In [32]:

```
#Import All the required libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
from wordcloud import WordCloud
```

In [33]:

```
#Load the data in the data set
dataSet = pd.read_csv('patient.csv')
```

In [34]:

```
dataSet.head()
```

Out[34]:

	id	sex	birth_year	country	region	group	infection_reason	infection_order	infected_by
0	1	female	1984.0	China	filtered at airport	NaN	visit to Wuhan	1.0	NaN
1	2	male	1964.0	Korea	filtered at airport	NaN	visit to Wuhan	1.0	NaN
2	3	male	1966.0	Korea	capital area	NaN	visit to Wuhan	1.0	NaN
3	4	male	1964.0	Korea	capital area	NaN	visit to Wuhan	1.0	NaN
4	5	male	1987.0	Korea	capital area	NaN	visit to Wuhan	1.0	NaN

In [35]:

```
dataSet.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5328 entries, 0 to 5327
Data columns (total 14 columns):
id                  5328 non-null int64
sex                 383 non-null object
birth_year          370 non-null float64
country             5328 non-null object
region              371 non-null object
group               81 non-null object
infection_reason    140 non-null object
infection_order     35 non-null float64
infected_by         70 non-null float64
contact_number      47 non-null float64
confirmed_date      5328 non-null object
released_date       32 non-null object
deceased_date       20 non-null object
state               5328 non-null object
dtypes: float64(4), int64(1), object(9)
memory usage: 582.8+ KB
```

In [36]:

```
dataSet.describe()
```

Out[36]:

	id	birth_year	infection_order	infected_by	contact_number
count	5328.000000	370.000000	35.000000	70.000000	47.000000
mean	2664.500000	1973.589189	2.285714	379.000000	72.978723
std	1538.205448	17.560546	1.405272	540.247528	188.155288
min	1.000000	1932.000000	1.000000	3.000000	0.000000
25%	1332.750000	1960.000000	1.000000	29.250000	2.500000
50%	2664.500000	1974.000000	2.000000	126.000000	16.000000
75%	3996.250000	1987.750000	3.000000	563.250000	46.000000
max	5328.000000	2018.000000	6.000000	2621.000000	1160.000000

In [37]:

```
#Cleaning the dataSets like removal of the duplicates
dataSet.duplicated().sum()
dataSet.drop_duplicates(inplace=True)
```

In [38]:

```
dataSet.head()
```

Out[38]:

	id	sex	birth_year	country	region	group	infection_reason	infection_order	infected_by
0	1	female	1984.0	China	filtered at airport	NaN	visit to Wuhan	1.0	NaN
1	2	male	1964.0	Korea	filtered at airport	NaN	visit to Wuhan	1.0	NaN
2	3	male	1966.0	Korea	capital area	NaN	visit to Wuhan	1.0	NaN
3	4	male	1964.0	Korea	capital area	NaN	visit to Wuhan	1.0	NaN
4	5	male	1987.0	Korea	capital area	NaN	visit to Wuhan	1.0	NaN

In [39]:

```
#There coluld be many Null values in the data and that could be the reason of slowne
dataSet.isnull().sum()
```

Out[39]:

```
id                   0
sex                4945
birth_year         4958
country               0
region             4957
group              5247
infection_reason   5188
infection_order    5293
infected_by        5258
contact_number     5281
confirmed_date        0
released_date      5296
deceased_date      5308
state                 0
dtype: int64
```

In [40]:

```
#Now check the shape of the data
print(dataSet.shape)
```

```
(5328, 14)
```

In [41]:

```
#Read the info of the colums
dataSet.columns
```

Out[41]:

```
Index(['id', 'sex', 'birth_year', 'country', 'region', 'group',
       'infection_reason', 'infection_order', 'infected_by', 'contact_
number',
       'confirmed_date', 'released_date', 'deceased_date', 'state'],
      dtype='object')
```

In [42]:

```
#Check how many Male & Female does exists
dataSet['sex'].value_counts()
```

Out[42]:

```
female    194
male      189
Name: sex, dtype: int64
```

In [43]:

```
#Sex column is a Categorical & here we need to apply encoding technique, female =1 &
dataSet.sex = dataSet.sex.apply(lambda X : 0 if X == 'female' else 1)
```

In [44]:

```
dataSet.head()
```

Out[44]:

	id	sex	birth_year	country	region	group	infection_reason	infection_order	infected_by	cou
0	1	0	1984.0	China	filtered at airport	NaN	visit to Wuhan	1.0	NaN	
1	2	1	1964.0	Korea	filtered at airport	NaN	visit to Wuhan	1.0	NaN	
2	3	1	1966.0	Korea	capital area	NaN	visit to Wuhan	1.0	NaN	
3	4	1	1964.0	Korea	capital area	NaN	visit to Wuhan	1.0	NaN	
4	5	1	1987.0	Korea	capital area	NaN	visit to Wuhan	1.0	NaN	

In [45]:

```
#Check the statstics summary of the numerical data
dataSet.describe().T
```

Out[45]:

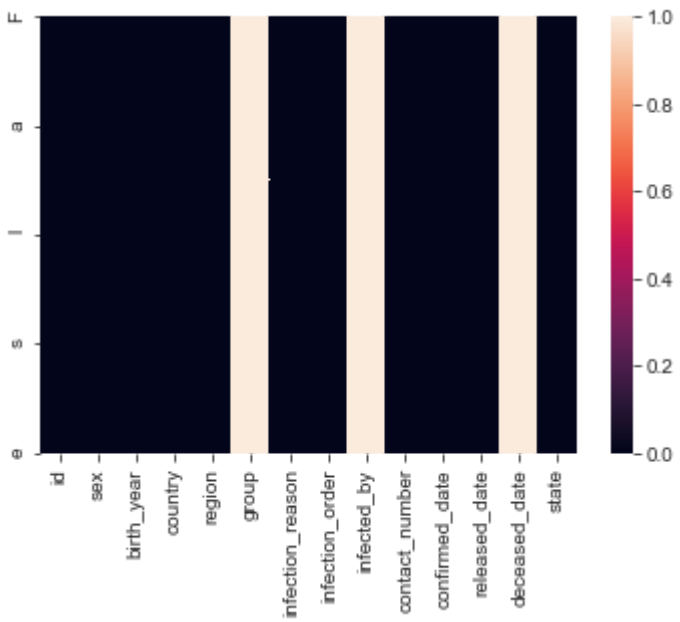
	count	mean	std	min	25%	50%	75%	max
id	5328.0	2664.500000	1538.205448	1.0	1332.75	2664.5	3996.25	5328.0
sex	5328.0	0.963589	0.187329	0.0	1.00	1.0	1.00	1.0
birth_year	370.0	1973.589189	17.560546	1932.0	1960.00	1974.0	1987.75	2018.0
infection_order	35.0	2.285714	1.405272	1.0	1.00	2.0	3.00	6.0
infected_by	70.0	379.000000	540.247528	3.0	29.25	126.0	563.25	2621.0
contact_number	47.0	72.978723	188.155288	0.0	2.50	16.0	46.00	1160.0

In [46]:

```
#Plot rectangular data as a color-encoded matrix to find out the null values, where
sns.heatmap(dataSet.isnull(), yticklabels='False')
```

Out[46]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x1a1b37dac8>
```



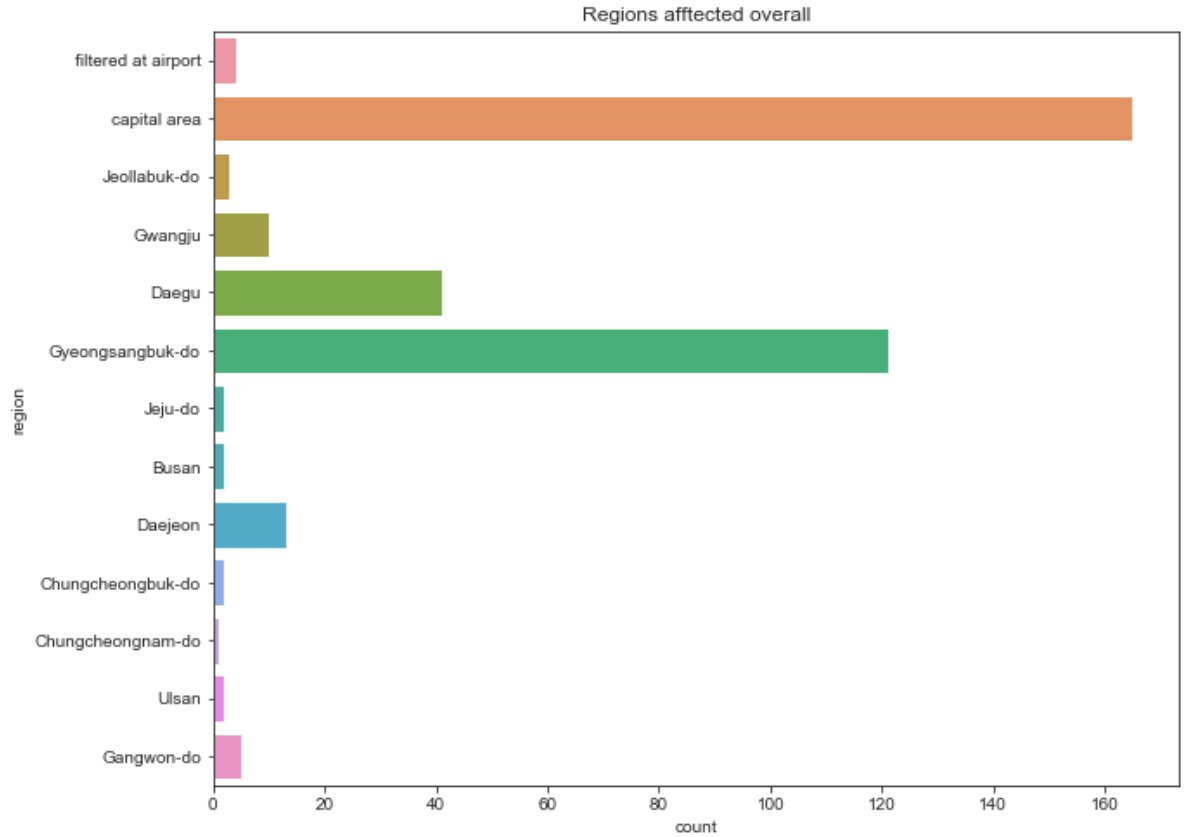
In [47]:

```
#Plot the graph to know the over all affected people within the region.
plt.figure(figsize=(10,8))
sns.set_style("ticks", {"xtick.major.size":8, "ytick.major.size": 8})

sns.countplot(y=dataSet['region'],).set_title('Regions afftected overall')
```

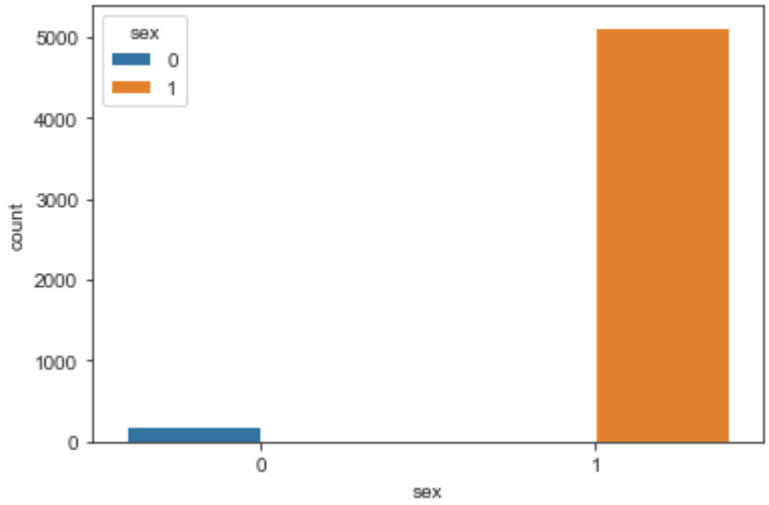
Out[47]:

```
Text(0.5, 1.0, 'Regions afftected overall')
```



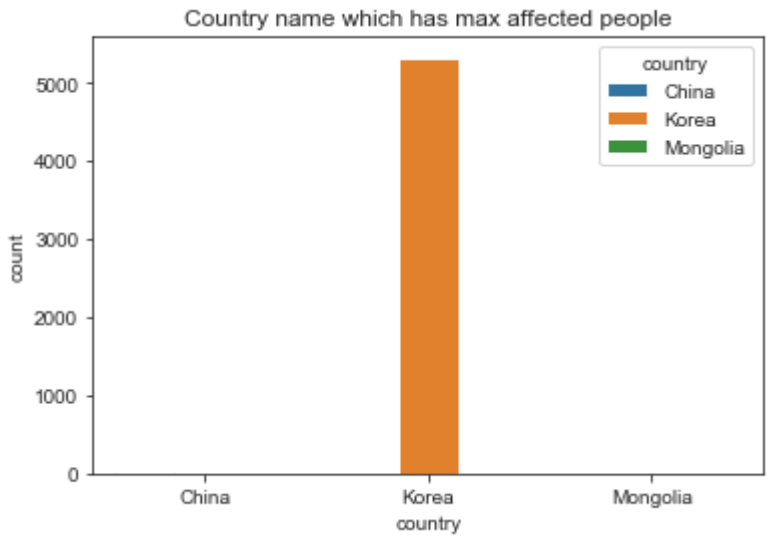
In [48]:

```
#Check the count of male and female affected by the virous
sns.countplot(x='sex',data=dataSet, hue='sex');
```



In [49]:

```
#Also check the country whcih has highest affected people
sns.countplot(x='country', data=dataSet, hue = 'country').set_title('Country name wh
```

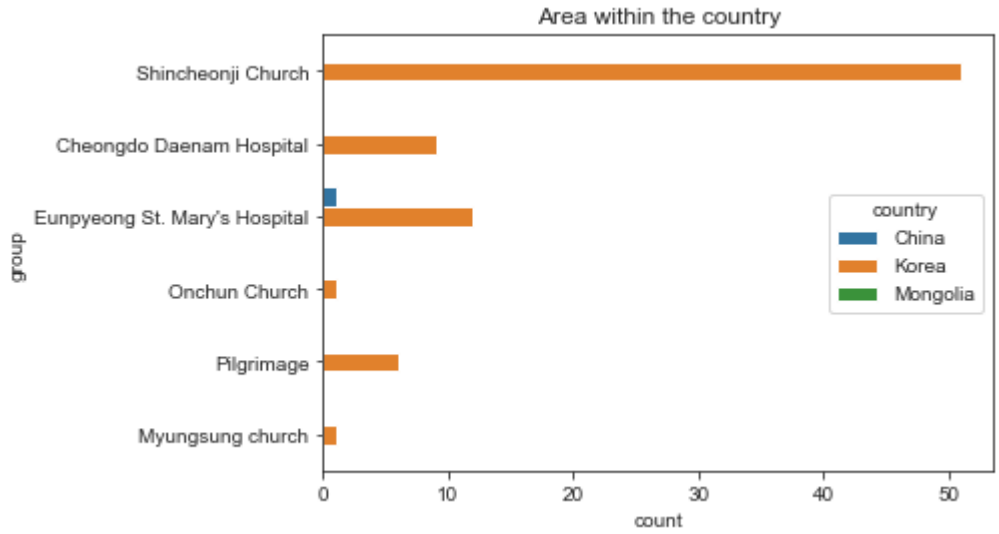


In [50]:

```
#Calculate the area within the country whcih has affected people
sns.countplot(y='group', data=dataSet, hue = 'country').set_title('Area within the c
```

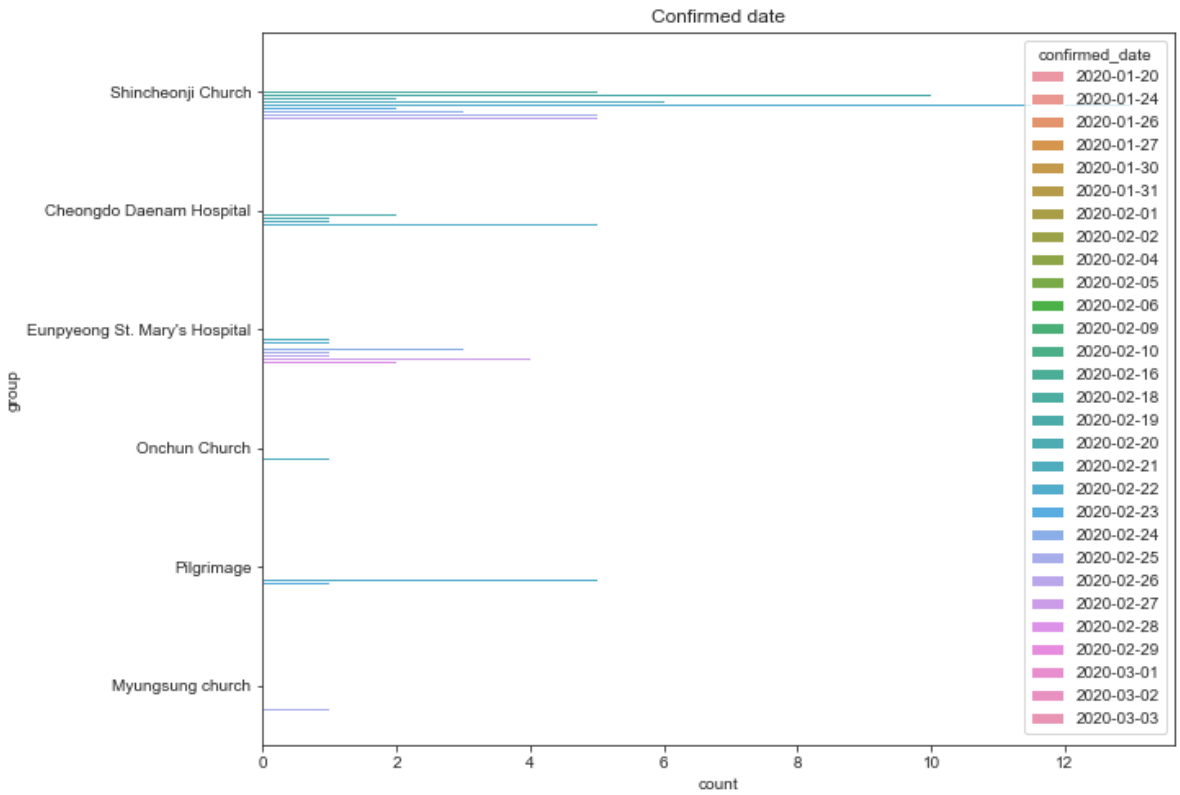
Out[50]:

