**BBK**

Table 1. Descriptive statistics of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, BBK).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Mean | SD | Median | Min | Max |
| Cases | 574.90 | 1083.22 | 16.0 | 0.00 | 5418.00 |
| PM2.5 | 21.06 | 13.22 | 16.47 | 6.07 | 83.57 |
| WS | 0.87 | 0.27 | 0.84 | 0.39 | 2.03 |
| RH | 66.08 | 10.75 | 66.33 | 36.92 | 92.57 |
| AH | 19.54 | 3.32 | 20.62 | 7.86 | 27.59 |
| P | 752.90 | 2.14 | 752.60 | 746.80 | 759.30 |
| R | 3.19 | 7.59 | 0.00 | 0.00 | 69.47 |
| T | 29.46 | 1.78 | 29.55 | 21.59 | 33.42 |

Table 2. Mean differences of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, BBK).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean (2020) | Mean (2021) | P-value |
| Cases | 6.32 | 1144.96 | <0.001 |
| PM2.5 | 20.86 | 21.26 | 0.683 |
| WS | 0.89 | 0.86 | 0.135 |
| RH | 66.23 | 65.92 | 0.696 |
| AH | 19.85 | 19.21 | 0.009 |
| P | 752.93 | 752.89 | 0.787 |
| R | 2.85 | 3.53 | 0.225 |
| T | 29.75 | 29.17 | <0.001 |

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| E:\Air Quality - GAM\Rplot11.tiff |
| Figure 1. Correlations |

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| E:\Air Quality - GAM\Rplot.tiff |
| Figure 2. Season wise daily pattern of COVID-19 cases, 2020–2021. |

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| E:\Air Quality - GAM\Rplot09.tiff |
| Figure 3. Time Vs covid cases with GAM model |

Table 3. Trend results from adjusted GAMs and COVID-19 cases trends

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Adjusted (95% CI) | P-value |
| Season | |  |  |
| Summer | | 656.41 (649.95 to 662.88) | <0.001 |
| Winter | | 125.92 (119.28 to 132.55) | 0.170 |
| PM2.5 | | -3.36 (-3.517 to -3.21) | 0.118 |
| WS | | -143.25 (-149.20 to -137.29) | 0.082 |
| RH | | 1.73 (0.70 to 2.76) | 0.903 |
| AH | | -5.80 (-9.55 to -2.05) | 0.911 |
| P | | -2.56 (-3.54 to -1.57) | 0.851 |
| R | | 5.74 (5.57 to 5.92) | 0.019 |
| T | | 9.17 (5.55 to 12.79) | 0.854 |
| **Model diagnosis for adjusted model** | |  | |
| Adjusted R-square | | 0.852 | |
| Deviance explained | | 85.6% | |
| AIC | 10914.24 | | |

**SSK**

Table 1. Descriptive statistics of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, SSK).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Mean | SD | Median | Min | Max |
| Cases | 139 | 312.71 | 9 | 0 | 1744 |
| PM2.5 | 25.00 | 19.18 | 17.42 | 2.67 | 115.83 |
| WS | 0.81 | 0.32 | 0.80 | 0 | 1.91 |
| RH | 70.19 | 9.85 | 69.96 | 0 | 98.00 |
| AH | 19.70 | 4.36 | 20.70 | 0 | 30.02 |
| P | 752.7 | 31.70 | 754.6 | 0 | 759.6 |
| R | 187.1 | 963.11 | 0 | 0 | 7746.0 |
| T | 28.10 | 5.54 | 28.88 | 0 | 35.74 |

Table 2. Mean differences of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, SSK).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean (2020) | Mean (2021) | P-value |
| Cases | 4.06 | 274.22 | <0.001 |
| PM2.5 | 23.20 | 26.80 | 0.011 |
| WS | 0.84 | 0.78 | 0.008 |
| RH | 69.80 | 70.57671 | 0.288 |
| AH | 20.51 | 18.89 | <0.001 |
| P | 750.76 | 754.62 | 0.099 |
| R | 370.75 | 2.99 | <0.001 |
| T | 29.27 | 26.92 | <0.001 |

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| E:\Air Quality - GAM\Rplot12.tiff |
| Figure 1. Correlations |

