Line Chart In Machine Learning

June 10, 2021

1 Line Chart in Machine Learning

[1]:
```
import pandas as pd
```

[2]:
```
df = pd.read_csv('hiv.csv', encoding='latin-1')
```

[3]:
```
df.head()
```

[3]:

	Country	UNICEF Region	Year	Sex	Age	Estimated incidence rate of new HIV infection per 1 000 uninfected population	Estimated number of annual AIDS related deaths	Estimated number of annual new HIV infections
0	Angola	Eastern and Southern Africa	1990	Female	Age 10-19	0.64	100.0	500.0
1	Angola	Eastern and Southern Africa	1990	Male	Age 10-19	0.15	100.0	100.0
2	Angola	Eastern and Southern Africa	1991	Female	Age 10-19	0.75	100.0	500.0
3	Angola	Eastern and Southern Africa	1991	Male	Age 10-19	0.17	100.0	200.0
4	Angola	Eastern and Southern Africa	1992	Female	Age 10-19	0.88	100.0	590.0

```
   Estimated number of people living with HIV  \
0                                          860
1                                          200
2                                         1100
3                                          500
4                                         1300

   Estimated rate of annual AIDS related deaths  per 100 000 population
0                                                                  0.36
1                                                                  0.07
2                                                                  0.42
3                                                                  0.14
4                                                                  0.54
```

[4]:
```
country = set(df['Country'])
country
```

[4]:
```
{'Angola',
 'Benin',
 'Burkina Faso',
 'Burundi',
 'Cameroon',
 'Central African Republic',
 'Chad',
 'Congo',
 "Côte d'Ivoire",
 'Democratic Republic of the Congo',
 'Djibouti',
 'Equatorial Guinea',
 'Eritrea',
 'Eswatini',
 'Ethiopia',
 'Gabon',
 'Gambia',
 'Ghana',
 'Guinea',
 'Guinea-Bissau',
 'Kenya',
 'Lesotho',
 'Liberia',
 'Madagascar',
 'Malawi',
 'Mali',
 'Mauritania',
 'Mauritius',
 'Mozambique',
 'Namibia',
```

```
 'Niger',
 'Nigeria',
 'Rwanda',
 'Senegal',
 'Sierra Leone',
 'Somalia',
 'South Africa',
 'South Sudan',
 'Sudan',
 'Togo',
 'Uganda',
 'United Republic of Tanzania',
 'Zambia',
 'Zimbabwe'}
```

