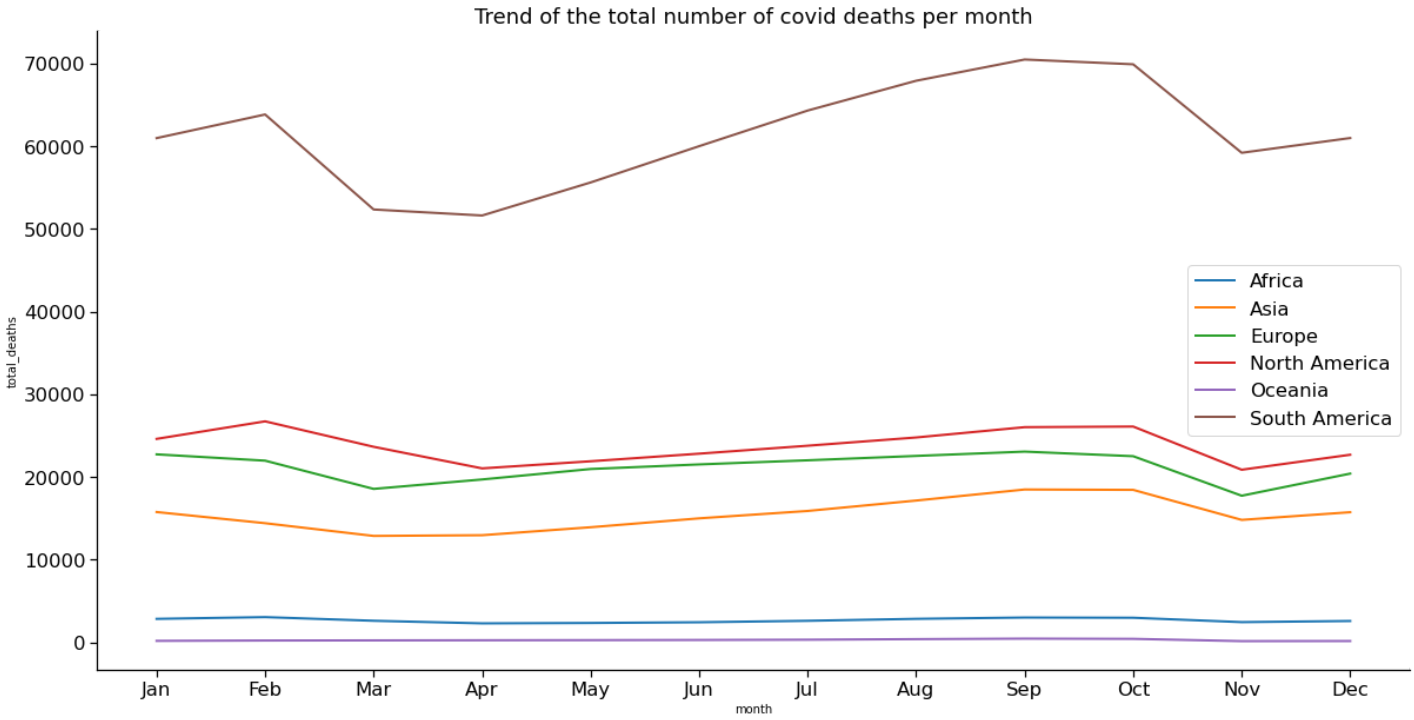


In [19]:

```
#Logic to capture total cases and deaths in each month.
pltm_df = plt1_df
pltk_df = sqldf("select continent,monthabb,sum(total_cases)/count(total_cases) as total_ca
pltk_df['total_cases'] = pltk_df['total_cases'].astype('int64')
```

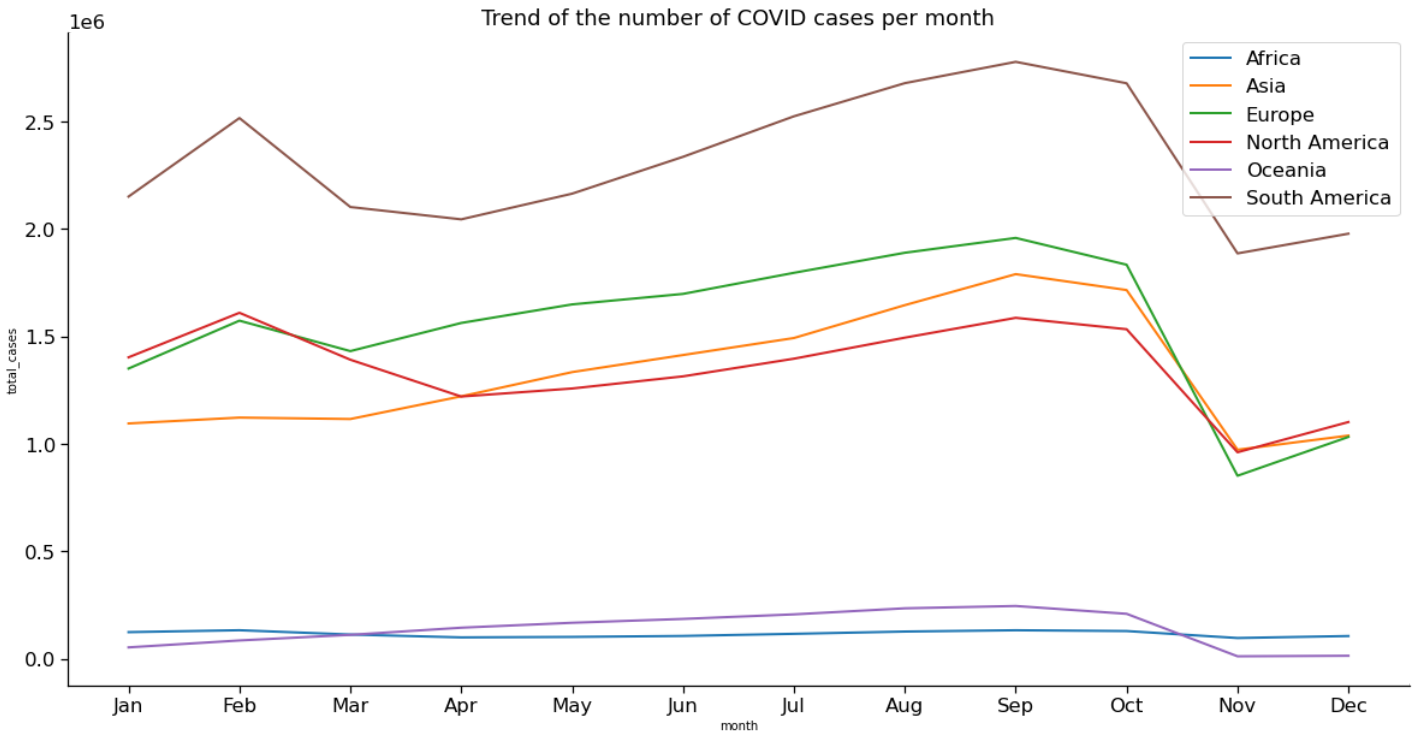
In [20]:

```
#Plot logic for the total number of covid deaths per month
fig,ax = plt.subplots(figsize=(20, 10))
sns.despine()
sns.set_context("notebook", font_scale=1.5, rc={"lines.linewidth": 2})

sns.lineplot(x="monthabb", y="total_deaths", data=pltk_df, hue='continent')
ax.set_ylabel(ylabel = 'total_deaths', fontsize = 10)
ax.set_xlabel(xlabel = 'month', fontsize = 10)
ax.set_title('Trend of the total number of covid deaths per month')
ax.legend();
```



In [21]:

```
#Plot logic for the number of COVID cases per month
fig,ax = plt.subplots(figsize=(20, 10))
sns.despine()
sns.set_context("notebook", font_scale=1.5, rc={"lines.linewidth": 2})

sns.lineplot(x="monthabb", y="total_cases", data=pltk_df, hue='continent')
ax.set_ylabel(ylabel = 'total_cases', fontsize = 10)
ax.set_xlabel(xlabel = 'month', fontsize = 10)
ax.set_title('Trend of the number of COVID cases per month')
ax.legend();
```



In [22]:

```
vac_df = plt_df
vac_df = sqldf("select continent,people_vaccinated as people_partially_vaccinated,people_f
display(vac_df)
```

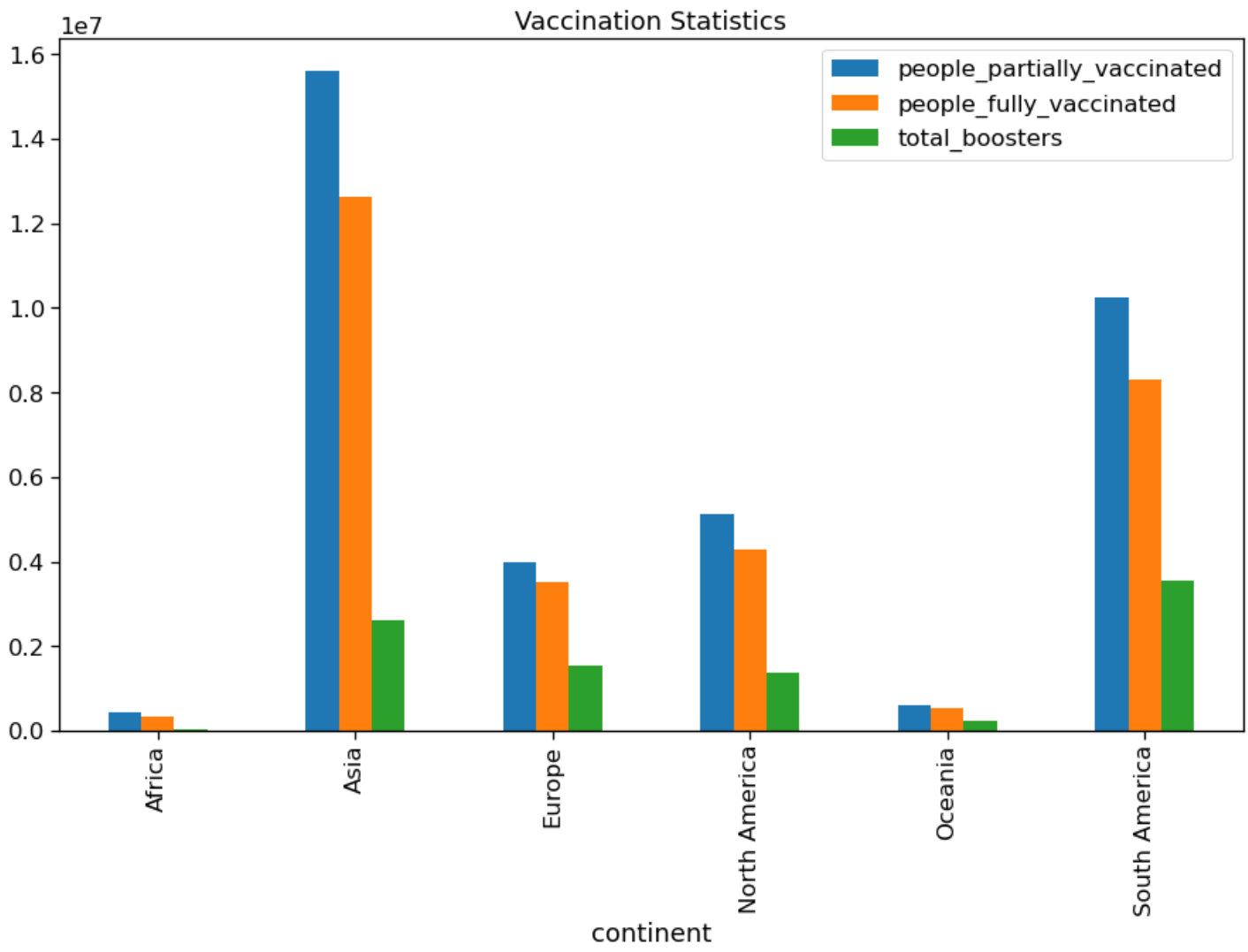
	continent	people_partially_vaccinated	people_fully_vaccinated	total_boosters
0	Africa	438696	320064	28474
1	Asia	15606749	12625052	2611860
2	Europe	3974006	3510299	1540726
3	North America	5119585	4297841	1361452
4	Oceania	615227	537888	223719
5	South America	10236717	8324092	3544518

In [23]:

```
#Plot logic for vaccination
vac_df.plot(x='continent', y=["people_partially_vaccinated", "people_fully_vaccinated","to
```

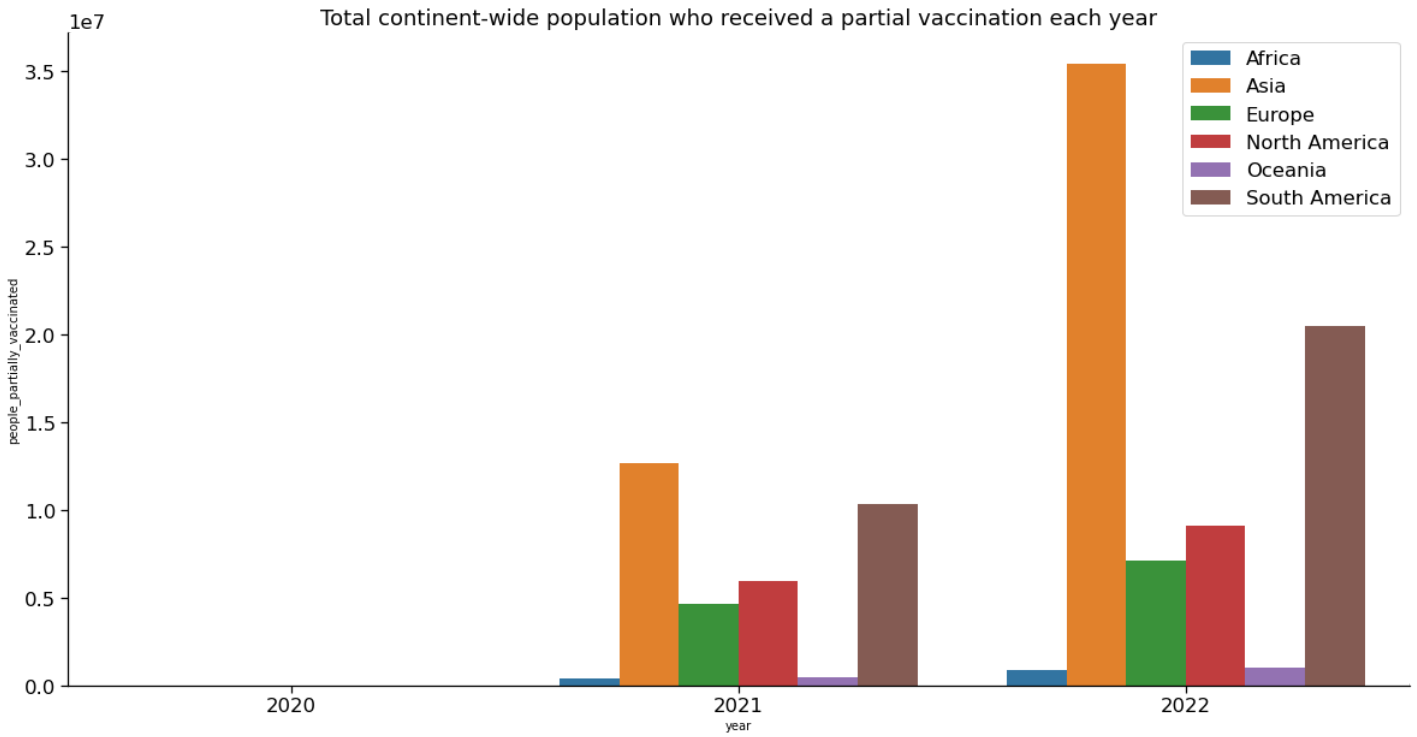
Out[23]:

```
<AxesSubplot:title={'center':'Vaccination Statistics'}, xlabel='continent'>
```



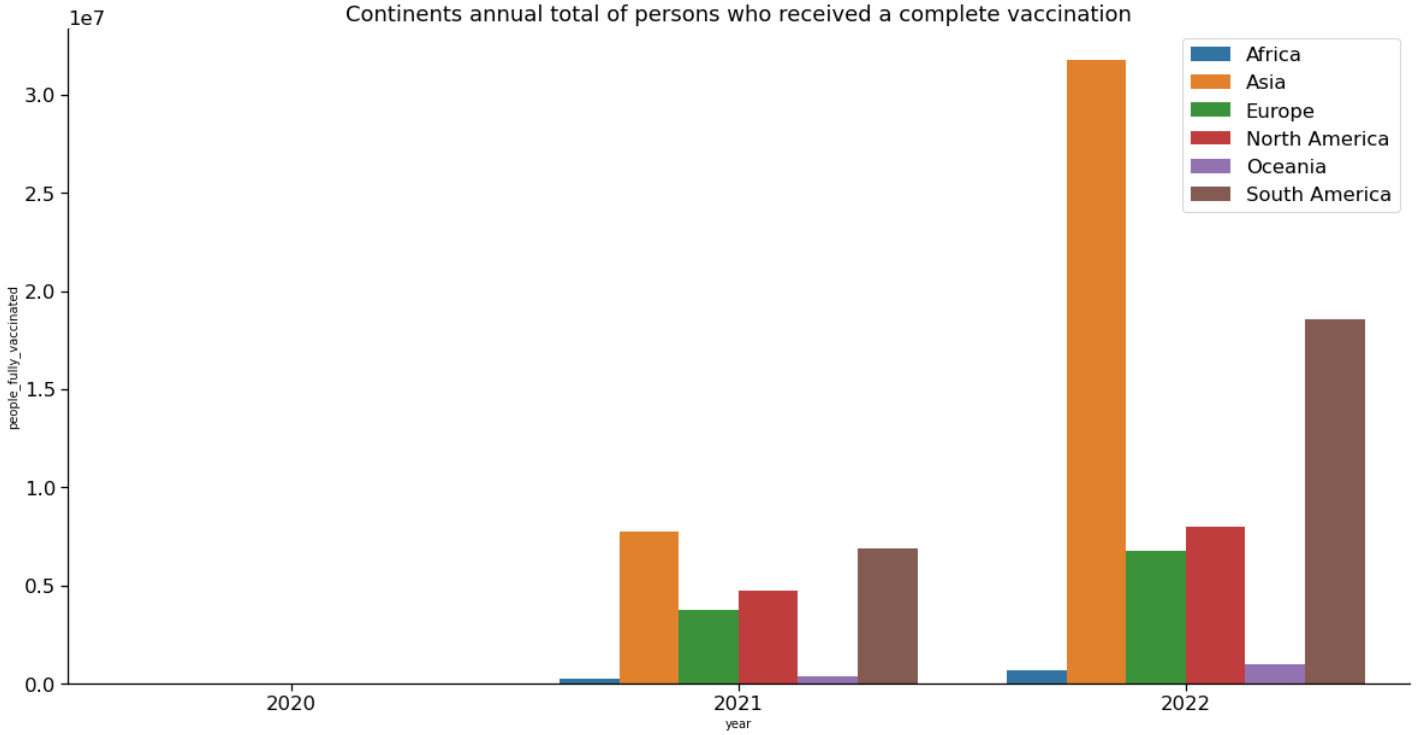
In [24]:

```
vac_yr = plt1_df
vacyr = sqldf("select continent,year,sum(people_vaccinated)/count(people_vaccinated) as pe
fig,ax = plt.subplots(figsize=(20, 10))
sns.despine()
sns.set_context("notebook", font_scale=1.5, rc={"lines.linewidth": 2})

sns.barplot(x="year", y="people_partially_vaccinated", data=vacyr, hue='continent')
ax.set_ylabel(ylabel = 'people_partially_vaccinated', fontsize = 10)
ax.set_xlabel(xlabel = 'year', fontsize = 10)
ax.set_title('Total continent-wide population who received a partial vaccination each year
ax.legend();
```



In [25]:

```
fig,ax = plt.subplots(figsize=(20, 10))
sns.despine()
sns.set_context("notebook", font_scale=1.5, rc={"lines.linewidth": 2})
sns.barplot(x="year", y="people_fully_vaccinated", data=vacyr, hue='continent')
ax.set_ylabel(ylabel = 'people_fully_vaccinated', fontsize = 10)
ax.set_xlabel(xlabel = 'year', fontsize = 10)
ax.set_title('Continents annual total of persons who received a complete vaccination')
ax.legend();
```



In [26]:

```
fig,ax = plt.subplots(figsize=(20, 10))
sns.despine()
sns.set_context("notebook", font_scale=1.5, rc={"lines.linewidth": 2})
sns.barplot(x="year", y="total_boosters", data=vacyr, hue='continent')
ax.set_ylabel(ylabel = 'total_boosters', fontsize = 10)
ax.set_xlabel(xlabel = 'year', fontsize = 10)
```

```
ax.set_title('People received a boost overall each year from the continent.')
ax.legend();
```