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| E:\Air Quality - GAM\Rplot13.tiff |
| Figure 2. Season wise daily pattern of COVID-19 cases, 2020–2021. |

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| E:\Air Quality - GAM\Rplot14.tiff |
| Figure 3. Time Vs covid cases with GAM model |

Table 3. Trend results from adjusted GAMs and COVID-19 cases trends

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Adjusted (95% CI) | P-value |
| Season | |  |  |
| Summer | | 189.86 (187.42 to 192.29) | <0.001 |
| Winter | | 176.36 (173.90 to 178.83) | <0.001 |
| PM2.5 | | -0.70 (-0.73 to -0.66) | 0.189 |
| WS | | -88.02 (-90.19 to -85.85) | 0.003 |
| RH | | -8.44 (-8.59 to -8.29) | <0.001 |
| AH | | 32.08 (31.51 to 32.65) | <0.001 |
| P | | -0.06 (-0.08 to -0.05) | 0.760 |
| R | | 0.03 (0.02 to 0.03) | <0.001 |
| T | | -12.37 (-12.76 to -11.99) | 0.020 |
| **Model diagnosis for adjusted model** | |  | |
| Adjusted R-square | | 0.74 | |
| Deviance explained | | 75.3% | |
| AIC | 9491.529 | | |

**NKT**

Table 1. Descriptive statistics of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, NKT).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Mean | SD | Median | Min | Max |
| Cases | 62.19 | 158.08 | 0.0 | 0.00 | 1184.00 |
| PM2.5 | 21.08 | 15.56 | 15.67 | 3.41 | 84.46 |
| WS | 1.927 | 0.74 | 1.88 | 0.00 | 4.220 |
| RH | 73.35 | 12.26 | 72.75 | 0.00 | 99.83 |
| AH | 20.60 | 3.59 | 21.44 | 0.00 | 26.60 |
| P | 747.9 | 73.62 | 754.9 | 0.0 | 760.9 |
| R | 2.524 | 8.23 | 0.000 | 0.000 | 112.000 |
| T | 28.28 | 3.36 | 28.67 | 0.00 | 32.36 |

Table 2. Mean differences of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, NKT).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean (2020) | Mean (2021) | P-value |
| Cases | 0.22 | 124.33 | <0.001 |
| PM2.5 | 124.33 | 21.98 | 0.121 |
| WS | 1.97 | 1.89 | 0.121 |
| RH | 71.30 | 75.40 | <0.001 |
| AH | 20.33 | 20.88 | 0.038 |
| P | 755.25 | 740.62 | 0.007 |
| R | 2.32 | 2.73 | 0.4931 |
| T | 28.86 | 27.69 | <0.001 |

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| E:\Air Quality - GAM\Rplot15.tiff |
| Figure 1. Correlations |

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| E:\Air Quality - GAM\Rplot16.tiff |
| Figure 2. Season wise daily pattern of COVID-19 cases, 2020–2021. |

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| E:\Air Quality - GAM\Rplot17.tiff |
| Figure 3. Time Vs covid cases with GAM model |

Table 3. Trend results from adjusted GAMs and COVID-19 cases trends

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Adjusted (95% CI) | P-value |
| Season | |  |  |
| Summer | | 141.27 (139.93 to 142.61) | <0.001 |
| Winter | | 78.90 (77.54 to 80.27) | <0.001 |
| PM2.5 | | -0.21 (-0.24 to -0.18) | 0.621 |
| WS | | 2.42 (1.94 to 2.90) | 0.715 |
| RH | | -4.06 (-4.28 to -3.85) | 0.173 |
| AH | | 19.94 (19.14 to 20.74) | 0.069 |
| P | | 0.28 (0.25 to 0.31) | 0.507 |
| R | | -0.26 (-0.29 to -0.23) | 0.567 |
| T | | -13.45 (-14.25 to -12.65) | 0.226 |
| **Model diagnosis for adjusted model** | |  | |
| Adjusted R-square | | 0.69 | |
| Deviance explained | | 69.8% | |
| AIC | 8640.50 | | |

