In [1]:
```
#Import of the main libraries for DataViz
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
from scipy import stats as stats
print("Setup Complete")
```

```
Setup Complete
```

Quick Analysis for Covid Evolution in France

Goal

The main goal is to visualize the covid 19 pandemic in france using jupyter Notebook.

Sources

I used french gouverment open data website here. The data is for the whole France.

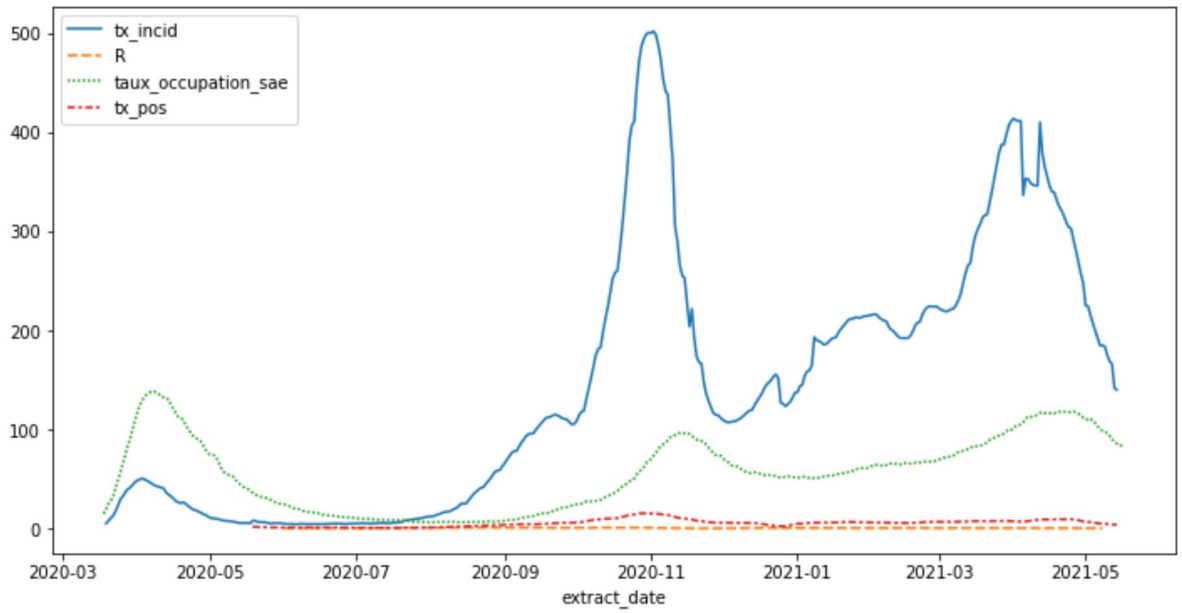
In [2]:
```
# definition of the file path
file_path_indicateurs = '/table-indicateurs-open-data-france.csv'

#I put the data into a pandas dataframe
data_indicateurs = pd.read_csv(file_path_indicateurs)
data_indicateurs['extract_date'] = pd.to_datetime(data_indicateurs['extract
data_indicateurs.set_index('extract_date',inplace=True)
#I read the head of the dataframe to have an understanding of data structu
data_indicateurs.head()
```

Out[2]:

extract_date	tx_incid	R	taux_occupation_sae	tx_pos
2020-03-18	NaN	NaN	15.2	NaN
2020-03-19	5.570823	NaN	19.8	NaN
2020-03-20	8.403950	NaN	25.6	NaN
2020-03-21	11.013409	NaN	28.7	NaN
2020-03-22	13.600502	NaN	33.1	NaN

Quick graph of the data in function of time

In [3]:
```
#Plotting data in function of time
ax1 = plt.figure(figsize=(12,6))
ax1 = sns.lineplot(data=data_indicateurs)
```



Clearly the main phases of the epidemic can be seen with the incidence rate evolution trough time.

Looking for relation between variables

we delete missing values to make better correlatins between variables. Then we can ask ourselves what are the relation among outputs.

