Supplementary Materials: Heat-Related Mortality in Washington State: The Historical and Projected Public Health Burden

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Model Selection Results

Model selection compared polynomials between degrees 2 and 10 to model the nonlinear relationship between humidex and mortality. Based on ease of interpretation/implementation as well as AIC values, a quadratic polynomial was chosen for the final model. AIC values for each polynomial and climate division are given below.

Table S1. AIC values for conditional logistic regression models using polynomials between degrees 2 and 10 for each climate division. The lowest AIC value in each climate division has been bolded.

Degree of Polynomial	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten
Cascade Mountains West	**3,032.09**	3,033.69	3,035.68	3,037.67	3,039.63	3,040.87	3,042.06	3,043.31	3,041.52
Central Basin	**185,985.90**	185,987.90	185,989.60	185,991.50	185,993.40	185,995.30	185,996.30	185,997.90	185,999.70
E Olympic Cascade Foothills	**253,219.20**	253,221.10	253,222.60	253,222.50	253,222.70	253,224.60	253,225.90	253,227.80	253,229.20
East Slope Cascades	**12,806.63**	12,808.22	12,809.21	12,811.01	12,811.52	12,813.04	12,814.80	12,816.54	12,814.49
NE Olympic San Juan	**43,576.77**	43,578.49	43,580.34	43,582.08	43,582.82	43,584.82	43,586.08	43,587.18	43,589.16
Northeastern	**156,020.10**	156,022.10	156,021.20	156,022.10	156,023.30	156,025.00	156,026.70	156,028.70	156,029.30
Okanogan Big Bend	**19,172.63**	19,174.48	19,176.41	19,177.90	19,178.69	19,179.47	19,180.82	19,179.82	19,180.65
Palouse Blue Mountains	21,181.48	21,183.43	**21,179.70**	21,180.61	21,182.03	21,182.10	21,182.56	21,182.69	21,184.68
Puget Sound Lowlands	**939,192.00**	939,193.70	939,195.50	939,197.30	939,199.30	939,201.30	939,201.70	939,203.70	939,205.60
West Olympic Coast	34,647.59	34,649.16	**34,646.89**	34,648.89	34,649.08	34,650.21	34,651.84	34,653.27	34,654.61

Full Effect Modification Results

Age/Cause of Death by Climate Division

The effect modification results given in Tables 2 and 3 are pooled across all climate zones. This section gives the results for each climate division.

Table S2. Odds ratio (95% CI) of non-traumatic mortality comparing the 99th and 50th percentiles of humidex, for ages 0–4 and for each climate division.

Climate Division	All Causes	Diabetes	Circulatory	Cardiovascular	Ischemic	Cerebrovascular	Respiratory	Nephritis and Nephrotic	Acute Renal Failure	Mental Disorders
Cascade Mountains West	9.5 (0.1, 878.77)	–	–	–	–	–	–	–	–	–
Central Basin	0.97 (0.64, 1.47)	–	0.95 (0.1, 8.68)	2.19 (0.19, 25.18)	–	–	0.62 (0.03, 14.16)	–	–	–
E Olympic Cascade Foothills	0.52 (0.28, 0.95)	–	11.47 (0.13, 1001.26)	79.09 (0.27, 23374.69)	–	–	0.13 (0, 7.54)	–	–	–
E Slope Cascades	0.22 (0.02, 2.88)	–	–	–	–	–	–	–	–	–
NE Olympic San Juan	1.24 (0.14, 11.07)	–	1.64 (0, 1087.91)	–	–	–	–	–	–	–
Northeastern	1.12 (0.64, 1.95)	–	2.24 (0.07, 71.11)	–	–	–	0.04 (0, 3.7)	1.41 (0.01, 329.36)	–	–
Okanogan Big Bend	0.97 (0.09, 10.71)	–	–	–	–	–	–	–	–	–
Palouse Blue Mountains	0.55 (0.06, 4.81)	–	–	2.08 (0, 2176.48)	–	–	–	–	–	–
Puget Sount Lowlands	0.93 (0.73, 1.18)	–	0.94 (0.25, 3.47)	0.85 (0.2, 3.56)	–	0.16 (0, 45.34)	0.5 (0.09, 2.74)	1.75 (0.1, 32.07)	–	–
West Olympic Coast	1 (0.1, 10.15)	–	0.02 (0, 252.94)	0.22 (0, 23665.07)	–	–	–	–	–	–
Fixed Effects Pooled OR	0.9 (0.75, 1.08)	–	1.12 (0.41, 3.08)	1.36 (0.44, 4.16)	–	0.16 (0, 45.34)	0.36 (0.1, 1.36)	1.83 (0.15, 22.31)	–	–

Table S3. Odds ratio (95% CI) of non-traumatic mortality comparing the 99th and 50th percentiles of humidex, for ages 5–14 and for each climate division.