2 Line Chart using mathplotlib library

[5]:
```
import matplotlib.pyplot as plt
```

[6]:
```
for i in sorted(country):
    x = df[df['Sex'] == 'Male'][df['Country'] == i]
    y = df[df['Sex'] == 'Female'][df['Country'] == i]
    plt.title('Estimated number of people living with HIV in '+ i)
    plt.ylabel('Estimated number of people living with HIV')
    plt.xlabel('Years')
    plt.plot(x['Year'],x['Estimated number of people living with HIV'],␣
↪marker='o', label='Male')
    plt.plot(y['Year'],y['Estimated number of people living with HIV'],␣
↪marker='o', label='Female')
    plt.legend()
    plt.show()
```

```
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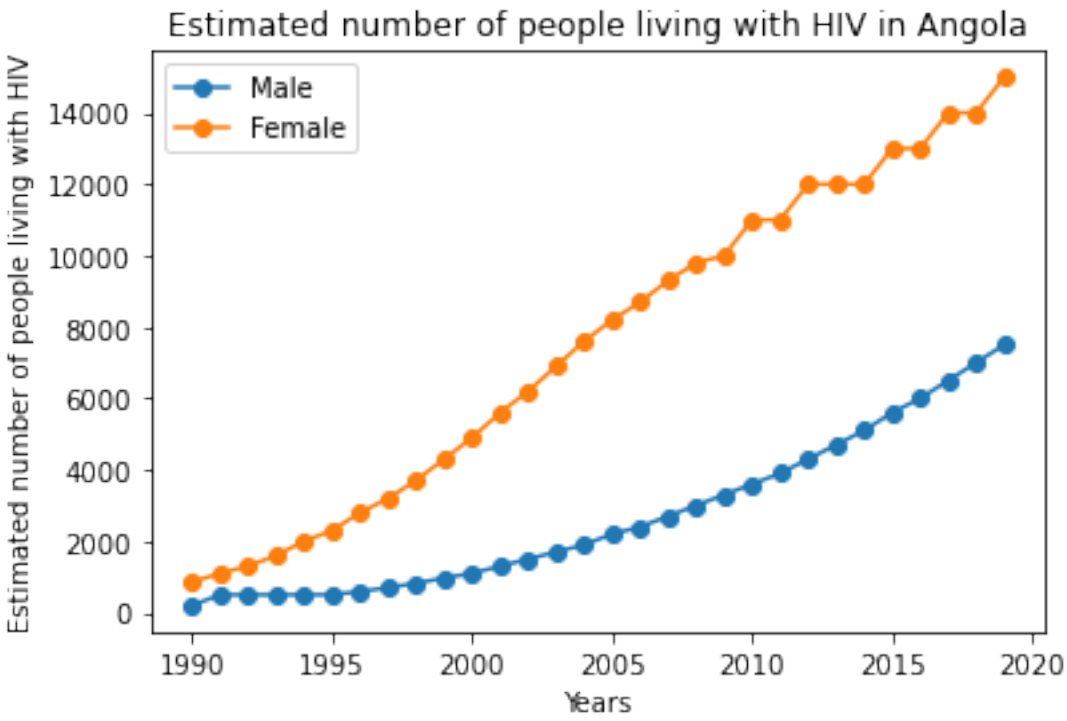


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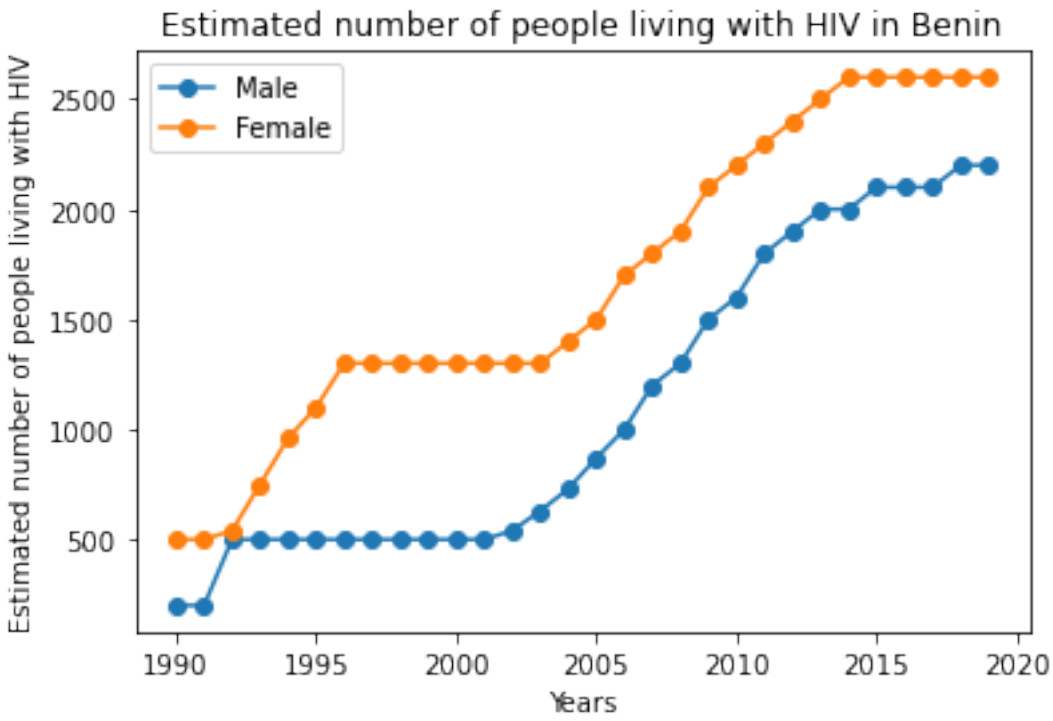


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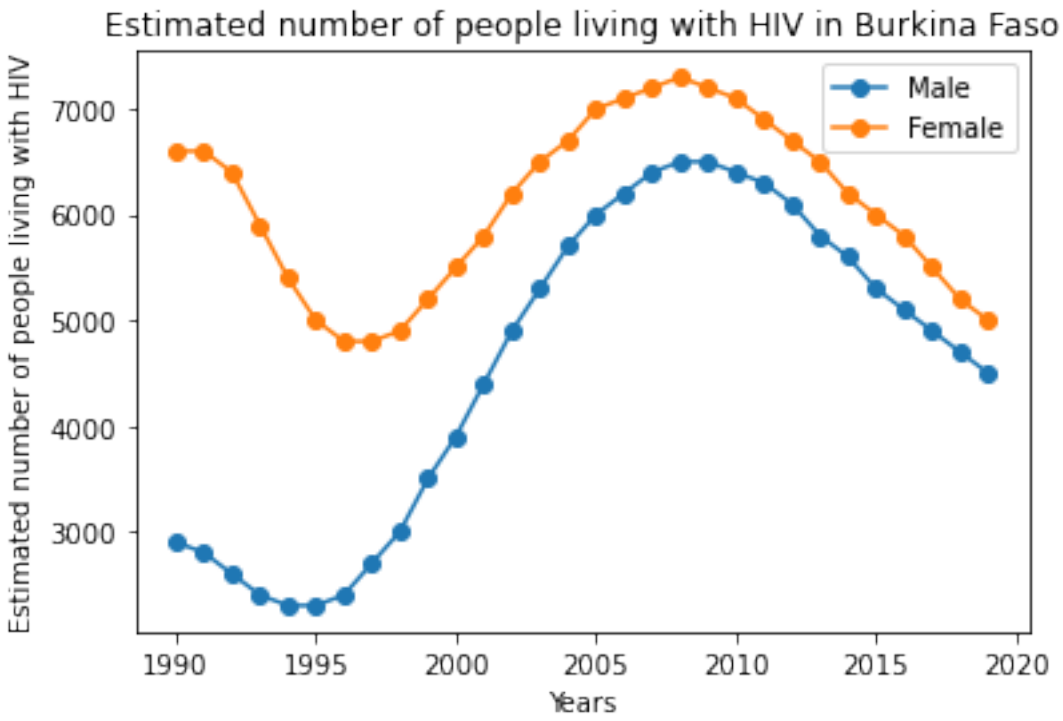


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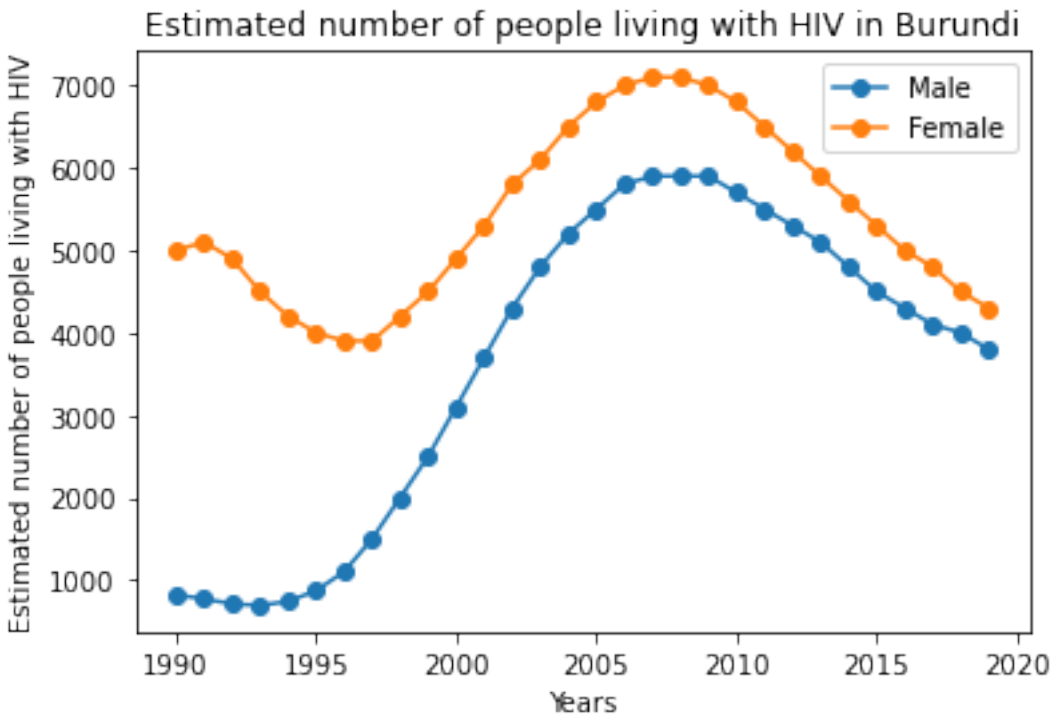


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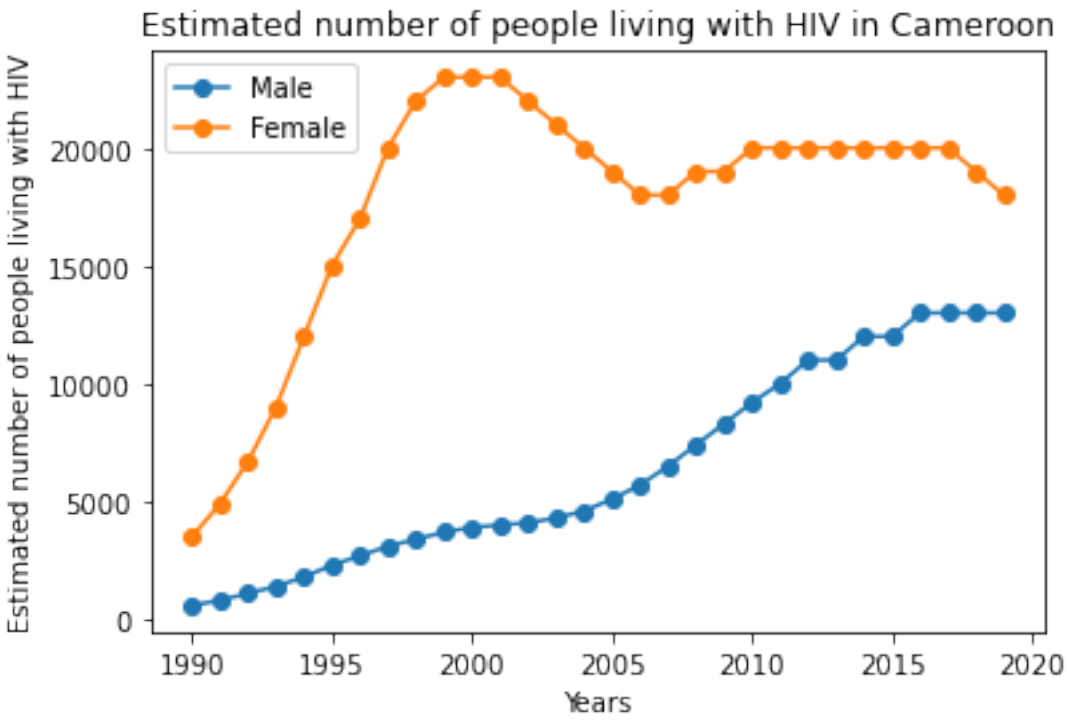


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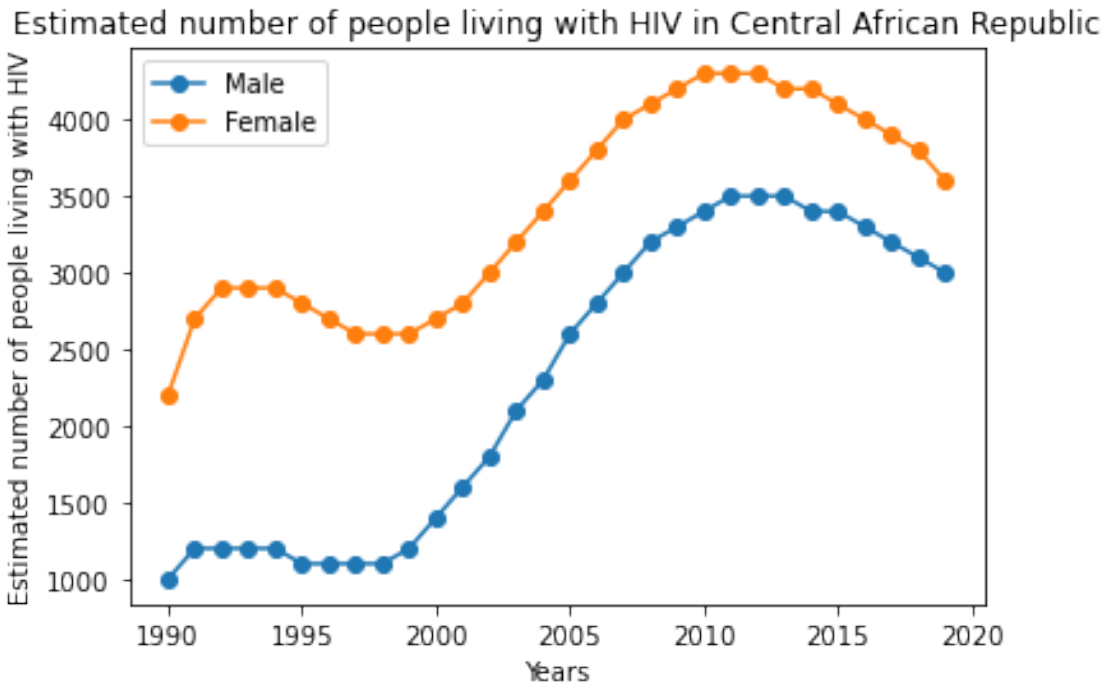


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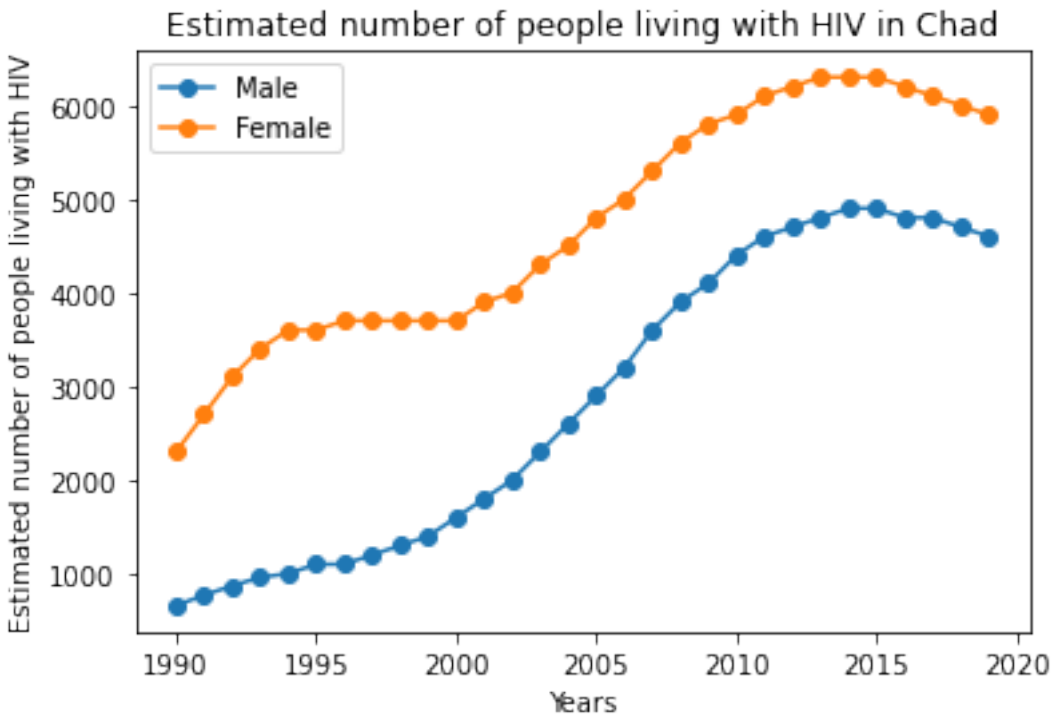


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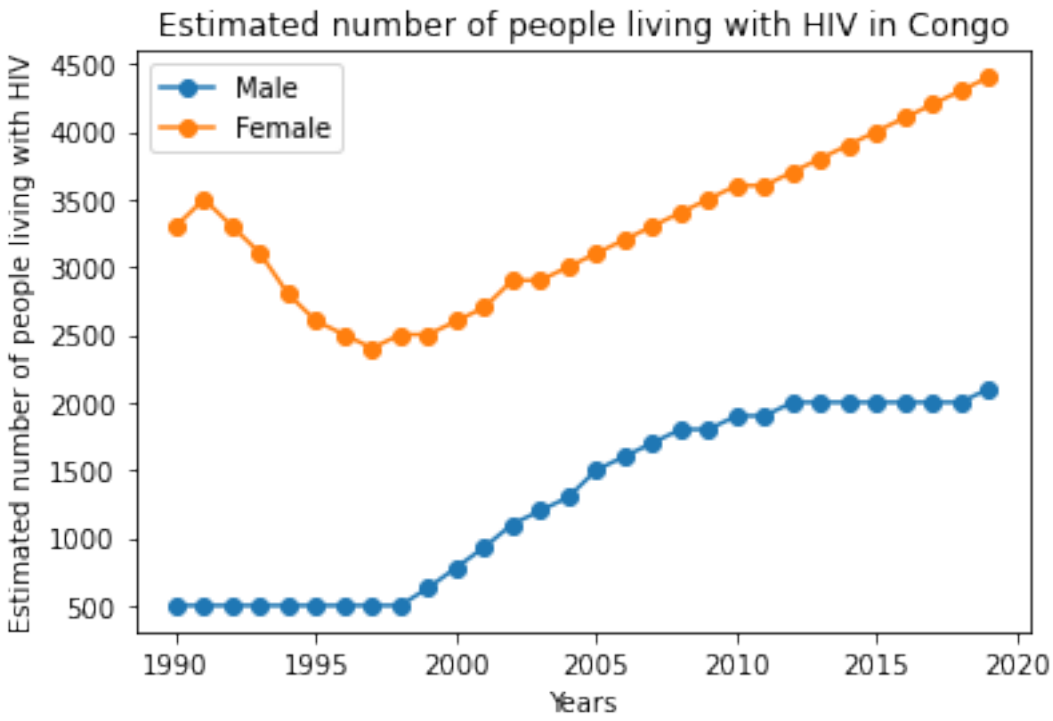


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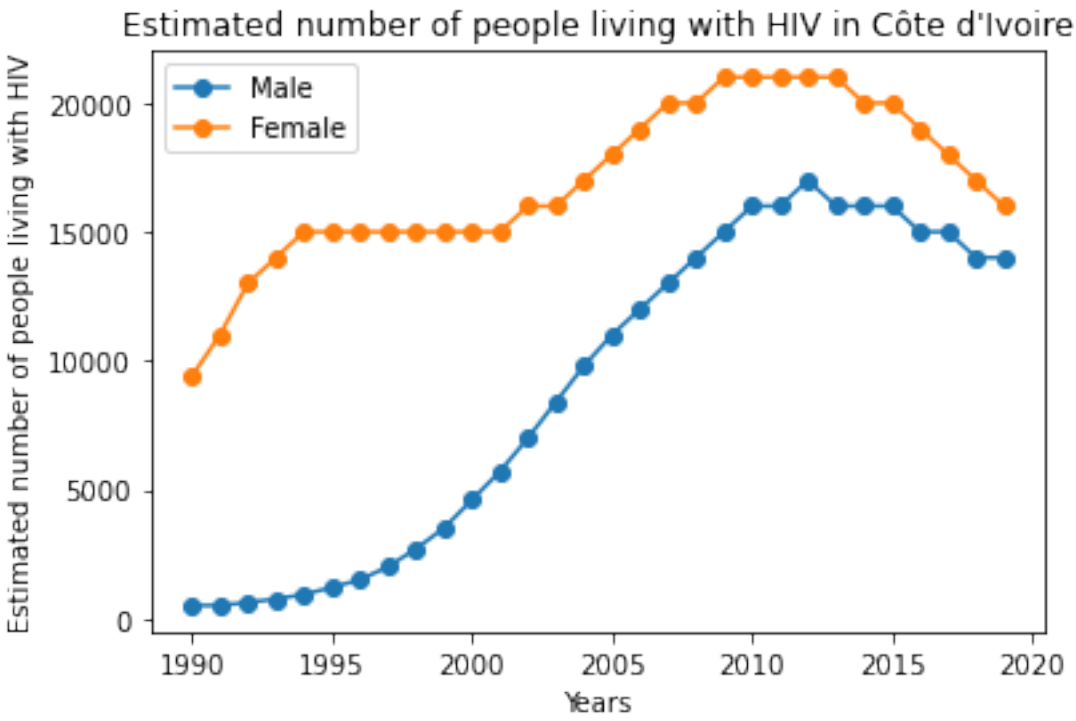