```
Text(0.5, 1.0, 'Area within the country')
```



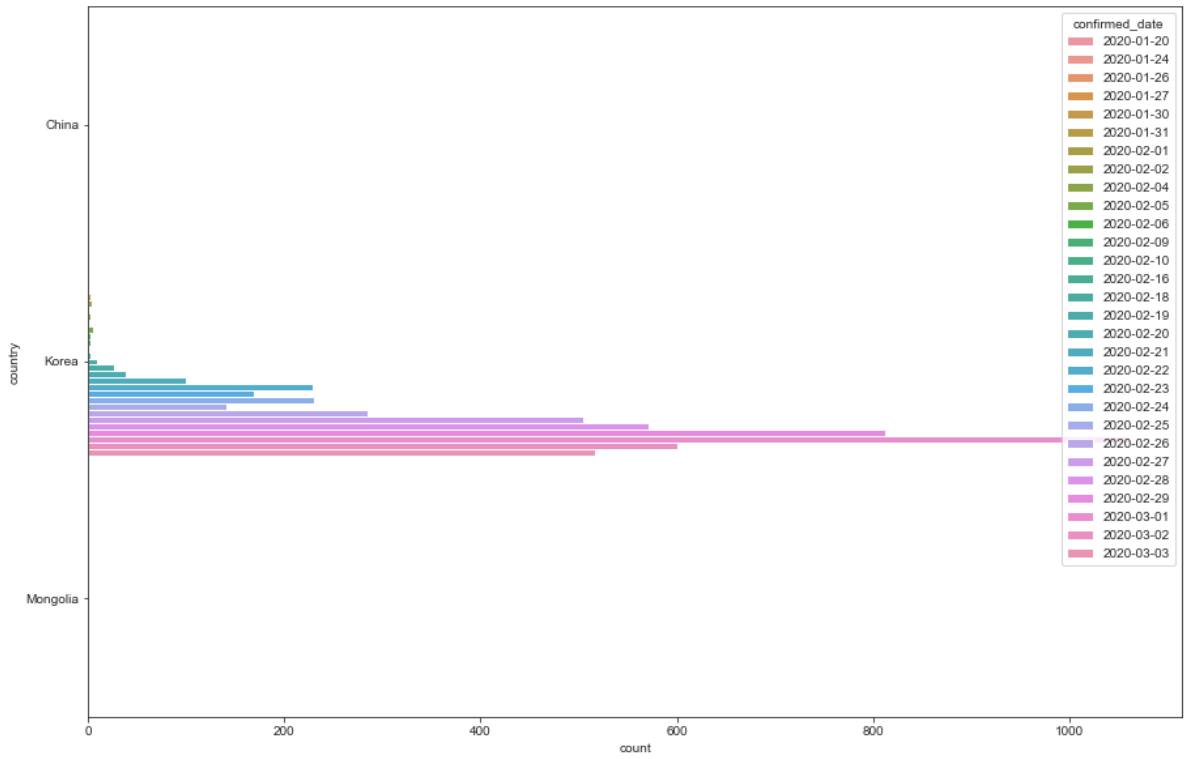
In [51]:

```
plt.figure(figsize=(10,8))
sns.countplot(y='group',data=dataSet, hue='confirmed_date').set_title('Confirmed dat
```



In [52]:

```
plt.figure(figsize=(15,10))
sns.countplot(y='country',data=dataSet, hue='confirmed_date');
```

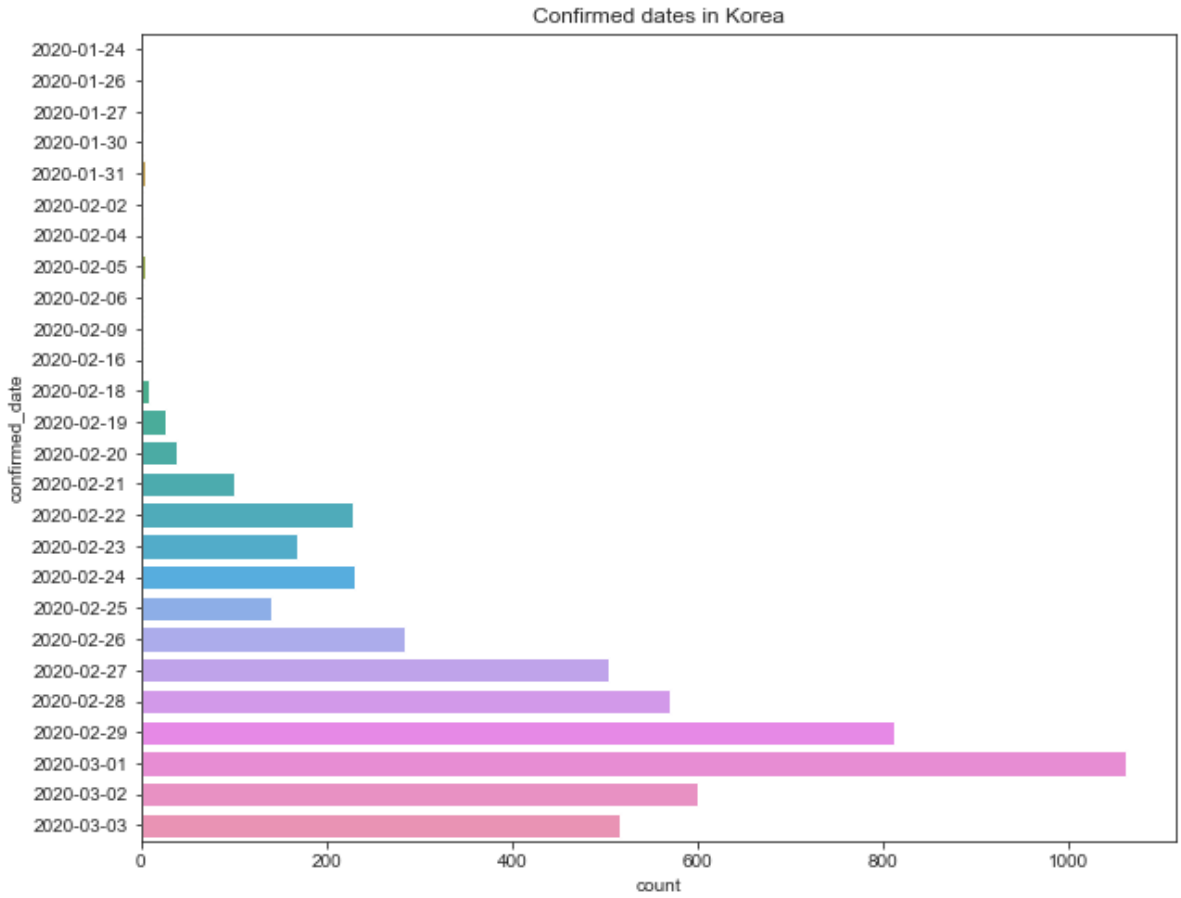


In [53]:

```
# plot the graph with confirmed date of the human infected or not in the Korea Count
plt.figure(figsize=(10,8))
sns.countplot(y=dataSet['confirmed_date'].loc[(dataSet['country']=="Korea")],).set_t
```

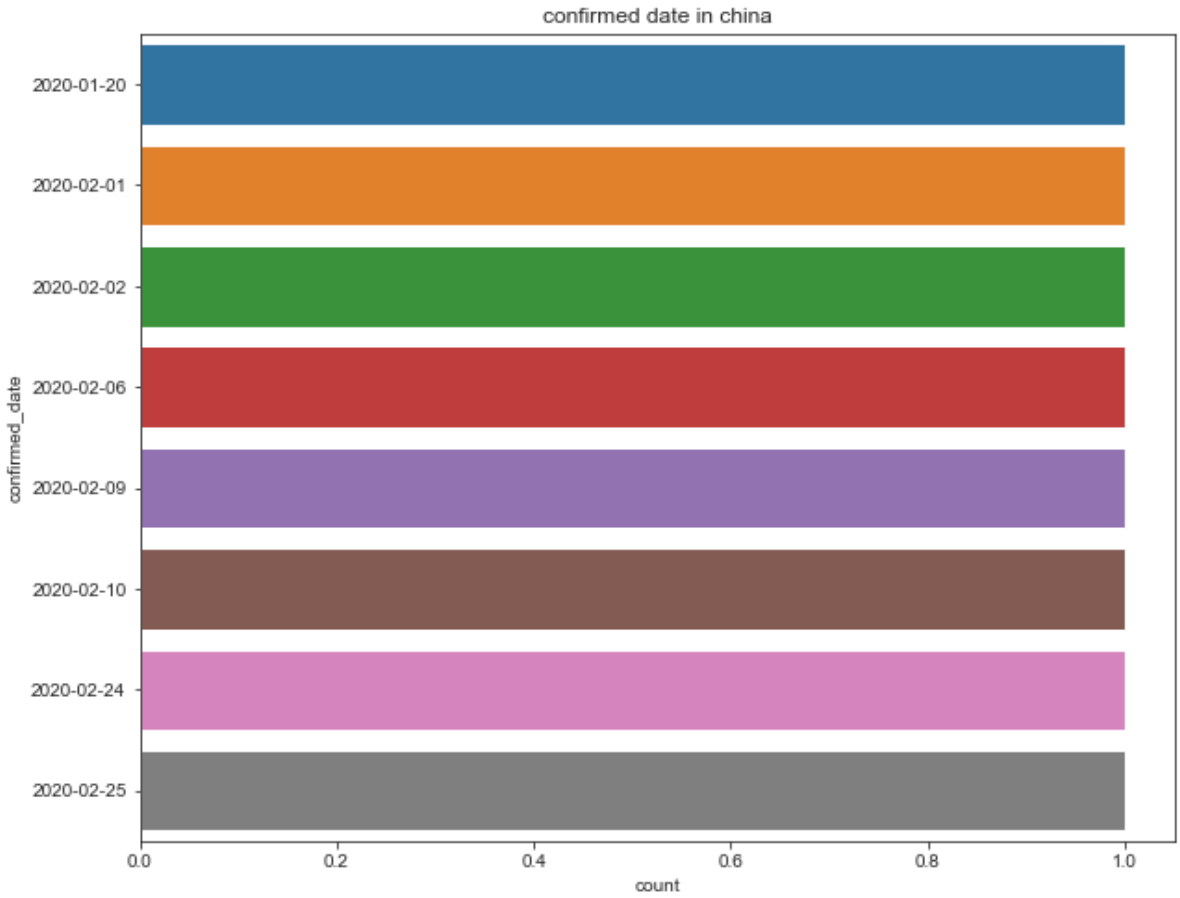
Out[53]:

```
Text(0.5, 1.0, 'Confirmed dates in Korea')
```



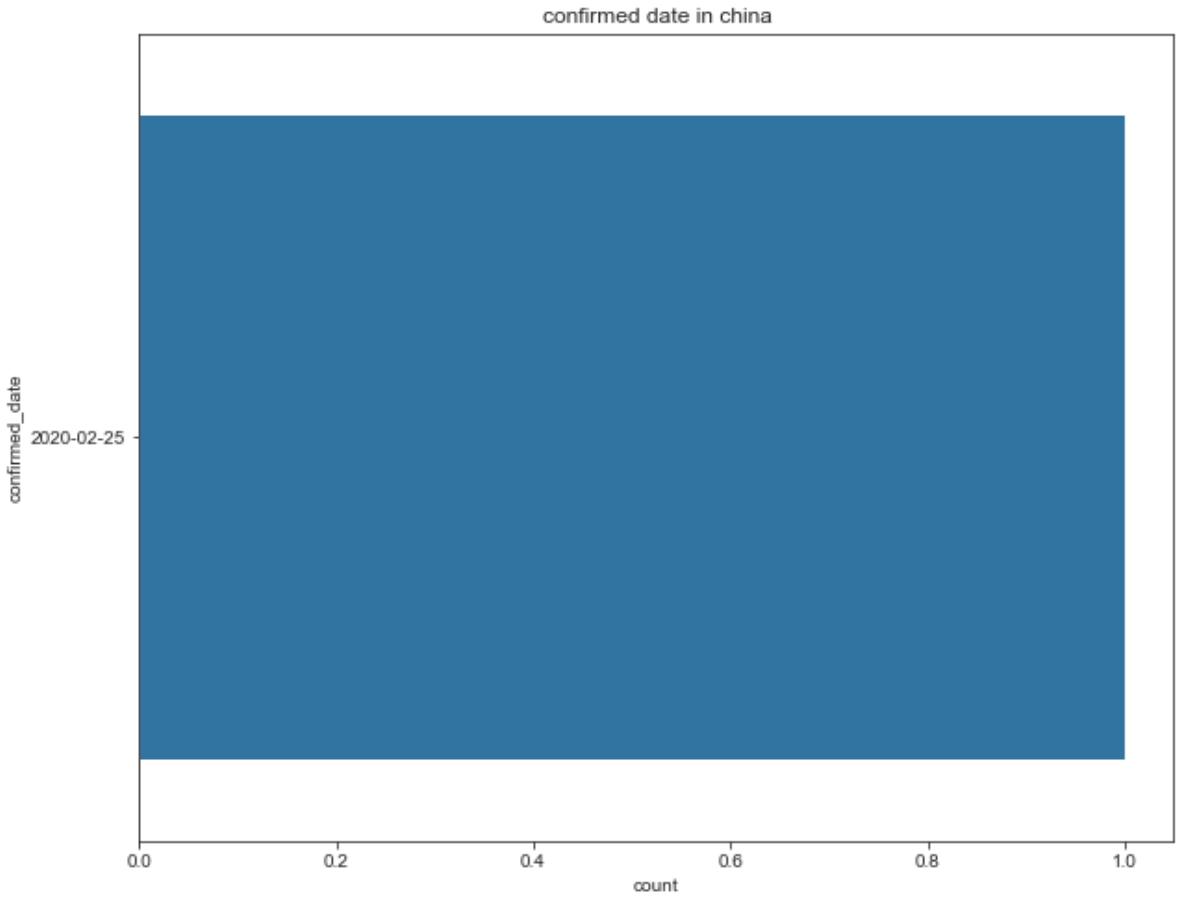
In [54]:

```
# plot the graph with confirmed date of the human infected or not in the China Count
plt.figure(figsize=(10,8))
sns.countplot(y=dataSet['confirmed_date'].loc[(dataSet['country']=="China")],).set_t
```



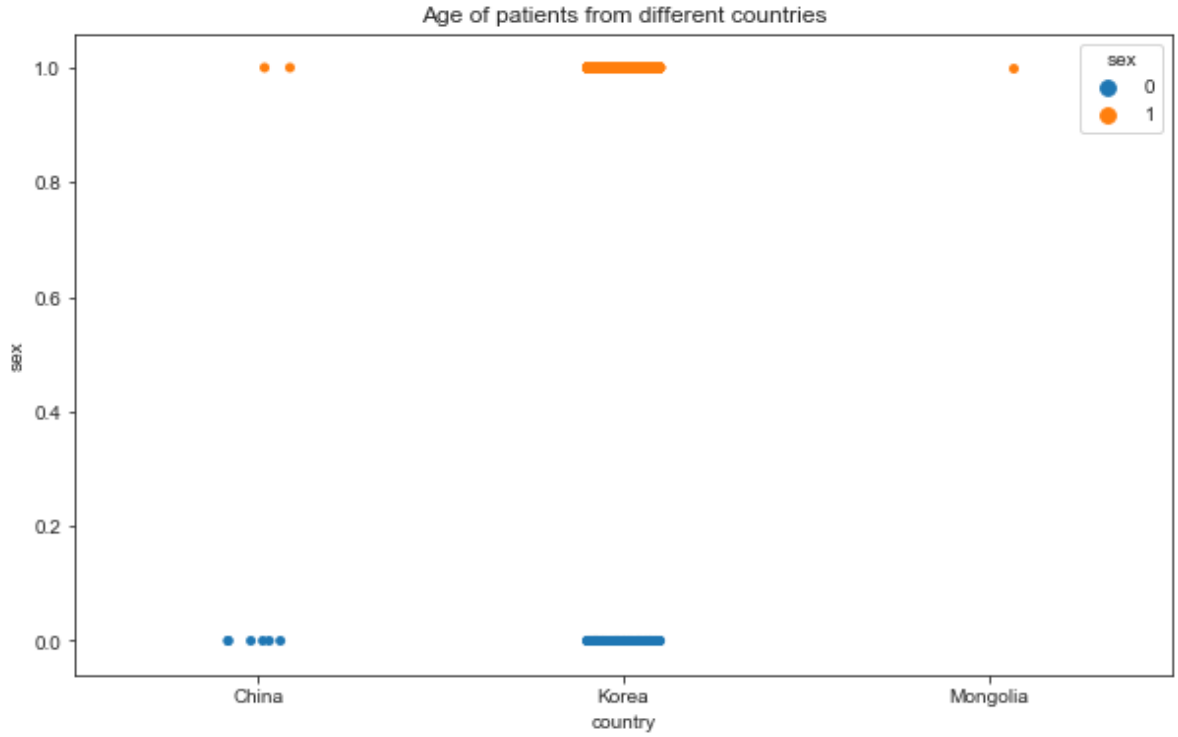
In [55]:

```
# plot the graph with confirmed date of the human infected or not in the Mongloia Co
plt.figure(figsize=(10,8))
sns.countplot(y=dataSet['confirmed_date'].loc[(dataSet['country']=="Mongolia")],).se
```



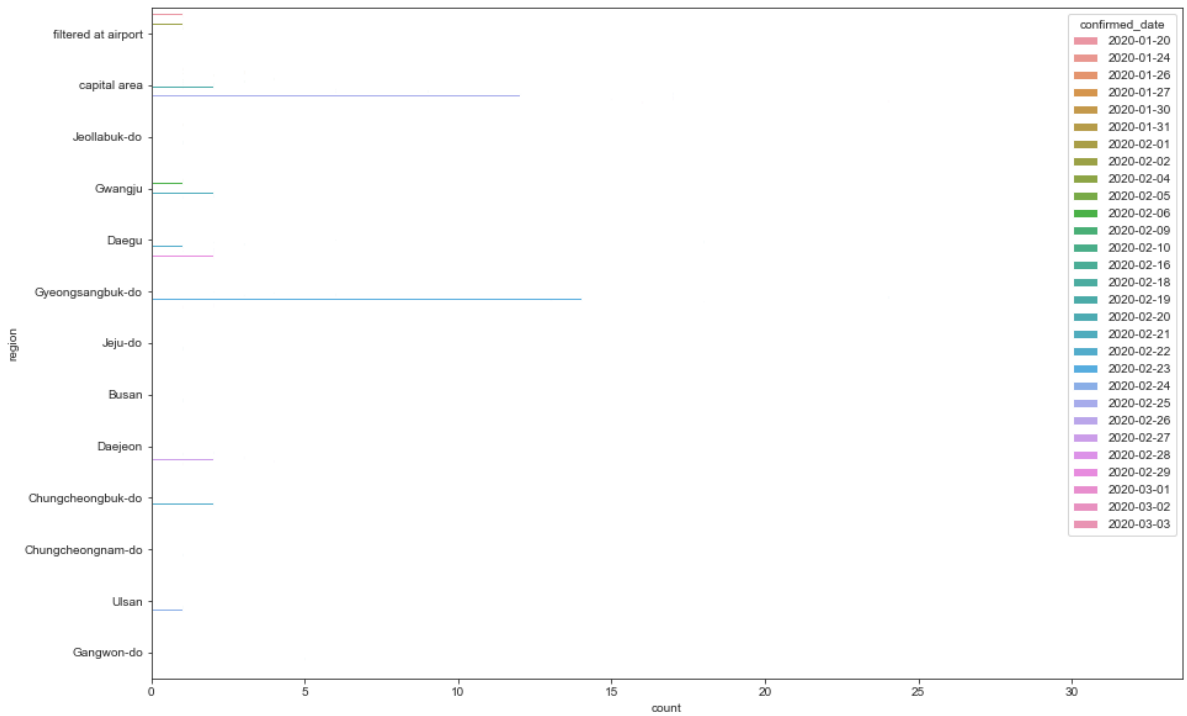
In [56]:

```
plt.figure(figsize=(10,6))
sns.stripplot(x=dataSet.country, y=dataSet.sex, hue=dataSet.sex)
plt.title("Age of patients from different countries")
plt.show()
```



In [57]:

```
plt.figure(figsize=(15,10))
sns.countplot(y='region',data=dataSet, hue='confirmed_date');
```



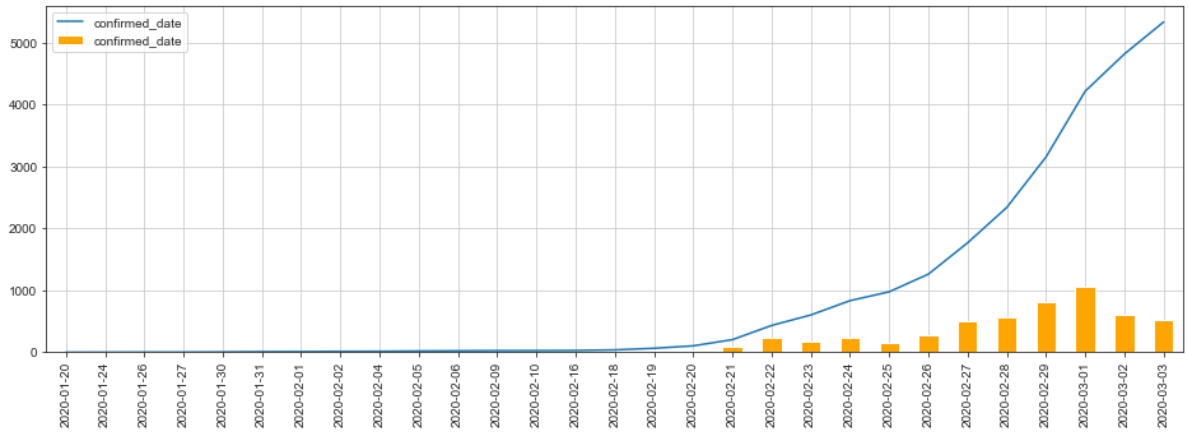
In [58]:

```
confirmed_patients = dataSet['confirmed_date'].value_counts().sort_index()

confirmed_patients.cumsum().plot(legend='accumulated')
confirmed_patients.plot(kind='bar', color='orange', legend='daily', figsize=(16, 5),
```

Out[58]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x1a1d05a390>
```