Climate Division	All Causes	Diabetes	Circulatory	Cardiovascular	Ischemic	Cerebrovascular	Respiratory	Nephritis and Nephrotic	Acute Renal Failure	Mental Disorders
Cascade Mountains West	–	–	–	–	–	–	–	–	–	–
Central Basin	0.98 (0.26, 3.59)	–	1 (0.02, 48.61)	1.07 (0.02, 60.41)	–	–	0.56 (0.01, 59.17)	–	–	–
E Olympic Cascade Foothills	0.62 (0.14, 2.79)	–	0.11 (0, 327.91)	0.27 (0, 772)	–	–	2.9 (0, 3931.34)	–	–	–
E Slope Cascades	0.87 (0, 854.19)	–	–	–	–	–	–	–	–	–
NE Olympic San Juan	25.4 (0.09, 7553.66)	–	–	–	–	–	–	–	–	–
Northeastern	0.64 (0.14, 2.8)	–	0 (0, 2142.95)	0 (0, 2142.95)	–	–	–	–	–	–
Okanogan Big Bend	0.79 (0.02, 28.1)	–	–	–	–	–	–	–	–	–
Palouse Blue Mountains	0.49 (0, 113.59)	–	–	– (–, –)	–	–	–	–	–	–
Puget Sount Lowlands	1 (0.54, 1.86)	–	0.83 (0.08, 9.01)	0.15 (0, 5.68)	–	–	2.45 (0.1, 57.89)	–	–	–
West Olympic Coast	0.56 (0.02, 15.12)	–	–	0.29 (0, Inf)	–	–	–	–	–	–
Fixed Effects Pooled OR	0.9 (0.56, 1.45)	–	0.68 (0.1, 4.71)	0.3 (0.02, 3.56)	–	–	1.64 (0.15, 18.52)	–	–	–

Table S4. Odds ratio (95% CI) of non-traumatic mortality comparing the 99th and 50th percentiles of humidex, for ages 15–44 and for each climate division.

Climate Division	All Causes	Diabetes	Circulatory	Cardiovascular	Ischemic	Cerebrovascular	Respiratory	Nephritis and Nephrotic	Acute Renal Failure	Mental Disorders
Cascade Mountains West	0.47 (0.02, 10.9)	–	0.05 (0, 24.24)	0.21 (0, 76.52)	1.7 (0, 1053.41)	–	–	–	–	–
Central Basin	1.12 (0.82, 1.52)	1.32 (0.22, 7.92)	1.15 (0.63, 2.08)	1.14 (0.58, 2.24)	1.19 (0.44, 3.17)	0.77 (0.06, 10.45)	1.18 (0.22, 6.33)	0.74 (0.01, 48.85)	–	0.71 (0.09, 5.4)
E Olympic Cascade Foothills	1.02 (0.74, 1.4)	1.88 (0.23, 15.54)	0.81 (0.44, 1.51)	0.93 (0.48, 1.82)	1.05 (0.4, 2.75)	0.8 (0.06, 11.11)	1.04 (0.26, 4.08)	0.18 (0, 44.79)	–	0.14 (0.02, 0.88)
E Slope Cascades	1.22 (0.23, 6.37)	61.57 (0, 7531181.75)	0.58 (0.05, 6.64)	0.46 (0.02, 13.7)	0.1 (0, 19.35)	–	–	–	–	–
NE Olympic San Juan	1.35 (0.51, 3.59)	–	2.89 (0.27, 31.22)	4.44 (0.52, 61.96)	–	0.08 (0, 1495.07)	0.02 (0, 9.9)	–	–	–
Northeastern	1.05 (0.73, 1.47)	1.44 (0.12, 17.68)	1.52 (0.72, 3.2)	1.37 (0.58, 3.26)	1.71 (0.51, 5.71)	2.88 (0.19, 43.23)	0.43 (0.1, 1.93)	2.94 (0.04, 220.7)	–	1.41 (0.28, 7.02)
Okanogan Big Bend	1.17 (0.38, 3.65)	60.93 (0.19, 19047.03)	2.94 (0.36, 23.77)	4.01 (0.37, 43.97)	102.43 (0.31, 33914.08)	1.85 (0, 724.48)	0.15 (0, 27.42)	–	–	1.17 (0, 336.79)
Palouse Blue Mountains	1.41 (0.49, 4.1)	0.64 (0.01, 65.62)	1.57 (0.23, 10.68)	0.72 (0.08, 6.61)	0.29 (0.01, 5.93)	–	0.76 (0, 141.89)	–	–	0.01 (0, 247.69)
Puget Sount Lowlands	1.03 (0.9, 1.18)	0.94 (0.34, 2.56)	1.04 (0.78, 1.39)	1.11 (0.79, 1.54)	1.03 (0.62, 1.71)	0.64 (0.22, 1.82)	0.9 (0.44, 1.82)	2.5 (0.31, 20.41)	–	1.06 (0.48, 2.32)
West Olympic Coast	0.88 (0.23, 3.4)	–	1.11 (0.1, 12.09)	1.19 (0.08, 18.54)	1.34 (0.11, 17.11)	–	0.19 (0, 286.92)	0.95 (0, 273.76)	–	0.09 (0, 40.44)
Fixed Effects Pooled OR	1.05 (0.94, 1.17)	1.25 (0.6, 2.62)	1.07 (0.86, 1.34)	1.12 (0.87, 1.44)	1.12 (0.77, 1.63)	1.12 (0.77, 1.63)	0.81 (0.48, 1.38)	1.61 (0.34, 7.67)	–	0.81 (0.44, 1.48)

