**Supplementary Table 1.** Demographics of EMS transports

|  |  |
| --- | --- |
| **Events** | **Transports (n=373,493)** |
| Age, ±SD | 55.8 ±24.4 |
| Number female (%) | 205965/372,269 (55.3) |
| Race/Ethnicity (%) |  |
| White non-Hispanic | 165,623 (44.3) |
| White Hispanic | 1,710 (0.5) |
| Black non-Hispanic | 72,926 (19.5) |
| Black Hispanic | 721 (0.2) |
| Other/unknown | 132,513 (35.5) |
| Medical category (%) |  |
| General medical | 120,375 (32.3) |
| Trauma | 63,856 (17.2) |
| Respiratory/airway | 36,325 (9.8) |
| Allergic | 2,469 (0.7) |
| Gastrointestinal | 29,394 (7.9) |
| Cardiovascular | 23,107 (6.2) |
| Cardiac arrest | 3,166 (0.8) |
| Neurologic | 26,591 (7.1) |
| Psychiatric/behavioral | 9,167 (2.5) |
| Toxicologic | 18,508 (5.0) |
| Dizziness/syncope | 17,370 (4.7) |
| Other | 16,314 (4.5) |
| Unknown | 4,778 (1.3) |
| Weekend (%) | 101,136 (37.1) |
| Day period (%) |  |
| Day time (sunrise to sunset) | 228,045 (61.1) |
| Night time (sunset to sunrise) | 145,448 (38.9) |

**Supplementary Table 2.** Demographics of trauma transports

|  |  |
| --- | --- |
| **Events** | **Trauma transports (n=64,235)** |
| Age, ±SD | 55.4 ±26.7 |
| Number female (%) | 34,757/63,973 (54.3) |
| Race/Ethnicity (%) |  |
| White non-Hispanic | 30,028 (46.7) |
| White Hispanic | 319 (0.5) |
| Black non-Hispanic | 9,115 (14.2) |
| Black Hispanic | 114 (0.2) |
| Other/unknown | 24,659 (38.4) |
| Weekend (%) | 18,823 (29.3) |
| Day period (%) |  |
| Day time (sunrise to sunset) | 38026 (59.2) |
| Night time (sunset to sunrise) | 26,209 (40.8) |

**Supplementary Table 3.** Demographics of pediatric transports

|  |  |
| --- | --- |
| **Events** | **Pediatric transports (n=21,880)** |
| Age, ±SD | 8.34 ±6.2 |
| Number female (%) | 10,329/21,776 (47.4) |
| Race/Ethnicity (%) |  |
| White non-Hispanic | 4,585 (21.0) |
| White Hispanic | 91 (0.4) |
| Black non-Hispanic | 6,465 (29.5) |
| Black Hispanic | 89 (0.4) |
| Other/unknown | 10,650 (48.7) |
| Medical category (%) |  |
| General medical | 6,698 (30.6) |
| Trauma | 5,514 (25.2) |
| Respiratory/airway | 2,728 (12.5) |
| Allergic | 520 (2.4) |
| Gastrointestinal | 1,043 (4.8) |
| Cardiovascular | 239 (1.1) |
| Cardiac arrest | 42 (0.2) |
| Neurologic | 2,027 (9.3) |
| Psychiatric/behavioral | 784 (3.6) |
| Toxicologic | 574 (2.6) |
| Dizziness/syncope | 631 (2.9) |
| Other | 946 (4.3) |
| Unknown | 134 (0.6) |
| Weekend (%) | 15,821 (72.3) |
| Day period (%) |  |
| Day time (sunrise to sunset) | 11,964 (54.7) |
| Night time (sunset to sunrise) | 9,916 (45.3) |