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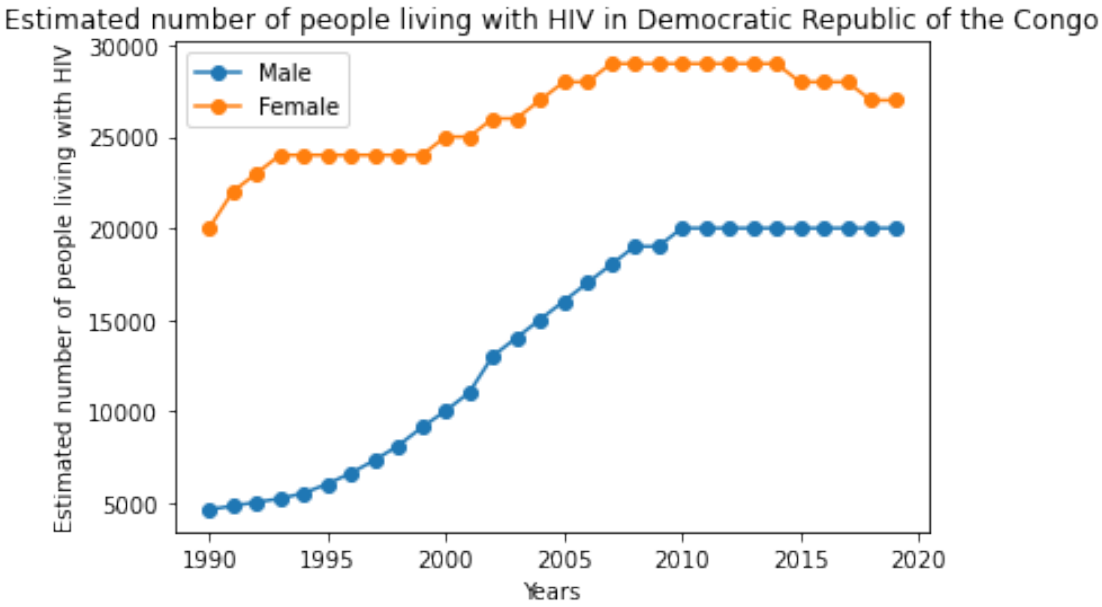

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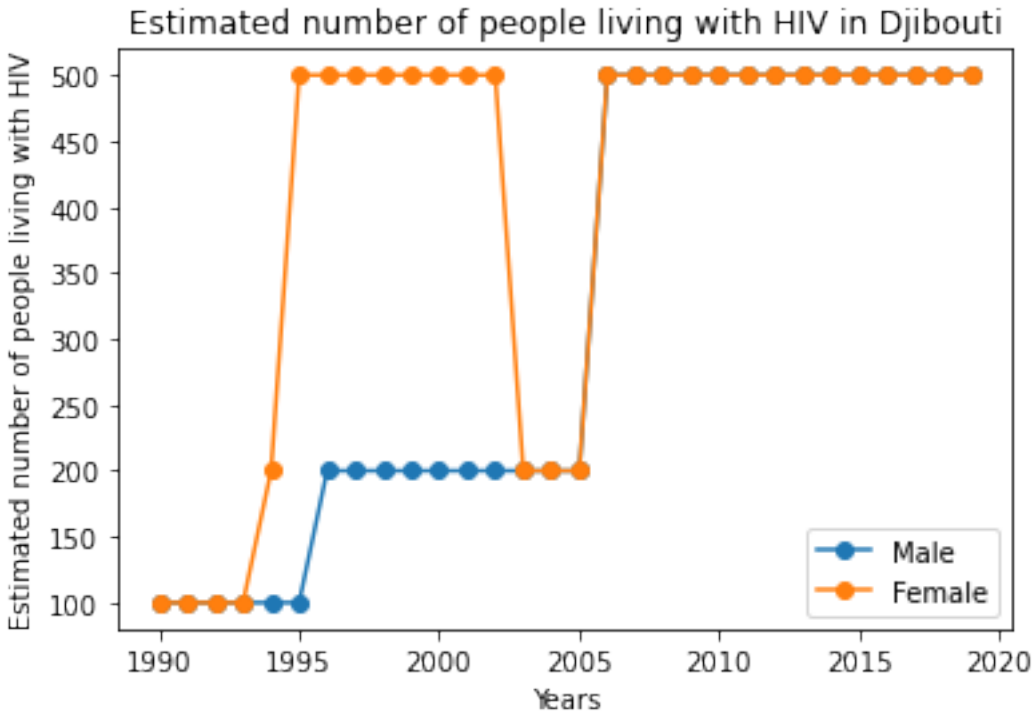


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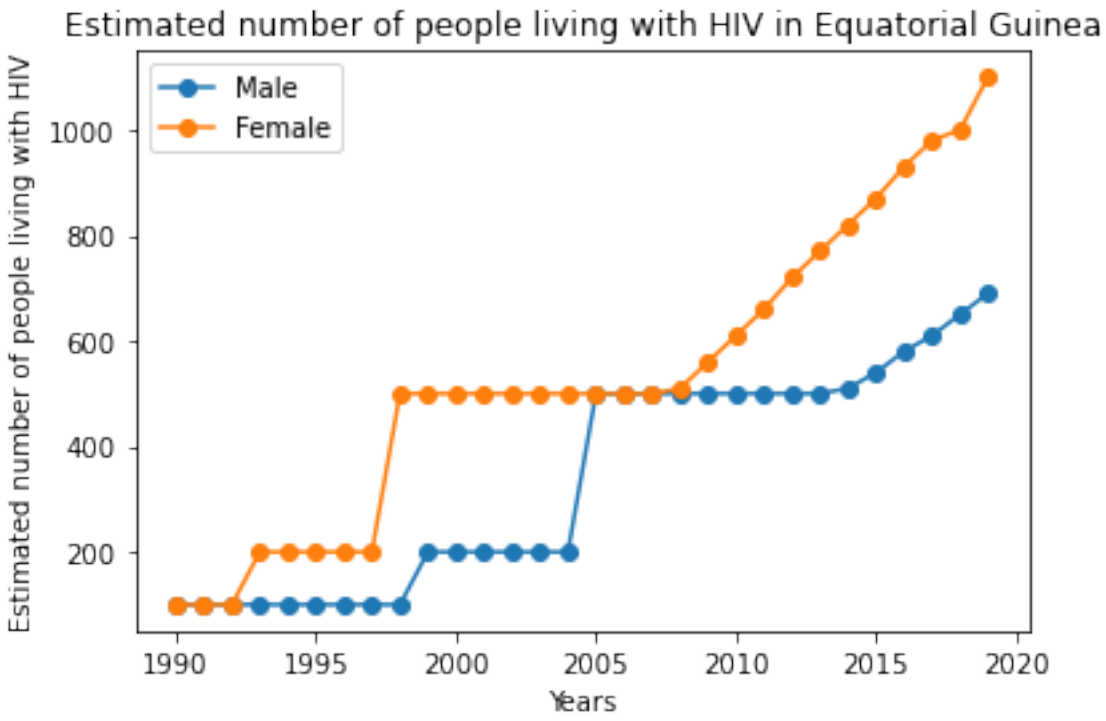


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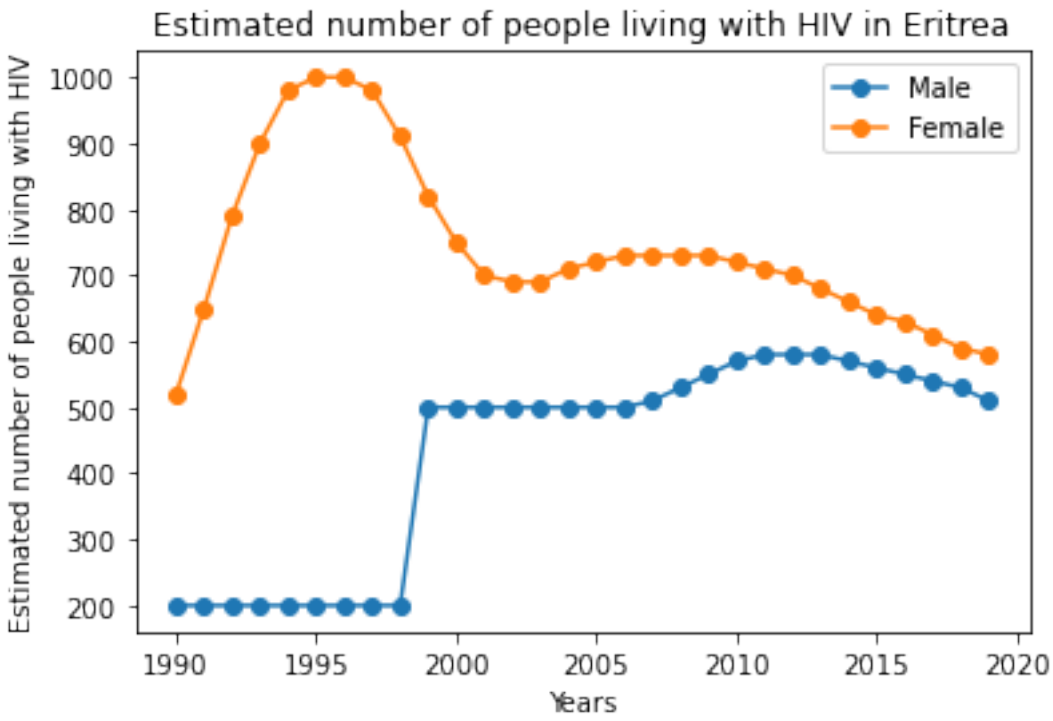


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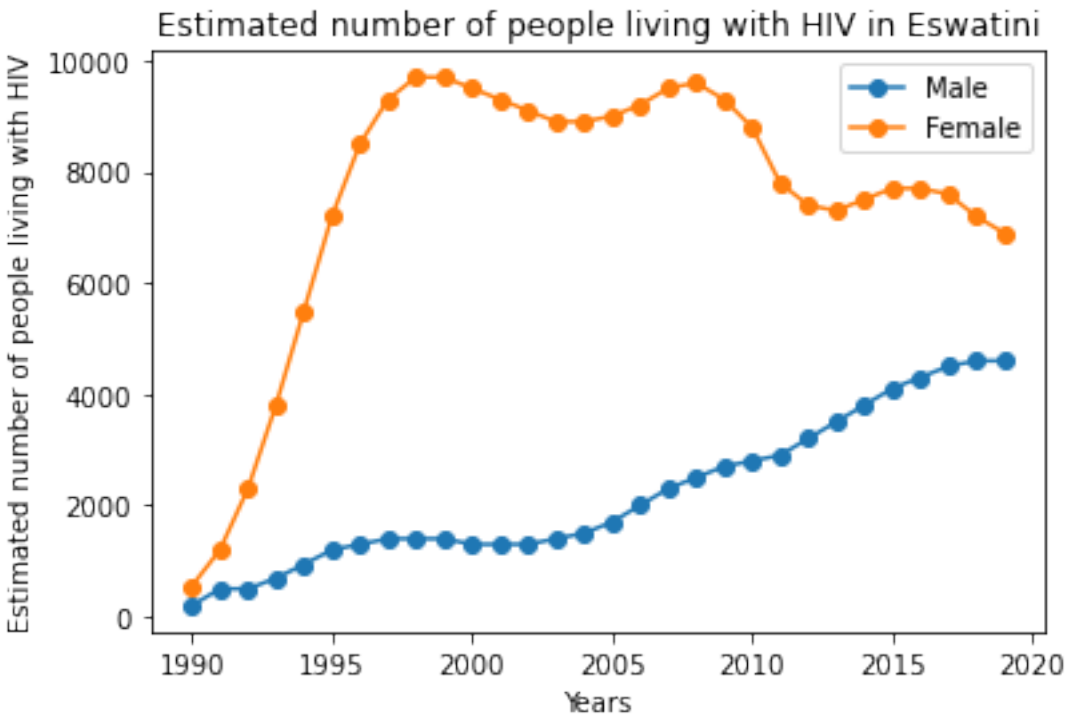


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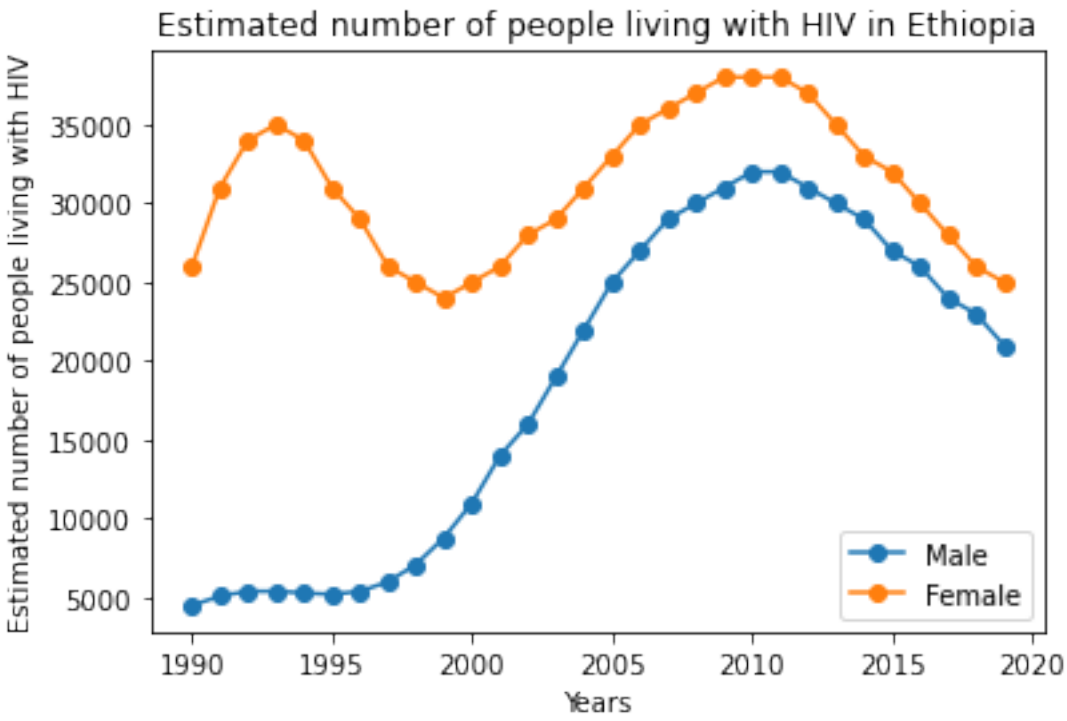


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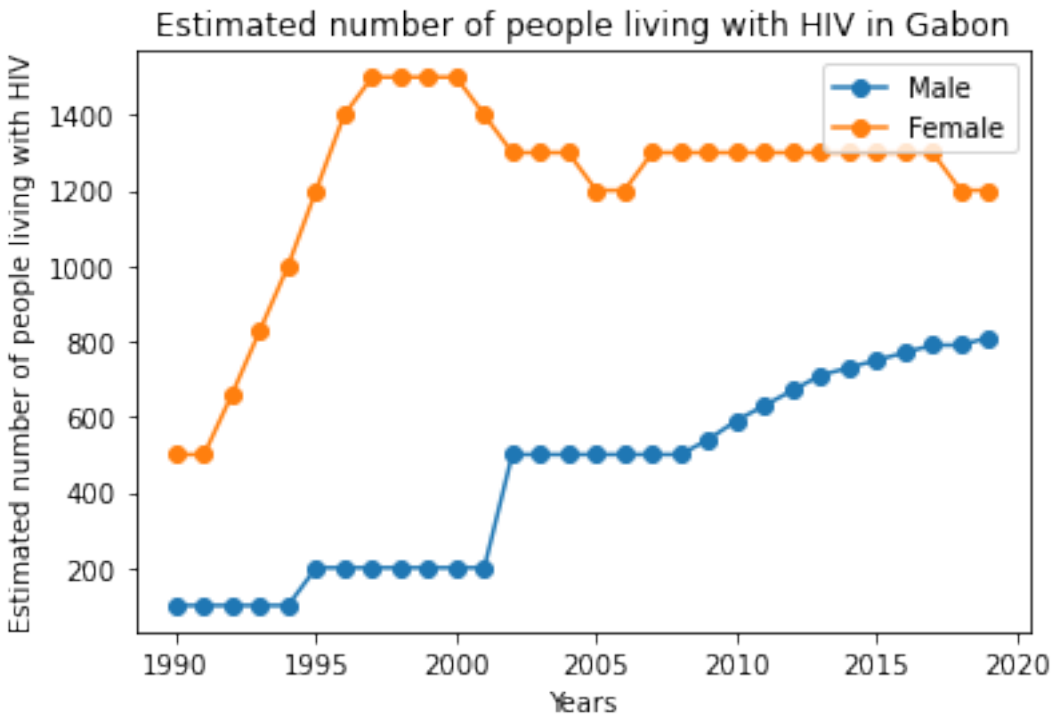


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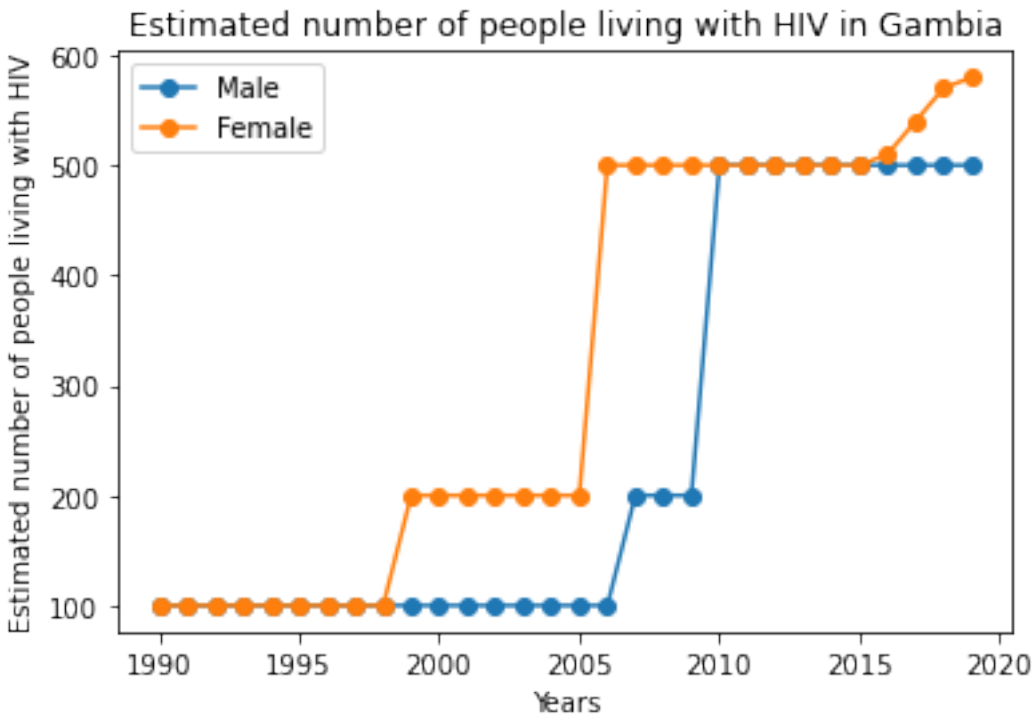


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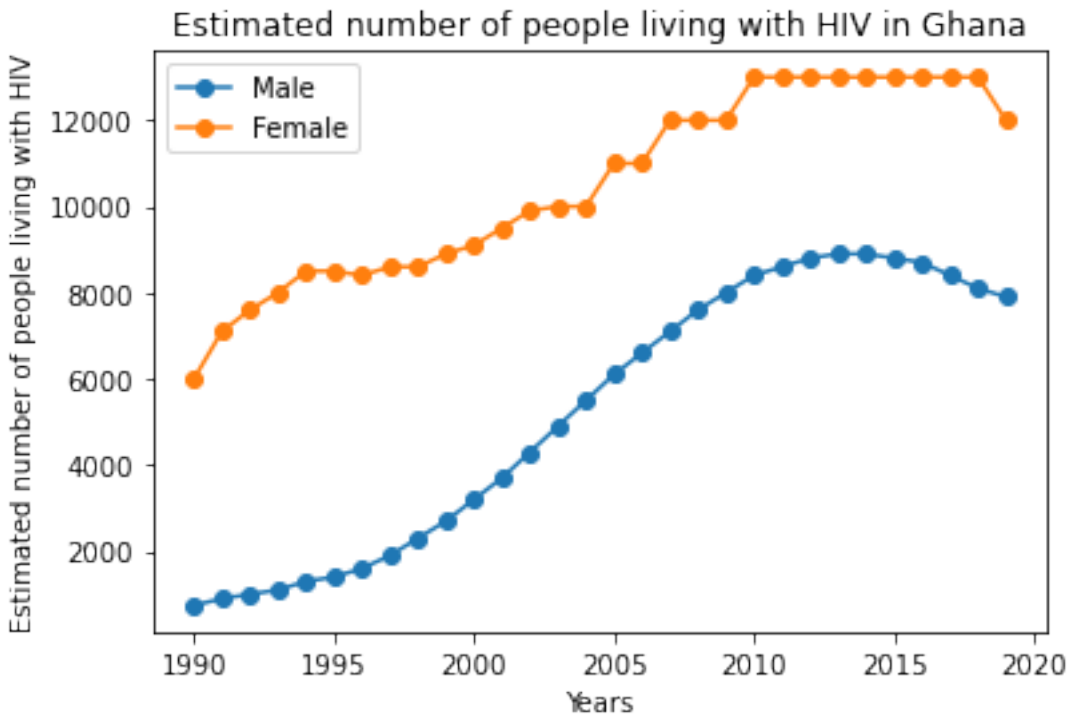


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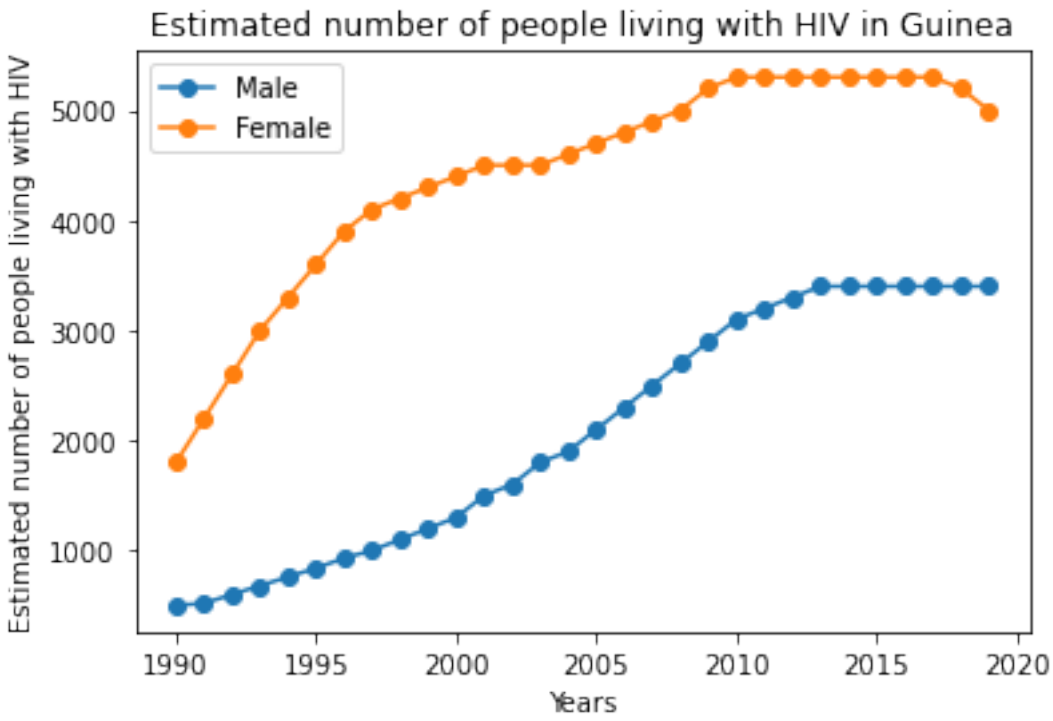


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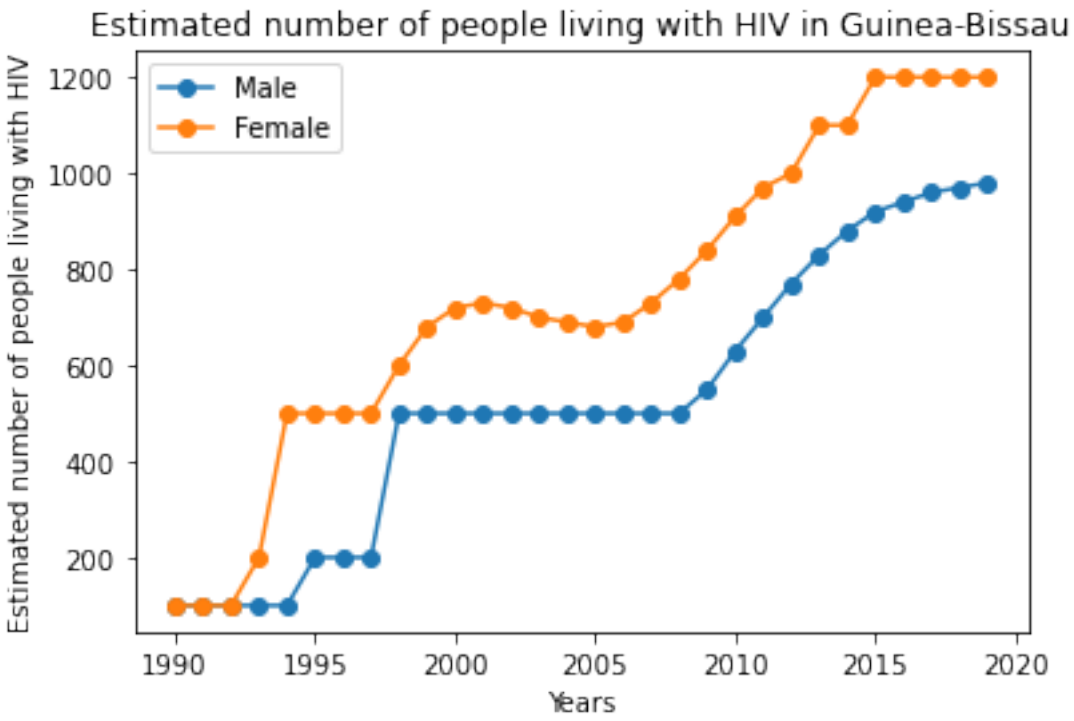


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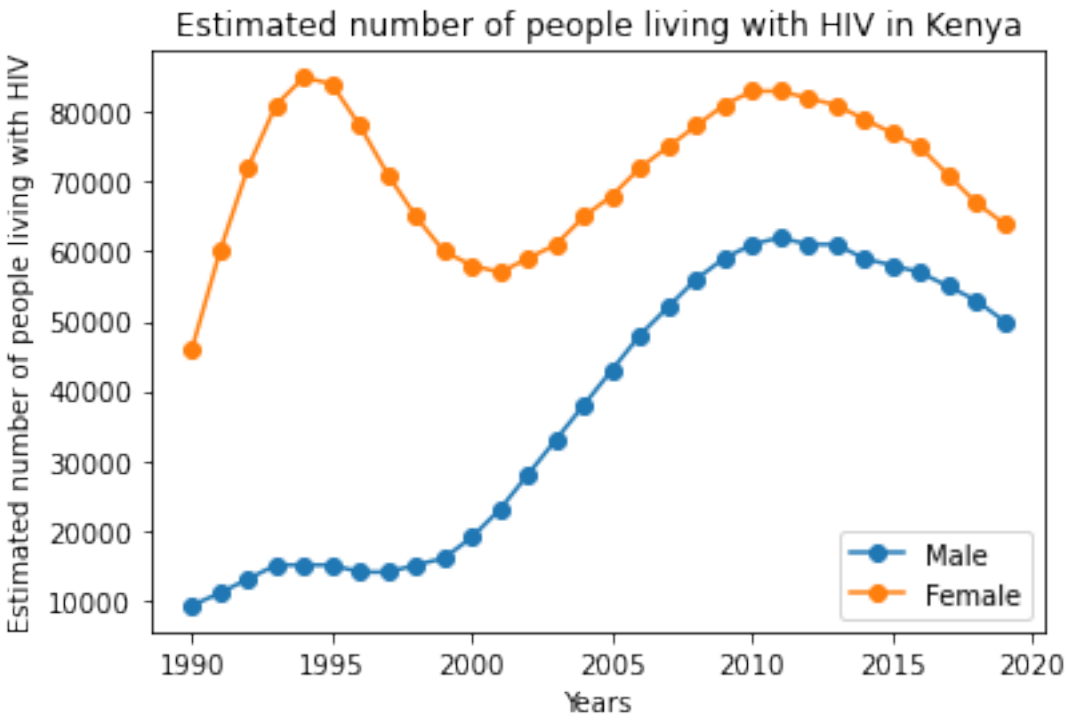


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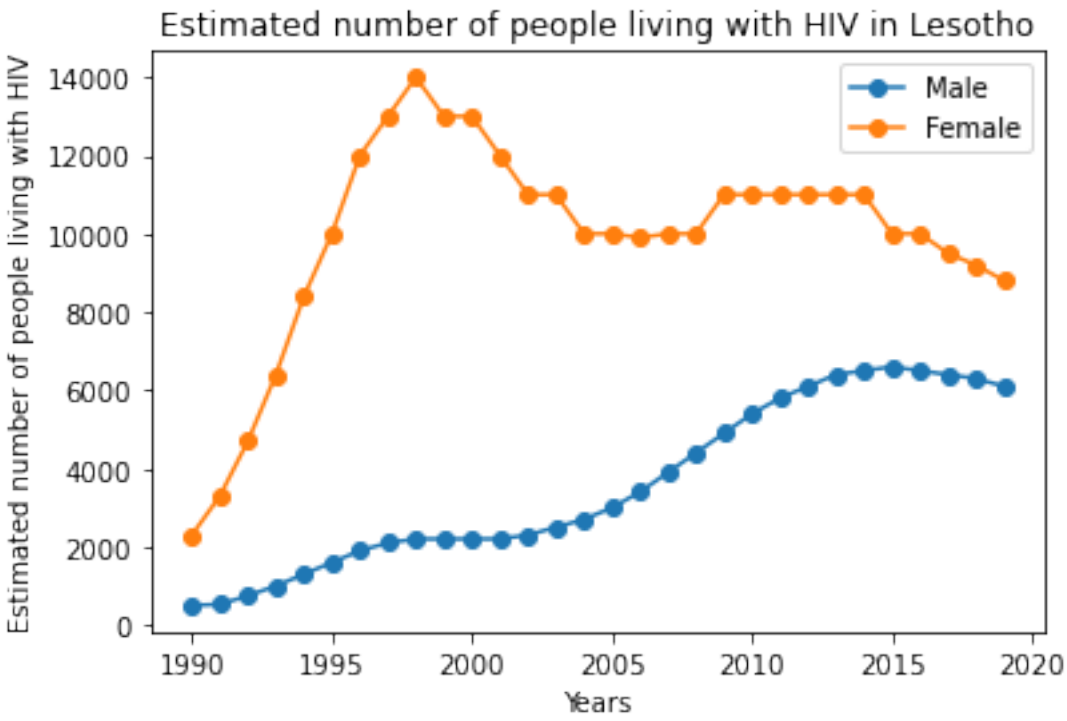


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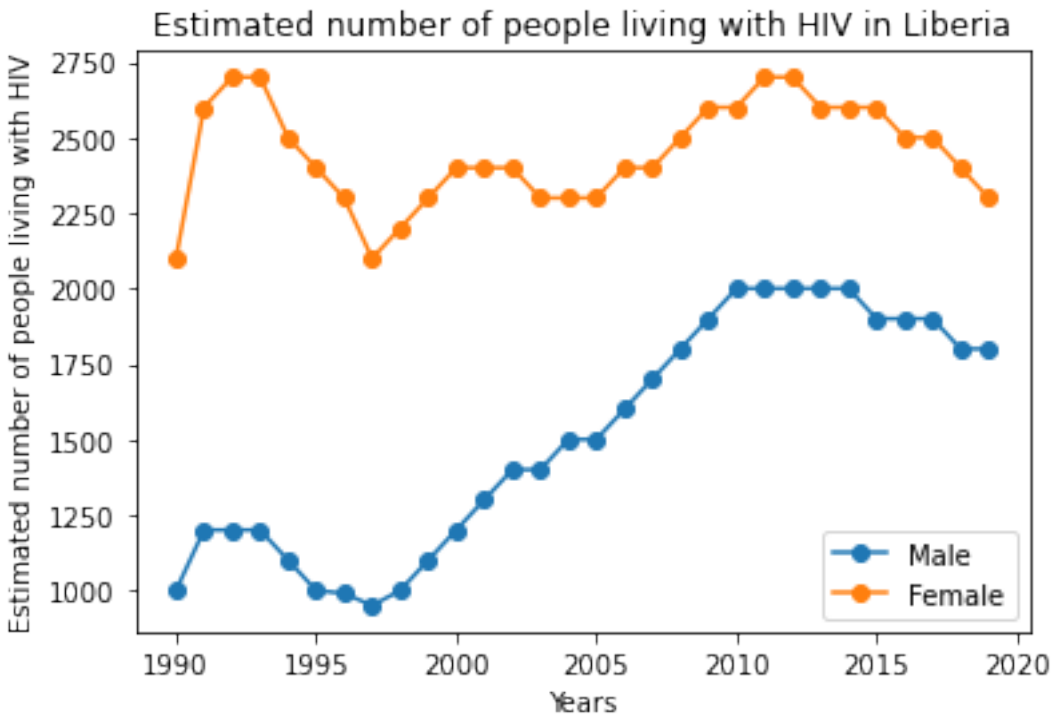


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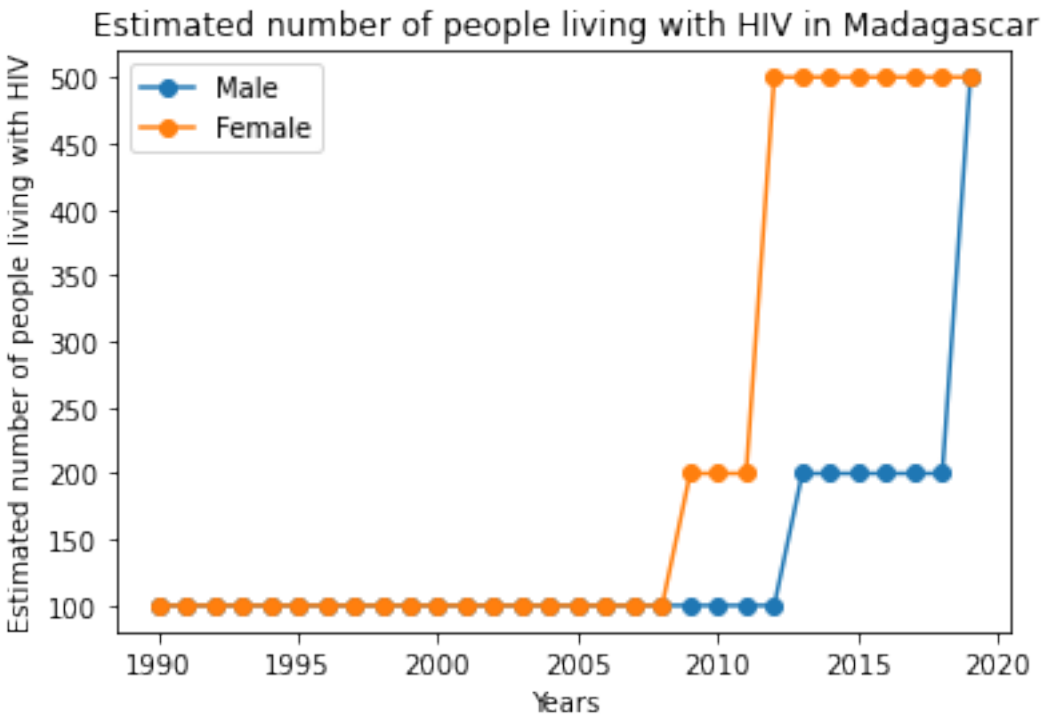


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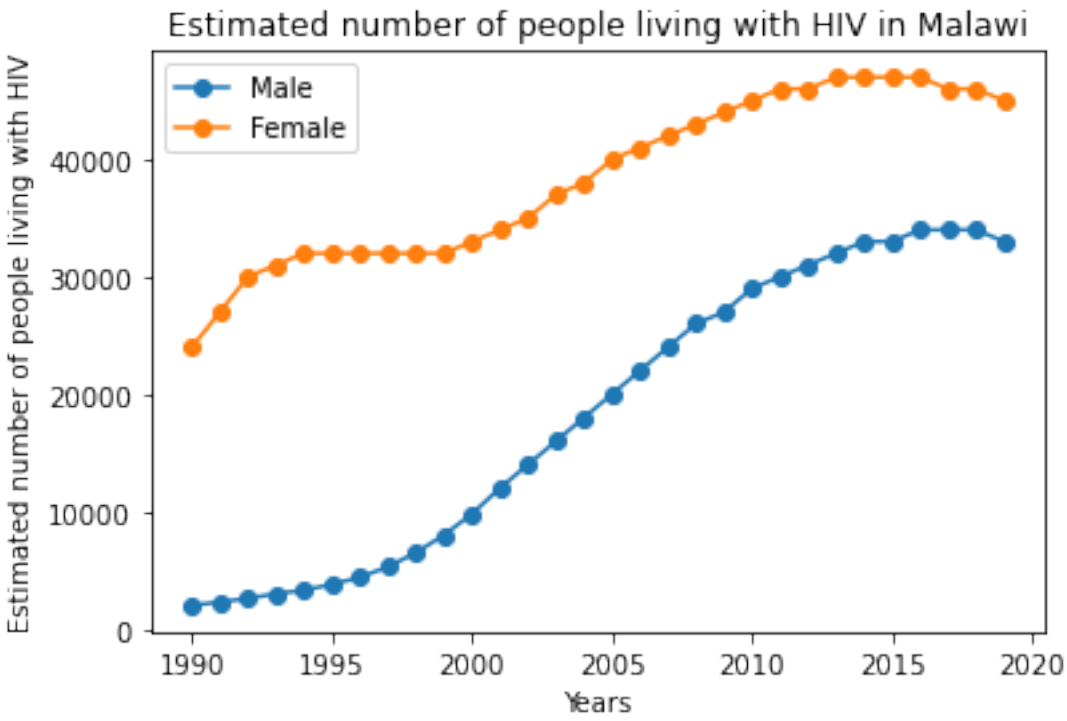
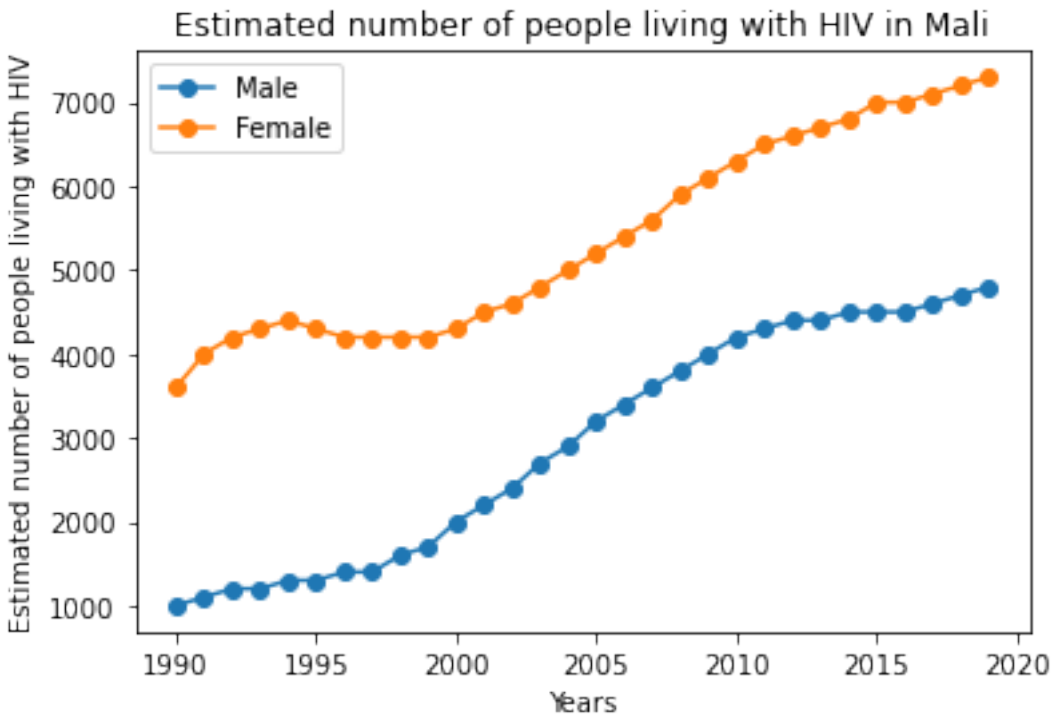



```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
<ipython-input-6-0acd1e499407>:3: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  y = df[df['Sex'] == 'Female'][df['Country'] == i]
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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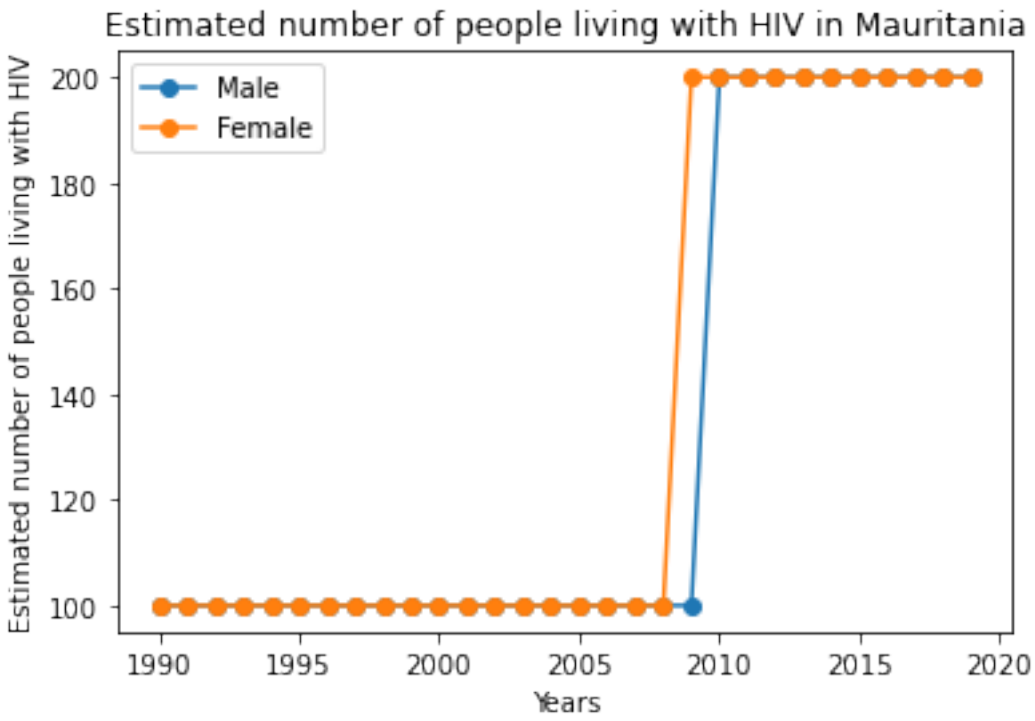
reindexed to match DataFrame index.
  y = df[df['Sex'] == 'Female'][df['Country'] == i]
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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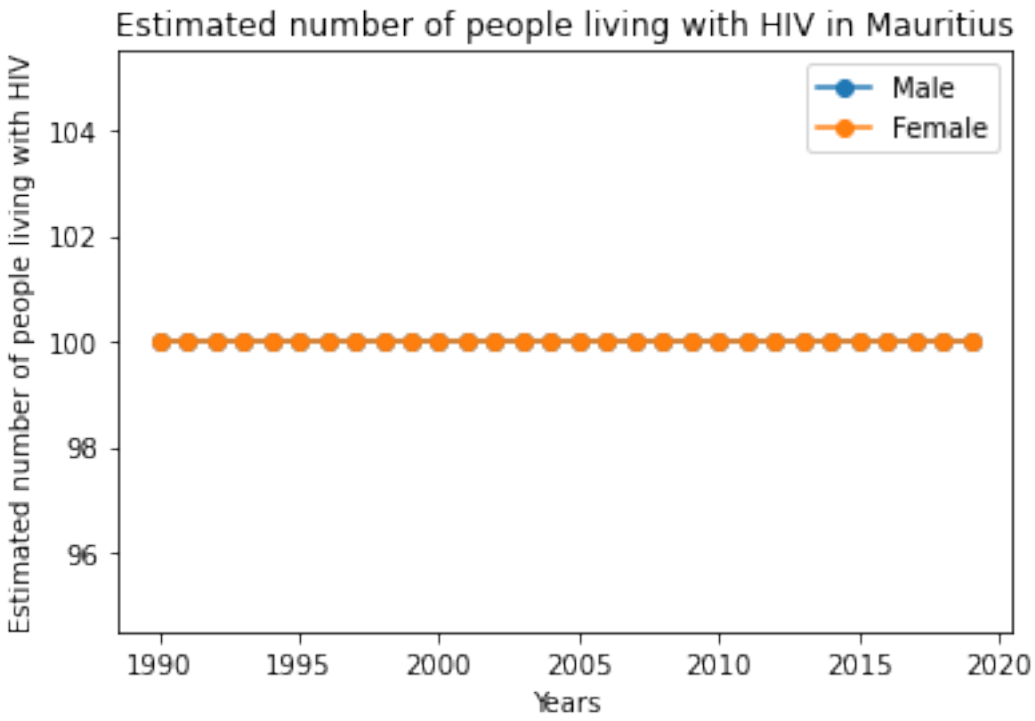
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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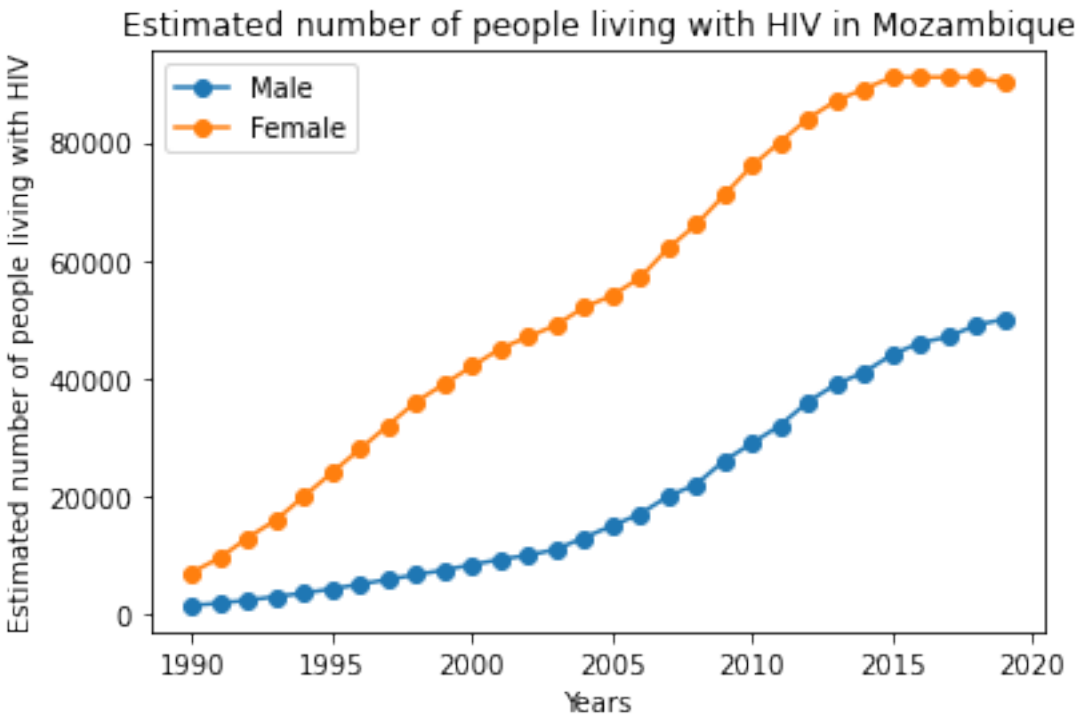
  y = df[df['Sex'] == 'Female'][df['Country'] == i]
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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reindexed to match DataFrame index.
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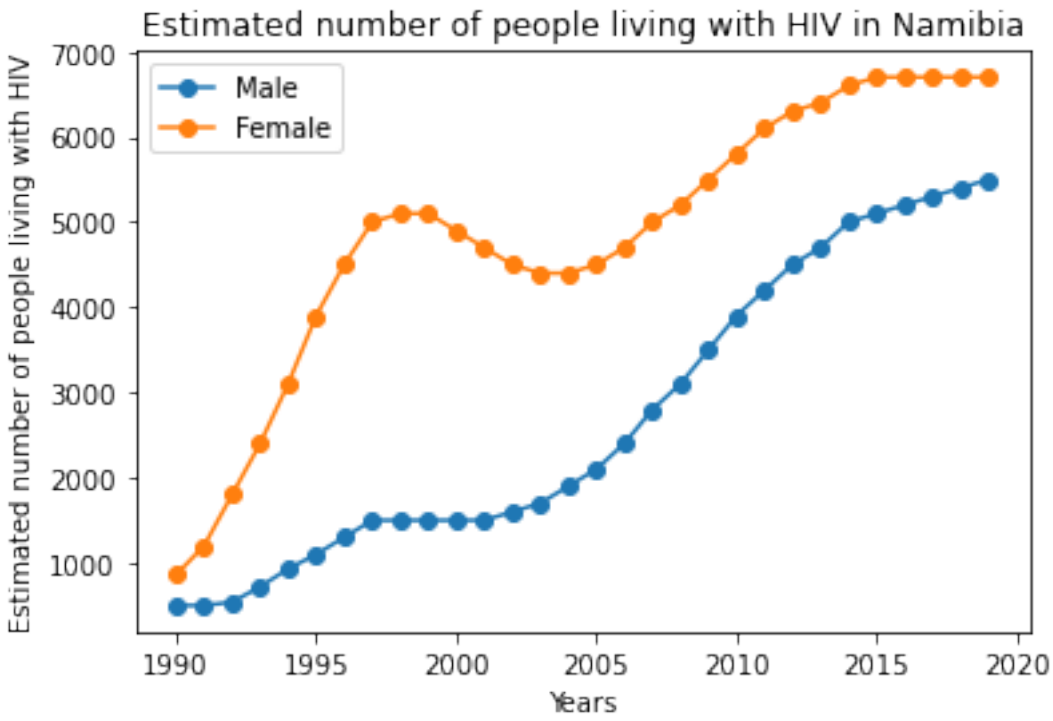
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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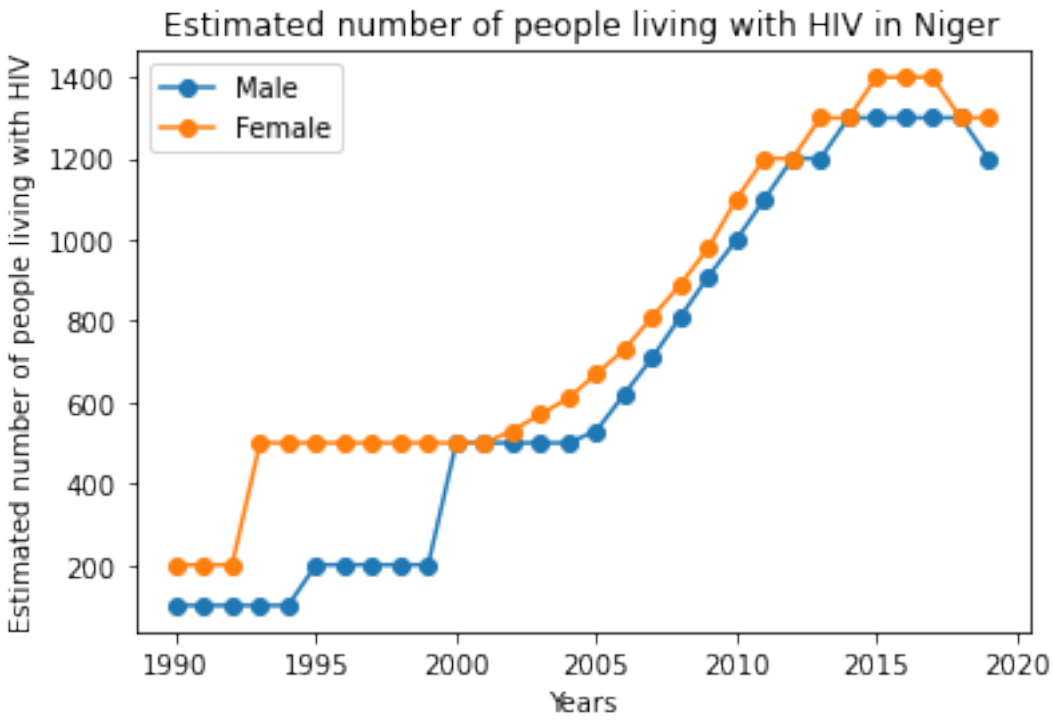
  y = df[df['Sex'] == 'Female'][df['Country'] == i]
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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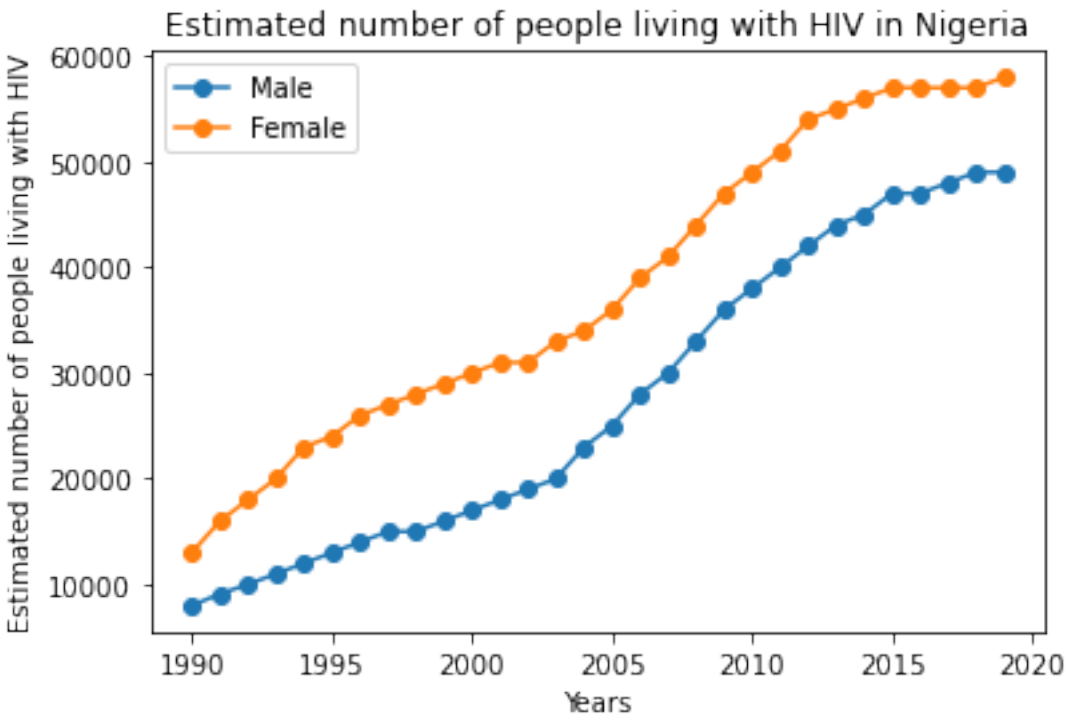


```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
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  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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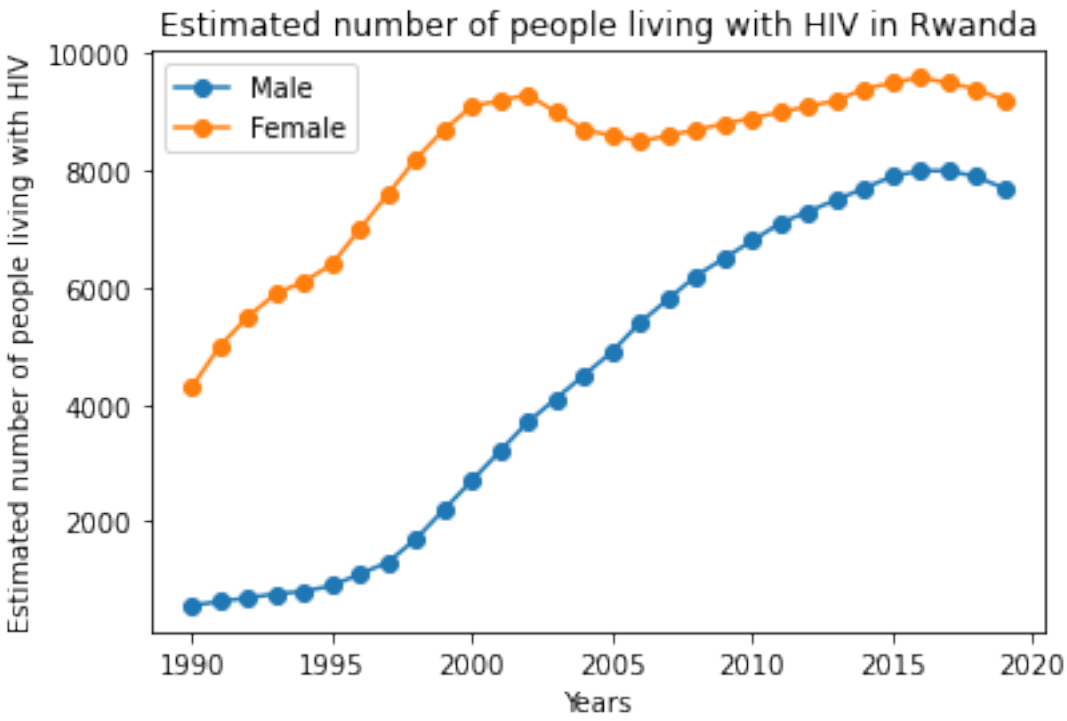
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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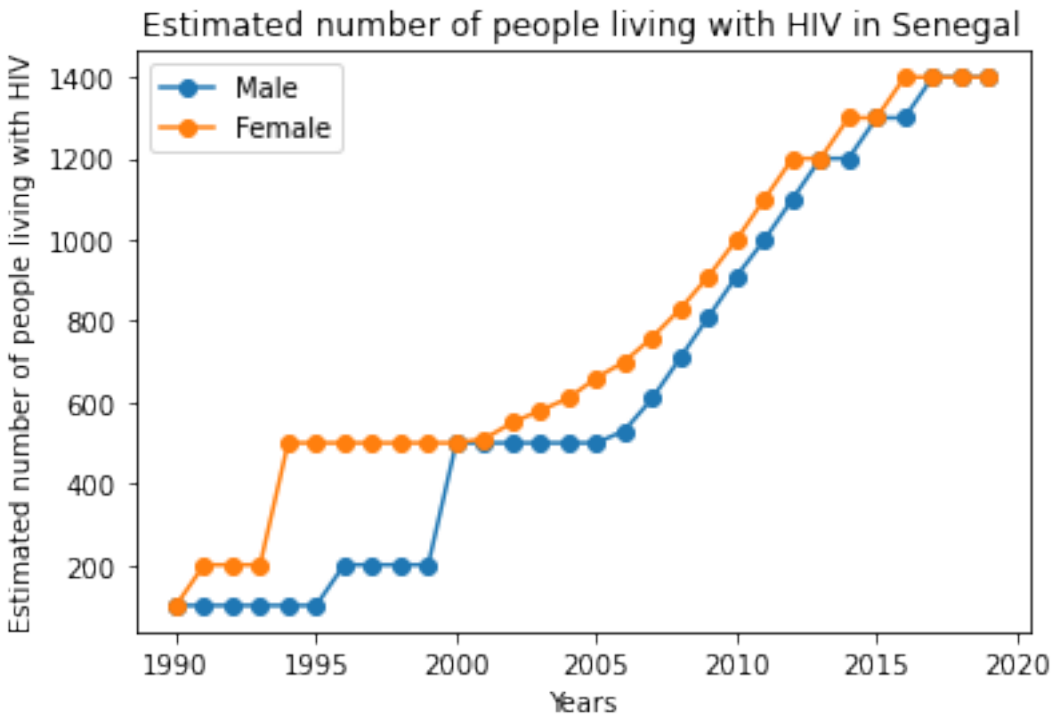
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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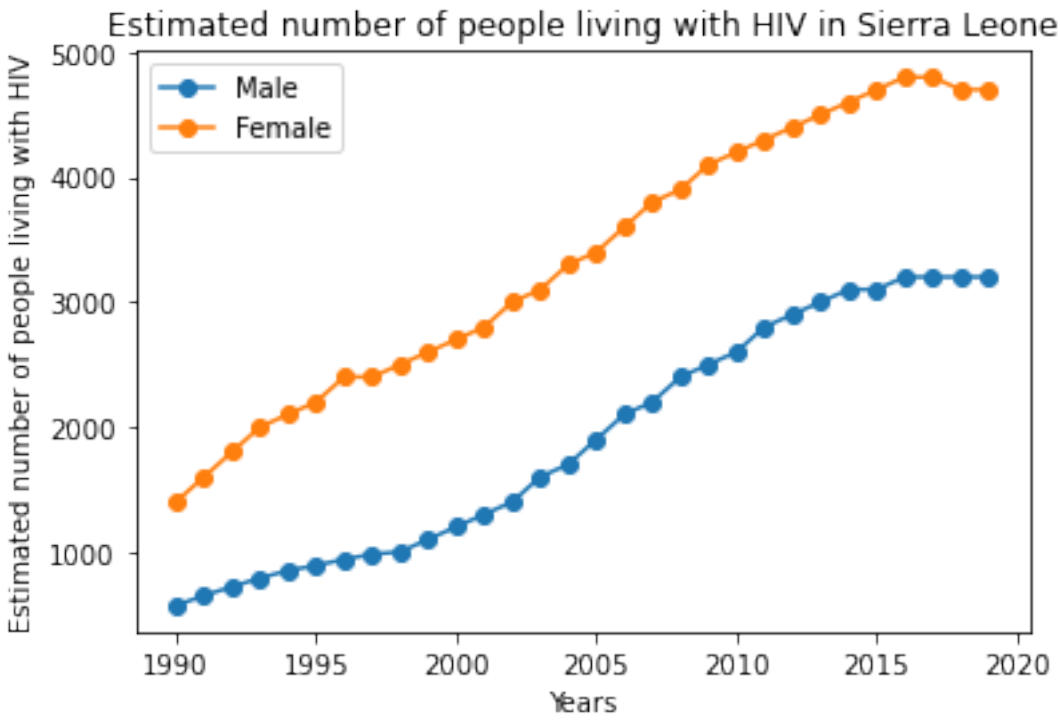
  y = df[df['Sex'] == 'Female'][df['Country'] == i]
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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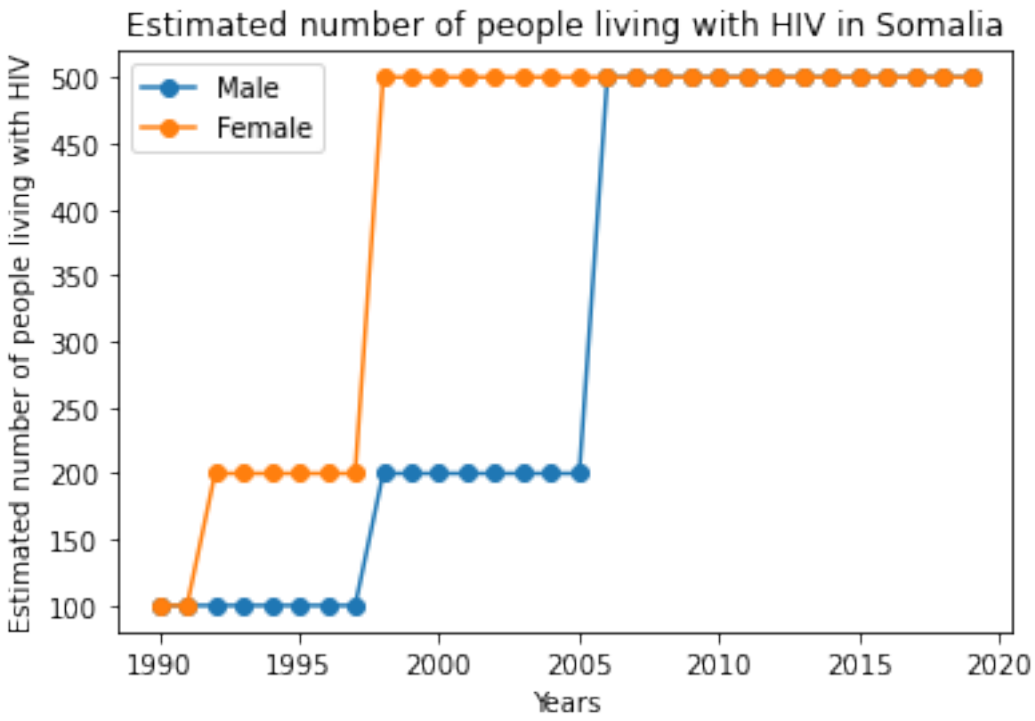


```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
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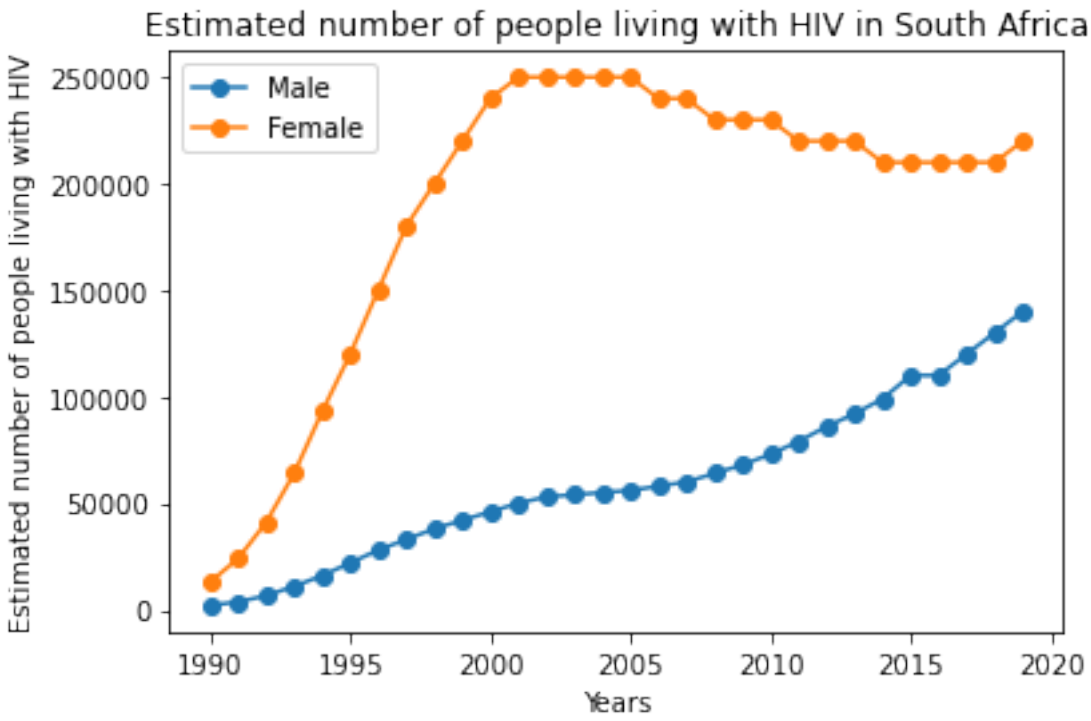


```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
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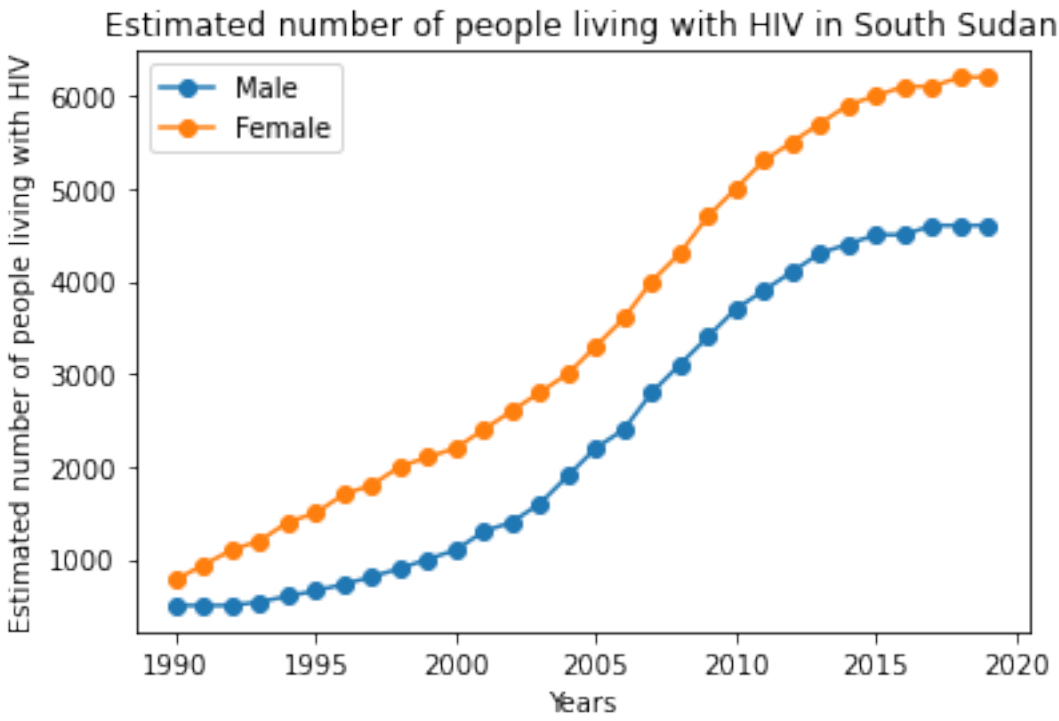
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
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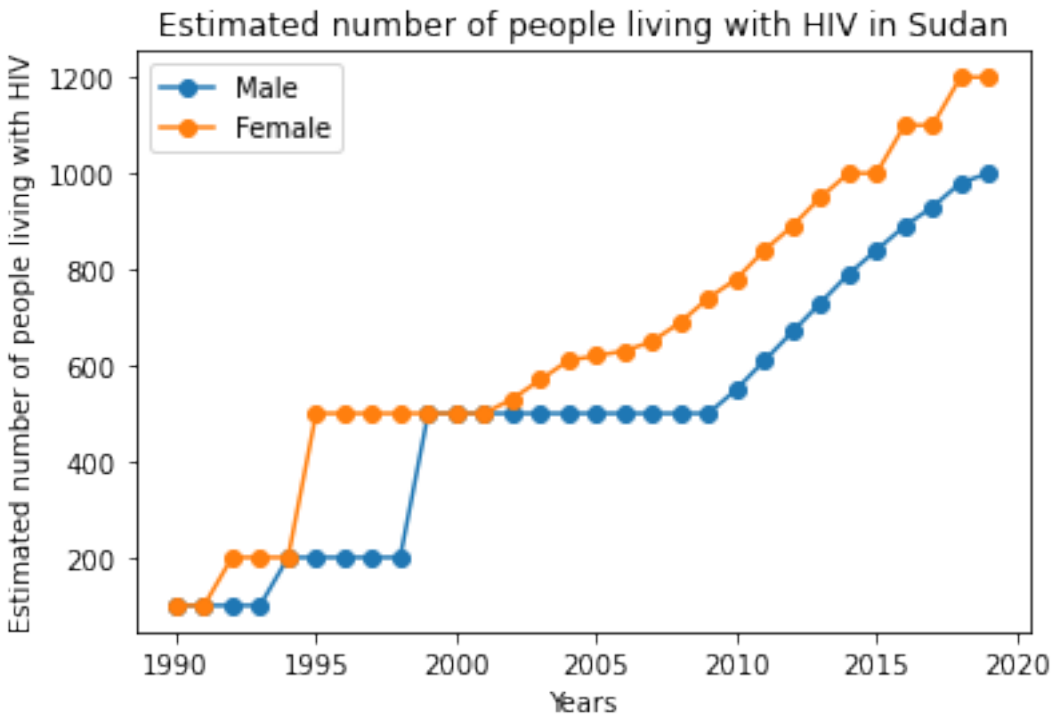


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<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
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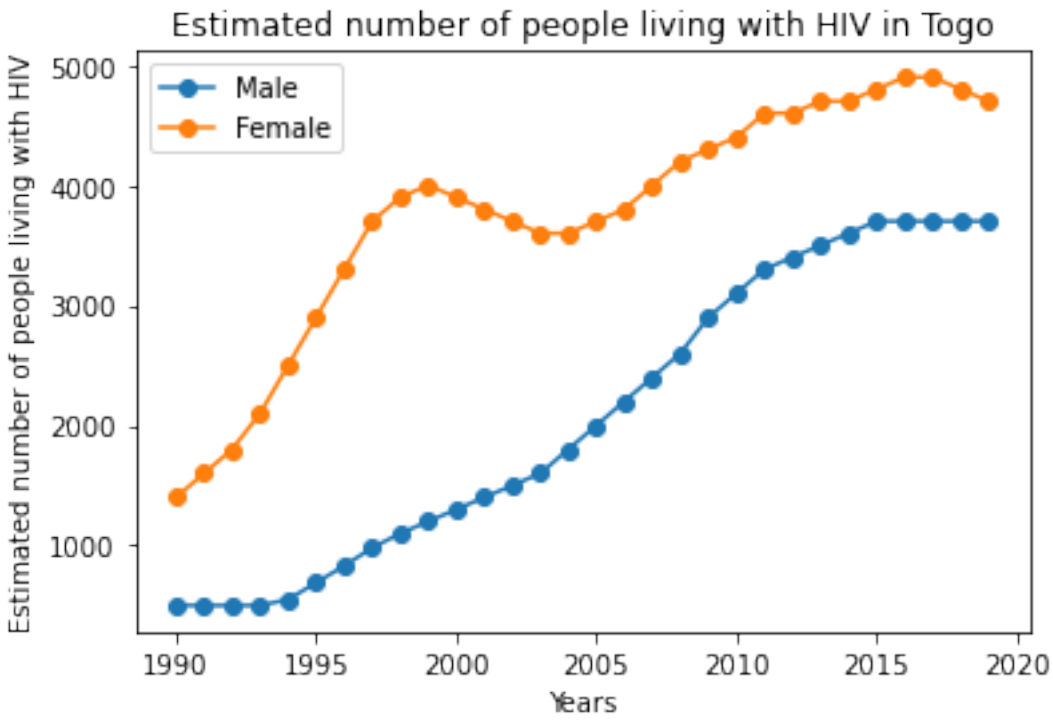
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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  y = df[df['Sex'] == 'Female'][df['Country'] == i]
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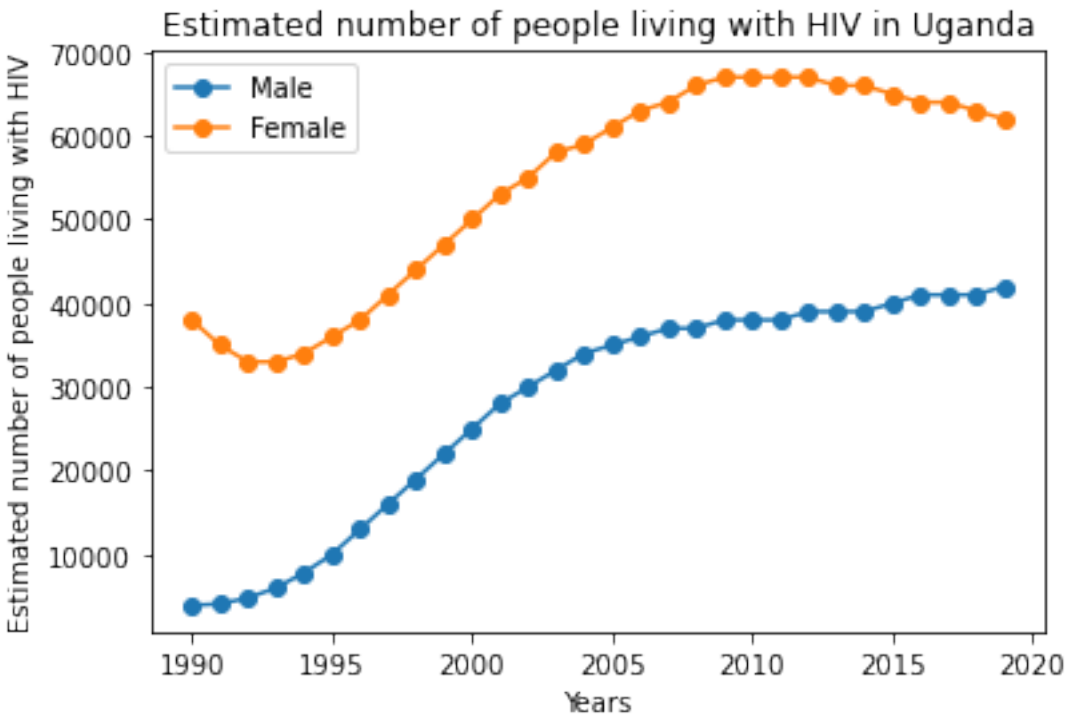


```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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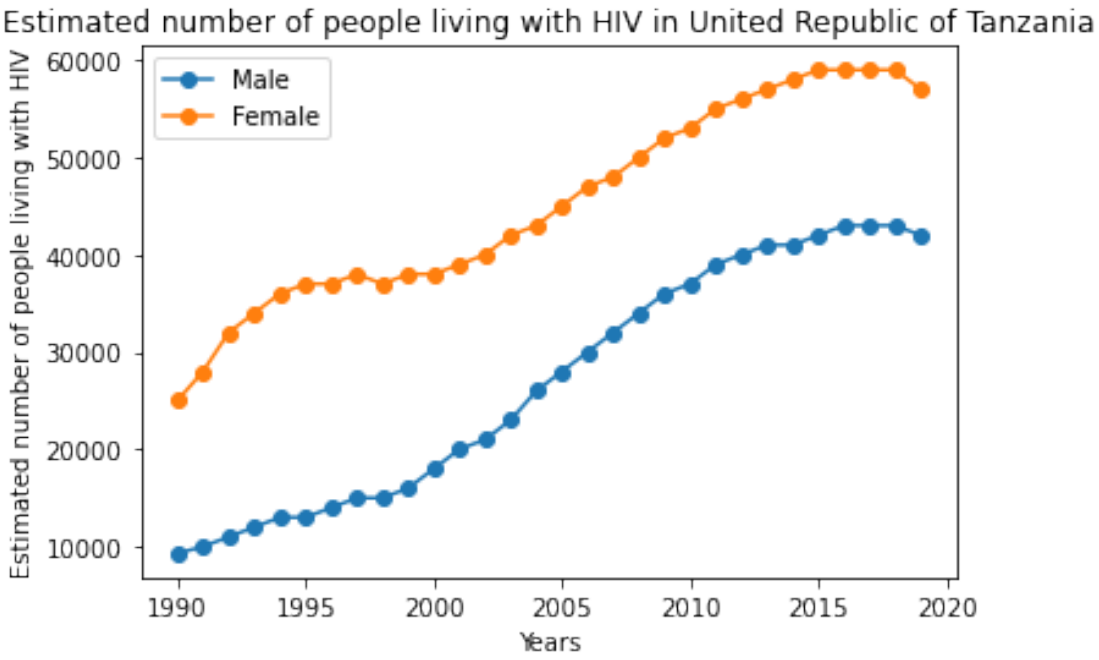
  y = df[df['Sex'] == 'Female'][df['Country'] == i]
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
  x = df[df['Sex'] == 'Male'][df['Country'] == i]
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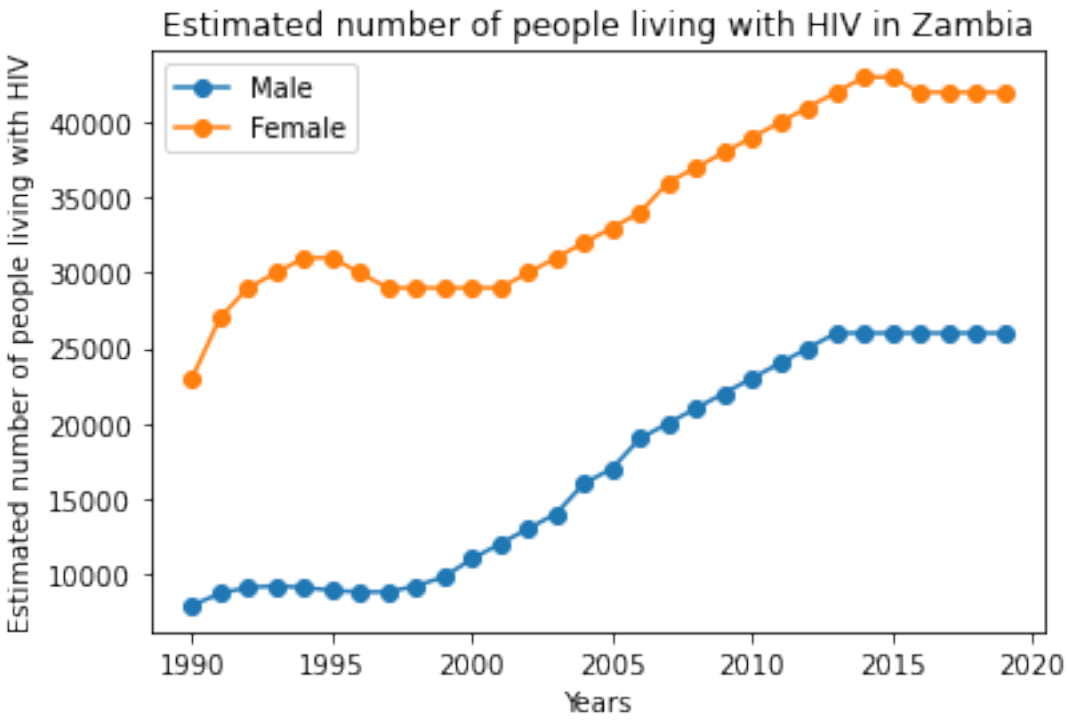
  y = df[df['Sex'] == 'Female'][df['Country'] == i]
```




```
<ipython-input-6-0acd1e499407>:2: UserWarning: Boolean Series key will be
reindexed to match DataFrame index.
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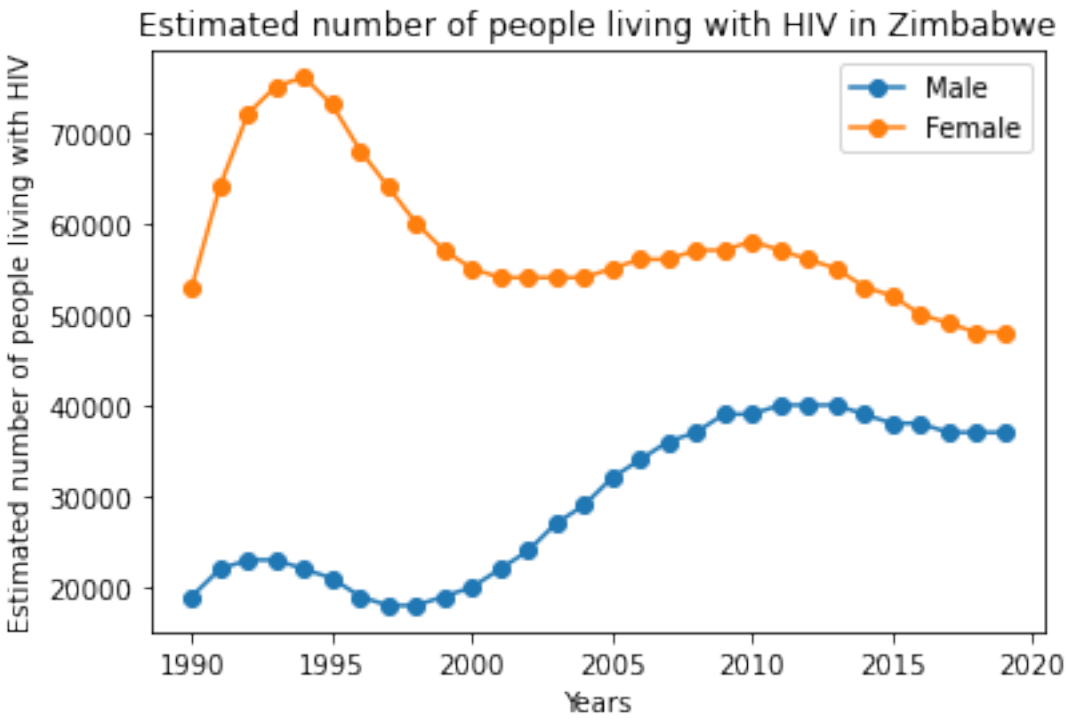
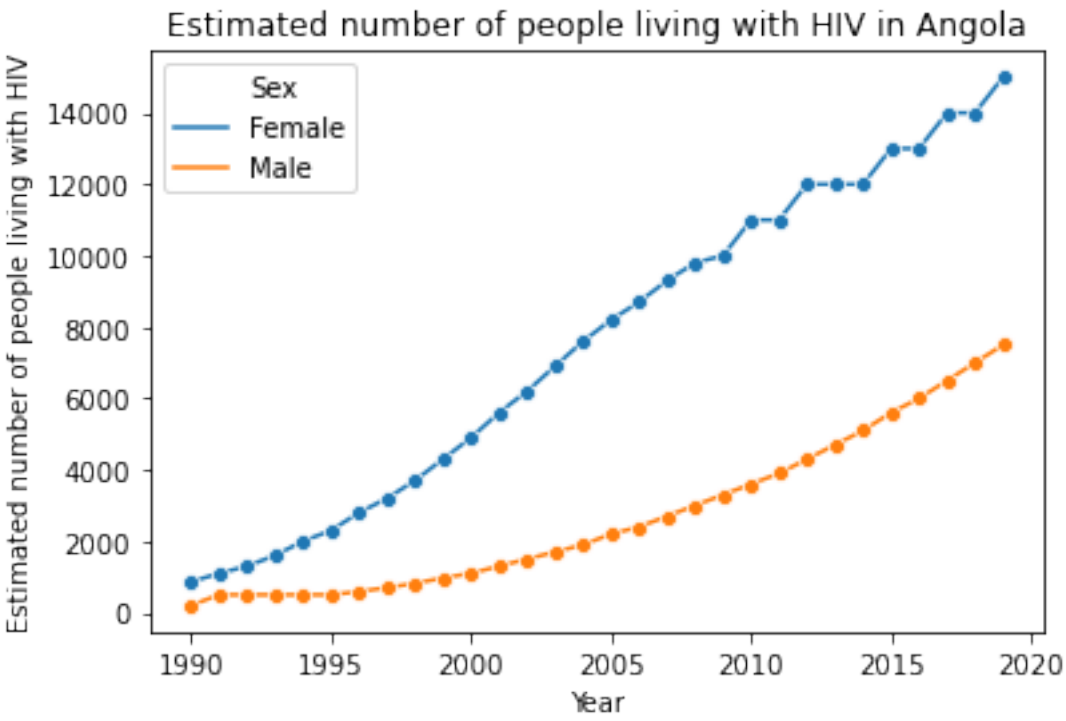
  y = df[df['Sex'] == 'Female'][df['Country'] == i]
```

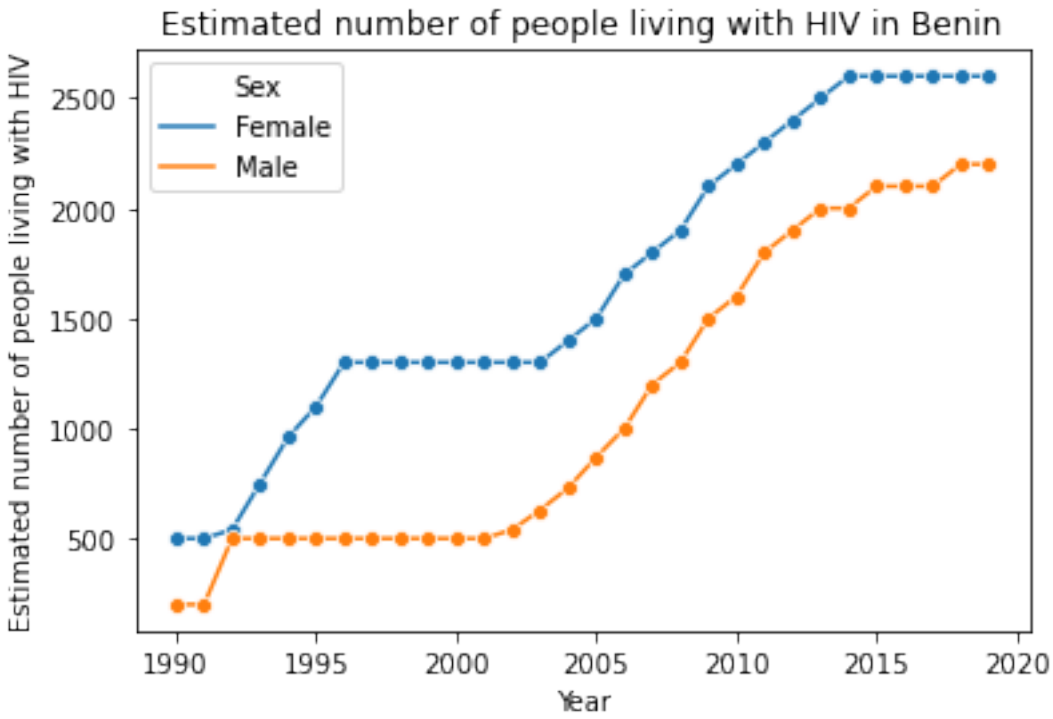


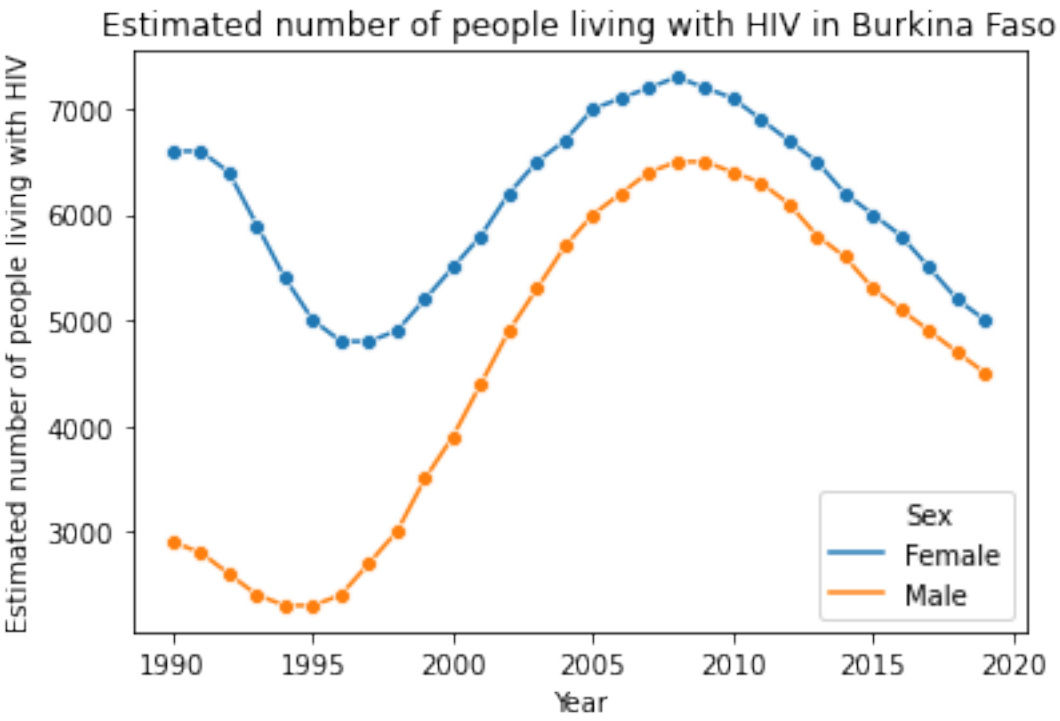
3 Line Chart using seaborn library

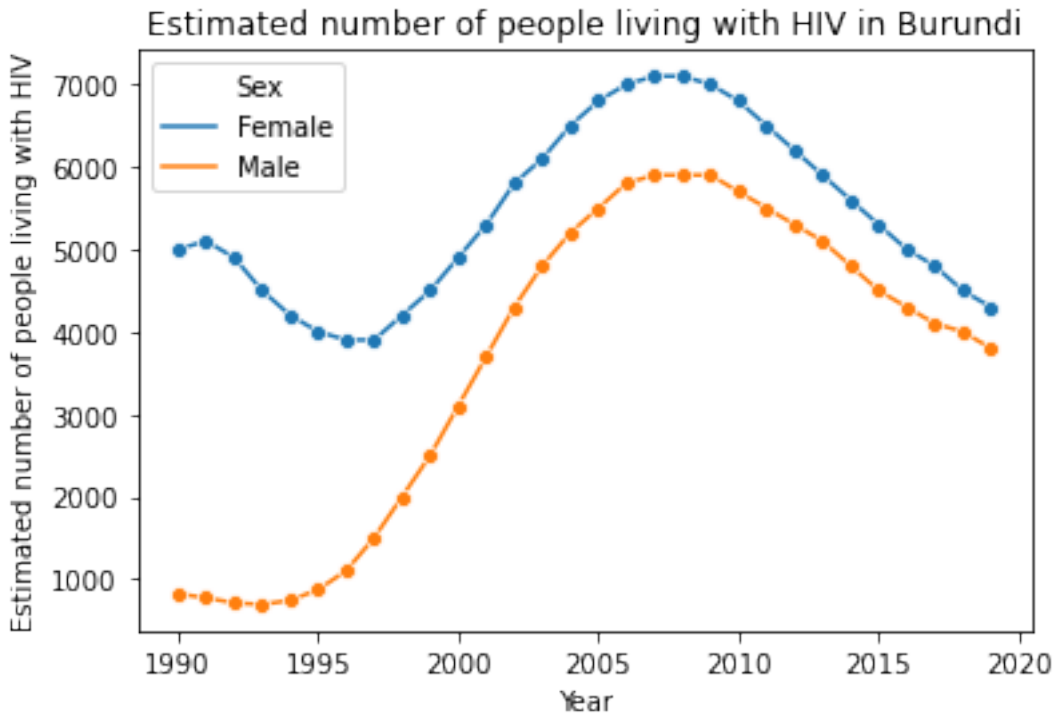
[7]:
```
import seaborn as sns
```

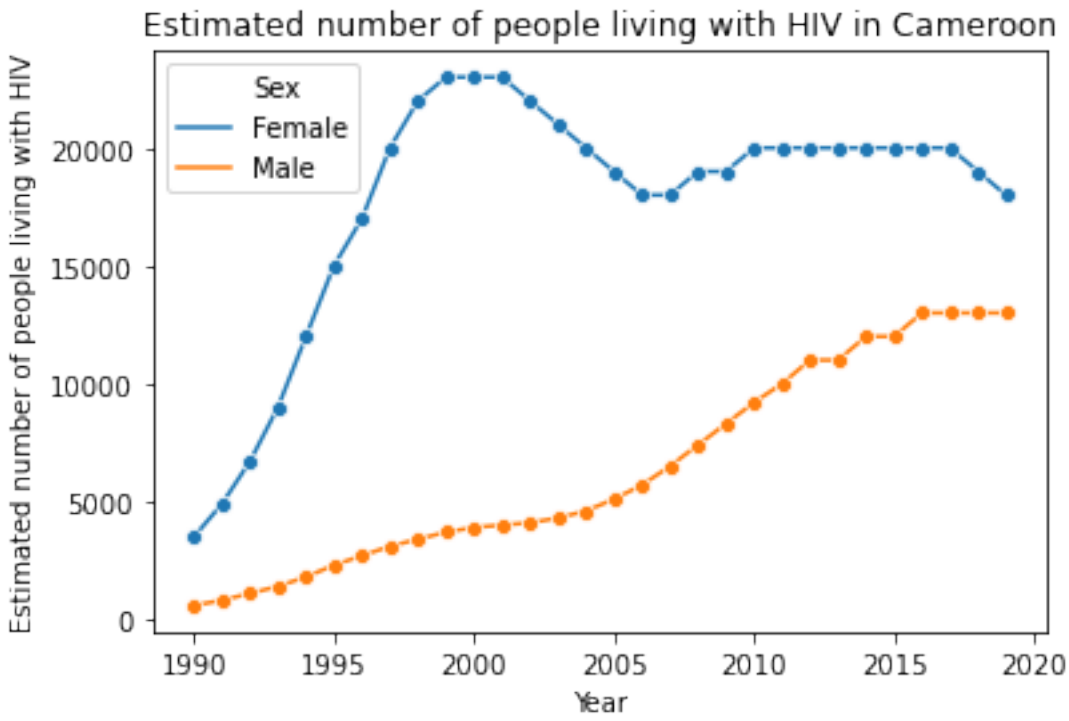
[8]:
```
for i in sorted(country):
    f = df[df['Country'] == i]
    plt.title('Estimated number of people living with HIV in '+i)
    sns.lineplot(data = f, x='Year', y='Estimated number of people living with␣
 ↪HIV', hue="Sex", marker='o')
    plt.show()
```

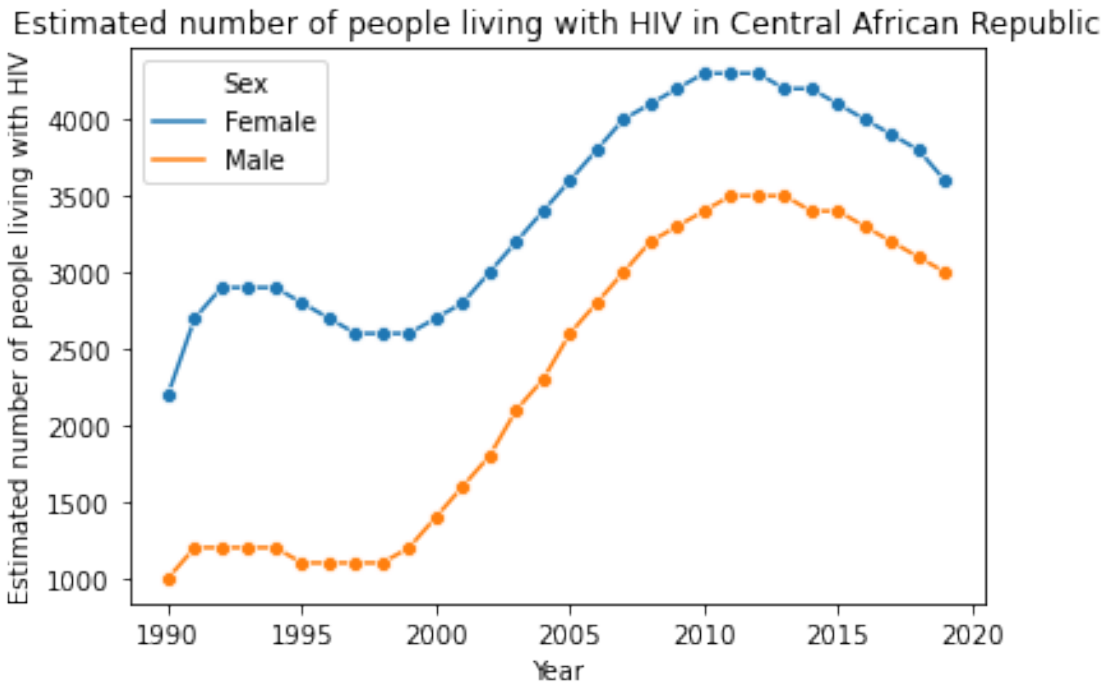

Estimated number of people living with HIV in Angola
Sex
Female
Male
Estimated number of people living with HIV
0
2000
4000
6000
8000
10000
12000
14000
1990
1995
2000
2005
2010
2015
2020
Year

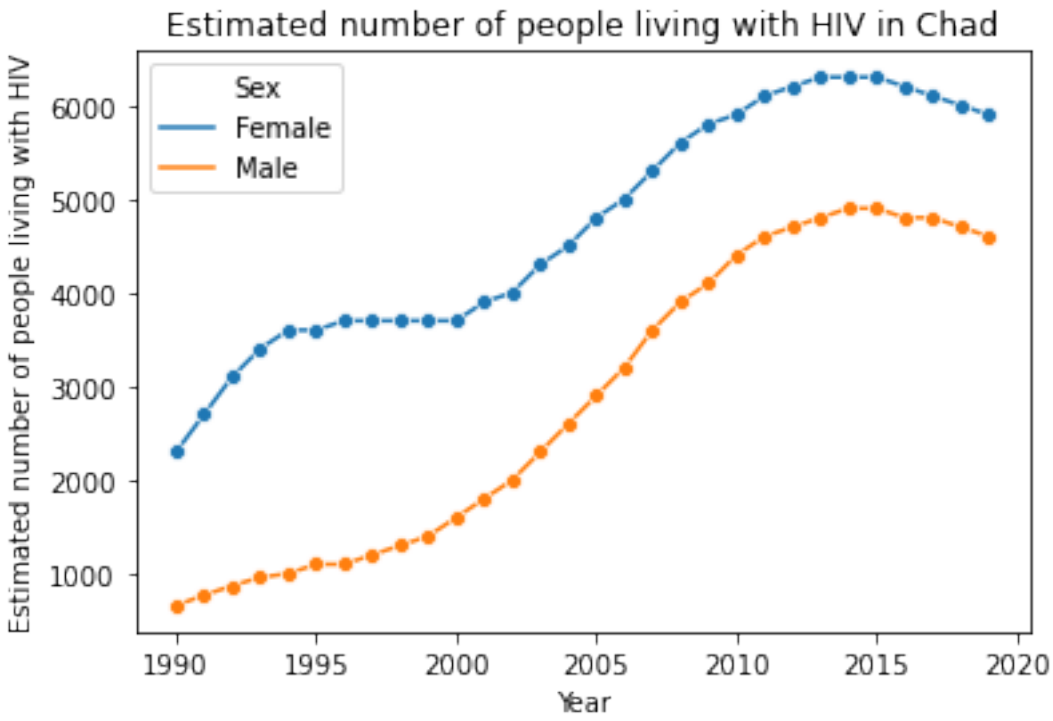

Estimated number of people living with HIV in Benin
Sex
Female
Male
Estimated number of people living with HIV
500
1000
1500
2000
2500
1990
1995
2000
2005
2010
2015
2020
Year

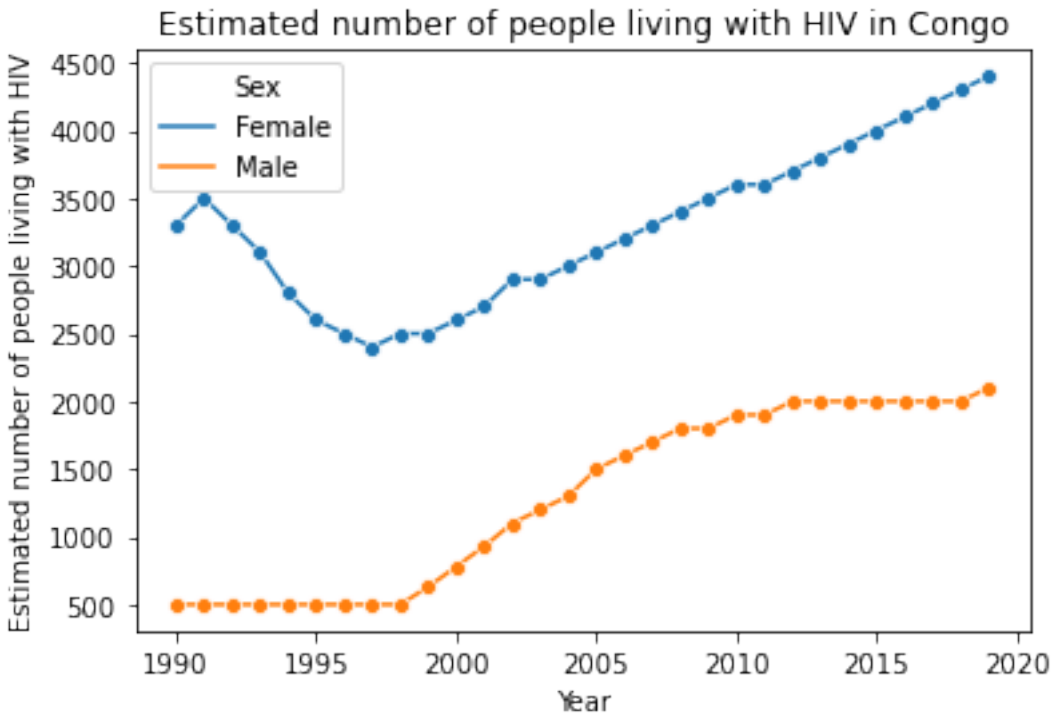

Estimated number of people living with HIV in Burkina Faso
Estimated number of people living with HIV
7000
6000
5000
4000
3000
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

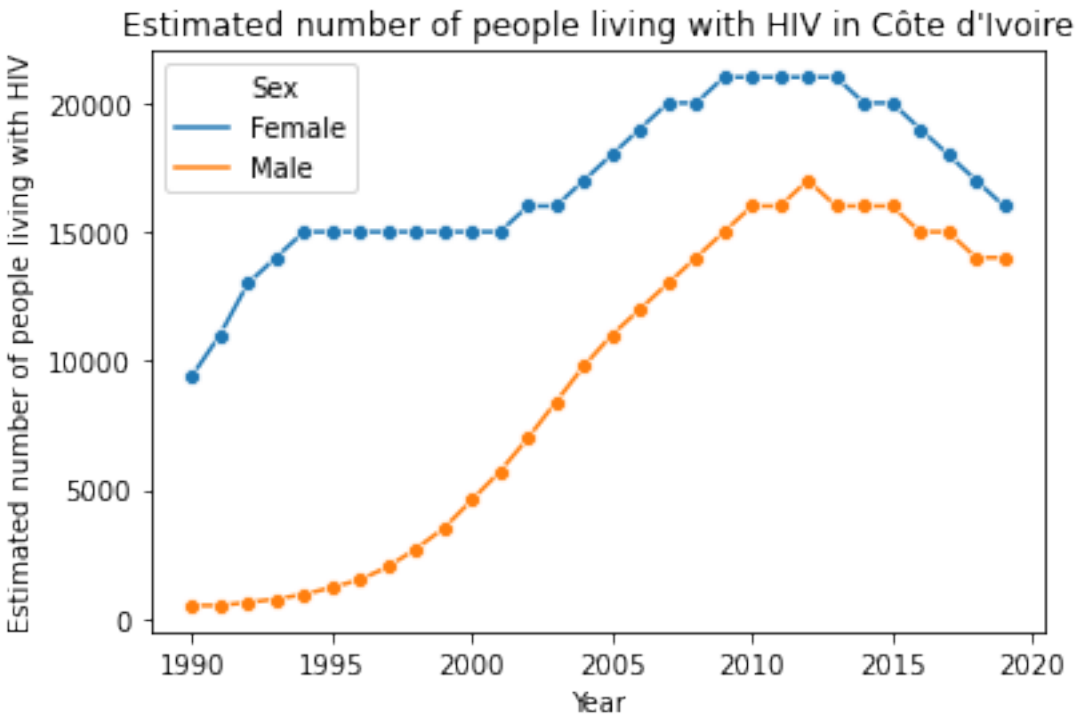

Estimated number of people living with HIV in Burundi
Estimated number of people living with HIV
7000
6000
5000
4000
3000
2000
1000
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

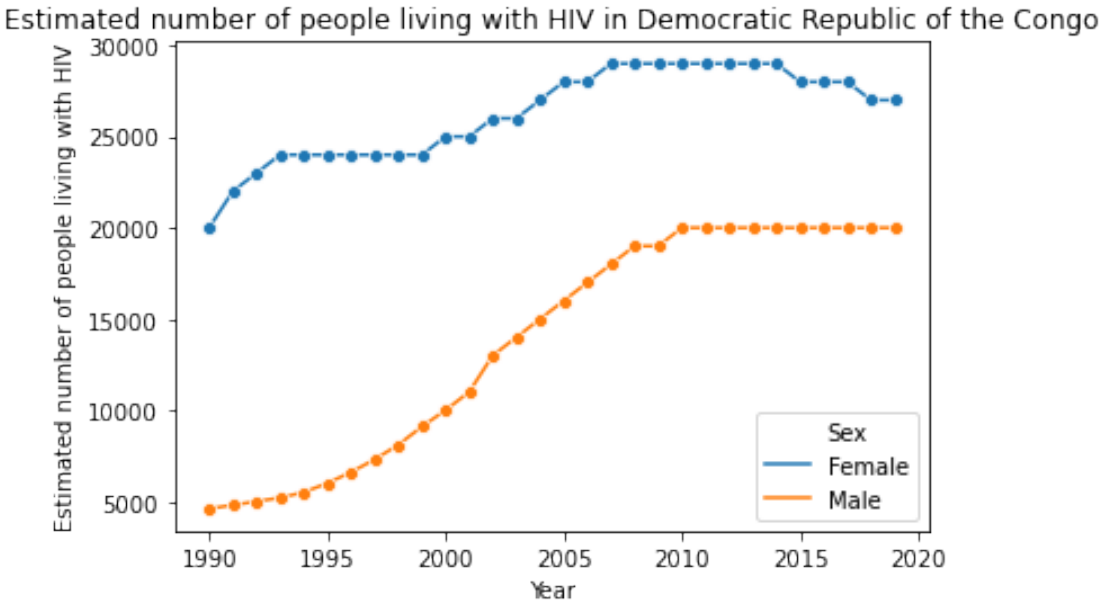

Estimated number of people living with HIV in Cameroon
Sex
Female
Male
Estimated number of people living with HIV
0
5000
10000
15000
20000
1990
1995
2000
2005
2010
2015
2020
Year

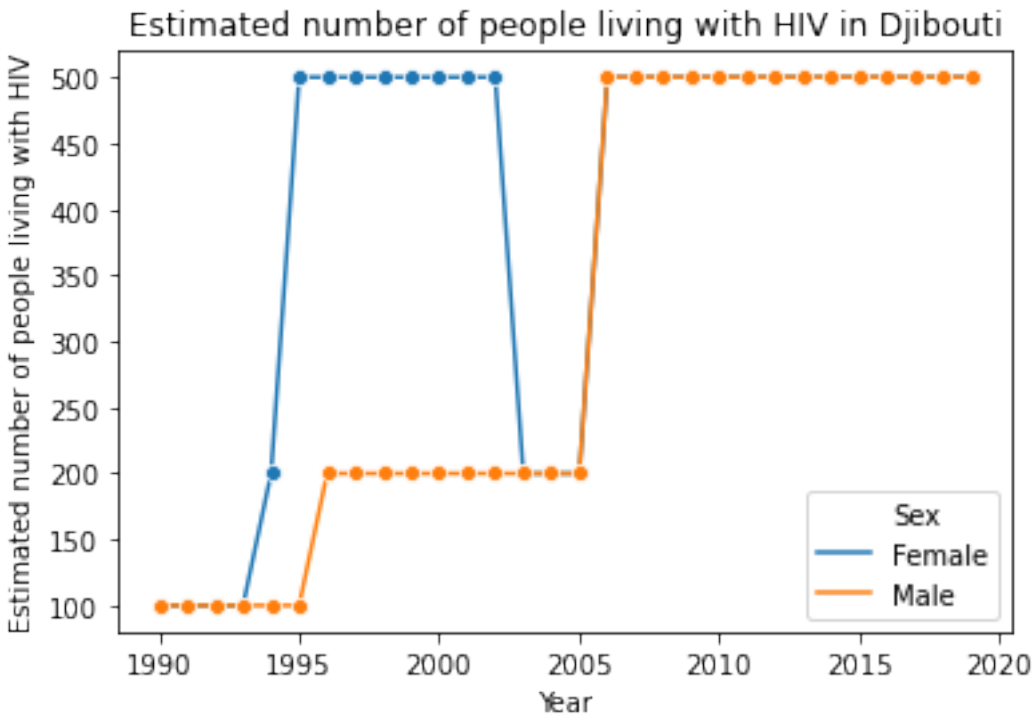

Estimated number of people living with HIV in Central African Republic
Sex
Female
Male
Estimated number of people living with HIV
1000
1500
2000
2500
3000
3500
4000
1990
1995
2000
2005
2010
2015
2020
Year

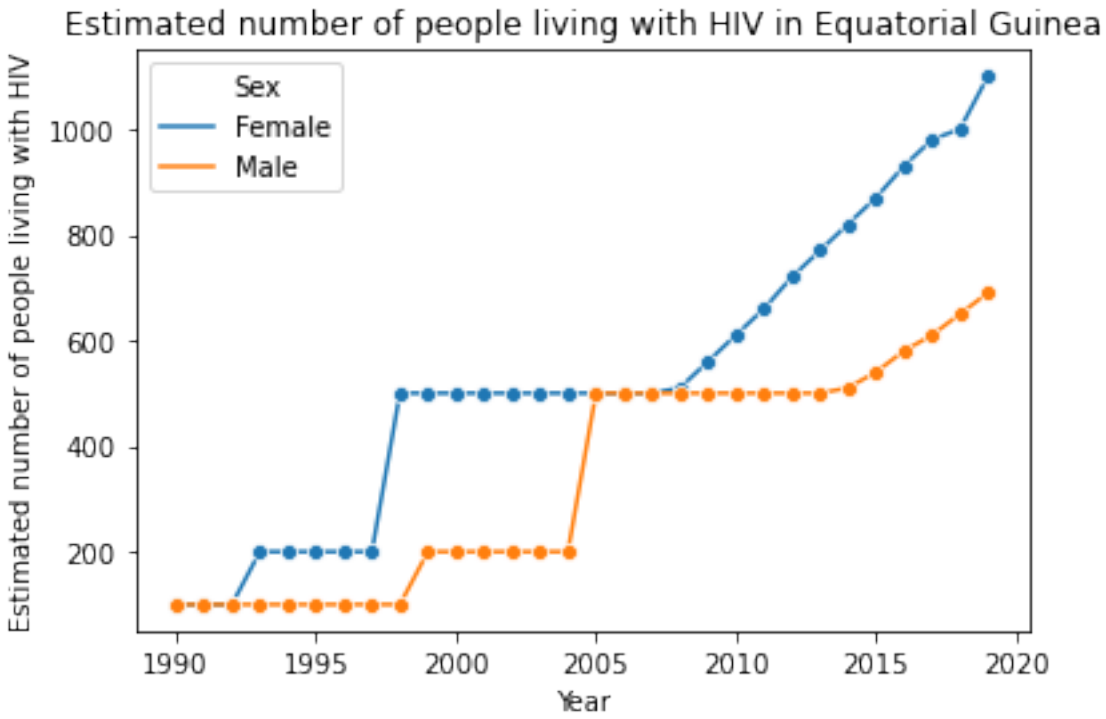

Estimated number of people living with HIV in Chad
Sex
Female
Male
Estimated number of people living with HIV
6000
5000
4000
3000
2000
1000
1990
1995
2000
2005
2010
2015
2020
Year

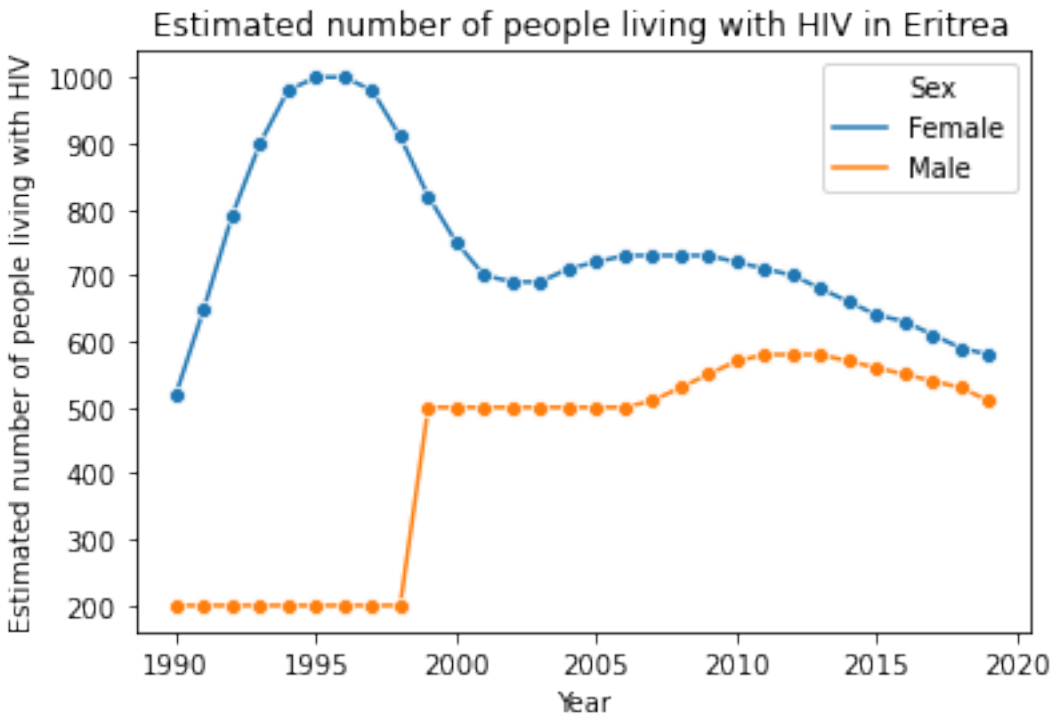

Estimated number of people living with HIV in Congo
Sex
Female
Male
Estimated number of people living with HIV
4500
4000
3500
3000
2500
2000
1500
1000
500
1990
1995
2000
2005
2010
2015
2020
Year

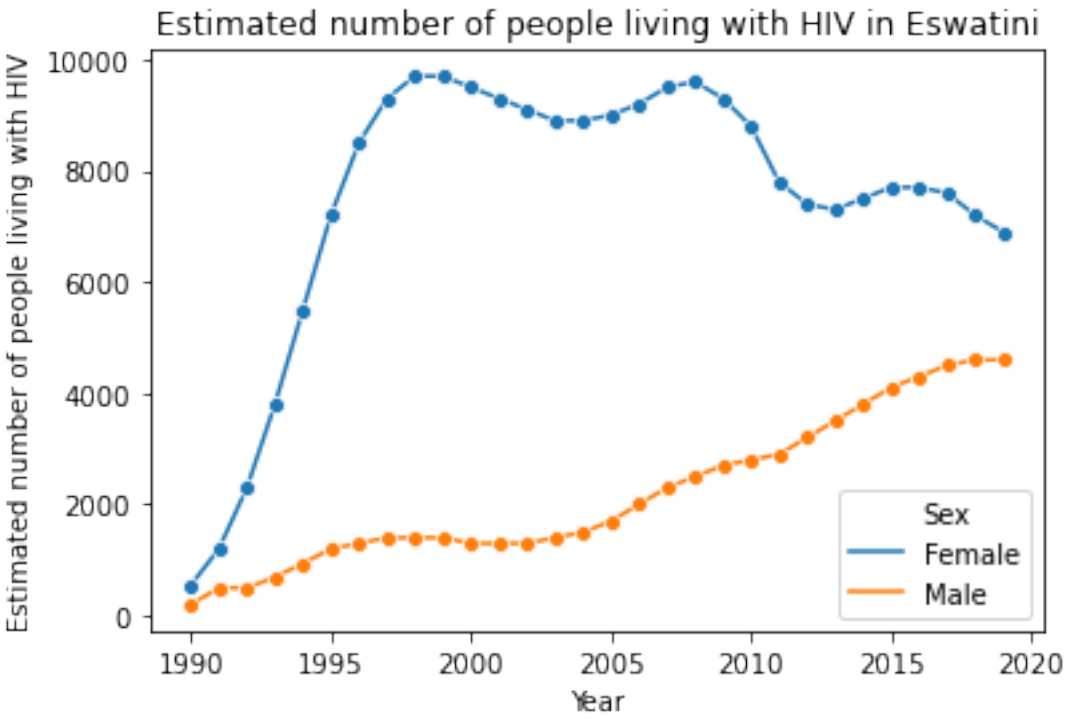

Estimated number of people living with HIV in Côte d'Ivoire
Estimated number of people living with HIV
Year
Sex
Female
Male
0
5000
10000
15000
20000
1990
1995
2000
2005
2010
2015
2020

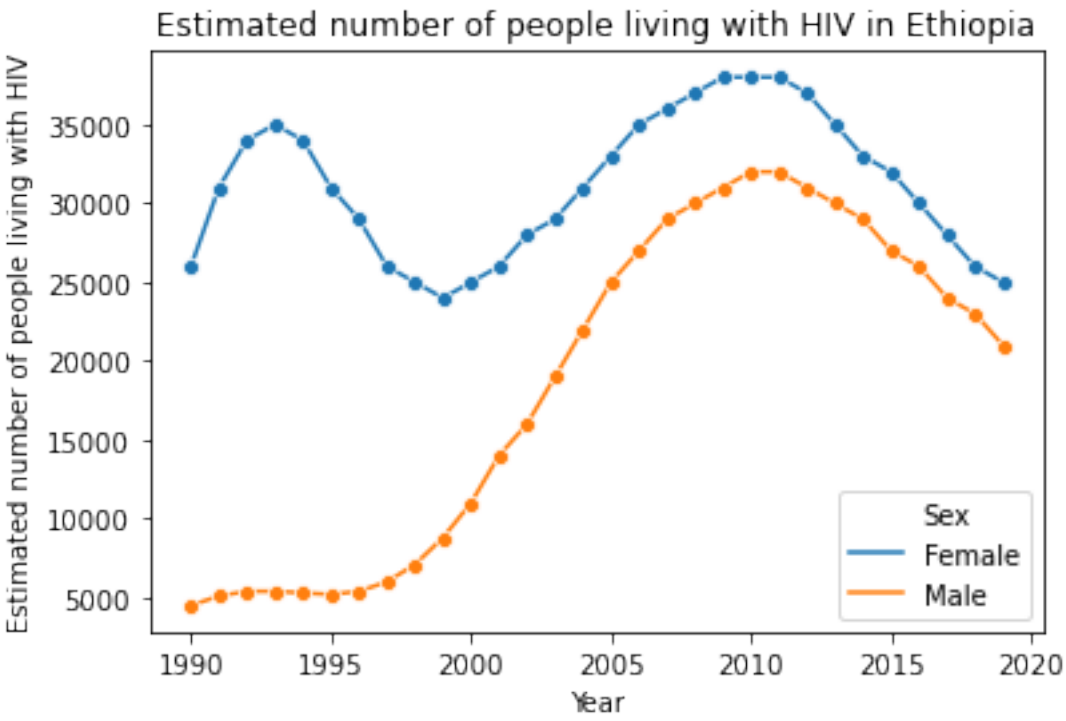

Estimated number of people living with HIV in Democratic Republic of the Congo
Estimated number of people living with HIV
Year
Sex
Female
Male
5000
10000
15000
20000
25000
30000
1990
1995
2000
2005
2010
2015
2020

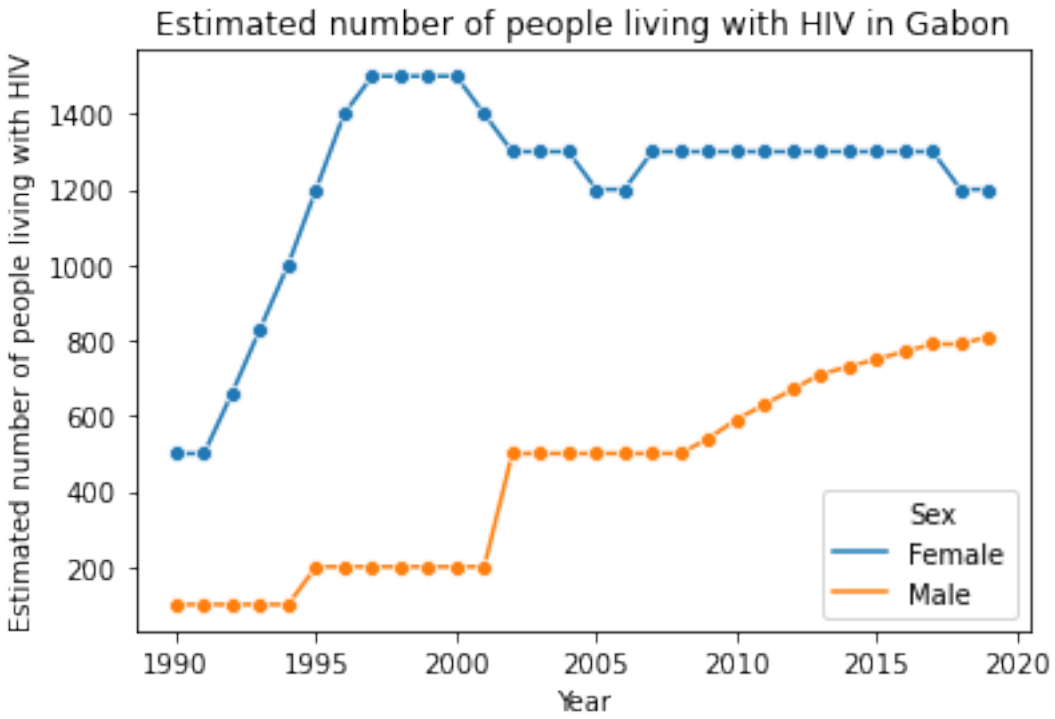

Estimated number of people living with HIV in Djibouti
Estimated number of people living with HIV
500
450
400
350
300
250
200
150
100
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

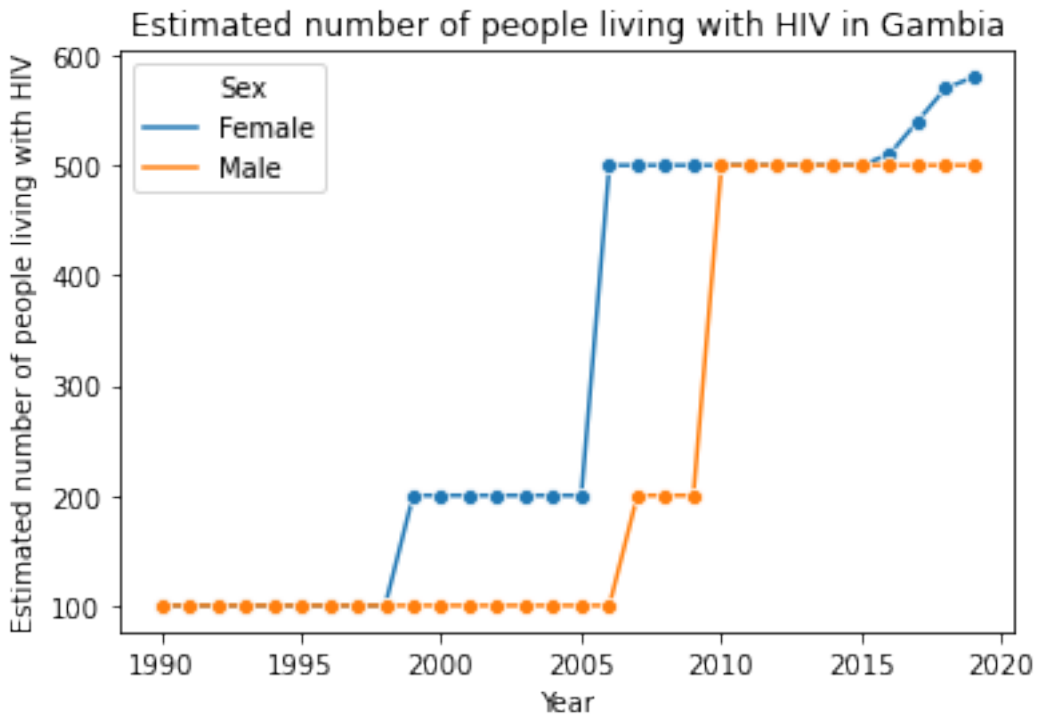

Estimated number of people living with HIV in Equatorial Guinea
Estimated number of people living with HIV
1000
800
600
400
200
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

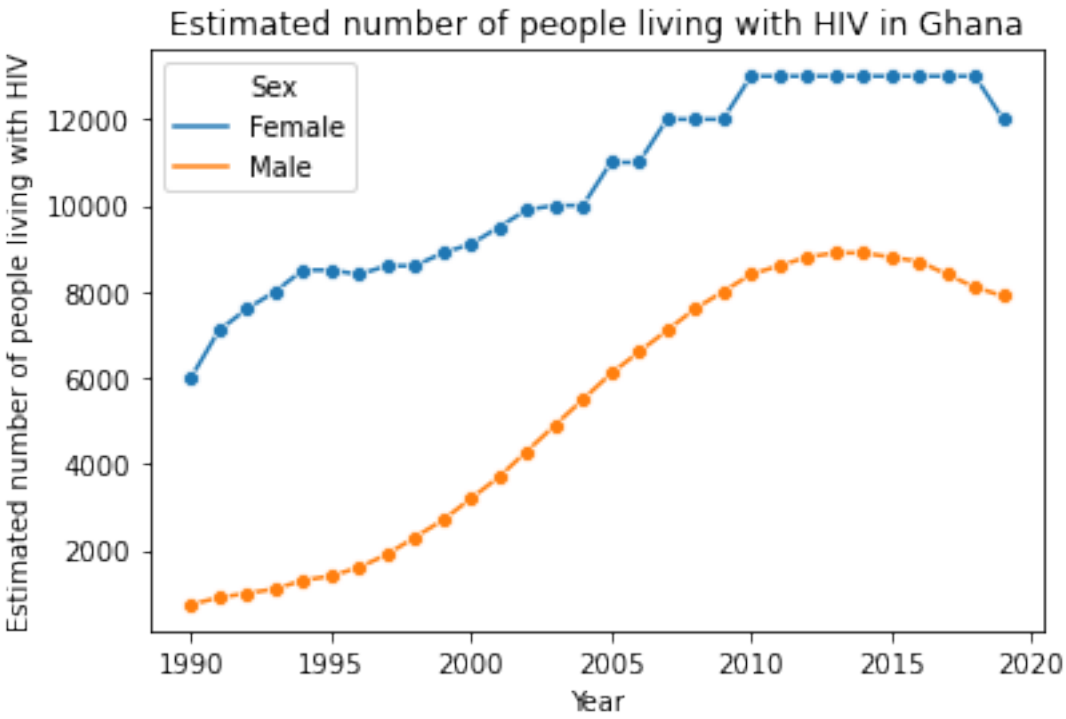

Estimated number of people living with HIV in Eritrea
Estimated number of people living with HIV
1000
900
800
700
600
500
400
300
200
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

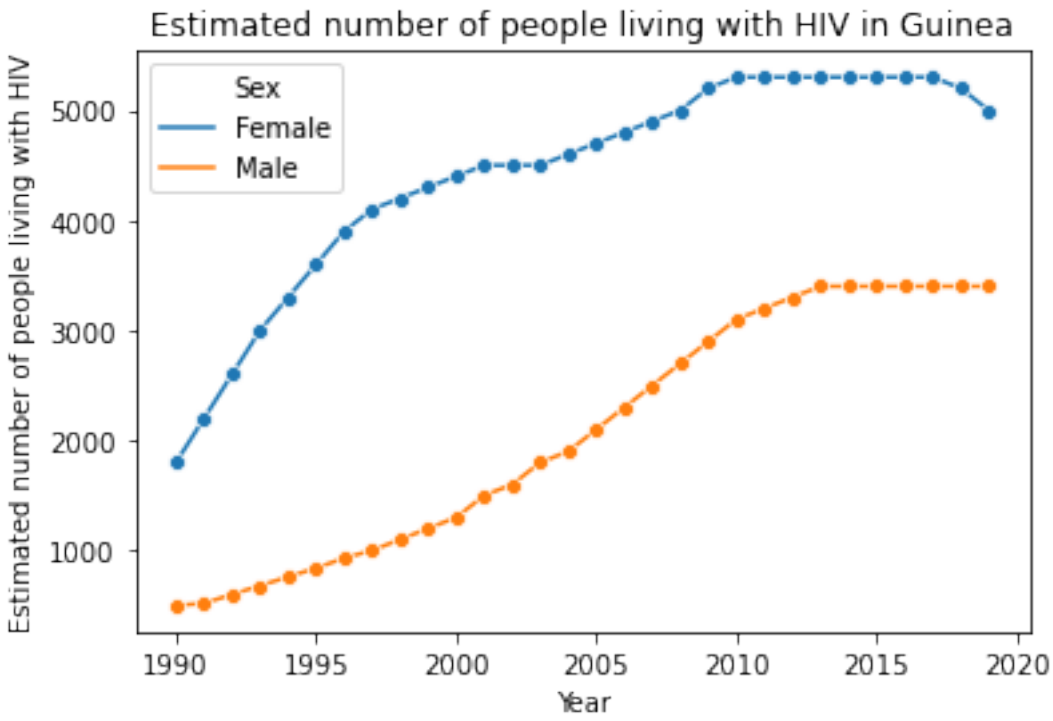

Estimated number of people living with HIV in Eswatini
Estimated number of people living with HIV
10000
8000
6000
4000
2000
0
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

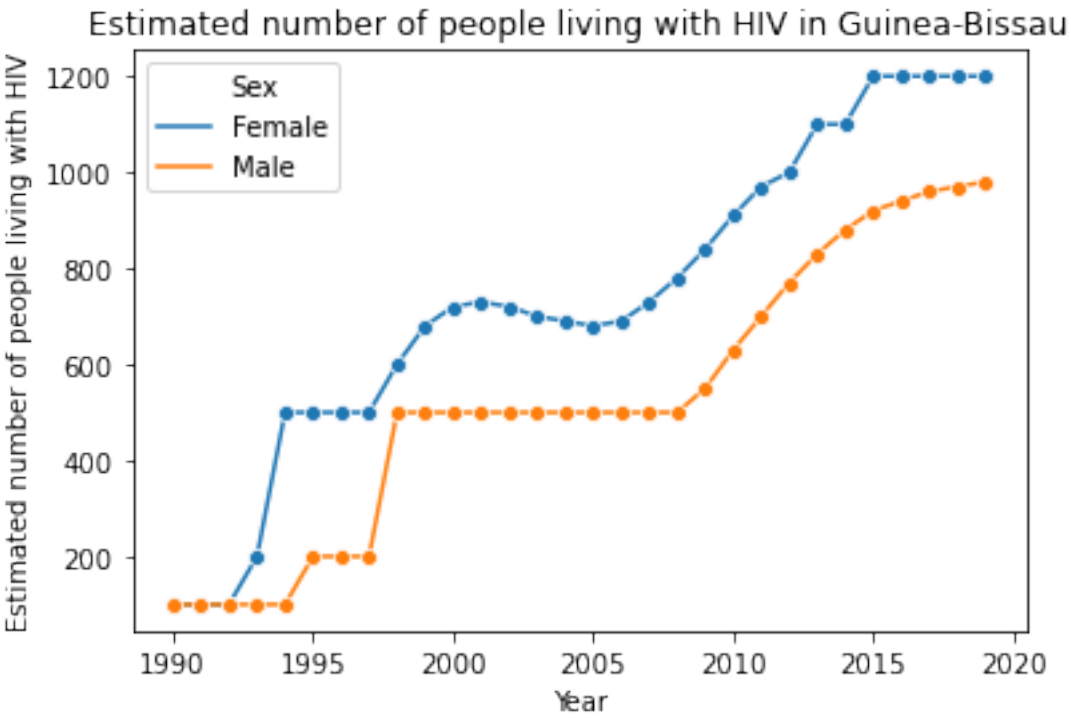

Estimated number of people living with HIV in Ethiopia
Estimated number of people living with HIV
35000
30000
25000
20000
15000
10000
5000
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

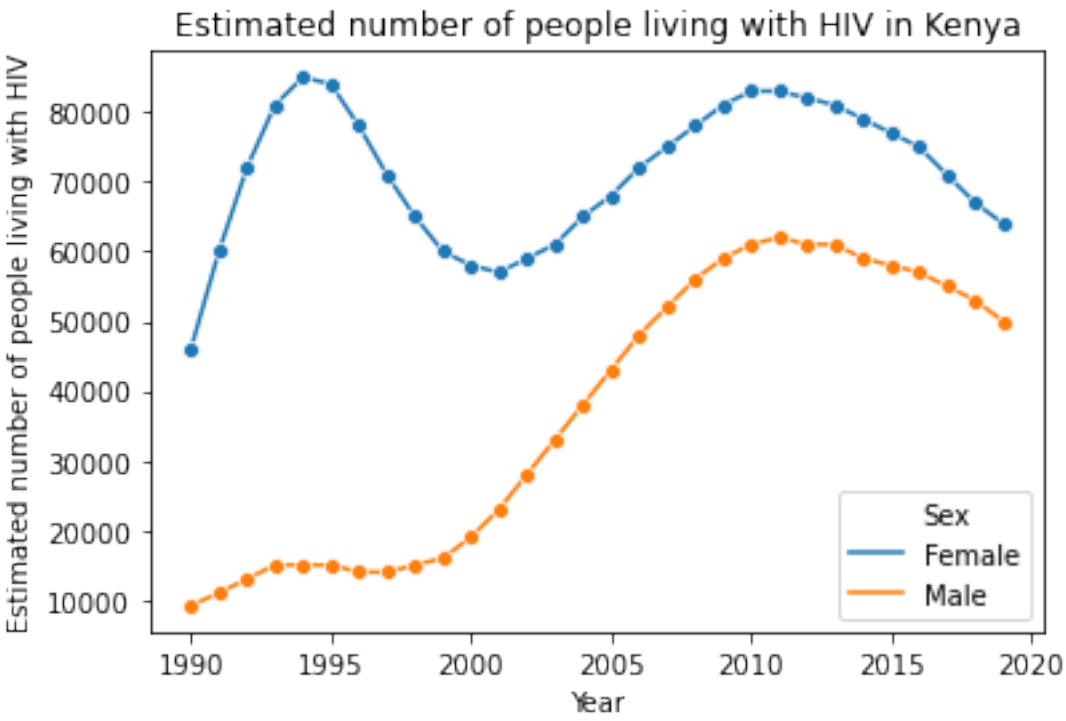

Estimated number of people living with HIV in Gabon
Estimated number of people living with HIV
1400
1200
1000
800
600
400
200
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

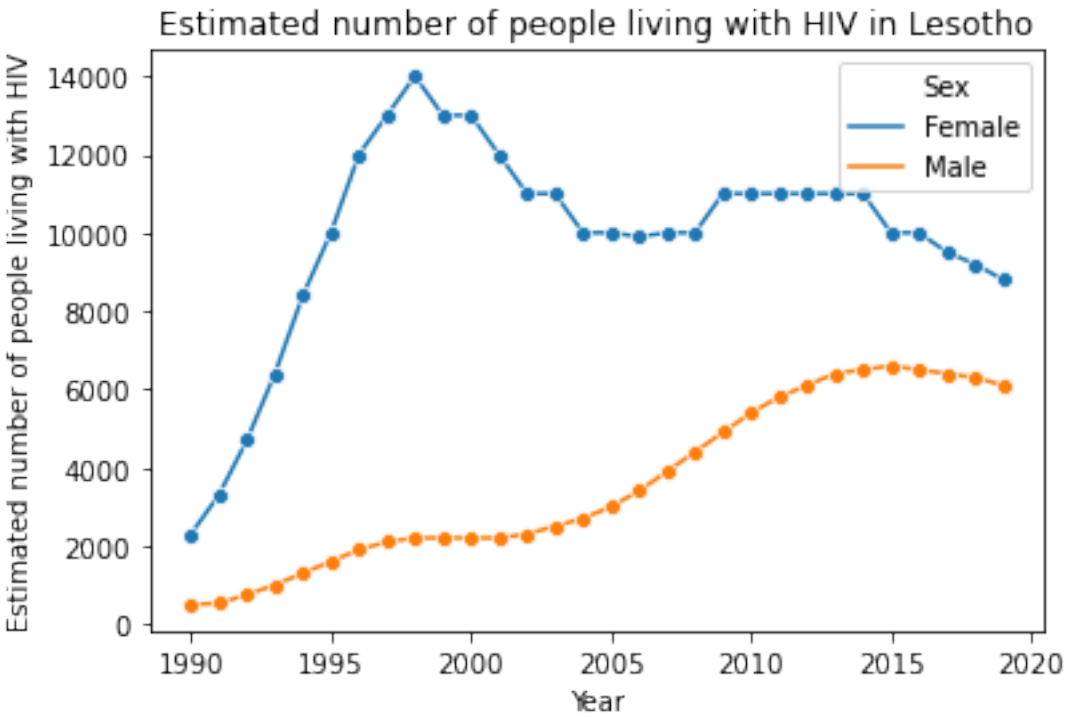

Estimated number of people living with HIV in Gambia
Estimated number of people living with HIV
Year
Sex
Female
Male
600
500
400
300
200
100
1990
1995
2000
2005
2010
2015
2020

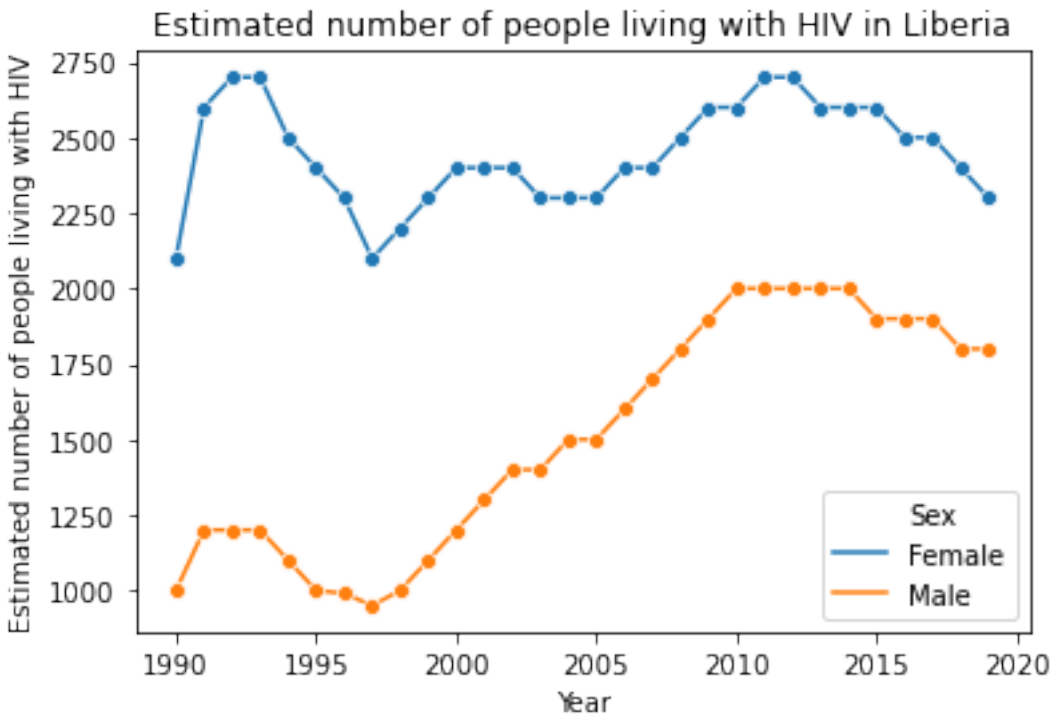

Estimated number of people living with HIV in Ghana
Estimated number of people living with HIV
Year
Sex
Female
Male
12000
10000
8000
6000
4000
2000
1990
1995
2000
2005
2010
2015
2020

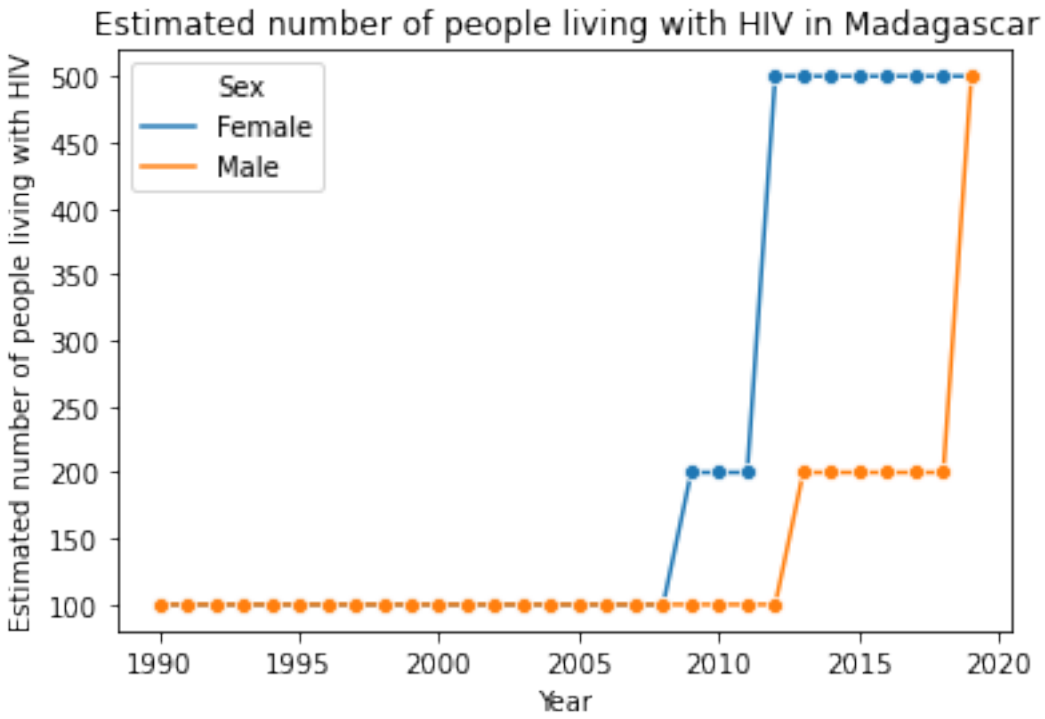

Estimated number of people living with HIV in Guinea
Sex
Female
Male
Estimated number of people living with HIV
5000
4000
3000
2000
1000
1990
1995
2000
2005
2010
2015
2020
Year

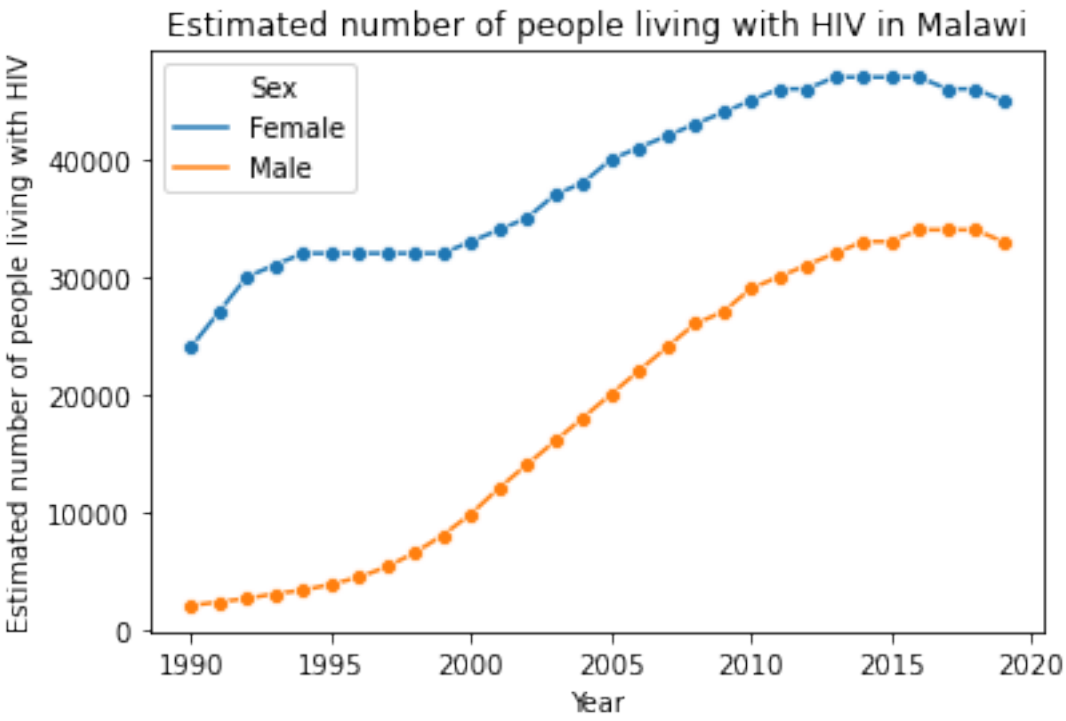

Estimated number of people living with HIV in Guinea-Bissau
Sex
Female
Male
Estimated number of people living with HIV
1200
1000
800
600
400
200
1990
1995
2000
2005
2010
2015
2020
Year

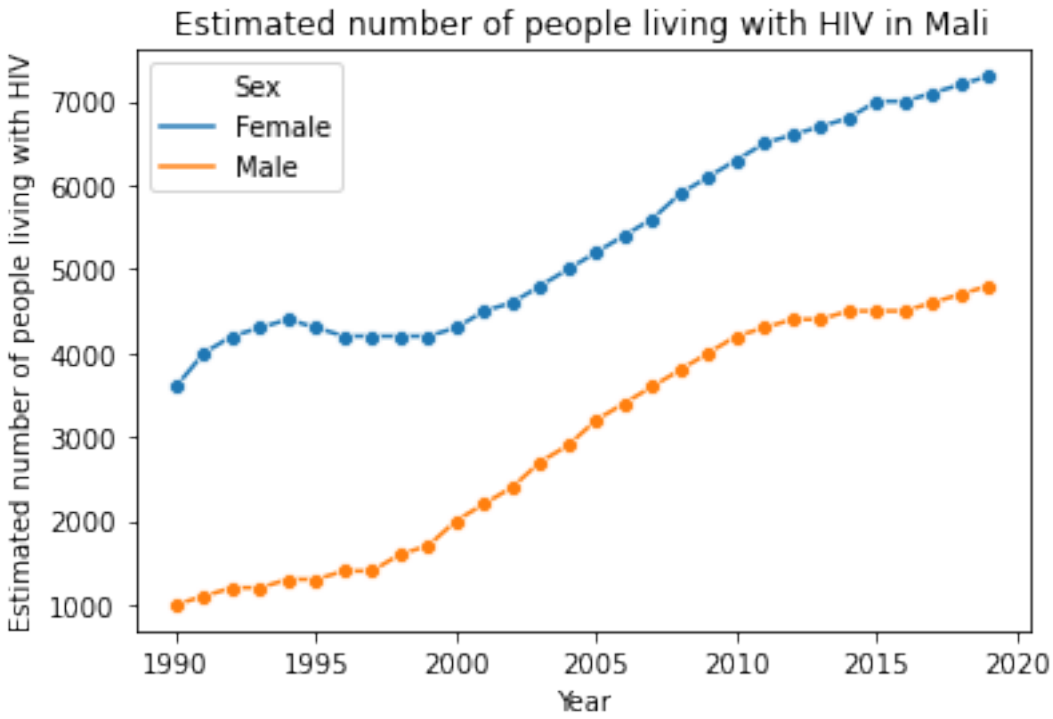

Estimated number of people living with HIV in Kenya
Estimated number of people living with HIV
80000
70000
60000
50000
40000
30000
20000
10000
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

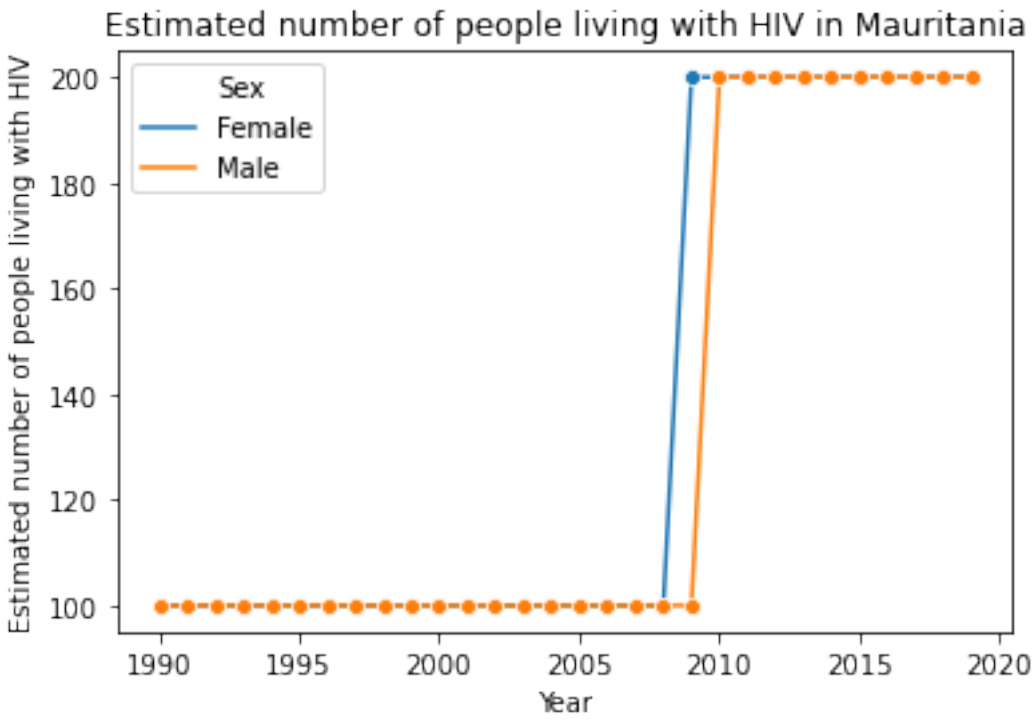

Estimated number of people living with HIV in Lesotho
Estimated number of people living with HIV
14000
12000
10000
8000
6000
4000
2000
0
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

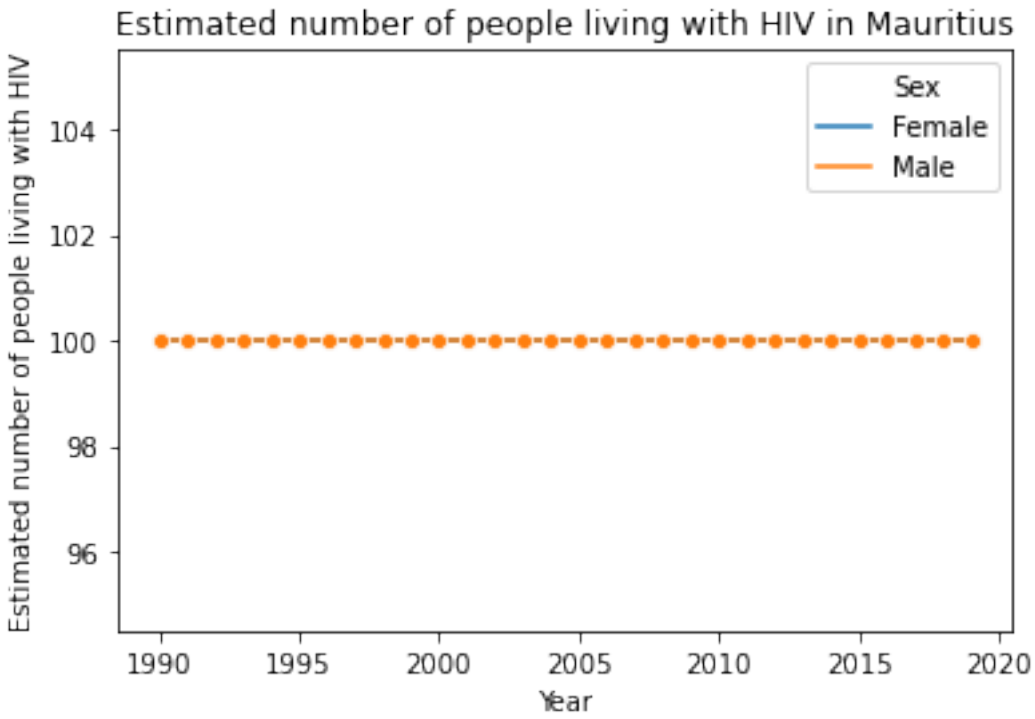

Estimated number of people living with HIV in Liberia
Estimated number of people living with HIV
2750
2500
2250
2000
1750
1500
1250
1000
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

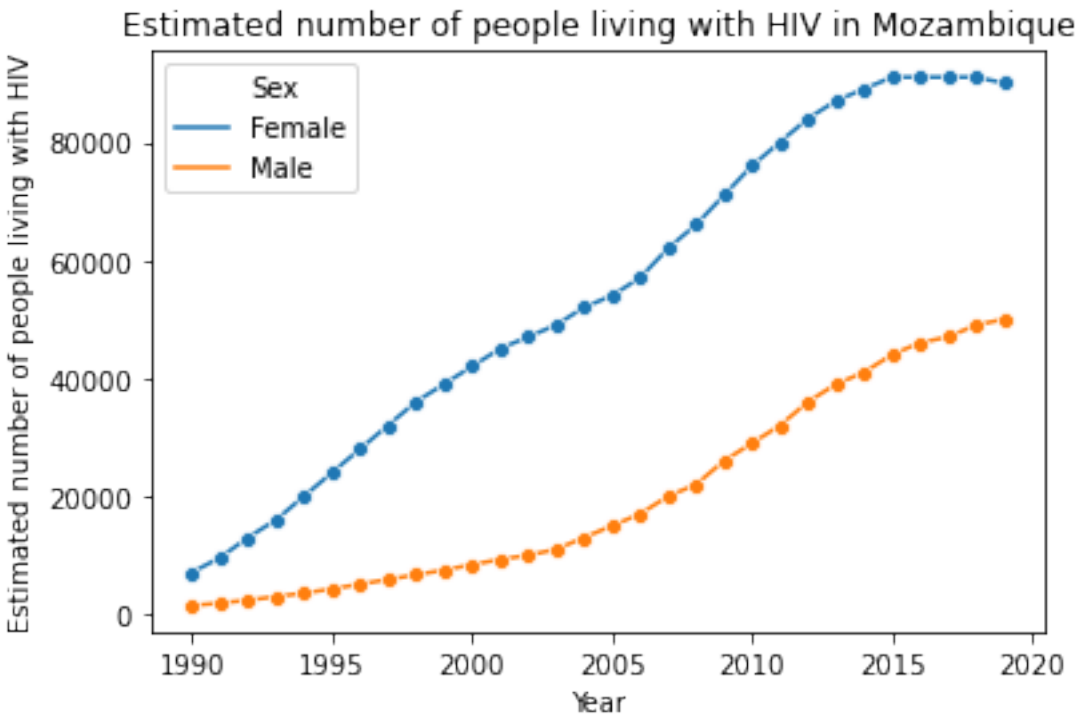

Estimated number of people living with HIV in Madagascar
Estimated number of people living with HIV
500
450
400
350
300
250
200
150
100
1990
1995
2000
2005
2010
2015
2020
Year
Sex
Female
Male

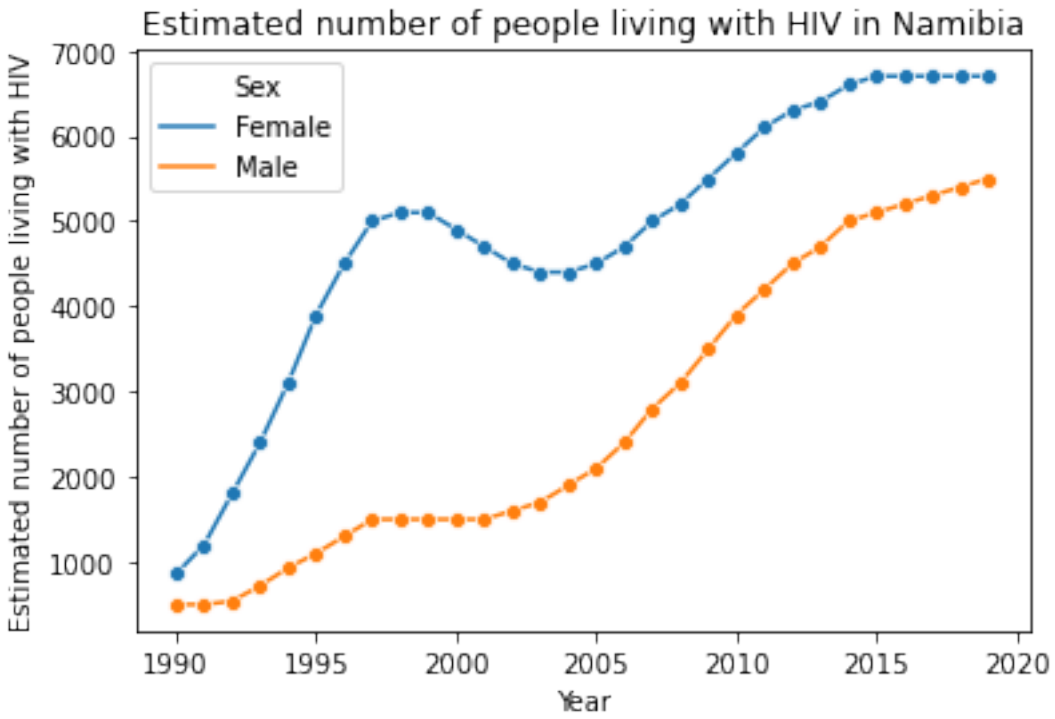

Estimated number of people living with HIV in Malawi
Sex
Female
Male
Estimated number of people living with HIV
0
10000
20000
30000
40000
1990
1995
2000
2005
2010
2015
2020
Year

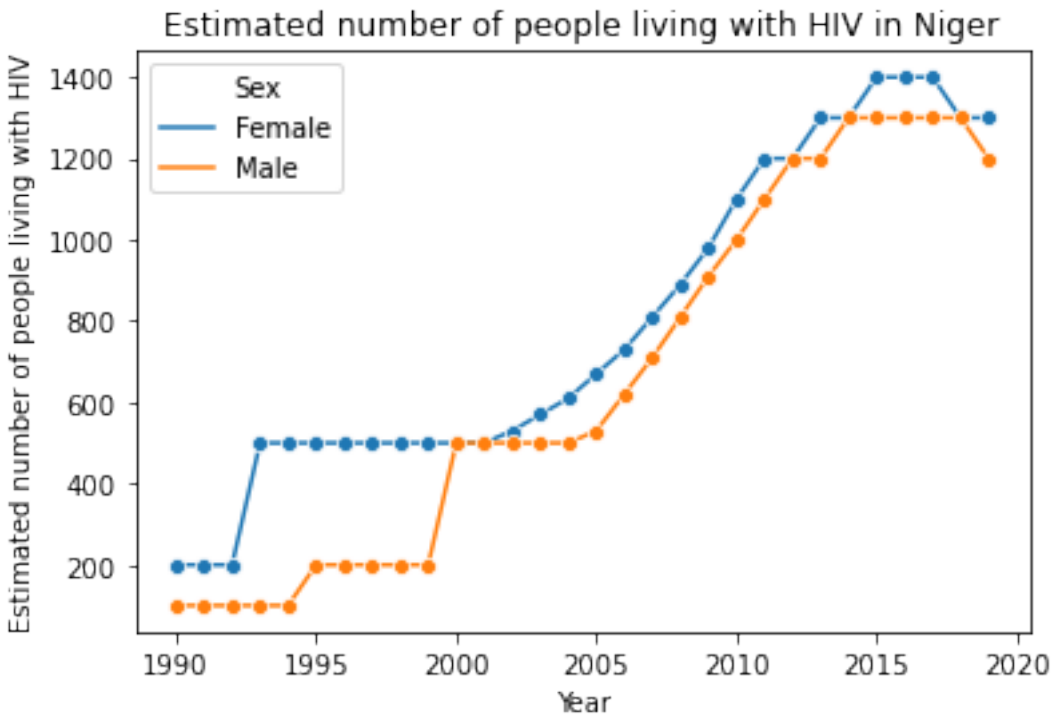

Estimated number of people living with HIV in Mali
Sex
Female
Male
Estimated number of people living with HIV
1000
2000
3000
4000
5000
6000
7000
1990
1995
2000
2005
2010
2015
2020
Year

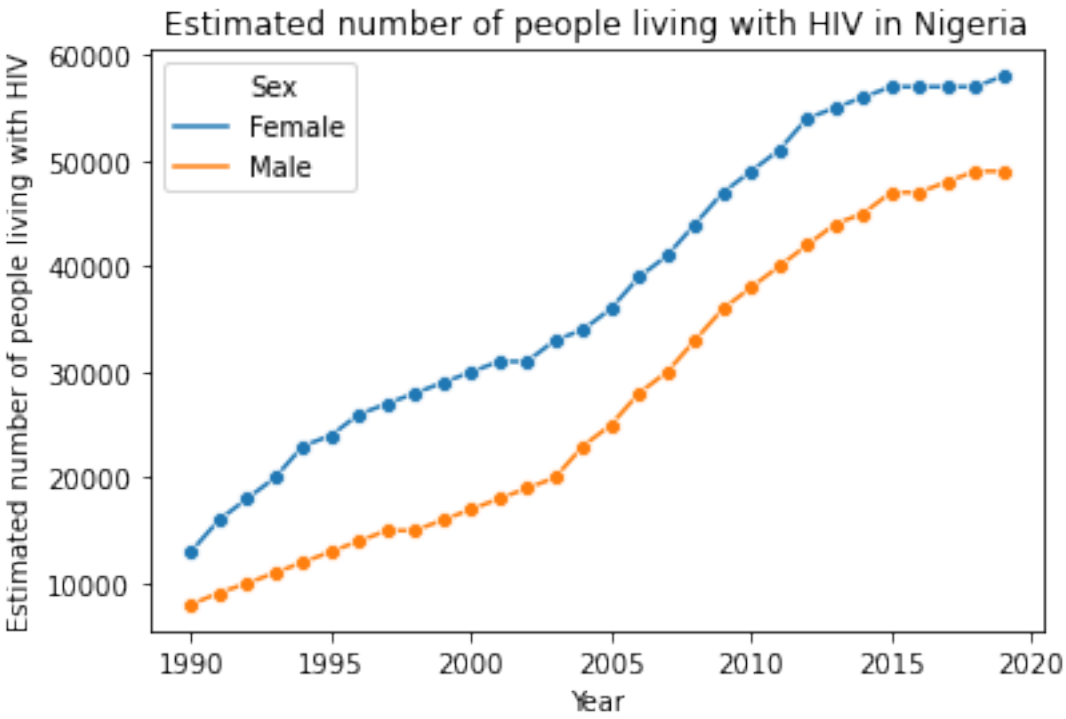

Estimated number of people living with HIV in Mauritania
Estimated number of people living with HIV
Year
Sex
Female
Male
100
120
140
160
180
200
1990
1995
2000
2005
2010
2015
2020

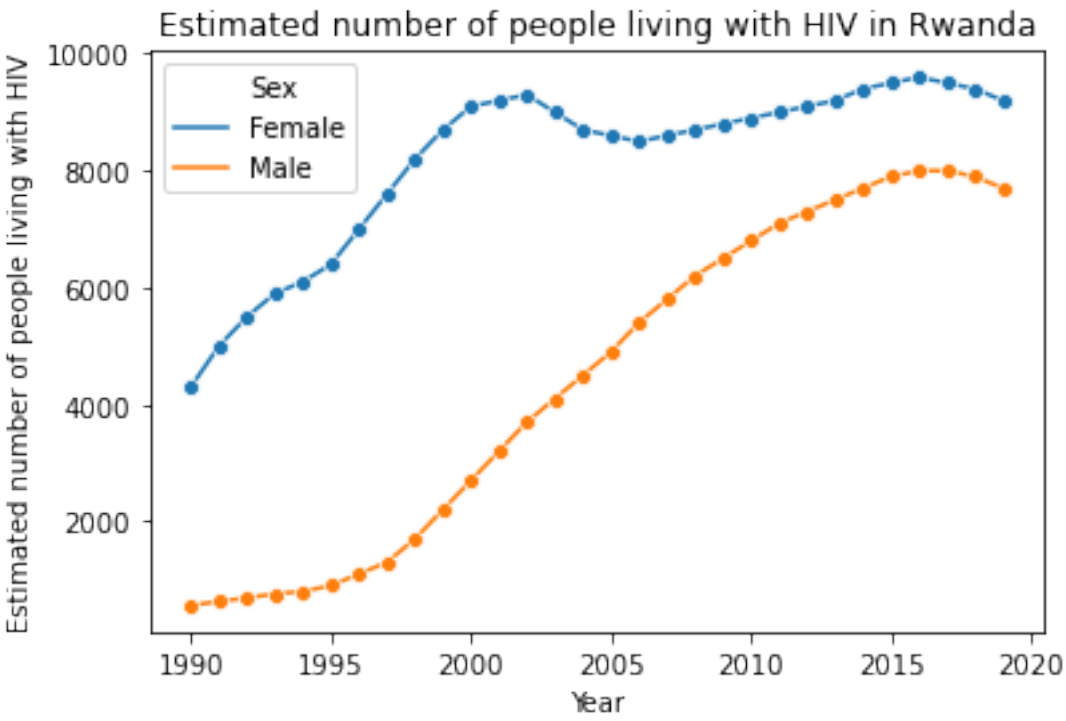

Estimated number of people living with HIV in Mauritius
Estimated number of people living with HIV
Year
Sex
Female
Male
96
98
100
102
104
1990
1995
2000
2005
2010
2015
2020

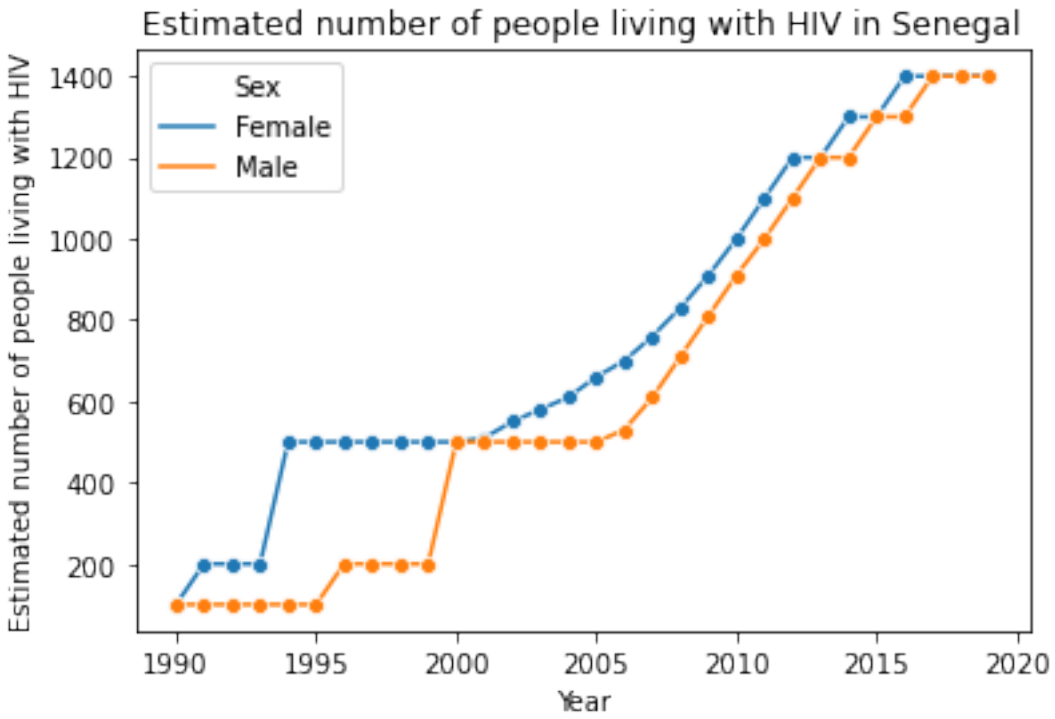

Estimated number of people living with HIV in Mozambique
Sex
Female
Male
Estimated number of people living with HIV
0
20000
40000
60000
80000
1990
1995
2000
2005
2010
2015
2020
Year

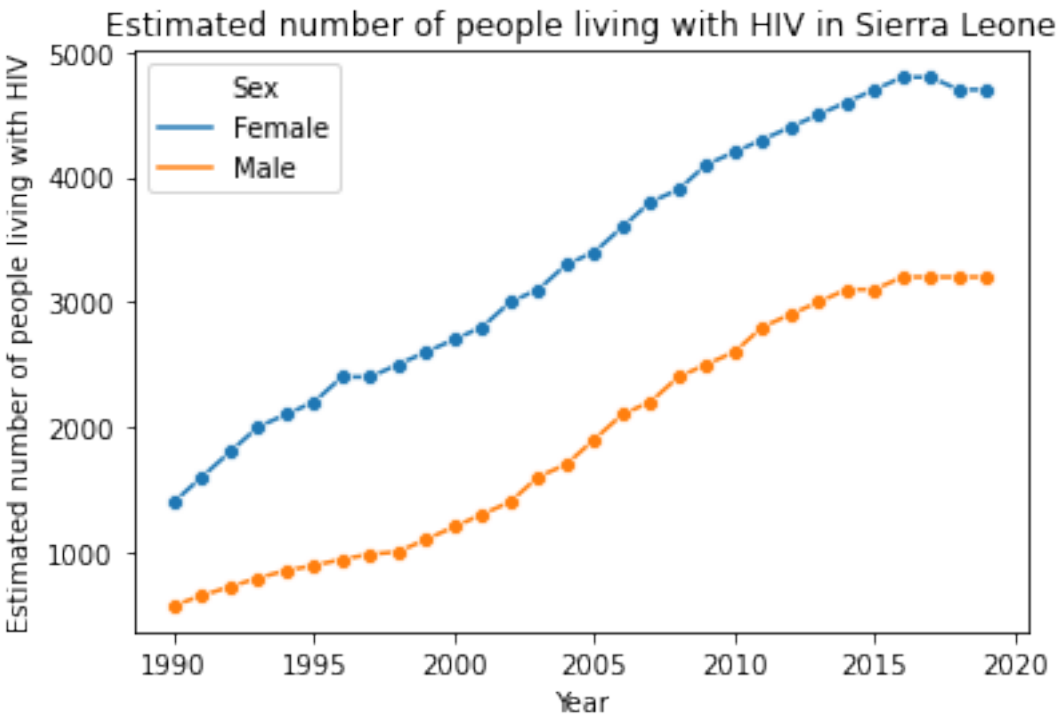

Estimated number of people living with HIV in Namibia
Sex
Female
Male
Estimated number of people living with HIV
1000
2000
3000
4000
5000
6000
7000
1990
1995
2000
2005
2010
2015
2020
Year

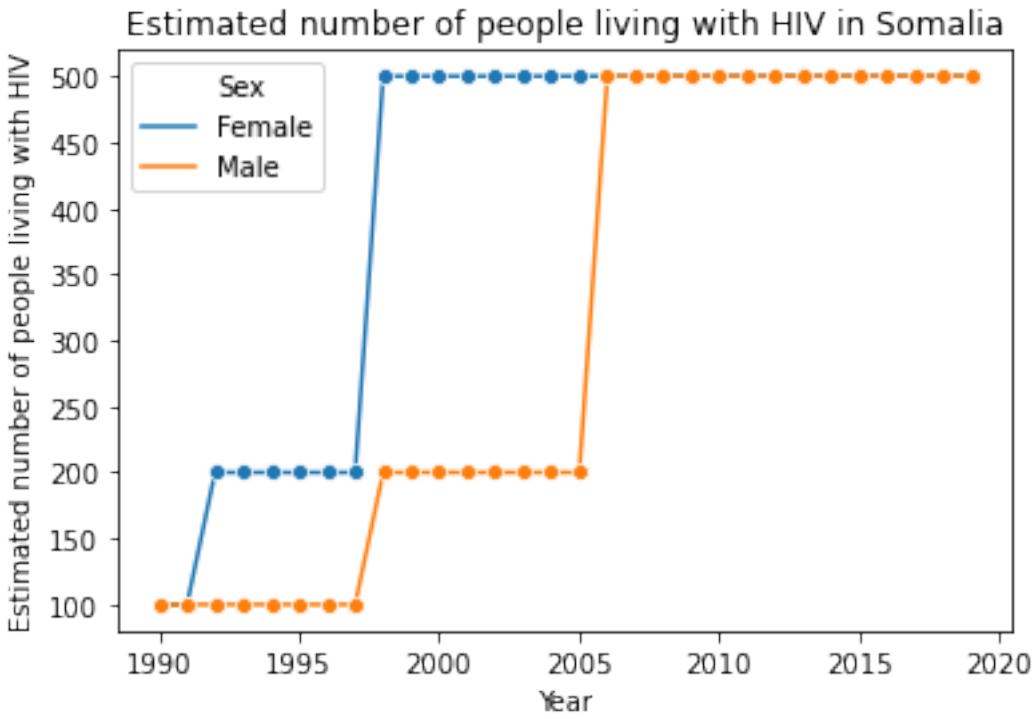

Estimated number of people living with HIV in Niger
Estimated number of people living with HIV
Year
Sex
Female
Male
1400
1200
1000
800
600
400
200
1990
1995
2000
2005
2010
2015
2020

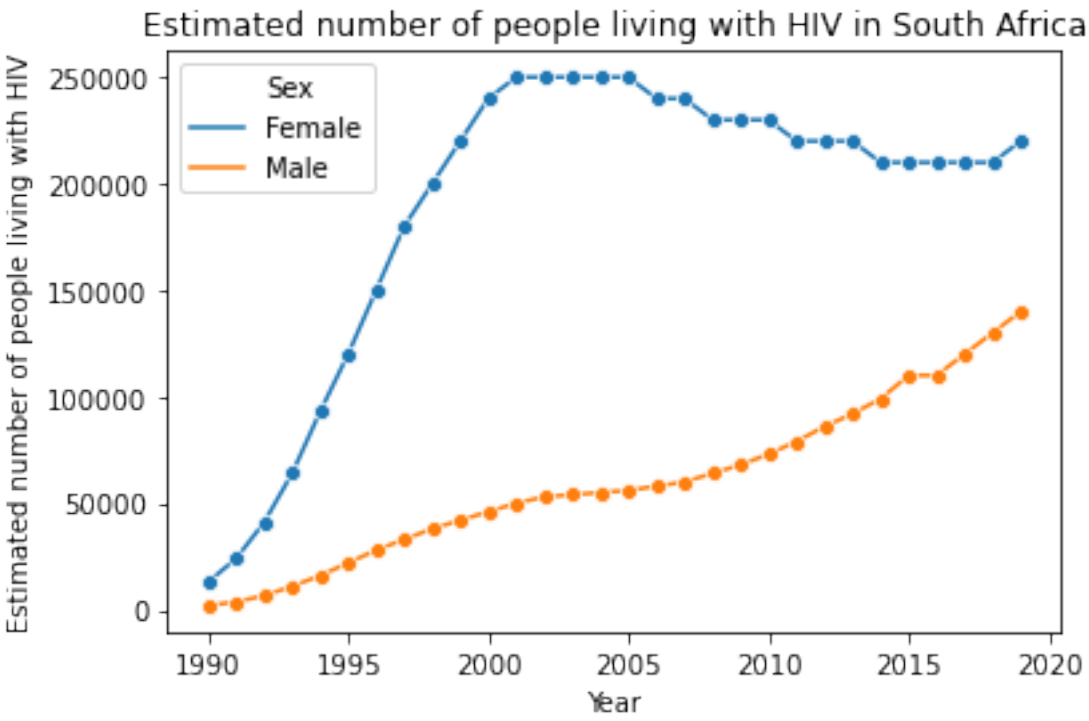

Estimated number of people living with HIV in Nigeria
Estimated number of people living with HIV
Year
Sex
Female
Male
60000
50000
40000
30000
20000
10000
1990
1995
2000
2005
2010
2015
2020

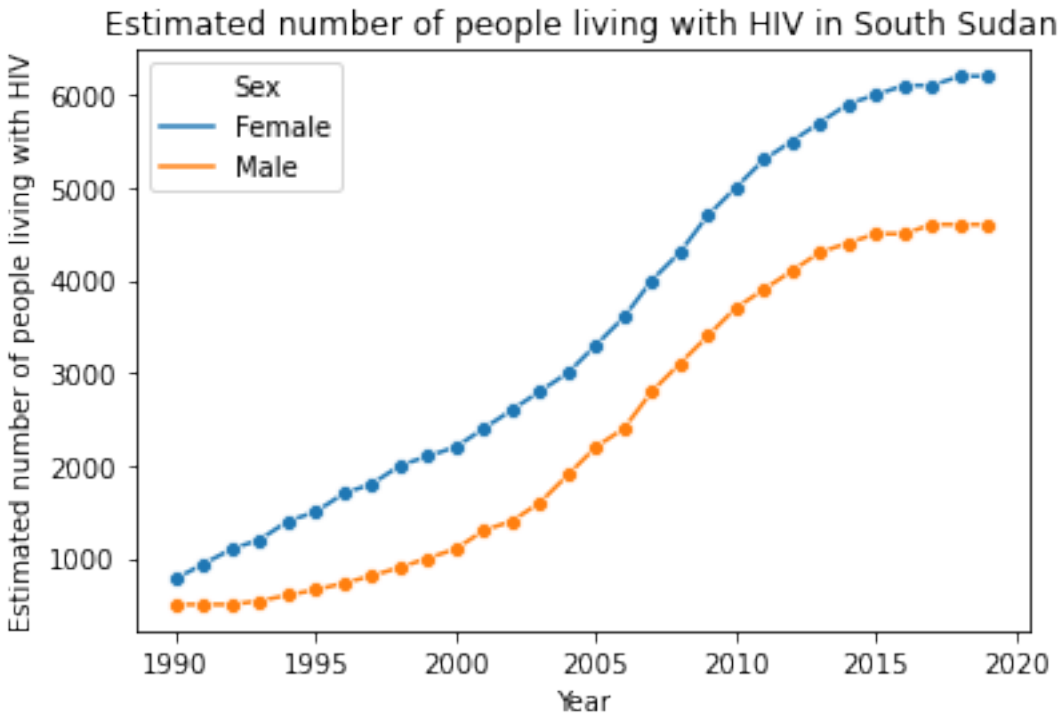

Estimated number of people living with HIV in Rwanda
Estimated number of people living with HIV
Year
Sex
Female
Male
10000
8000
6000
4000
2000
1990
1995
2000
2005
2010
2015
2020

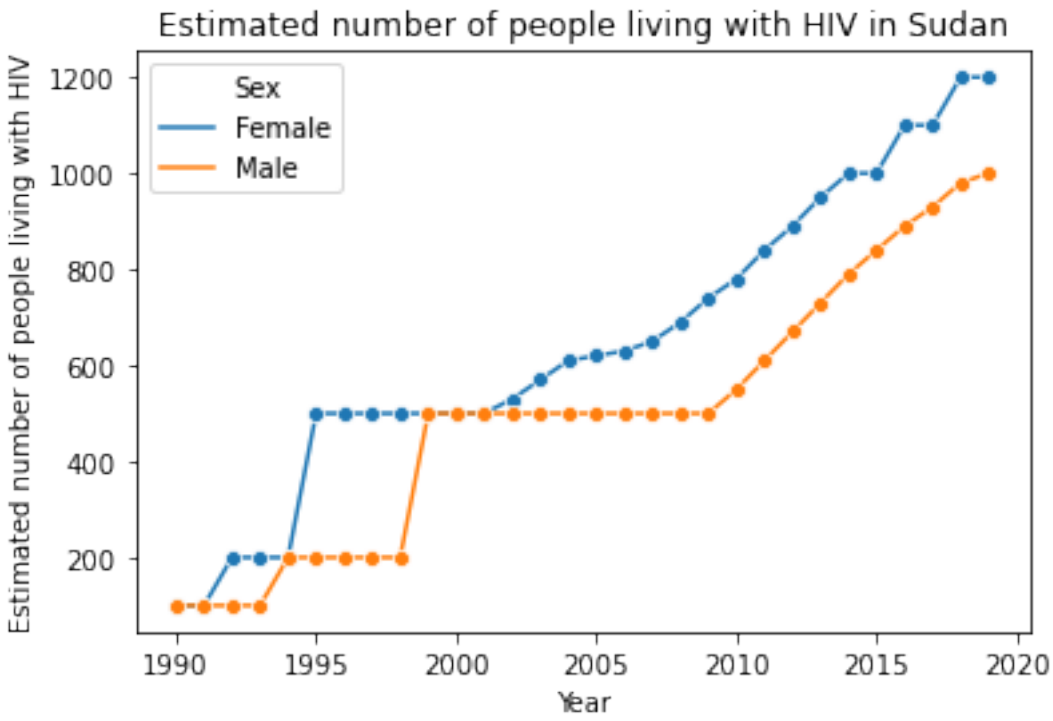

Estimated number of people living with HIV in Senegal
Estimated number of people living with HIV
Year
Sex
Female
Male
1400
1200
1000
800
600
400
200
1990
1995
2000
2005
2010
2015
2020

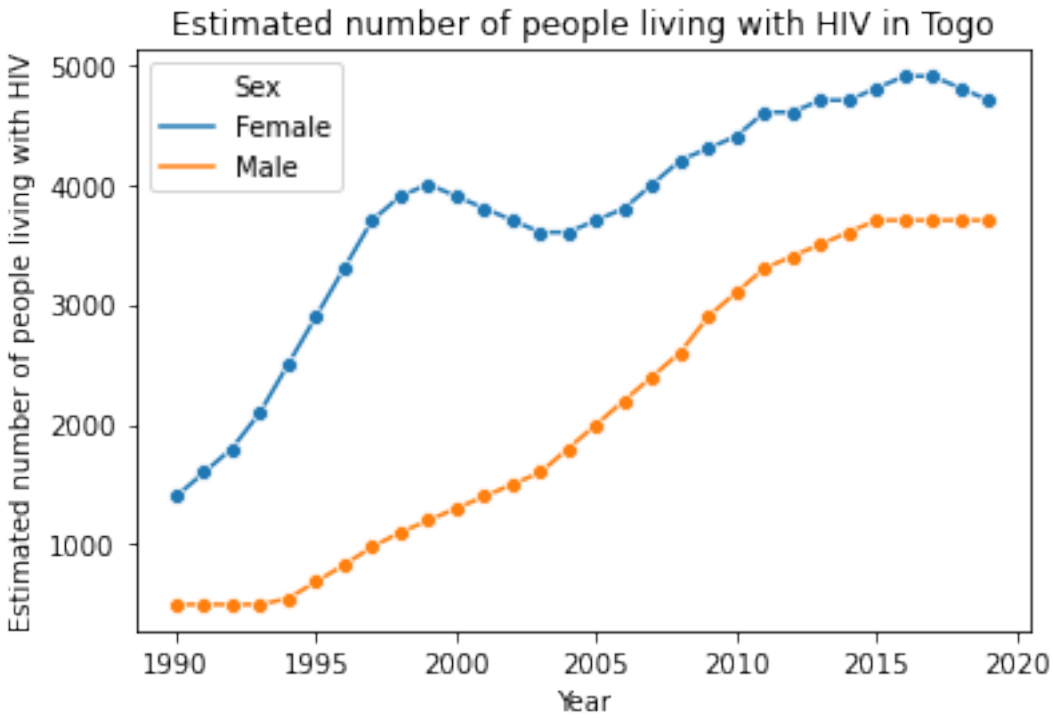

Estimated number of people living with HIV in Sierra Leone
Estimated number of people living with HIV
Year
Sex
Female
Male
5000
4000
3000
2000
1000
1990
1995
2000
2005
2010
2015
2020

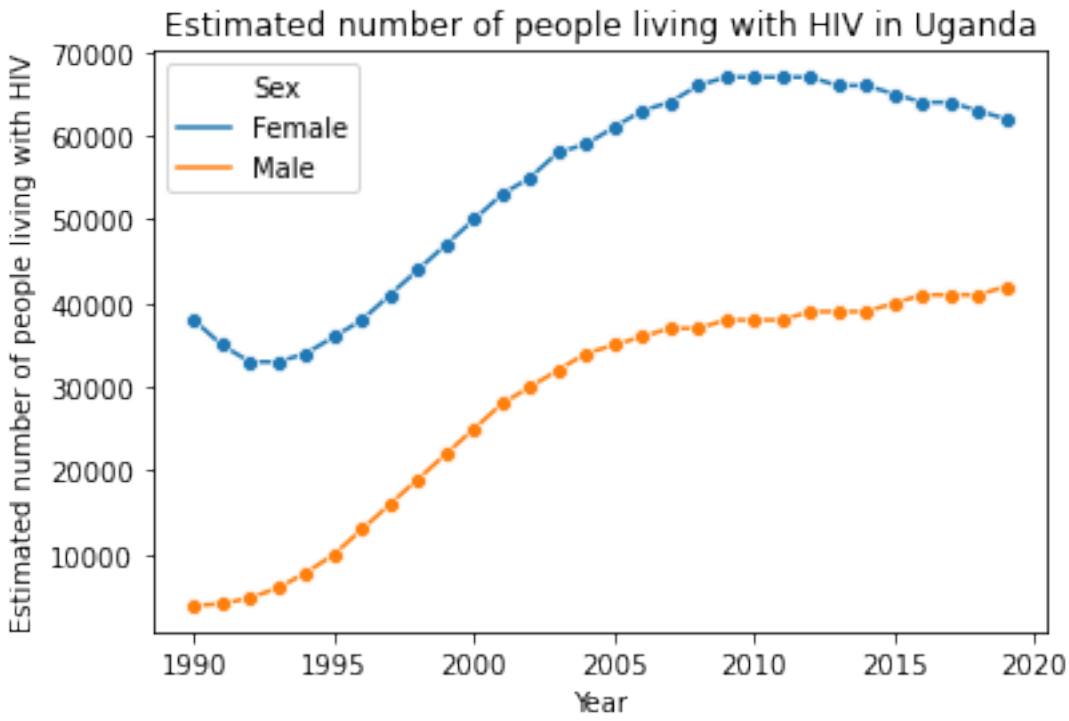

Estimated number of people living with HIV in Somalia
Estimated number of people living with HIV
Year
Sex
Female
Male
500
450
400
350
300
250
200
150
100
1990
1995
2000
2005
2010
2015
2020

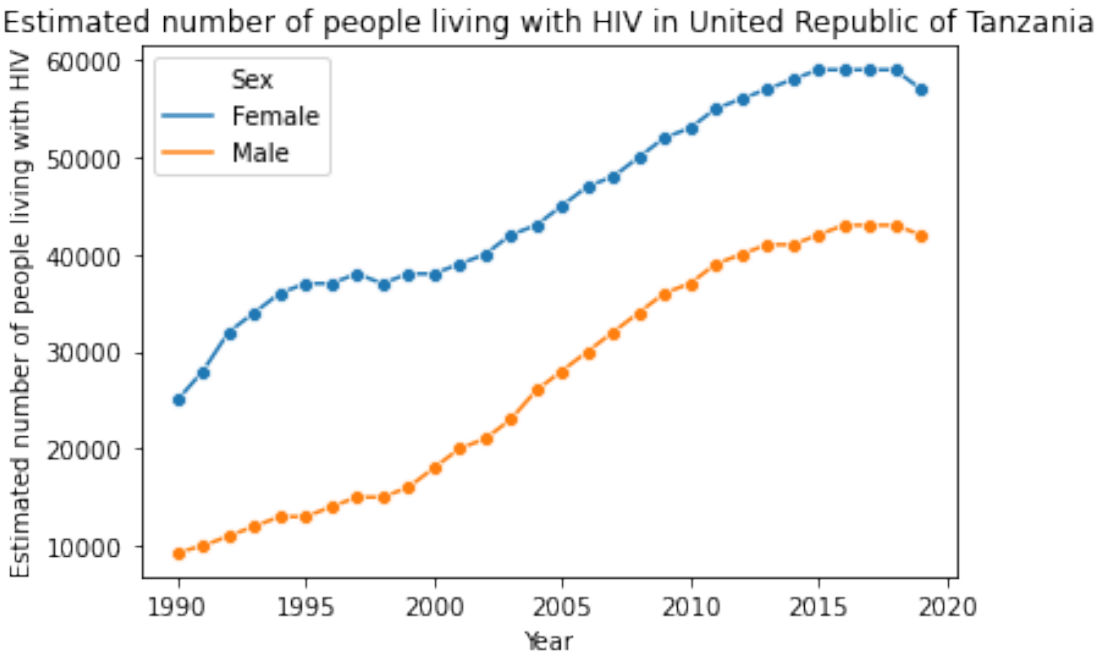

Estimated number of people living with HIV in South Africa
Estimated number of people living with HIV
Year
Sex
Female
Male
0
50000
100000
150000
200000
250000
1990
1995
2000
2005
2010
2015
2020

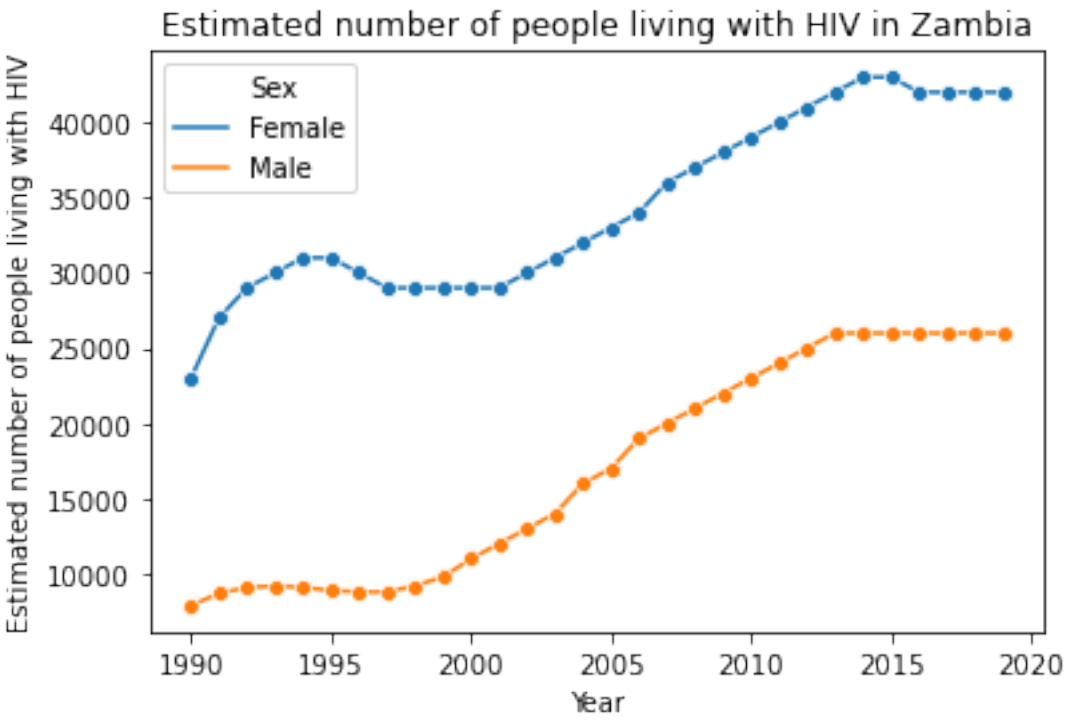

Estimated number of people living with HIV in South Sudan
Estimated number of people living with HIV
Year
Sex
Female
Male
1000
2000
3000
4000
5000
6000
1990
1995
2000
2005
2010
2015
2020

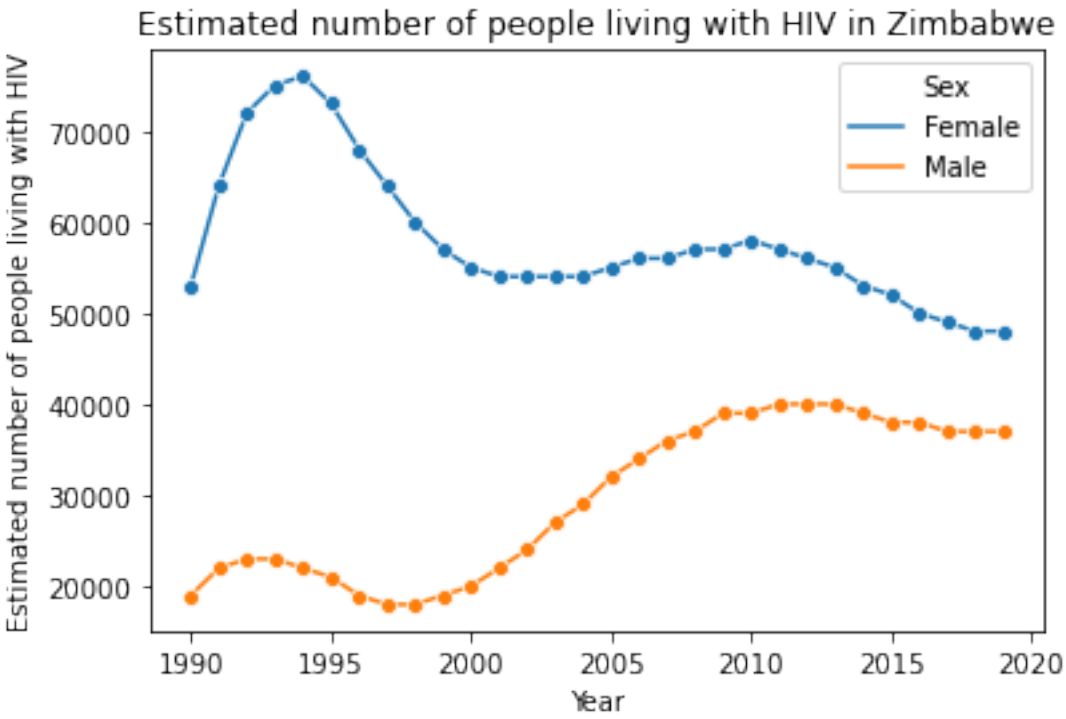

Estimated number of people living with HIV in Sudan
Sex
Female
Male
Estimated number of people living with HIV
1200
1000
800
600
400
200
1990
1995
2000
2005
2010
2015
2020
Year


Estimated number of people living with HIV in Togo
Sex
Female
Male
Estimated number of people living with HIV
5000
4000
3000
2000
1000
1990
1995
2000
2005
2010
2015
2020
Year


Estimated number of people living with HIV in Uganda
Estimated number of people living with HIV
70000
60000
50000
40000
30000
20000
10000
Sex
Female
Male
1990
1995
2000
2005
2010
2015
2020
Year


Estimated number of people living with HIV in United Republic of Tanzania
Estimated number of people living with HIV
60000
50000
40000
30000
20000
10000
Sex
Female
Male
1990
1995
2000
2005
2010
2015
2020
Year


Estimated number of people living with HIV in Zambia
Estimated number of people living with HIV
Sex
Female
Male
40000
35000
30000
25000
20000
15000
10000
1990
1995
2000
2005
2010
2015
2020
Year


Estimated number of people living with HIV in Zimbabwe
Estimated number of people living with HIV
Sex
Female
Male
70000
60000
50000
40000
30000
20000
1990
1995
2000
2005
2010
2015
2020
Year

4 Line Chart using Plotly library

[9]:
```
import plotly.express as px
```

[10]:
```
for i in sorted(country):
    f = df[df['Country'] == i]
    t = 'Estimated number of people living with HIV in '+i
    fig = px.line(f, x='Year', y='Estimated number of people living with HIV',␣
 ↪title=t, color='Sex')
    fig.show()
```

[ ]:
```

```