Table S5. Odds ratio (95% CI) of non-traumatic mortality comparing the 99th and 50th percentiles of humidex, for ages 45–64 and for each climate division.

Climate Division	All Causes	Diabetes	Circulatory	Cardiovascular	Ischemic	Cerebrovascular	Respiratory	Nephritis and Nephrotic	Acute Renal Failure	Mental Disorders
Cascade Mountains West	1.22 (0.47, 3.15)	6.54 (0.39, 109.34)	1.01 (0.47, 2.19)	1.29 (0.54, 3.09)	1.27 (0.39, 4.11)	0.19 (0, 12.99)	2.05 (0.43, 9.69)	–	–	0.67 (0.03, 16.18)
Central Basin	1.1 (0.96, 1.26)	1.17 (0.79, 1.72)	1.07 (0.98, 1.16)	1.09 (0.98, 1.2)	1.06 (0.94, 1.19)	1.05 (0.79, 1.39)	0.99 (0.82, 1.19)	0.93 (0.5, 1.73)	0.73 (0.15, 3.53)	0.99 (0.65, 1.51)
E Olympic Cascade Foothills	1 (0.89, 1.14)	1.19 (0.75, 1.63)	1.1 (1.01, 1.2)	1.09 (0.98, 1.2)	1.09 (0.96, 1.24)	1.26 (0.92, 1.73)	1.07 (0.9, 1.27)	1.27 (0.68, 2.4)	2.2 (0.62, 7.77)	0.98 (0.69, 1.37)
E Slope Cascades	1.06 (0.64, 1.77)	0.65 (0.09, 4.69)	0.99 (0.69, 1.42)	1 (0.67, 1.51)	1.09 (0.67, 1.78)	1.41 (0.32, 6.15)	1 (0.47, 2.1)	0.82 (0.04, 16.47)	–	1.78 (0.41, 7.69)
NE Olympic San Juan	1.04 (0.71, 1.54)	2.63 (0.98, 7.06)	1.27 (1.01, 1.58)	1.27 (0.98, 1.65)	1.36 (0.8, 2.04)	1.36 (0.6, 3.1)	0.85 (0.55, 1.26)	–	–	1.32 (0.53, 3.24)
Northeastern	1.05 (0.91, 1.21)	1.47 (0.93, 2.3)	1.09 (0.99, 1.2)	1.08 (0.96, 1.21)	1.08 (0.94, 1.24)	1.14 (0.84, 1.54)	1.14 (0.95, 1.36)	0.66 (0.32, 1.33)	0.63 (0.1, 4.18)	1.26 (0.84, 1.9)
Okanogan Big Bend	0.91 (0.58, 1.4)	1.62 (0.44, 5.9)	1.21 (0.9, 1.61)	1.13 (0.8, 1.58)	1.13 (0.77, 1.65)	1.26 (0.52, 3.04)	0.99 (0.59, 1.68)	1.53 (0.35, 6.76)	–	0.5 (0.15, 1.72)
Palouse Blue Mountains	0.74 (0.48, 1.14)	1.56 (0.48, 5.04)	1.25 (0.96, 1.61)	1.36 (1, 1.83)	1.13 (0.77, 1.65)	1.26 (0.52, 3.04)	0.99 (0.59, 1.68)	1.53 (0.35, 6.76)	–	0.5 (0.15, 1.72)
Puget Sount Lowlands	1.09 (1.02, 1.16)	1.13 (0.92, 1.38)	1.1 (1.05, 1.15)	1.09 (1.04, 1.15)	1.09 (1.02, 1.16)	1.17 (1.01, 1.35)	1.12 (1.03, 1.22)	1.07 (0.79, 1.45)	1.03 (0.47, 2.26)	1.01 (0.85, 1.21)
West Olympic Coast	1.01 (0.67, 1.52)	1.13 (0.33, 3.81)	1.18 (0.89, 1.58)	1.18 (0.85, 1.62)	1.27 (0.84, 1.9)	1.31 (0.39, 4.36)	0.96 (0.55, 1.68)	2.19 (0.25, 19.27)	–	0.68 (0.2, 2.25)
Fixed Effects Pooled OR	1.06 (1.02, 1.12)	1.2 (1.03, 1.39)	1.1 (1.07, 1.14)	1.1 (1.06, 1.14)	1.09 (1.04, 1.14)	1.16 (1.05, 1.29)	1.08 (1.02, 1.15)	1.03 (0.82, 1.28)	1.15 (0.66, 2)	1.02 (0.9, 1.17)