**NBR**

Table 1. Descriptive statistics of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, NBR).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Mean | SD | Median | Min | Max |
| Cases | 103.5 | 207.65 | 1 | 0.0 | 2151.0 |
| PM2.5 | 19.18 | 13.61 | 14.78 | 3.29 | 76.92 |
| WS | 0.8282 | 0.50 | 0.7500 | 0 | 2.8300 |
| RH | 59.75 | 21.38 | 63.83 | 0 | 96.50 |
| AH | 17.19 | 6.04 | 19.33 | 0 | 25.36 |
| P | 512.9 | 351.17 | 751.5 | 0 | 766.2 |
| R | 3.072 | 8.08 | 0.000 | 0 | 74.200 |
| T | 26.38 | 8.57 | 28.83 | 0 | 33.61 |

Table 2. Mean differences of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, NBR).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean (2020) | Mean (2021) | P-value |
| Cases | 0.69 | 206.61 | <0.001 |
| PM2.5 | 20.13 | 18.22 | 0.058 |
| WS | 0.44 | 1.22 | <0.001 |
| RH | 57.61 | 61.89 | 0.007 |
| AH | 16.25 | 18.14 | <0.001 |
| P | 275.45 | 751.08 | <0.001 |
| R | 4.09 | 2.05 | <0.001 |
| T | 23.45 | 29.32 | <0.001 |

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| E:\Air Quality - GAM\Rplot18.tiff |
| Figure 1. Correlations |

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| E:\Air Quality - GAM\Rplot19.tiff |
| Figure 2. Season wise daily pattern of COVID-19 cases, 2020–2021. |

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| E:\Air Quality - GAM\Rplot20.tiff |
| Figure 3. Time Vs covid cases with GAM model |

Table 3. Trend results from adjusted GAMs and COVID-19 cases trends

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Adjusted (95% CI) | P-value |
| Season | |  |  |
| Summer | | -17.10 (-19.06 to -16.10) | 0.527 |
| Winter | | -33.15 (-35.02 to -31.27) | 0.200 |
| PM2.5 | | -0.82 (-0.86 to -0.77) | 0.159 |
| WS | | -45.98 (-47.28 to -44.68) | 0.011 |
| RH | | 0.20 (0.13 to 0.28) | 0.843 |
| AH | | -1.82 (-2.20 to -1.43) | 0.730 |
| P | | 0.01 (0.01 to 0.02) | 0.915 |
| R | | 0.51 (0.46 to 0.56) | 0.439 |
| T | | 0.94 (0.78 to 1.10) | 0.671 |
| **Model diagnosis for adjusted model** | |  | |
| Adjusted R-square | | 0.666 | |
| Deviance explained | | 67.4% | |
| AIC | 9093.919 | | |

**PTN**

Table 1. Descriptive statistics of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, PTN).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Mean | SD | Median | Min | Max |
| Cases | 82.42 | 180.3556 | 1.00 | 0 | 1182.00 |
| PM2.5 | 22.40 | 14.31205 | 18.50 | 0 | 82.04 |
| WS | 0.8997 | 0.439386 | 0.8700 | 0 | 2.5400 |
| RH | 35.81 | 37.39598 | 0 | 0 | 100.00 |
| AH | 10.01 | 10.49239 | 0 | 0 | 28.30 |
| P | 694.4 | 466.3301 | 1005.1 | 0 | 1014.2 |
| R | 2.955 | 8.896414 | 0 | 0 | 75.400 |
| T | 14.25 | 14.30921 | 22.70 | 0 | 33.04 |

Table 2. Mean differences of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, PTN).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean (2020) | Mean (2021) | P-value |
| Cases | 0.1557377 | 164.9068493 | <0.001 |
| PM2.5 | 21.83740 | 22.95784 | 0.290 |
| WS | 0.8733060 | 0.9260822 | 0.105 |
| RH | 34.40921 | 37.21307 | 0.311 |
| AH | 10.245191 | 9.767562 | 0.539 |
| P | 1004.2611 | 383.6386 | <0.001 |
| R | 3.222951 | 2.686027 | 0.415 |
| T | 14.73921 | 13.76167 | 0.356 |

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| E:\Air Quality - GAM\Rplot21.tiff |
| Figure 1. Correlations |

