Correlation Matrix:

For the variable Life Ladder, we identify correlations to ensure we do not have too highly correlated of values, such as for instance, temperature and heat index, we would look to remove those as to reduce collinearity in our model. We do not have significant enough levels of correlation values to justify removing variables here.

|  |  |
| --- | --- |
|  | ***Average Life.Ladder*** |
| Average Life.Ladder | 1 |
| Average Healthy.Life.Expectancy.At.Birth | 0.73320429 |
| Average Perceptions.Of.Corruption | -0.483413718 |
| Average Confidence.In.National.Government | 0.024930561 |
| Average Population | -0.12427602 |
| Average Events | -0.14672073 |
| Average Demonstrations | 0.071332148 |
| Average New Cases | 0.107711305 |
| Average Cumulative Cases | 0.050447671 |
| Average New Deaths | 0.016600825 |
| Average Cumulative Deaths | 0.030732243 |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Variable*** | ***Avg. Life Ladder*** | ***Avg. Health Life Expectance*** | ***Avg. Perceptions.Of.Corruption*** | ***Avg. Confidence.In.National.Government*** | ***Avg. Population*** | ***Avg. Events*** | ***Avg. Demonstrations*** | ***Avg. New Cases*** | ***Avg. Cumulative Cases*** | ***Avg. New Deaths*** | ***Avg. Cumulative Deaths*** |
| Average Life.Ladder | 1 |  |  |  |  |  |  |  |  |  |  |
| Average Healthy.Life.Expectancy.At.Birth | 0.73320429 | 1 |  |  |  |  |  |  |  |  |  |
| Average Perceptions.Of.Corruption | -0.483413718 | -0.380733075 | 1 |  |  |  |  |  |  |  |  |
| Average Confidence.In.National.Government | 0.024930561 | -0.093948919 | -0.458875378 | 1 |  |  |  |  |  |  |  |
| Average Population | -0.12427602 | -0.066785857 | 0.058081996 | 0.102060242 | 1 |  |  |  |  |  |  |
| Average Events | -0.14672073 | -0.093976015 | 0.140531462 | -0.129228756 | 0.14071971 | 1 |  |  |  |  |  |
| Average Demonstrations | 0.071332148 | 0.11144554 | -0.03447716 | -0.009609726 | 0.607231664 | 0.172459 | 1 |  |  |  |  |
| Average New Cases | 0.107711305 | 0.206147745 | -0.094061281 | -0.010014525 | 0.303940856 | 0.146477922 | 0.469315446 | 1 |  |  |  |
| Average Cumulative Cases | 0.050447671 | 0.134393556 | -0.046974817 | -0.021789144 | 0.420916698 | 0.195906329 | 0.517223849 | 0.816561096 | 1 |  |  |
| Average New Deaths | 0.016600825 | 0.08423257 | 0.058842648 | -0.064661142 | 0.385202204 | 0.364486847 | 0.500174009 | 0.524152858 | 0.446942679 | 1 |  |
| Average Cumulative Deaths | 0.030732243 | 0.081521765 | 0.056030376 | -0.056854437 | 0.386856699 | 0.345712119 | 0.491942212 | 0.557037661 | 0.824472814 | 0.619322397 | 1 |

Regression –

Multiple R: Correlation, highly correlated variables, our model does a good job of explaining variation: 0.776321581

R Square: How much of changes in Y can be explained by changes in X variables

|  |  |
| --- | --- |
| SUMMARY OUTPUT |  |
|  |  |
| *Regression Statistics* | |
| Multiple R | 0.776321581 |
| R Square | 0.602675196 |
| Adjusted R Square | 0.589518746 |
| Standard Error | 0.747492831 |
| Observations | 313 |

SSE/SST = r^2

Regression - SSE - Sum of Squares, explained error

Residual - Unexplained Error

Total - SST - Sum of Total Error

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 10 | 255.9520706 | 25.59520706 | 45.80834312 | 9.18488E-55 |
| Residual | 302 | 168.7411507 | 0.558745532 |  |  |
| Total | 312 | 424.6932213 |  |  |  |

Regression Coefficients

For every point increase in X, we expect related increase or decreases in output variable Y by the amounts below

|  |  |
| --- | --- |
| ***Variables*** | ***Coefficients*** |
| Average Healthy.Life.Expectancy.At.Birth | 0.13255807 |
| Average Perceptions.Of.Corruption | (1.62172072) |
| Intercept | (1.69159279) |
| Average Cumulative Deaths | 0.00000324 |
| Average Events | (0.00003466) |
| Average Cumulative Cases | (0.00000005) |
| Average Population | (0.00000000) |
| Average Demonstrations | 0.00003795 |
| Average New Deaths | (0.00054064) |
| Average Confidence.In.National.Government | (0.25242746) |
| Average New Cases | 0.00000499 |

Significance values

|  |  |
| --- | --- |
| ***Variables*** | ***P-value*** |
| Intercept | 0.036770906 |
| Average Healthy.Life.Expectancy.At.Birth | 2.17712E-36 |
| Average Perceptions.Of.Corruption | 1.03073E-07 |
| Average Cumulative Deaths | 0.056837224 |
| Average Events | 0.08263396 |
| Average Cumulative Cases | 0.113122149 |
| Average Population | 0.114927212 |
| Average Demonstrations | 0.17621583 |
| Average New Deaths | 0.432268919 |
| Average Confidence.In.National.Government | 0.460868682 |
| Average New Cases | 0.609125614 |

Residuals

We had the highest absolute value of residuals in Africa

|  |  |
| --- | --- |
| **Highest Absolute Residuals** | **Count** |
| **Africa** | **19** |
| Sub-Saharan Africa | 11 |
| Western Asia | 7 |
| Northern Africa | 1 |
| **Asia** | **6** |
| Southern Asia | 5 |
| Eastern Asia | 1 |
| **Europe** | **5** |
| Western Asia | 2 |
| (blank) | 1 |
| Eastern Europe | 1 |
| Northern Europe | 1 |
| **Grand Total** | **30** |

We had the lowest absolute value of residuals in Europe

|  |  |
| --- | --- |
| **Row Labels** | **Count** |
| **Europe** | **16** |
| Southern Europe | 6 |
| Northern Europe | 5 |
| Eastern Europe | 3 |
| Western Europe | 2 |
| **Americas** | **7** |
| Latin America and the Caribbean | 4 |
| Australia and New Zealand | 2 |
| Northern America | 1 |
| **Africa** | **5** |
| Sub-Saharan Africa | 4 |
| Northern Africa | 1 |
| **Asia** | **2** |
| South-eastern Asia | 2 |
| **Grand Total** | **30** |