**Table 1: Forecasting up to 2030 (Bold = WHO recommendation)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **ARIMA (0,2,1)** | | | **ARIMAX (0,2,1)** | | |
|  | **Forecast** | **Lo 95** | **Hi 95** | **Forecast** | **Lo 95** | **Hi 95** |
| 2023 | 42 | 22 | 80 | 28 | 15 | 54 |
| 2024 | 38 | 15 | 100 | 31 | 11 | 82 |
| 2025 | 35 | 10 | 120 | 36 | 10 | 131 |
| 2026 | 33 | 8 | 140 | 33 | 7 | 160 |
| 2027 | 30 | 6 | 162 | 29 | 4 | 183 |
| 2028 | 28 | 4 | 186 | 30 | 3 | 253 |
| 2029 | 26 | 3 | 212 | 25 | 2 | 290 |
| **2030** | **24** | **2** | **241** | **19** | **1** | **288** |

F**igure 1: Forecasting plot up to 2037**

|  |  |
| --- | --- |
| **ARIMA** | **ARIMAX** |
|  |  |

**Regression Model to measure the coefficient of the data**

Call:

lm(formula = rabiesdata$IDH ~ rabiesdata$NVD + rabiesdata$ARV, data = rabiesdata)

Coefficients:

**(Intercept) rabiesdata$NVD rabiesdata$ARV**

**143.7357000 -0.0001190 -0.0002491**

**Regression line:** 143.74 - 0.00012\*NVD - 0.00025\*ARV

**Table 3: Forecasting to IDH, NVD, and ARV**

According to our data series up to 2021, we didn’t get 0 IDH up to 2046. But, with the regression line by inputting NVD and ARV data, 860153 and 173571, respectively, we get less than 1 IDH. So, we can conclude that given values NVD greater than 860153 and ARV greater than 173571 can provide us with 0 human cases.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **YEAR** | **NVD**  **ARIMA (0,2,1)** | **ARV**  **ARIMA (1,2,1)** | **IDH**  **ARIMA (1,2,1)** | **IDH**  **(**143.74 - 0.00012\*NVD - 0.00025\*ARV) |
| 2022 | 382290 | 231214 | 24 | 40.0617 |
| 2023 | 406183 | 159757 | 24 | 55.05879 |
| 2024 | 430076 | 188068 | 20 | 45.11388 |
| 2025 | 453970 | 214828 | 19 | 35.5566 |
| 2026 | 477863 | 165039 | 16 | 45.13669 |
| 2027 | 501756 | 187785 | 14 | 36.58303 |
| 2028 | 525649 | 202791 | 13 | 29.96437 |
| 2029 | 549542 | 168303 | 11 | 35.71921 |
| 2030 | 573435 | 185981 | 10 | 28.43255 |
| 2031 | 597328 | 193748 | 9 | 23.62364 |
| 2032 | 621221 | 169968 | 8 | 26.70148 |
| 2033 | 645115 | 183328 | 7 | 20.4942 |
| 2034 | 669008 | 186746 | 6 | 16.77254 |
| 2035 | 692901 | 170393 | 6 | 17.99363 |
| 2036 | 716794 | 180234 | 5 | 12.66622 |
| 2037 | 740687 | 181126 | 4 | 9.57606 |
| 2038 | 764580 | 169878 | 4 | 9.5209 |
| 2039 | 788473 | 176937 | 3 | 4.88899 |
| 2040 | 812366 | 176429 | 3 | 2.14883 |
| 2041 | 836260 | 168660 | 3 | 1.2238 |
| 2042 | **860153** | **173571** | 2 | **-2.87111** |
| 2043 | **884046** | **172345** | 2 | **-5.43177** |
| 2044 | **907939** | **166924** | 2 | **-6.94368** |
| 2045 | **931832** | **170210** | 2 | **-10.63234** |
| 2046 | **955725** | **168662** | 1 | **-13.1125** |

Series: myts

Regression with ARIMA(1,2,1) errors

Coefficients:

ar1 ma1 NVD ARB Lit GDP

0.0401 -0.3430 -0.0595 0.3388 -6.3635 2.5806

s.e. 0.8855 0.8935 0.0195 0.0816 1.5554 0.6264

sigma^2 estimated as 363: log likelihood=-34.4

AIC=82.8 AICc=194.8 BIC=84.18