Human Development Indicators Analysis

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HDIA

For the Human Development Indicators Analysis task the two countries whose data I have have chosen to work with are **Malaysia** and **Netherlands**.

Data Preparation

Here we’re just reading our datasets, merging them using rbind so that data analysis becomes easier further.

Data Exploration

Let's start off with doing some quick data exploration to understand our data.

```
Summary for Malaysia:
```

```
 country_code       country_name       indicator_id       indicator_name
 Length:862         Length:862         Length:862         Length:862
 Class :character   Class :character   Class :character   Class :character
 Mode  :character   Mode  :character   Mode  :character   Mode  :character
```

```
   index_id           index_name            value               year
 Length:862         Length:862         Min.   :  -11.00   Min.   :1990
 Class :character   Class :character   1st Qu.:   10.35   1st Qu.:1999
 Mode  :character   Mode  :character   Median :   17.22   Median :2008
                                       Mean   : 2132.75   Mean   :2007
                                       3rd Qu.:   74.62   3rd Qu.:2015
                                       Max.   :34983.47   Max.   :2022
```

```
Structure for Malaysia:
```

```
Classes 'data.table' and 'data.frame':  862 obs. of  8 variables:
 $ country_code  : chr  "MYS" "MYS" "MYS" "MYS" ...
 $ country_name  : chr  "Malaysia" "Malaysia" "Malaysia" "Malaysia" ...
 $ indicator_id  : chr  "abr" "abr" "abr" "abr" ...
 $ indicator_name: chr  "Adolescent Birth Rate (births per 1,000 women ages 15-19)" "Adolescent Birth Rate
(births per 1,000 women ages 15-19)" "Adolescent Birth Rate (births per 1,000 women ages 15-19)" "Adolescent
Birth Rate (births per 1,000 women ages 15-19)" ...
 $ index_id      : chr  "GII" "GII" "GII" "GII" ...
 $ index_name    : chr  "Gender Inequality Index" "Gender Inequality Index" "Gender Inequality Index" "Gender
Inequality Index" ...
 $ value         : num  19.4 19.3 19.1 18.4 18.1 ...
```

```
 $ year          : int  1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 ...
 - attr(*, ".internal.selfref")=<externalptr>


First few rows for Malaysia:

   country_code country_name indicator_id
1:          MYS     Malaysia          abr
2:          MYS     Malaysia          abr
3:          MYS     Malaysia          abr
4:          MYS     Malaysia          abr
5:          MYS     Malaysia          abr
6:          MYS     Malaysia          abr
                                          indicator_name index_id
1: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
2: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
3: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
4: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
5: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
6: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
               index_name  value year
1: Gender Inequality Index 19.418 1990
2: Gender Inequality Index 19.329 1991
3: Gender Inequality Index 19.064 1992
4: Gender Inequality Index 18.422 1993
5: Gender Inequality Index 18.055 1994
6: Gender Inequality Index 16.597 1995
```

Now lets do it for netherlands:

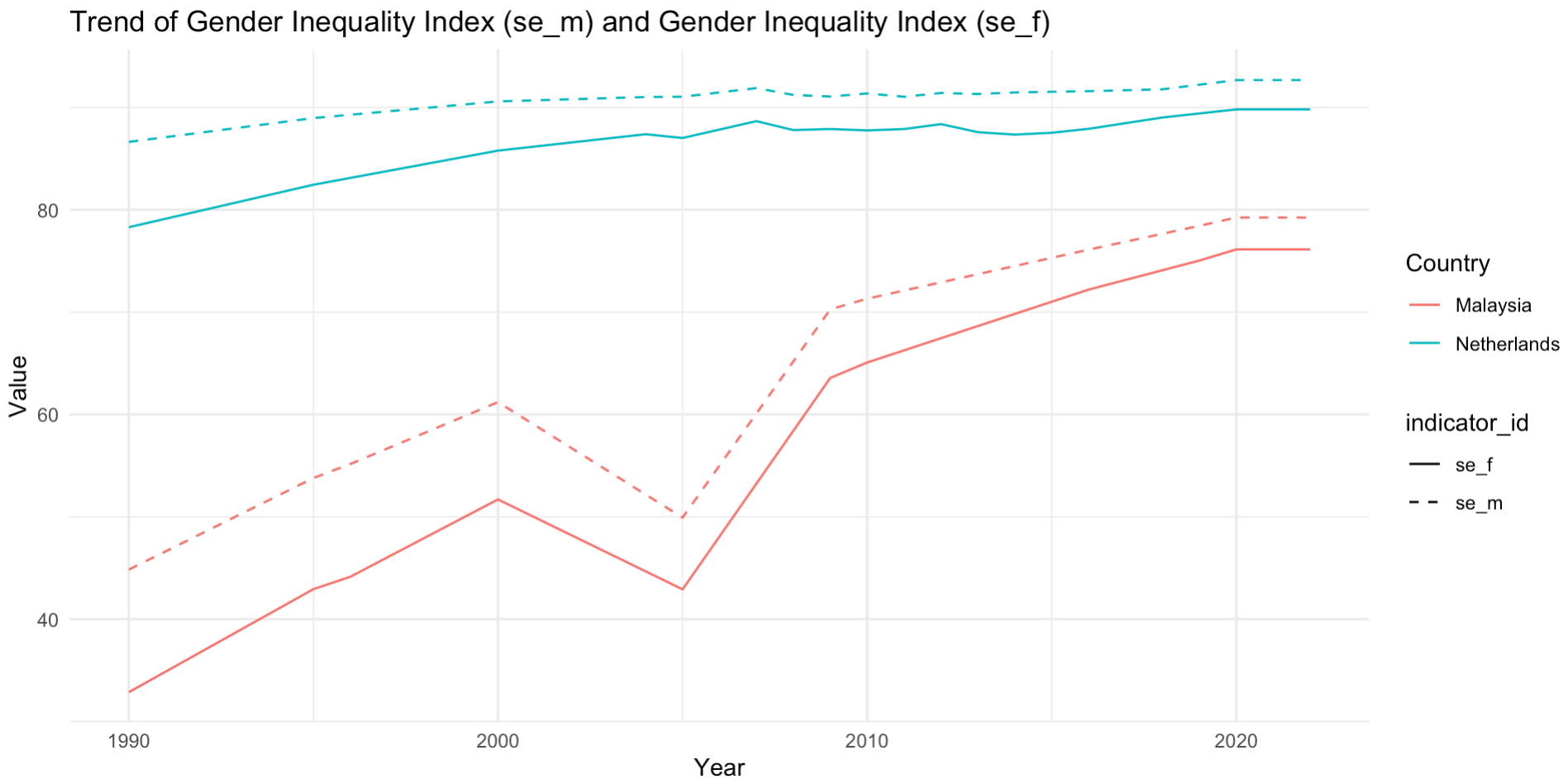
```
Summary for Netherlands:
 country_code       country_name       indicator_id       indicator_name
 Length:894         Length:894         Length:894         Length:894
 Class :character   Class :character   Class :character   Class :character
 Mode  :character   Mode  :character   Mode  :character   Mode  :character


   index_id           index_name            value               year
 Length:894         Length:894         Min.   :  -12.00   Min.   :1990
```

```
 Class :character   Class :character   1st Qu.:   11.34   1st Qu.:1998
 Mode  :character   Mode  :character   Median :   18.34   Median :2007
                                       Mean   : 5330.65   Mean   :2007
                                       3rd Qu.:   79.37   3rd Qu.:2015
                                       Max.   :71504.37   Max.   :2022


Structure for Netherlands:

Classes 'data.table' and 'data.frame':  894 obs. of  8 variables:
 $ country_code  : chr  "NLD" "NLD" "NLD" "NLD" ...
 $ country_name  : chr  "Netherlands" "Netherlands" "Netherlands" "Netherlands" ...
 $ indicator_id  : chr  "abr" "abr" "abr" "abr" ...
 $ indicator_name: chr  "Adolescent Birth Rate (births per 1,000 women ages 15-19)" "Adolescent Birth Rate
(births per 1,000 women ages 15-19)" "Adolescent Birth Rate (births per 1,000 women ages 15-19)" "Adolescent
Birth Rate (births per 1,000 women ages 15-19)" ...
 $ index_id      : chr  "GII" "GII" "GII" "GII" ...
 $ index_name    : chr  "Gender Inequality Index" "Gender Inequality Index" "Gender Inequality Index" "Gender
Inequality Index" ...
 $ value         : num  8.73 8.68 8.02 7.42 6.86 ...
 $ year          : int  1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 ...
 - attr(*, ".internal.selfref")=<externalptr>


First few rows for Netherlands:

   country_code country_name indicator_id
1:          NLD  Netherlands          abr
2:          NLD  Netherlands          abr
3:          NLD  Netherlands          abr
4:          NLD  Netherlands          abr
5:          NLD  Netherlands          abr
6:          NLD  Netherlands          abr
                                        indicator_name index_id
1: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
2: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
3: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
4: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
5: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
6: Adolescent Birth Rate (births per 1,000 women ages 15-19)      GII
               index_name value year
1: Gender Inequality Index 8.729 1990
2: Gender Inequality Index 8.679 1991
```

```
3: Gender Inequality Index 8.023 1992
4: Gender Inequality Index 7.420 1993
5: Gender Inequality Index 6.861 1994
6: Gender Inequality Index 5.884 1995
```