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| E:\Air Quality - GAM\Rplot22.tiff |
| Figure 2. Season wise daily pattern of COVID-19 cases, 2020–2021. |

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| E:\Air Quality - GAM\Rplot23.tiff |
| Figure 3. Time Vs covid cases with GAM model |

Table 3. Trend results from adjusted GAMs and COVID-19 cases trends

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Adjusted (95% CI) | P-value |
| Season | |  |  |
| Summer | | 113.67 (112.35 to 114.35) | <0.001 |
| Winter | | 69.01 (67.70 to 70.32) | <0.001 |
| PM2.5 | | -0.37 (-0.39 to -0.34) | 0.296 |
| WS | | 15.40 (14.61 to 16.19) | 0.157 |
| RH | | -0.83 (-0.90 to -0.77) | 0.356 |
| AH | | 4.33 (4.09 to 4.58) | 0.202 |
| P | | -0.03 (-0.04 to -0.04) | 0.015 |
| R | | 0.39 (0.35 to 0.44) | 0.316 |
| T | | 2.58 (2.42 to 2.74) | 0.010 |
| **Model diagnosis for adjusted model** | |  | |
| Adjusted R-square | | 0.788 | |
| Deviance explained | | 79.3% | |
| AIC | 8557.74 | | |

**SPK**

Table 1. Descriptive statistics of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, SPK).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Mean | SD | Median | Min | Max |
| Cases | 181.9 | 367.22 | 2.0 | 0 | 2084.0 |
| PM2.5 | 23.53 | 13.70 | 18.60 | 8.01 | 97.61 |
| WS | 1.866 | 0.56 | 1.780 | 0.64 | 3.50 |
| RH | 71.07 | 9.90 | 72.63 | 41.18 | 97.56 |
| AH | 20.44 | 3.08 | 21.52 | 8.69 | 24.98 |
| P | 755.1 | 2.12 | 754.9 | 746.0 | 760.6 |
| R | 3.432 | 8.14 | 0 | 0 | 62.53 |
| T | 28.96 | 1.58 | 29.07 | 21.86 | 32.65 |

Table 2. Mean differences of daily COVID-19 cases, PM2.5, WS, RH, AH, P, R and T rate (2020–2021, SPK).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean (2020) | Mean (2021) | P-value |
| Cases | 0.93 | 363.33 | <0.001 |
| PM2.5 | 23.16 | 23.89 | 0.470 |
| WS | 1.80 | 1.93 | 0.003 |
| RH | 71.00 | 71.14 | 0.843 |
| AH | 20.63 | 20.25 | 0.089 |
| P | 755.16 | 755.03 | 0.385 |
| R | 3.29 | 3.58 | 0.627 |
| T | 29.18 | 28.73 | <0.001 |

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| E:\Air Quality - GAM\Rplot24.tiff |
| Figure 1. Correlations |

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| E:\Air Quality - GAM\Rplot25.tiff |
| Figure 2. Season wise daily pattern of COVID-19 cases, 2020–2021. |

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| E:\Air Quality - GAM\Rplot26.tiff |
| Figure 3. Time Vs covid cases with GAM model |

Table 3. Trend results from adjusted GAMs and COVID-19 cases trends

|  |  |  |  |
| --- | --- | --- | --- |
|  | | Adjusted (95% CI) | P-value |
| Season | |  |  |
| Summer | | 147.29 (145.13 to 148.39) | <0.001 |
| Winter | | -62.96 (-65.18 to -60.74) | 0.040 |
| PM2.5 | | -0.43 (-0.48 to -0.38) | 0.532 |
| WS | | -8.93 (-9.99 to -7.87) | 0.542 |
| RH | | 2.47 (2.07 to 2.87) | 0.653 |
| AH | | -0.23 (-1.71 to 1.26) | 0.991 |
| P | | 8.62 (8.29 to 8.94) | 0.055 |
| R | | -1.90 (-1.96 to -1.84) | 0.016 |
| T | | 3.60 (2.10 to 5.11) | 0.862 |
| **Model diagnosis for adjusted model** | |  | |
| Adjusted R-square | | 0.852 | |
| Deviance explained | | 85.6% | |
| AIC | 9331.186 | | |