In [4]:
```
#Deleting missing values
data_indicateurs2 = data_indicateurs.dropna()
data_indicateurs2.reset_index(inplace=True)
data_indicateurs2.head()
```

Out[4]:

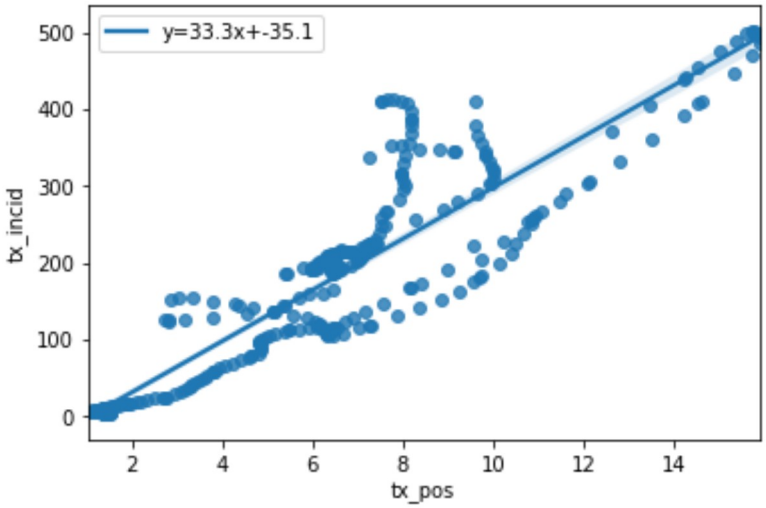
	extract_date	tx_incid	R	taux_occupation_sae	tx_pos
0	2020-06-01	5.197050	0.84	25.1	1.501300
1	2020-06-02	5.147881	0.84	24.1	1.520426
2	2020-06-03	5.067422	0.83	23.3	1.507729
3	2020-06-04	5.048052	0.84	22.4	1.522279
4	2020-06-05	5.000373	0.85	21.1	1.526863

Use of Linear Regression

I use linear regression to any sort of correlation between the variables.

In [5]:
```
#Linear regression between tx_pos and tx_incid with equation of the regress
slope, intercept, r_value, p_value, std_err = stats.linregress(data_indicat

ax2 = sns.regplot(x="tx_pos", y="tx_incid", data=data_indicateurs2,
 line_kws={'label':"y={0:.1f}x+{1:.1f}".format(slope,intercept)})
ax2.legend()
```

Out[5]: <matplotlib.legend.Legend at 0x7ffa11586ad0>



Here we can see a strong relation between the incidence rate and the positivity rate.

Correlation between variables

In [6]:
```
#Creating a dataframe with only the numerics values
dataframe = pd.DataFrame(data_indicateurs2, columns=['tx_incid', 'taux_occu
dataframe.head()
```

Out[6]:

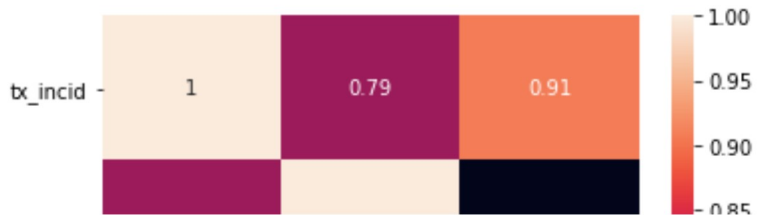
	tx_incid	taux_occupation_sae	tx_pos
0	5.197050	25.1	1.501300
1	5.147881	24.1	1.520426
2	5.067422	23.3	1.507729
3	5.048052	22.4	1.522279
4	5.000373	21.1	1.526863

In [7]:
```
#creating the correlation matrix
matrix = dataframe.corr()
print(matrix)
```

```
                    tx_incid  taux_occupation_sae    tx_pos
tx_incid            1.000000             0.794302  0.908775
taux_occupation_sae 0.794302             1.000000  0.662972
tx_pos              0.908775             0.662972  1.000000
```

In [8]:
```
sns.heatmap(data=matrix, annot=True)
```

Out[8]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x7ffa1158b950>
```



With this correlation matrix we can see that all variables are correlated. This is normal, because they all monitor the pandemic.

They also show that we don't need all of this to monitor the epidemic, but only the ones the less correlated; like : incidence rate and occupation rate.

Indeed if we take the positivity rate we can make good approximations based on the incidence rate. The incidence rate being more contrasted across time it will show more phases or informations than a flat line; Even if the incidence rate is a rate.

Conclusion

Better Analysis we'll take broader data and make more precise analysis. As a quick analysis it as shows that we can make some statement in a few times based on data freely at disposal.

On the other hand we can also critic the sources that are already formated. That was the job of this quick examination.