Data Analysis and Visualization

PLOT 1

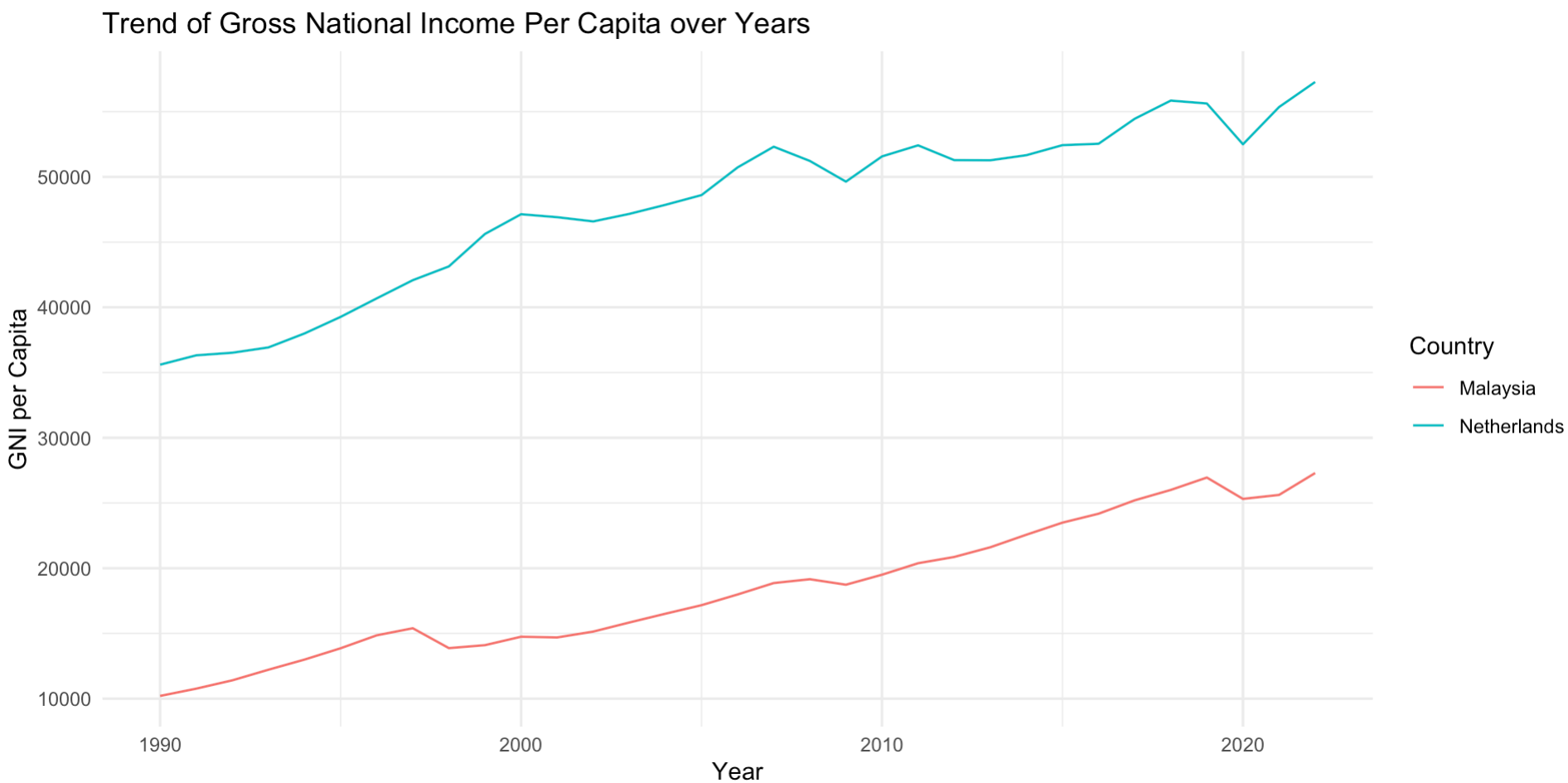


Here, the first observation we can make immediately is that the values present for Gender Inequality Index for se_m i.e, Population with at least some secondary education, male (% ages 25 and older) have always been ***higher*** than se_f i.e, Population with at least some secondary education, female (% ages 25 and older) at both countries Malaysia and Netherlands.

Also, the values for se_m and se_f for Netherlands were approximately (X2) compared to Malaysia {40 ish values at Malaysia but around 80 at Netherlands} in 1990 but by 2022, the values for Netherlands just went up 5 points, the values for Malaysia went up by soo much more. The trendlines portray how the values shot up from 40 to almost 80 for Malaysia by 2022.

So, even though Population with at least some secondary education(% ages 25 and older) did increase in both countries, its notable that a gap still exists amost the two genders in both countries.

PLOT 2

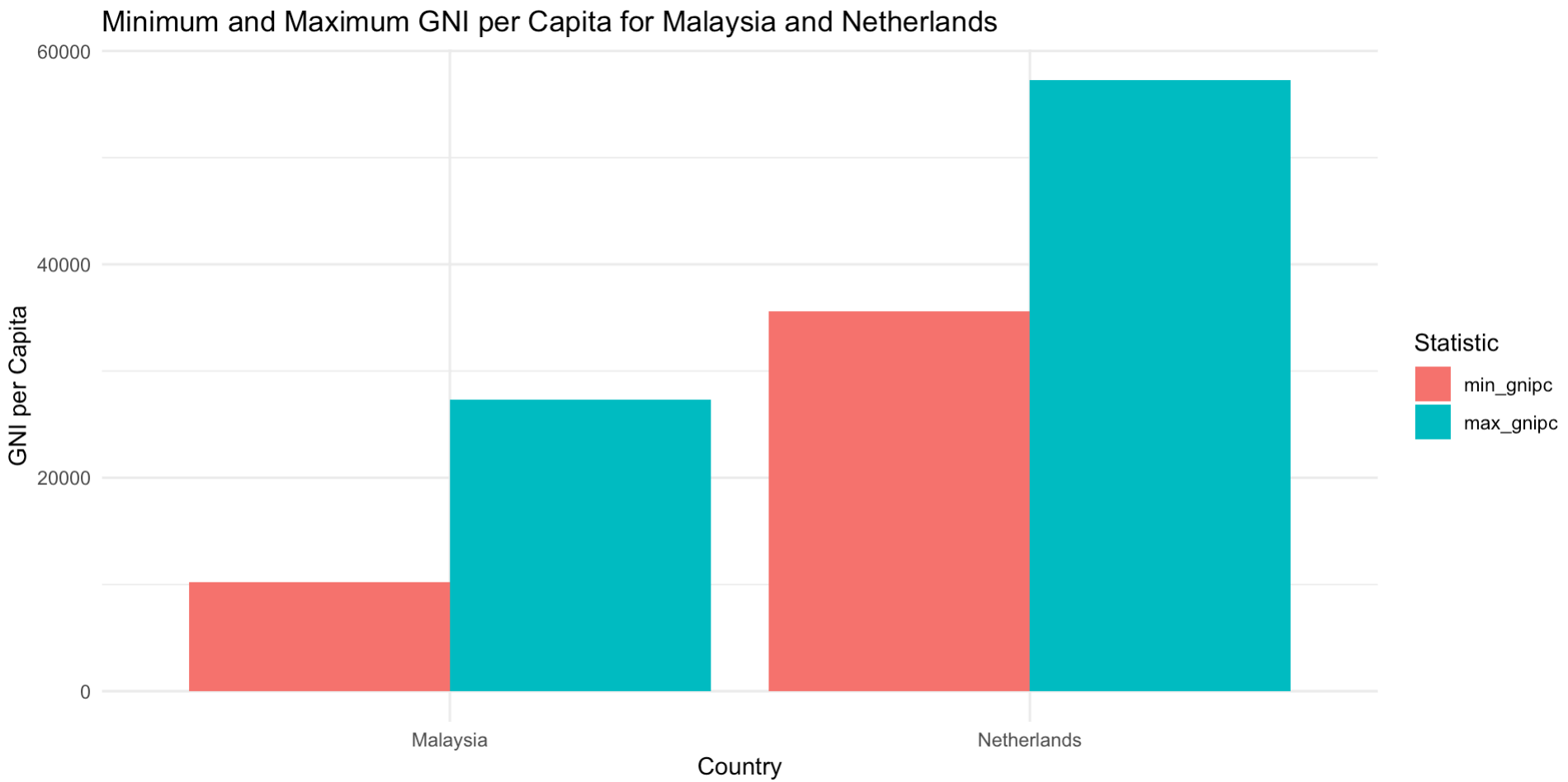


The observation we can make from this plot is that both the countries have a positive trendline, which is a good sign but Malaysia has always been behind Netherlands though.

Both of the countries do have a dip in their gnipc i.e, Gross National Income Per Capita (2017 PPP$) in the year 2020 which could have taken place becuse of the pandemic but eventually both of them did recover from that dip by 2022.

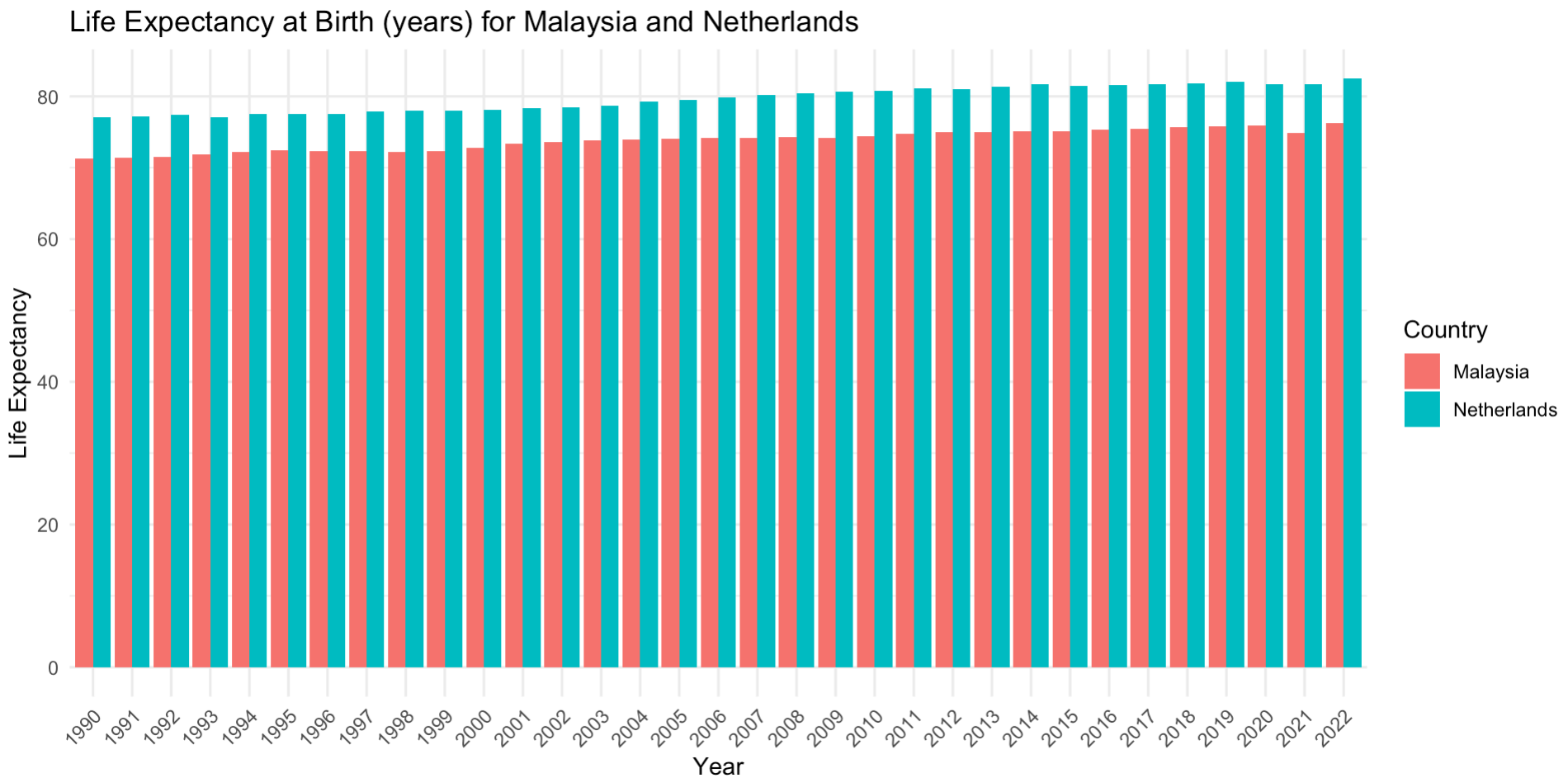
PLOT 3

```
Minimum and Maximum GNI per Capita by Country:

   country_name min_gnipc max_gnipc
1:     Malaysia  10209.35  27295.41
2:  Netherlands  35604.22  57278.31
```



Even the minimum gnicp of Netherlands is more than the maximum gnicp of Malaysia :(

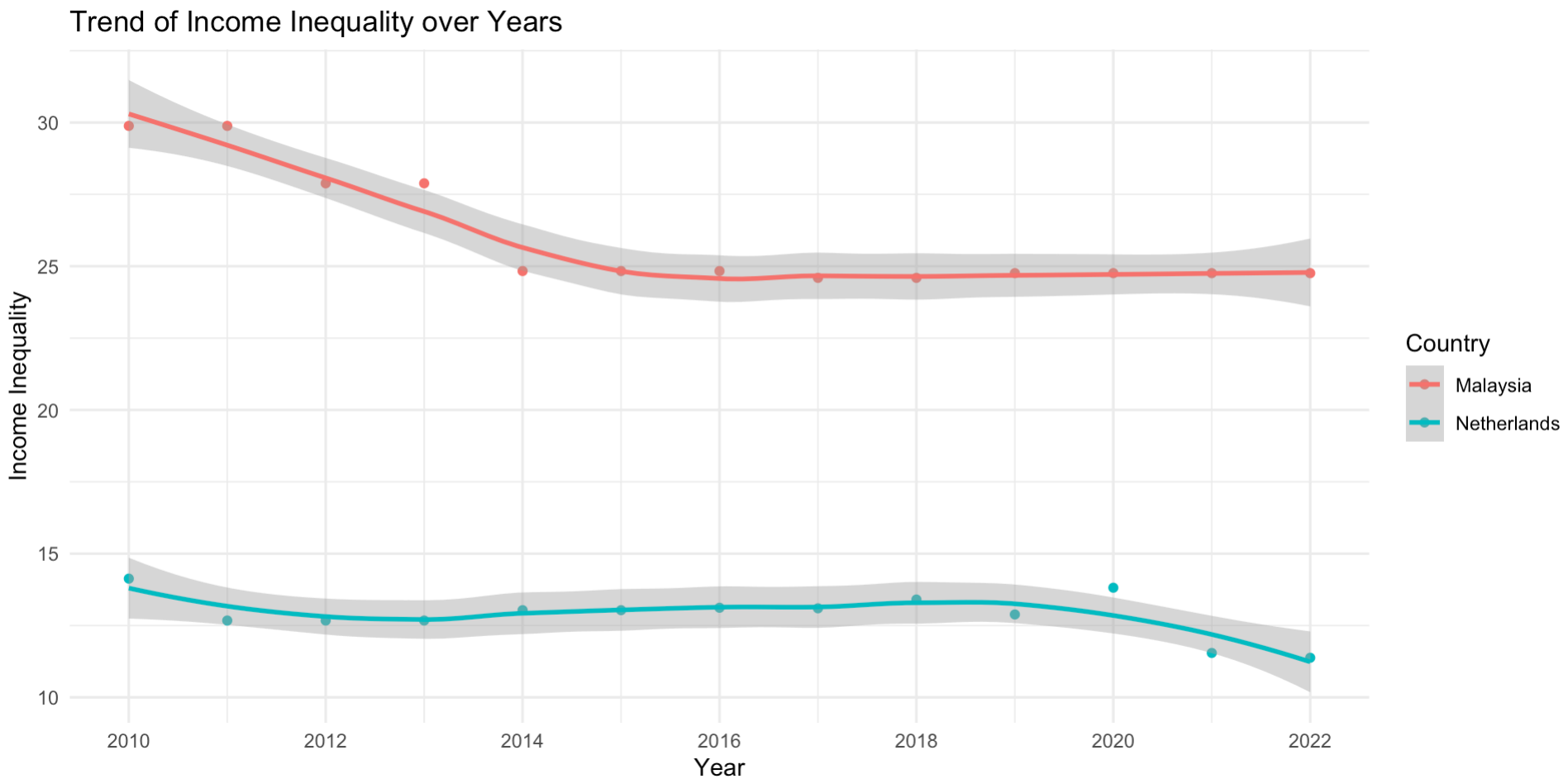
PLOT 4



As we can see from above plot, ‘le’ i.e, the Life Expectancy at Birth (years) for both the countries are well above 70 and ‘le’ has always been higher at Netherlands as compared to Malaysia.

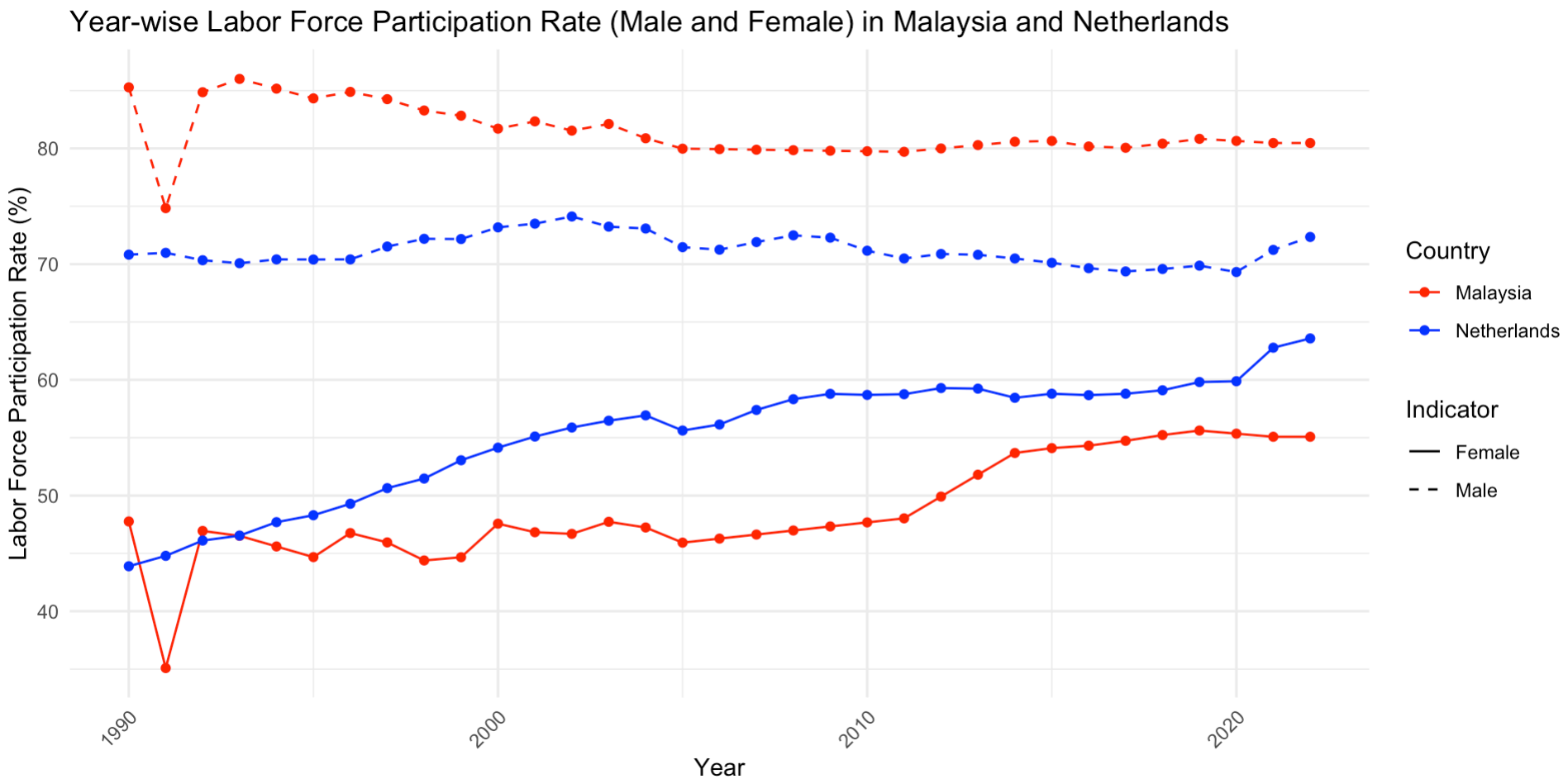
PLOT 5

Now for inequality in income, data has been provided only from year 2010, so we’ll plot from 2010 to 2022.



Now, in the plot shown above, it portrays how inequality in income has reduced in both countries and its clear than from 2010 to 2022, the income inequality value has always been been higher in Malaysia as compared to Netherlands.

PLOT 6



From the above plot we now know that value of lfpr_m i.e, Labour force participation rate, male (% ages 15 and older) has always been higher in Malaysia as compared to Netherlands.

As for lfpr_f i.e,Labour force participation rate, female (% ages 15 and older), we can see clearly that the value has increased significantly by 2022 as compared to 1990 for both countries.

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