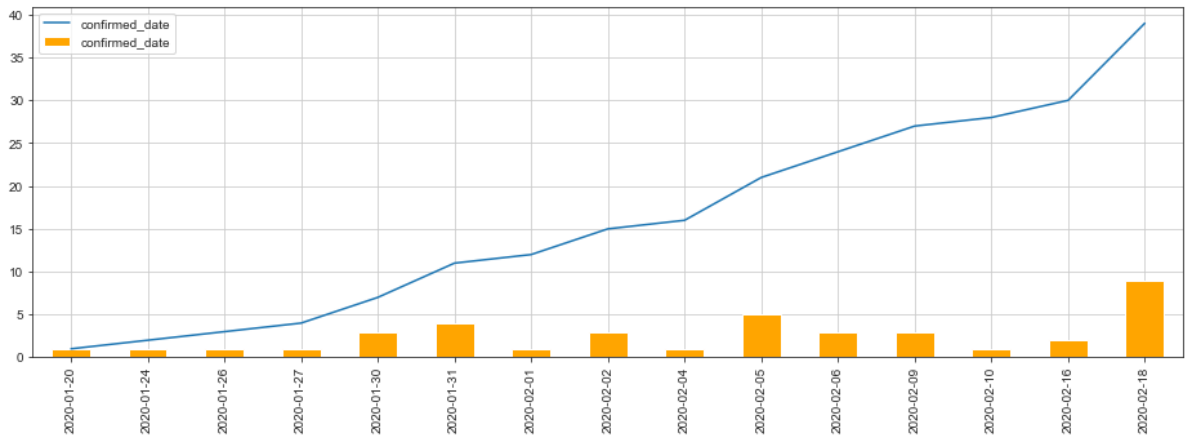


In [61]:

```
# before no.31 patient confirmed
limit_series = confirmed_patients[:dataSet[dataSet['id'] == 31]['confirmed_date'].va
limit_series.cumsum().plot(legend='accumulated')
limit_series.plot(kind='bar', color='orange', legend='daily', figsize=(16, 5), grid=
```

Out[61]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x1a1b73a128>
```

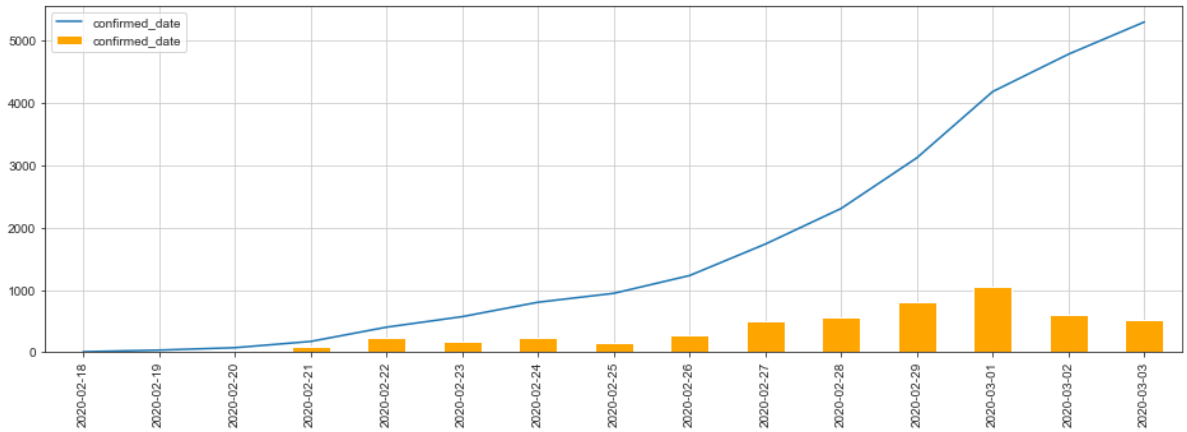


In [62]:

```
# after no.31 patient confirmed
limit_series = confirmed_patients[dataSet[dataSet['id'] == 31]['confirmed_date'].val
limit_series.cumsum().plot(legend='accumulated')
limit_series.plot(kind='bar', color='orange', legend='daily', figsize=(16, 5), grid=
```

Out[62]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x1a1d0c6c50>
```

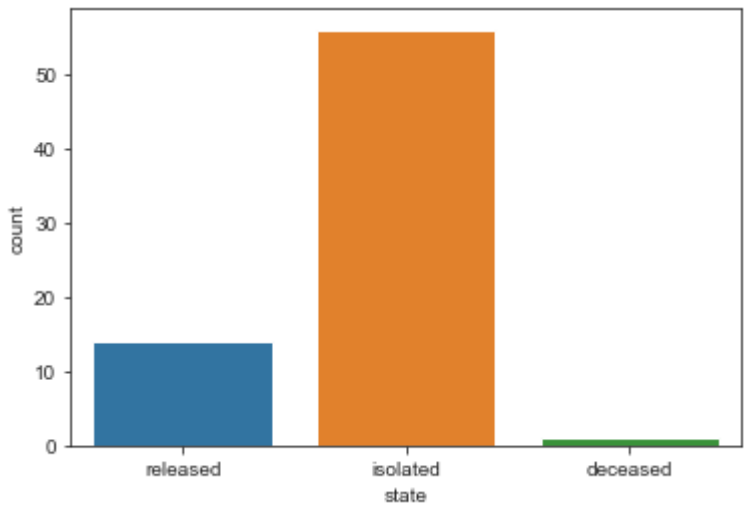


In [63]:

```
sns.countplot(x=dataSet['state'].loc[(dataSet['infection_reason']=='contact with pat
```

Out[63]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x1a1ac5cba8>
```



In [65]:

```
#Using WordCloud to check most frequently country suffered from "Coronavirus"
plt.subplots(figsize=(15,15))
wordcloud = WordCloud(
                          background_color='white',
                          width=1920,
                          height=1080
                         ).generate(" ".join(dataSet.country))
plt.imshow(wordcloud)
plt.axis('off')
plt.savefig('country.png')
plt.show()
```

In [ ]: