In [ ]:
```
import pandas as pd
import matplotlib.pyplot as plt
```

In [ ]:
```
df = pd.read_csv('swedish_population_by_year_and_sex_1860-2022.csv')
year_columns = df.columns[2:]

melted_df = pd.melt(df, id_vars=['age', 'sex'], value_vars=year_columns, var

print(melted_df)
```

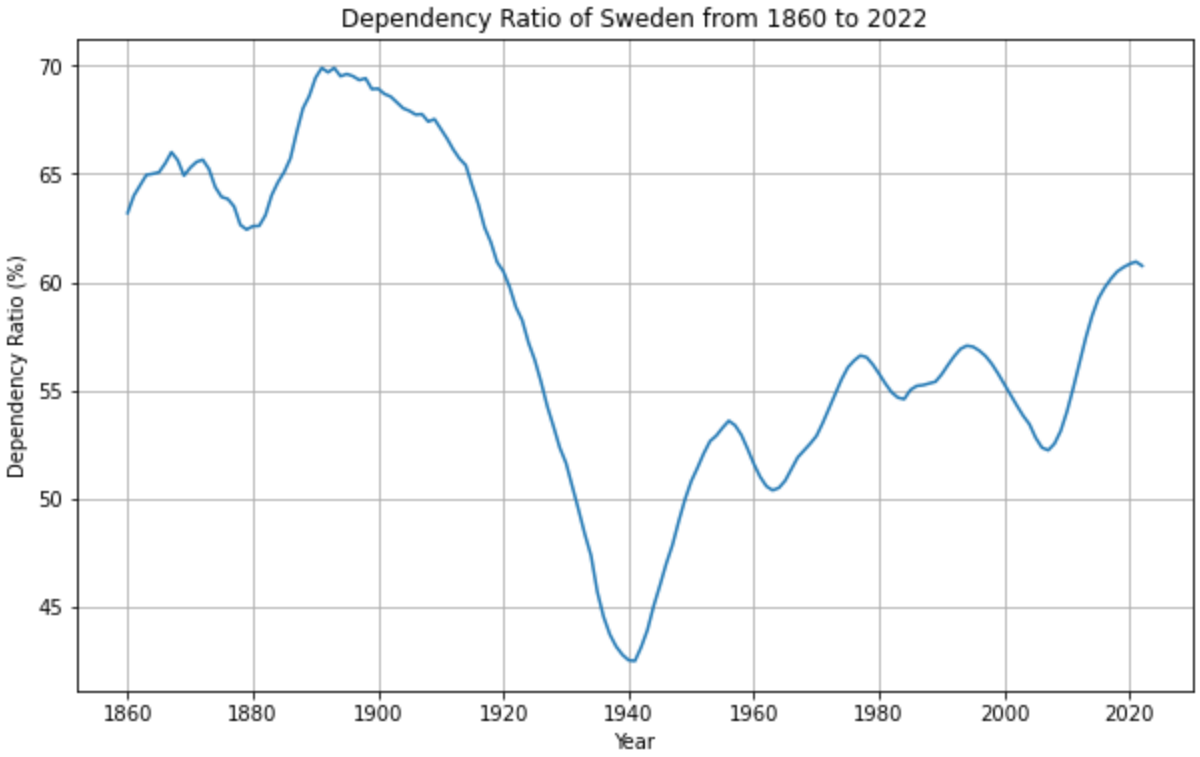
```
        age    sex  Year  Population
0         0    men  1860       60589
1         0  women  1860       58837
2         1    men  1860       56001
3         1  women  1860       54833
4         2    men  1860       52502
...     ...    ...   ...         ...
36181   108  women  2022           8
36182   109    men  2022           0
36183   109  women  2022           1
36184  110+    men  2022           0
36185  110+  women  2022           3

[36186 rows x 4 columns]
```

In [ ]:
```
# Change data types so comparison works
melted_df['Year'] = pd.to_numeric(melted_df['Year'])
melted_df['age'] = melted_df['age'].astype(str)
melted_df.loc[melted_df['age'] == '110+', 'age'] = '110'
melted_df['age'] = pd.to_numeric(melted_df['age'])

children = melted_df[melted_df['age'] <= 14].groupby('Year')['Population'].s
elderly = melted_df[melted_df['age'] >= 65].groupby('Year')['Population'].su
labor_force = melted_df[(melted_df['age'] >= 15) & (melted_df['age'] <= 64)]
dependency_ratio = 100 * (children + elderly) / labor_force
```

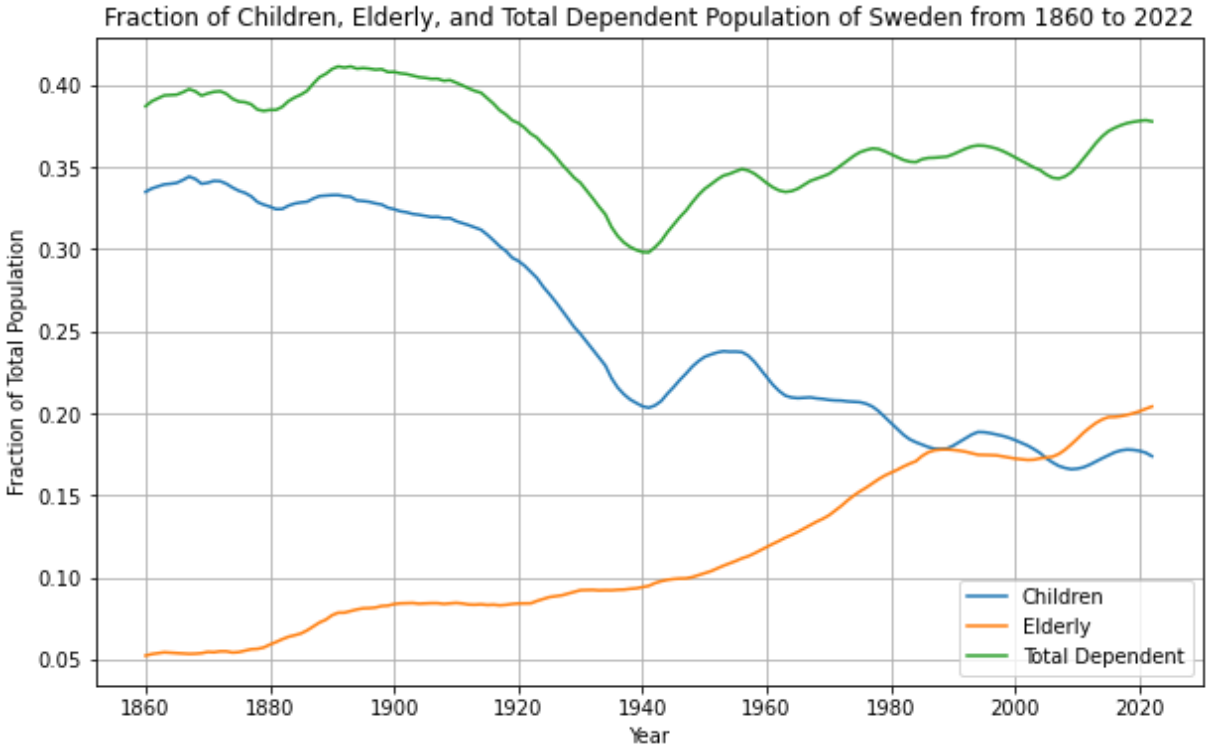
In [ ]:
```
plt.figure(figsize=(10, 6))
plt.plot(dependency_ratio.index, dependency_ratio.values)
plt.xlabel('Year')
plt.ylabel('Dependency Ratio (%)')
plt.title('Dependency Ratio of Sweden from 1860 to 2022')
plt.grid(True)
plt.show()
```



In [ ]:
```
total_population = melted_df.groupby('Year')['Population'].sum()

children_fraction = children / total_population
elderly_fraction = elderly / total_population
dependent_fraction = (children + elderly) / total_population


plt.figure(figsize=(10, 6))
plt.plot(children_fraction.index, children_fraction.values, label='Children'
plt.plot(elderly_fraction.index, elderly_fraction.values, label='Elderly')
plt.plot(dependent_fraction.index, dependent_fraction.values, label='Total D
plt.xlabel('Year')
plt.ylabel('Fraction of Total Population')
plt.title('Fraction of Children, Elderly, and Total Dependent Population of
plt.legend()
plt.grid(True)
plt.show()
```


Fraction of Children, Elderly, and Total Dependent Population of Sweden from 1860 to 2022
Fraction of Total Population
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
1860
1880
1900
1920
1940
1960
1980
2000
2020
Year
Children
Elderly
Total Dependent