**Supplementary Table 4.** Incidence rate IRR and 95% confidence intervals (CI) from univariate and multivariable linear logistic regression for EMS transports. In the multivariable model, temperature was modeled as an interaction effect by season.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Transported patients** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.02 (1.02-1.03) | <0.001 | -- | -- |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- | 1.12 (1.11-1.13) | <0.001 |
| Spring | -- | -- | 1.18 (1.16-1.20) | <0.001 |
| Summer | -- | -- | 1.24 (1.22-1.27) | <0.001 |
| Fall | -- | -- | 1.14 (1.12-1.16) | <0.001 |
| Season |  |  |  |  |
| Winter | Ref | -- | Ref | -- |
| Spring | 0.99 (0.97-1.00) | 0.101 | 0.75 (0.73-0.77) | <0.001 |
| Summer | 0.98 (0.96-0.99) | 0.002 | 0.60 (0.58-0.63) | <0.001 |
| Fall | 0.97 (0.95-0.98) | <0.001 | 0.97 (0.95-0.98) | <0.001 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 1.01 (1.00-1.03) | 0.069 | 1.08 (1.06-1.09) | <0.001 |
| Snow | 1.00 (0.99-1.02) | 0.667 | 1.06 (1.04-1.08) | <0.001 |
| Mixed | 1.08 (1.03-1.13) | <0.001 | 1.15 (1.11-1.20) | <0.001 |
| Poor visibility | 0.86 (0.76-0.96) | 0.009 |  |  |
| 5°C dew point change | 1.00 (1.00-1.01) | 0.011 | 0.90 (0.89-0.90) | <0.001 |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.18 (1.16-1.19) | <0.001 | 1.08 (1.07-1.09) | <0.001 |
| Moderate breeze | 1.26 (1.25-1.28) | <0.001 | 1.11 (1.20-1.12) | <0.001 |
| Fresh breeze or greater | 1.31 (1.22-1.40) | <0.001 | 1.13 (1.07-1.20) | <0.001 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.67 (0.66-0.67) | <0.001 | 0.68 (0.68-0.69) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.93 (0.92-0.94) | <0.001 | 0.94 (0.93-0.95) | <0.001 |

**Supplementary Table 5.** Incidence rate IRR and 95% confidence intervals (CI) from univariate and multivariable linear logistic regression for trauma transports. In the multivariable model, temperature was modeled as an interaction effect by season.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trauma transports** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.04 (1.04-1.05) | <0.001 | -- | -- |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- | 1.15 (1.13-1.17) | <0.001 |
| Spring | -- | -- | 1.27 (1.22-1.31) | <0.001 |
| Summer | -- | -- | 1.31 (1.26-1.36) | <0.001 |
| Fall | -- | -- | 1.19 (1.16-1.23) | <0.001 |
| Season |  |  |  |  |
| Winter | Ref | -- | Ref | -- |
| Spring | 1.06 (1.03-1.08) | <0.001 | 0.71 (0.68-0.75) | <0.001 |
| Summer | 1.07 (1.05-1.10) | <0.001 | 0.61 (0.56-0.68) | <0.001 |
| Fall | 1.00 (0.98-1.03) | 0.844 | 0.99 (0.96-1.03) | 0.722 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 0.99 (0.97-1.02) | 0.531 | 1.09 (1.06-1.12) | <0.001 |
| Snow | 0.99 (0.96-1.02) | 0.597 | 1.14 (1.10-1.18) | <0.001 |
| Mixed | 1.11 (1.03-1.20) | 0.005 | 1.31 (1.21-1.40) | <0.001 |
| Poor visibility | 0.93 (0.76-1.14) | 0.515 |  |  |
| 5°C dew point change | 1.02 (1.01-1.02) | <0.001 | 0.87 (0.86-0.88) | <0.001 |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.19 (1.16-1.21) | <0.001 | 1.08 (1.06-1.11) | <0.001 |
| Moderate breeze | 1.26 (1.23-1.29) | <0.001 | 1.12 (1.09-1.15) | <0.001 |
| Fresh breeze or greater | 1.36 (1.22-1.53) | <0.001 | 1.21 (1.08-1.35) | 0.001 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.72 (0.71-0.74) | <0.001 | 0.75 (0.74-0.77) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 1.03 (1.01-1.06) | <0.001 | 1.04 (1.02-1.06) | <0.001 |

**Supplementary Table 6.** Incidence rate IRR and 95% confidence intervals (CI) from univariate and multivariable linear logistic regression for pediatric transports.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pediatric transports** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change | 1.05 (1.04-1.05) | <0.001 | 1.05 (1.04-1.06) | <0.001 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- |  |  |
| Rain | 0.99 (0.95-1.03) | 0.520 |  |  |
| Snow | 0.99 (0.94-1.04) | 0.682 |  |  |
| Mixed | 1.08 (0.95-1.21) | 0.228 |  |  |
| Poor visibility | 0.68 (0.46-0.97) | 0.043 |  |  |
| 5°C dew point change | 1.00 (1.00-1.01) | 0.186 |  |  |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.27 (1.23-1.32) | <0.001 | 1.26 (1.22-1.30) | <0.001 |
| Moderate breeze | 1.36 (1.31-1.41) | <0.001 | 1.38 (1.33-1.43) | <0.001 |
| Fresh breeze or greater | 1.53 (1.28-1.82) | <0.001 | 1.69 (1.41-2.01) | <0.001 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.87 (0.84-0.89) | <0.001 | 0.92 (0.89-0.94) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.96 (0.93-0.99) | 0.006 | 0.96 (0.93-0.99) | 0.013 |
| Season |  |  |  |  |
| Winter | Ref | -- |  |  |
| Spring | 0.99 (0.95-1.03) | 0.633 |  |  |
| Summer | 1.01 (0.97-1.05) | 0.586 |  |  |
| Fall | 1.00 (0.96-1.04) | 0.980 |  |  |

**Supplementary Table 7.** Sensitivity analysis showingincidence rate ratios (IRR) and 95% confidence intervals (CI) from univariate and multivariable (stepwise) linear logistic regression for tested variables in primary (a) and secondary (b-d) outcomes using 3-hour windows for weather data. In the multivariable model for outcomes of all responses, transports, and trauma transports, temperature was modeled as an interaction effect by season.

7a) All responses

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **All Responses** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.04 (1.04-1.04) |  | -- | -- |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- | 1.16 (1.15-1.17) | <0.001 |
| Spring | -- | -- | 1.23 (1.21-1.25) | <0.001 |
| Summer | -- | -- | 1.31 (1.29-1.33) | <0.001 |
| Fall | -- | -- | 1.18 (1.16-1.19) | <0.001 |
| Season |  |  |  |  |
| Winter | Ref | -- | Ref | -- |
| Spring | 1.00 (0.99-1.02) | 0.831 | 0.71 (0.69-0.73) | <0.001 |
| Summer | 0.99 (0.97-1.00) | 0.066 | 0.54 (0.51-0.56) | <0.001 |
| Fall | 0.98 (0.96-0.99) | 0.009 | 0.98 (0.96-0.99) | 0.006 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 1.00 (0.98-1.01) | 0.686 | 0.98 (0.96-0.99) | <0.001 |
| Snow | 0.97 (0.95-0.99) | 0.012 | 1.10 (1.08-1.11) | <0.001 |
| Mixed | 1.00 (0.94-1.07) | 0.944 | 1.13 (1.08-1.19) | <0.001 |
| Poor visibility | 0.88 (0.81-0.95) | 0.001 |  |  |
| 5°C dew point change | 1.00 (1.00-1.01) | <0.001 | 0.88 (0.87-0.88) | <0.001 |
| Wind speed | Ref | -- |  |  |
| Calm to light air | 1.25 (1.23-1.26) | <0.001 | Ref | -- |
| Light to gentle breeze | 1.40 (1.38-1.42) | <0.001 | 1.09 (1.08-1.10) | <0.001 |
| Moderate breeze | 1.54 (1.45-1.63) | <0.001 | 1.14 (1.13-1.15) | <0.001 |
| Fresh breeze or greater |  |  | 1.18 (1.13-1.24) | <0.001 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.60 (0.59-0.61) | <0.001 | 0.67 (0.66-0.68) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.81 (0.80-0.82) | <0.001 | 0.84 (0.83-0.85) | <0.001 |

7b) Transported patients

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Transported patients** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.03 (1.03-1.04) | <0.001 | -- | **--** |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- | 1.12 (1.11-1.13) | <0.001 |
| Spring | -- | -- | 1.18 (1.16-1.20) | <0.001 |
| Summer | -- | -- | 1.24 (1.22-1.27) | <0.001 |
| Fall | -- | -- | 1.14 (1.12-1.15) | <0.001 |
| Season |  |  |  |  |
| Winter |  | -- | Ref | -- |
| Spring | 0.99 (0.97-1.00) | 0.101 | 0.74 (0.72-0.76) | <0.001 |
| Summer | 0.98 (0.96-0.99) | 0.002 | 0.58 (0.56-0.61) | <0.001 |
| Fall | 0.97 (0.95-0.98) | <0.001 | 0.96 (0.95-0.97) | <0.001 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 1.00 (0.98-1.01) | 0.553 | 1.08 (1.06-1.09) | <0.001 |
| Snow | 0.99 (0.97-1.01) | 0.204 | 1.07 (1.04-1.09) | <0.001 |
| Mixed | 1.05 (0.99-1.11) | 0.092 | 1.15 (1.09-1.21) | <0.001 |
| Poor visibility | 0.88 (0.81-0.95) | 0.001 |  |  |
| 5°C dew point change | 1.00 (1.00-1.01) | 0.004 | 0.90 (0.90-0.91) | <0.001 |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.20 (1.19-1.21) | <0.001 | 1.08 (1.07-1.09) | <0.001 |
| Moderate breeze | 1.30 (1.29-1.32) | <0.001 | 1.11 (1.09-1.12) | <0.001 |
| Fresh breeze or greater | 1.37 (1.30-1.45) | <0.001 | 1.11 (1.06-1.17) | <0.001 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.67 (0.66-0.67) | <0.001 | 0.73 (0.72-0.73) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.93 (0.92-0.94) | <0.001 | 0.94 (0.93-0.95) | <0.001 |

7c) Trauma transports

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trauma transports** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.05 (1.05-1.05) | <0.001 | -- | **--** |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- |  |  |
| Spring | -- | -- | 1.25 (1.21-1.29) | <0.001 |
| Summer | -- | -- | 1.29 (1.25-1.34) | <0.001 |
| Fall | -- | -- | 1.18 (1.15-1.12) | <0.001 |
| Season |  |  |  |  |
| Winter | Ref | -- | Ref | -- |
| Spring | 1.06 (1.03-1.08) | <0.001 | 0.72 (0.68-0.76) | <0.001 |
| Summer | 1.07 (1.05-1.10) | <0.001 | 0.62 (0.56-0.68) | <0.001 |
| Fall | 1.00 (0.98-1.03) | 0.844 | 0.98 (0.95-1.01) | 0.276 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 0.99 (0.96-1.01) | 0.384 | 1.10 (1.07-1.13) | <0.001 |
| Snow | 0.99 (0.95-1.02) | 0.493 | 1.15 (1.10-1.20) | <0.001 |
| Mixed | 1.20 (1.08-1.32) | <0.001 | 1.42 (1.29-1.56) | <0.001 |
| Poor visibility | 0.95 (0.83-1.10) | 0.514 |  |  |
| 5°C dew point change | 1.02 (1.01-1.02) | <0.001 | 0.88 (0.87-0.89) | <0.001 |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.19 (1.17-1.22) | <0.001 | 1.08 (1.06-1.10) | <0.001 |
| Moderate breeze | 1.27 (1.24-1.30) | <0.001 | 1.11 (1.08-1.13) | <0.001 |
| Fresh breeze or greater | 1.32 (1.20-1.45) | <0.001 | 1.12 (1.01-1.23) | 0.022 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.72 (0.71-0.74) | <0.001 | 0.81 (0.79-0.82) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 1.03 (1.01-1.06) | <0.001 | 1.04 (1.02-1.06) | <0.001 |

7d) Pediatric transports

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pediatric transports** | **Univariate analysis** |  | **Multivariable analysis** |  |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change | 1.05 (1.04-1.05) | <0.001 | 1.05 (1.04-1.06) | <0.001 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- |  |  |
| Rain | 0.97 (0.93-1.01) | 0.154 |  |  |
| Snow | 1.00 (0.95-1.06) | 0.941 |  |  |
| Mixed | 1.08 (0.92-1.27) | 0.345 |  |  |
| Poor visibility | 0.74 (0.57-0.95) | 0.020 |  |  |
| 5°C dew point change | 1.01 (1.00-1.01) | 0.127 |  |  |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.22 (1.18-1.27) | <0.001 | 1.26 (1.22-1.30) | <0.001 |
| Moderate breeze | 1.29 (1.25-1.34) | <0.001 | 1.38 (1.33-1.43) | <0.001 |
| Fresh breeze or greater | 1.38 (1.19-1.60) | <0.001 | 1.69 (1.41-2.01) | <0.001 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.87 (0.84-0.89) | <0.001 | 0.92 (0.89-0.94) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.96 (0.93-0.99) | 0.006 | 0.96 (0.93-0.99) | 0.013 |
| Season |  |  |  |  |
| Winter | Ref | -- |  |  |
| Spring | 0.99 (0.95-1.03) | 0.633 |  |  |
| Summer | 1.01 (0.97-1.05) | 0.586 |  |  |
| Fall | 1.00 (0.96-1.04) | 0.980 |  |  |

**Supplementary Table 8.** Sensitivity analysis showingincidence rate ratios (IRR) and 95% confidence intervals (CI) from univariate and multivariable (stepwise) linear logistic regression for tested variables in primary (a) and secondary outcomes (b-d) using 12-hour windows for weather data. In the multivariable model for outcomes of all responses, transports, and trauma transports, temperature was modeled as an interaction effect by season.

8a) All responses

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **All Responses** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.01 (1.00-1.01) | <0.001 | -- | -- |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- | 1.11 (1.10-1.12) | <0.001 |
| Spring | -- | -- | 1.16 (1.14-1.25) | <0.001 |
| Summer | -- | -- | 1.23 (1.20-1.25) | <0.001 |
| Fall | -- | -- | 1.12 (1.10-1.14) | 0.010 |
| Season |  |  |  |  |
| Winter | Ref | -- | Ref | -- |
| Spring | 1.00 (0.99-1.02) | 0.831 | 0.77 (0.75-0.80) | <0.001 |
| Summer | 0.99 (0.97-1.00) | 0.066 | 0.62 (0.59-0.66) | <0.001 |
| Fall | 0.98 (0.96-0.99) | 0.009 | 1.00 (0.99-1.02) | 0.712 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 1.02 (1.01-1.04) | <0.001 | 1.05 (1.04-1.06) | <0.001 |
| Snow | 1.02 (1.00-1.04) | 0.050 | 1.05 (1.03-1.07) | <0.001 |
| Mixed | 1.07 (1.03-1.10) | <0.001 | 1.13 (1.09-1.16) | <0.001 |
| Poor visibility | 0.60 (0.46-0.80) | <0.001 |  |  |
| 5°C dew point change | 1.00 (1.00-1.01) | 0.003 | 0.90 (1.08-1.10) | <0.001 |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.07 (1.06-1.08) | <0.001 | 1.09 (1.08-1.10) | <0.001 |
| Moderate breeze | 1.11 (1.09-1.12) | <0.001 | 1.13 (1.12-1.15) | <0.001 |
| Fresh breeze or greater | 0.93 (0.82-1.06) | 0.276 | 1.06 (0.95-1.18) | 0.293 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.60 (0.59-0.61) | <0.001 | 0.56 (0.56-0.57) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.81 (0.80-0.82) | <0.001 | 0.84 (0.83-0.85) | <0.001 |

8b) All transports

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Transported patients** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.00 (1.00-1.01) | <0.001 | -- | **--** |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- | 1.09 (1.08-1.10) | <0.001 |
| Spring | -- | -- | 1.13 (1.11-1.15) | <0.001 |
| Summer | -- | -- | 1.19 (1.16-1.21) | <0.001 |
| Fall | -- | -- | 1.10 (1.08-1.12) | 0.005 |
| Season |  |  |  |  |
| Winter | Ref | -- | Ref | -- |
| Spring | 0.99 (0.97-1.00) | 0.101 | 0.79 (0.77-0.81) | <0.001 |
| Summer | 0.98 (0.96-0.99) | 0.002 | 0.66 (0.63-0.69) | <0.001 |
| Fall | 0.97 (0.95-0.98) | <0.001 | 0.98 (0.97-1.00) | 0.015 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 1.01 (1.00-1.03) | 0.031 | 1.04 (1.03-1.05) | <0.001 |
| Snow | 1.02 (1.00-1.03) | 0.052 | 1.04 (1.02-1.06) | <0.001 |
| Mixed | 1.07 (1.04-1.10) | <0.001 | 1.11 (1.08-1.14) | <0.001 |
| Poor visibility | 0.67 (0.52-0.87) | 0.002 |  |  |
| 5°C dew point change | 1.00 (1.00-1.00) | 0.059 | 0.92 (0.92-0.93) | <0.001 |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.06 (1.04-1.07) | <0.001 | 1.07 (1.06-1.08) | <0.001 |
| Moderate breeze | 1.09 (1.07-1.10) | <0.001 | 1.11 (1.09-1.12) | <0.001 |
| Fresh breeze or greater | 0.91 (0.81-1.03) | 0.128 | 1.01 (0.90-1.12) | 0.925 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.67 (0.66-0.67) | <0.001 | 0.63 (0.63-0.64) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.93 (0.92-0.94) | <0.001 | 0.94 (0.93-0.95) | <0.001 |

8c) Trauma transports

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Trauma transports** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.02 (1.02-1.03) | <0.001 | -- | **--** |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- | 1.12 (1.10-1.14) | <0.001 |
| Spring | -- | -- | 1.23 (1.18-1.27) | <0.001 |
| Summer | -- | -- | 1.27 (1.22-1.33) | <0.001 |
| Fall | -- | -- | 1.16 (1.12-1.20) | <0.001 |
| Season |  |  |  |  |
| Winter | Ref | -- | Ref | -- |
| Spring | 1.06 (1.03-1.08) | <0.001 | 0.75 (0.71-0.79) | <0.001 |
| Summer | 1.07 (1.05-1.10) | <0.001 | 0.65 (0.59-0.72) | <0.001 |
| Fall | 1.00 (0.98-1.03) | 0.844 | 1.02 (0.99-1.05) | 0.296 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 1.00 (0.98-1.02) | 0.845 | 1.05 (1.03-1.08) | <0.001 |
| Snow | 1.00 (0.97-1.03) | 0.831 | 1.10 (1.06-1.15) | <0.001 |
| Mixed | 1.06 (1.00-1.12) | 0.043 | 1.20 (1.14-1.27) | <0.001 |
| Poor visibility | 0.75 (0.46-1.18) | 0.235 |  |  |
| 5°C dew point change | 1.01 (1.01-1.02) | <0.001 | 0.89 (0.88-0.90) | <0.001 |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.07 (1.05-1.10) | <0.001 | 1.08 (1.05-1.10) | <0.001 |
| Moderate breeze | 1.09 (1.07-1.12) | <0.001 | 1.11 (1.09-1.14) | <0.001 |
| Fresh breeze or greater | 0.97 (0.79-1.20) | 0.808 | 1.08 (0.87-1.32) | 0.467 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.72 (0.71-0.74) | <0.001 | 0.68 (0.66-0.69) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 1.03 (1.01-1.06) | <0.001 | 1.05 (1.03-1.07) | <0.001 |

8d) Pediatric transports

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pediatric transports** | **Univariate analysis** |  | **Multivariable analysis** |  |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change | 1.02 (1.02-1.03) | <0.001 | 1.05 (1.04-1.06) | <0.001 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- |  |  |
| Rain | 1.00 (0.96-1.03) | 0.870 |  |  |
| Snow | 0.99 (0.95-1.04) | 0.789 |  |  |
| Mixed | 1.07 (0.98-1.16) | 0.135 |  |  |
| Poor visibility | 0.40 (0.12-0.98) | 0.078 |  |  |
| 5°C dew point change | 1.00 (1.00-1.01) | 0.231 |  |  |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.17 (1.13-1.21) | <0.001 | 1.26 (1.22-1.30 | <0.001 |
| Moderate breeze | 1.25 (1.21-1.30) | <0.001 | 1.38 (1.33-1.43) | <0.001 |
| Fresh breeze or greater | 1.52 (1.13-2.02) | 0.004 | 1.69 (1.41-2.01) | <0.001 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.87 (0.84-0.89) | <0.001 | 0.92 (0.89-0.94) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.96 (0.93-0.99) | 0.006 | 0.96 (0.93-0.99) | 0.013 |
| Season |  |  |  |  |
| Winter | Ref | -- |  |  |
| Spring | 0.99 (0.95-1.03) | 0.633 |  |  |
| Summer | 1.01 (0.97-1.05) | 0.586 |  |  |
| Fall | 1.00 (0.96-1.04) | 0.980 |  |  |

**Supplementary Table 9.** Sensitivity analysis showingincidence rate ratios (IRR) and 95% confidence intervals (CI) for primary outcome of EMS responses in in regions divided by thirds of population density per ZIP code tabulation area for n=520,903 responses. In the multivariable models, temperature was modeled as an interaction effect by season.

9a) Low population density

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Low population density** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.03 (1.03-1.03) | <0.001 | -- | -- |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- | 1.15 (1.14-1.16) | <0.001 |
| Spring | -- | -- | 1.21 (1.19-1.24) | <0.001 |
| Summer | -- | -- | 1.29 (1.26-1.33) | <0.001 |
| Fall | -- | -- | 1.16 (1.14-1.18) | 0.280 |
| Season |  |  |  |  |
| Winter | Ref | -- | Ref | -- |
| Spring | 1.01 (0.99-1.03) | 0.543 | 0.73 (0.70-0.75) | <0.001 |
| Summer | 0.98 (0.96-1.00) | 0.034 | 0.55 (0.52-0.59) | <0.001 |
| Fall | 1.00 (0.98-1.02) | 0.872 | 1.03 (1.01-1.05) | 0.003 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 1.03 (1.01-1.05) | 0.004 | 1.10 (1.08-1.12) | <0.001 |
| Snow | 1.01 (0.99-1.04) | 0.322 | 1.08 (1.05-1.11) | <0.001 |
| Mixed | 1.10 (1.04-1.16) | 0.001 | 1.18 (1.12-1.24) | <0.001 |
| Poor visibility | 0.88 (0.75-1.03) | 0.107 |  |  |
| 5°C dew point change | 1.00 (1.00-1.01) | 0.167 | 0.88 (0.87-0.88) | <0.001 |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.23 (1.21-1.25) | <0.001 | 1.10 (1.08-1.12) | <0.001 |
| Moderate breeze | 1.36 (1.34-1.38) | <0.001 | 1.14 (1.12-1.15) | <0.001 |
| Fresh breeze or greater | 1.49 (1.37-1.63) | <0.001 | 1.21 (1.12-1.30) | <0.001 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.53 (0.53-0.54) | <0.001 | 0.54 (0.54-0.55) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.77 (0.76-0.78) | <0.001 | 0.78 (0.77-0.79) | <0.001 |

9b) Medium population density

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Medium population density** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.03 (1.03-1.03) | <0.001 | -- | -- |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- | 1.14 (1.13-1.15) | <0.001 |
| Spring | -- | -- | 1.20 (1.18-1.23) | <0.001 |
| Summer | -- | -- | 1.28 (1.25-1.31) | <0.001 |
| Fall | -- | -- | 1.15 (1.29-1.17) | 0.005 |
| Season |  |  |  |  |
| Winter | Ref | -- | Ref | -- |
| Spring | 1.01 (0.99-1.03) | <0.001 | 0.74 (0.72-0.77) | <0.001 |
| Summer | 0.99 (0.97-1.01) | <0.001 | 0.56 (0.53-0.59) | <0.001 |
| Fall | 0.97 (0.95-0.98) | <0.001 | 0.97 (0.95-0.99) | 0.010 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 1.01 (1.00-1.03) | 0.081 | 1.09 (1.07-1.10) | <0.001 |
| Snow | 0.99 (0.97-1.01) | 0.269 | 1.05 (1.03-1.08) | <0.001 |
| Mixed | 1.05 (1.00-1.11) | 0.046 | 1.15 (1.10-1.20) | <0.001 |
| Poor visibility | 0.84 (0.73-0.97) | 0.017 |  |  |
| 5°C dew point change | 1.01 (1.00-1.01) | <0.001 | 0.89 (0.88-0.89) | <0.001 |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.19 (1.17-1.20) | <0.001 | 1.08 (1.07-1.10) | <0.001 |
| Moderate breeze | 1.29 (1.27-1.31) | <0.001 | 1.13 (1.11-1.14) | <0.001 |
| Fresh breeze or greater | 1.33 (1.23-1.44) | <0.001 | 1.16 (1.08-1.24) | <0.001 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.68 (0.67-0.68) | <0.001 | 0.69 (0.69-0.70) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.89 (0.88-0.90) | <0.001 | 0.90 (0.89-0.91) | <0.001 |

9c) High population density

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **High population density** | **Univariate analysis** | | **Multivariable analysis** | |
|  | **IRR (95% CI)** | **p** | **IRR (95% CI)** | **p** |
| 5°C temperature change (univariate only) | 1.03 (1.03-1.04) | <0.001 | -- | -- |
| 5°C temperature change (interaction effect by season; multivariable only) |  |  |  |  |
| Winter | -- | -- | 1.17 (1.16-1.19) | <0.001 |
| Spring | -- | -- | 1.25 (1.22-1.28) | <0.001 |
| Summer | -- | -- | 1.32 (1.29-1.36) | <0.001 |
| Fall | -- | -- | 1.20 (1.18-1.23) | <0.001 |
| Season |  |  |  |  |
| Winter | Ref | -- | Ref | -- |
| Spring | 0.97 (0.95-0.99) | 0.005 | 0.68 (0.65-0.70) | <0.001 |
| Summer | 0.97 (0.95-0.99) | 0.002 | 0.53 (0.50-0.57) | <0.001 |
| Fall | 0.95 (0.93-0.97) | <0.001 | 0.95 (0.93-0.97) | <0.001 |
| Precipitation |  |  |  |  |
| No precipitation | Ref | -- | Ref | -- |
| Rain | 1.01 (0.99-1.03) | 0.324 | 1.09 (1.07-1.11) | <0.001 |
| Snow | 1.00 (0.97-1.02) | 0.717 | 1.06 (1.04-1.09) | <0.001 |
| Mixed | 1.00 (0.94-1.07) | 0.938 | 1.10 (1.04-1.16) | <0.001 |
| Poor visibility | 0.75 (0.63-0.89) | <0.001 |  |  |
| 5°C dew point change | 1.00 (1.00-1.01) | 0.055 | 0.86 (0.86-0.87) | <0.001 |
| Wind speed |  |  |  |  |
| Calm to light air | Ref | -- | Ref | -- |
| Light to gentle breeze | 1.25 (1.23-1.27) | <0.001 | 1.12 (1.10-1.13) | <0.001 |
| Moderate breeze | 1.40 (1.37-1.43) | <0.001 | 1.18 (1.16-1.20) | <0.001 |
| Fresh breeze or greater | 1.60 (1.46-1.75) | <0.001 | 1.31 (1.21-1.42) | <0.001 |
| Day period |  |  |  |  |
| Day time (sunrise to sunset) | Ref | -- | Ref | -- |
| Night time (sunset to sunrise) | 0.59 (0.58-0.60) | <0.001 | 0.62 (0.61-0.62) | <0.001 |
| Time of week |  |  |  |  |
| Weekday | Ref | -- | Ref | -- |
| Weekend | 0.77 (0.76-0.78) | <0.001 | 0.79 (0.78-0.80) | <0.001 |