**SUPPORTING INFORMATION**

Table S1. Hospitalizations counts (and percentages) by principal discharge diagnosisa and individual characteristics for Wayne, Washtenaw and Ingham Counties, Michigan, May- September, 2000-2009.

|  | Heat | Cardiovascular diseases | Respiratory diseases | Diabetes mellitus | Renal diseases | Acute myocardial infarction | All natural causes |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Wayne | 121 | 221,361 | 108,114 | 22,754 | 15,712 | 23,851 | 1,035,117 |
| Age |  |  |  |  |  |  |  |
| <65years | 63 (53) | 93,127 (42) | 61,526 (57) | 16,498 (73) | 6,299 (40) | 9,983 (42) | 653,472 (63) |
| >=65years | 57 (48) | 128,226 (58) | 46,581 (43) | 6,256 (27) | 9,413 (60) | 13,867 (58) | 379,462 (37) |
| Sex |  |  |  |  |  |  |  |
| Male | 37 (31) | 114,401 (52) | 57,895 (54) | 11,488 (50) | 7,836 (50) | 11,377 (48) | 626,872 (61) |
| Female | 84 (69) | 106,958 (48) | 50,219 (46) | 11,266 (50) | 7,876 (50) | 12,472 (52) | 408,240 (39) |
| Race |  |  |  |  |  |  |  |
| White | 61 (50) | 118,588 (54) | 51,442 (48) | 7,455 (33) | 6,838 (44) | 14,699 (62) | 513,576 (50) |
| Non-white | 60 (50) | 102,724 (46) | 56,633 (52) | 15,291 (67) | 8,869 (56) | 9,148 (38) | 520,982 (50) |
| Payerb |  |  |  |  |  |  |  |
| High | 50 (79) | 73,357 (79) | 42,511 (69) | 11,593 (70) | 4,637 (74) | 8,027 (80) | 470,124 (72) |
| Low | 13 (21) | 19,770 (21) | 19,015 (31) | 4,905 (30) | 1,662 (26) | 1,956 (20) | 183,348 (28) |
| Washtenaw | 14 | 18,867 | 9,216 | 1,700 | 1,375 | 2,188 | 107,619 |
| Age |  |  |  |  |  |  |  |
| <65years | 5 (36) | 7,353 (39) | 4,956 (54) | 1,225 (72) | 562 (41) | 925 (42) | 70,444 (66) |
| >=65years | 9 (64) | 11,514 (61) | 4,255 (46) | 475 (28) | 813 (59) | 1,263 (58) | 36,831 (34) |
| Sex |  |  |  |  |  |  |  |
| Male | 5 (36) | 8,934 (47) | 4,890 (53) | 797 (47) | 683 (50) | 881 (40) | 67,349 (63) |
| Female | 9 (64) | 9,933 (53) | 4,326 (47) | 903 (53) | 692 (50) | 1,307 (60) | 40,268 (37) |
| Race |  |  |  |  |  |  |  |
| White | 12 (86) | 15,319 (81) | 6,968 (76) | 1,038 (61) | 1,030 (75) | 1,887 (86) | 82,237 (76) |
| Non-white | 2 (14) | 3,539 (19) | 2,242 (24) | 661 (39) | 344 (25) | 300 (14) | 25,284 (24) |
| Payera |  |  |  |  |  |  |  |
| High | 4 (80) | 6,647 (90) | 3,984 (80) | 974 (80) | 496 (88) | 856 (93) | 60,138 (85) |
| Low | 1 (20) | 706 (10) | 972 (20) | 251 (20) | 66 (12) | 69 ( 7) | 10,306 (15) |
| Ingham | 9 | 20,137 | 9,415 | 1,909 | 986 | 1,940 | 108,745 |
| Age |  |  |  |  |  |  |  |
| <65years | 6 (67) | 8,034 (40) | 5,315 (56) | 1,433 (75) | 424 (43) | 847 (44) | 71,004 (66) |
| >=65years | 3 (33) | 12,102 (60) | 4,098 (44) | 476 (25) | 562 (57) | 1,093 (56) | 37,394 (34) |
| Sex |  |  |  |  |  |  |  |
| Male | 3 (33) | 9,728 (48) | 4,781 (51) | 984 (52) | 515 (52) | 807 (42) | 67,413 (62) |
| Female | 6 (67) | 10,409 (52) | 4,634 (49) | 925 (48) | 471 (48) | 1,133 (58) | 41,332 (38) |
| Race |  |  |  |  |  |  |  |
| White | 8 (89) | 17,182 (85) | 7,442 (79) | 1,304 (68) | 764 (77) | 1,730 (89) | 87,043 (80) |
| Non-white | 1 (11) | 2,946 (15) | 1,962 (21) | 603 (32) | 222 (23) | 210 (11) | 21,553 (20) |
| Payera |  |  |  |  |  |  |  |
| High | 4 (67) | 6,664 (83) | 3,703 (70) | 974 (68) | 320 (75) | 700 (83) | 53,404 (75) |
| Low | 2 (33) | 1,370 (17) | 1,612 (30) | 459 (32) | 104 (25) | 147 (17) | 17,600 (25) |

aInternational Classification of Diseases (ICD), 9th Revision, Clinical Modification (ICD-9-CM) codes for each admissions case diagnosis: heat (992.0-992.3, E900, E900.0, E900.9) cardiovascular diseases (390– 448), respiratory diseases (460–519), diabetes mellitus (250), renal diseases (580-589), acute myocardial infarction (410) and all natural causes ( < 800).

bPayer is among individuals less than 65 years of age. High = private insurance. Low = Medicaid or self-paid.

Table S2. Odds ratios and 95% confidence intervals for the association between hospitalization for the principal diagnoses of cardiovascular disease, acute myocardial infarction, respiratory disease, diabetes mellitus and all natural causes and extreme heat (defined as mean daily temperature above the 97th percentile on lag day 0) within categories of age, sex, race and income in Wayne, Ingham and Washtenaw Counties in Michigan, 2000-2009.

|  | Cardiovascular diseases | Respiratory diseases | Diabetes Mellitus | Renal diseases | Acute myocardial infarction | All natural cause |
| --- | --- | --- | --- | --- | --- | --- |
| Wayne |  |  |  |  |  |  |
| Age  |  |  |  |  |  |  |
| <65years | 0.97 (0.93, 1.01) | 0.96 (0.91, 1.02) | 0.91 (0.83, 1.00) | 1.21 (1.06, 1.39) | 1.00 (0.89, 1.13) | 0.99 (0.98, 1.00) |
| >=65years | 0.97 (0.93, 1.00) | 1.01 (0.95, 1.07) | 1.11 (0.96, 1.29)\* | 1.22 (1.09, 1.37) | 1.07 (0.96, 1.18) | 0.99 (0.97, 1.01) |
| Sex |  |  |  |  |  |  |
| Male | 0.97 (0.93, 1.00) | 0.98 (0.93, 1.04) | 0.98 (0.87, 1.09) | 1.26 (1.12, 1.43) | 0.97 (0.86, 1.08) | 0.99 (0.97, 1.00) |
| Female | 0.97 (0.94, 1.01) | 0.98 (0.93, 1.04) | 0.95 (0.85, 1.06) | 1.17 (1.04, 1.33) | 1.11 (1.00, 1.23) | 0.99 (0.97, 1.01) |
| Race |  |  |  |  |  |  |
| White | 0.97 (0.93, 1.00) | 1.02 (0.96, 1.07) | 1.00 (0.87, 1.15) | 1.00 (0.87, 1.15) | 1.02 (0.93, 1.13) | 0.99 (0.97, 1.00) |
| Non-white | 0.97 (0.94, 1.01) | 0.95 (0.90, 1.00) | 0.94 (0.86, 1.04) | 1.41 (1.26, 1.58)\* | 1.07 (0.94, 1.21) | 0.99 (0.98, 1.01) |
| Payera |  |  |  |  |  |  |
| High | 0.97 (0.86, 1.09) | 1.03 (0.83, 1.27) | 1.10 (0.65, 1.85) | 0.88 (0.55, 1.41) | 0.89 (0.61, 1.29) | 0.96 (0.90, 1.04) |
| Low | 1.16 (0.72, 1.86) | 1.25 (0.58, 2.67) | b | 1.03 (0.21, 4.99) | 1.59 (0.28, 8.94) | 1.01 (0.77, 1.33) |
| Washtenaw |  |  |  |  |  |  |
| Age  |  |  |  |  |  |  |
| <65years | 0.92 (0.79, 1.07) | 0.96 (0.78, 1.17) | 1.09 (0.77, 1.52) | 0.82 (0.49, 1.39) | 0.86 (0.55, 1.35) | 0.96 (0.92, 1.01) |
| >=65years | 0.87 (0.77, 0.99) | 1.12 (0.92, 1.35) | 0.82 (0.45, 1.52) | 1.03 (0.68, 1.55) | 0.93 (0.65, 1.35) | 1.03 (0.96, 1.10) |
| Sex |  |  |  |  |  |  |
| Male | 0.86 (0.75, 0.99) | 1.01 (0.84, 1.23) | 1.05 (0.68, 1.62) | 0.94 (0.59, 1.50) | 1.05 (0.70, 1.56) | 0.97 (0.92, 1.01) |
| Female | 0.92 (0.81, 1.05) | 1.06 (0.86, 1.30) | 0.98 (0.65, 1.48) | 0.94 (0.61, 1.47) | 0.79 (0.53, 1.18) | 1.02 (0.96, 1.08) |
| Race |  |  |  |  |  |  |
| White | 0.89 (0.80, 0.99) | 1.05 (0.89, 1.22) | 0.92 (0.62, 1.35) | 1.05 (0.73, 1.52) | 0.88 (0.65, 1.19) | 0.98 (0.94, 1.02) |
| Non-white | 0.88 (0.71, 1.10) | 0.99 (0.72, 1.35) | 1.20 (0.76, 1.90) | 0.69 (0.36, 1.33) | 1.12 (0.48, 2.64) | 1.00 (0.93, 1.09) |
| Payera |  |  |  |  |  |  |
| High | 0.94 (0.62, 1.41) | 0.69 (0.29, 1.66) | b | 0.63 (0.07, 5.89) | 0.40 (0.09, 1.89) | 0.97 (0.76, 1.24) |
| Low | b | b | b | b | b | 0.97 (0.20, 4.74) |
| Ingham |  |  |  |  |  |  |
| Age |  |  |  |  |  |  |
| <65years | 1.05 (0.87, 1.27) | 1.05 (0.81, 1.36) | 1.01 (0.65, 1.55) | 1.05 (0.42, 2.63) | 1.02 (0.53, 1.96) | 1.01 (0.95, 1.08) |
| >=65years | 0.94 (0.80, 1.10) | 0.95 (0.72, 1.26) | 0.99 (0.50, 1.95) | 0.71 (0.27, 1.86) | 1.23 (0.74, 2.03) | 1.08 (0.99, 1.18) |
| Sex |  |  |  |  |  |  |
| Male | 0.87 (0.73, 1.05) | 1.10 (0.85, 1.44) | 1.05 (0.62, 1.78) | 1.13 (0.37, 3.46) | 1.18 (0.61, 2.28) | 1.02 (0.95, 1.09) |
| Female | 1.09 (0.92, 1.29) | 0.91 (0.69, 1.19) | 0.96 (0.58, 1.59) | 0.75 (0.33, 1.72) | 1.12 (0.68, 1.85) | 1.06 (0.98, 1.15) |
| Race |  |  |  |  |  |  |
| White | 1.00 (0.87, 1.14) | 1.02 (0.82, 1.26) | 0.85 (0.52, 1.40) | 1.03 (0.50, 2.10) | 1.20 (0.79, 1.81) | 1.05 (0.99, 1.11) |
| Non-white | 0.90 (0.65, 1.26) | 0.95 (0.63, 1.44) | 1.17 (0.67, 2.03) | 0.33 (0.04, 2.54) | 0.67 (0.15, 3.07) | 0.97 (0.86, 1.09) |
| Payera |  |  |  |  |  |  |
| High | 0.46 (0.21, 1.02) | 0.38 (0.05, 3.02) | 1.65 (0.15, 18.2) | b | 0.55 (0.07, 4.47) | 0.70 (0.47, 1.05) |
| Low | 5.67 (0.94, 34.0)\* | b | b | b | b | 3.17 (1.15, 8.77)\* |

aPayer is among individuals less than 65 years of age. High = private insurance. Low = Medicaid or self-paid.

bToo few cases on heat-wave days in this group to estimate an effect.