Table S6. Odds ratio (95% CI) of non-traumatic mortality comparing the 99th and 50th percentiles of humidex, for ages 65–84 and for each climate division.

Climate Division	All Causes	Diabetes	Circulatory	Cardiovascular	Ischemic	Cerebrovascular	Respiratory	Nephritis and Nephrotic	Acute Renal Failure	Mental Disorders
Cascade Mountains West	0.92 (0.5, 1.71)	0.76 (0.01, 106.59)	0.45 (0.14, 1.42)	0.44 (0.11, 1.73)	0.53 (0.09, 3.06)	1.2 (0.01, 279.48)	1.19 (0.14, 10.1)	–	–	5.38 (0.03, 961.13)
Central Basin	1.04 (0.96, 1.13)	1.37 (0.82, 2.28)	1.07 (0.94, 1.21)	1.07 (0.92, 1.24)	1.02 (0.86, 1.21)	1.16 (0.78, 1.72)	1 (0.78, 1.29)	1.15 (0.46, 2.86)	0.67 (0.06, 7.08)	1.16 (0.55, 2.43)
E Olympic Cascade Foothills	1 (1, 1.17)	1.19 (0.72, 1.97)	1.09 (0.96, 1.23)	1.08 (0.93, 1.25)	1.08 (0.9, 1.29)	1.41 (0.91, 2.17)	1.05 (0.84, 1.31)	1.36 (0.55, 3.33)	2.2 (0.4, 11.97)	1.03 (0.57, 1.86)
E Slope Cascades	1.02 (0.75, 1.39)	0.51 (0.04, 6.67)	1.25 (0.75, 2.1)	1.37 (0.75, 2.48)	1.57 (0.78, 3.18)	2.05 (0.33, 12.73)	1.08 (0.43, 2.68)	0.16 (0, 54.78)	0.31 (0, 244.52)	0.98 (0.04, 26.41)
NE Olympic San Juan	1.12 (0.93, 1.36)	2.41 (0.64, 9.07)	1.16 (0.84, 1.61)	1.27 (0.87, 1.86)	1.28 (0.8, 2.04)	1.58 (0.52, 4.86)	0.62 (0.33, 1.17)	3.22 (0.19, 55.3)	0.4 (0, 2019.88)	1.6 (0.31, 8.39)
Northeastern	1.09 (1, 1.18)	1.4 (0.76, 2.56)	1.12 (0.97, 1.29)	1.09 (0.93, 1.29)	1.13 (0.93, 1.37)	1.38 (0.91, 2.12)	1.22 (0.96, 1.54)	0.93 (0.33, 2.63)	0.57 (0.03, 10.26)	1.1 (0.53, 2.25)
Okanogan Big Bend	1.07 (0.83, 1.37)	2.16 (0.41, 11.45)	1.42 (0.93, 2.15)	1.38 (0.85, 2.23)	1.9 (0.98, 3.06)	1.75 (0.35, 8.8)	0.87 (0.43, 1.78)	0.07 (0, 3.09)	0.01 (0, 23955.1)	3.45 (0.44, 26.89)
Palouse Blue Mountains	0.98 (0.77, 1.24)	2.09 (0.38, 11.41)	1.24 (0.84, 1.82)	1.47 (0.93, 2.31)	1.22 (0.7, 2.13)	0.8 (0.21, 3.1)	0.87 (0.44, 1.75)	0.38 (0.02, 8.14)	0.21 (0, 15.96)	0.55 (0.06, 5.08)
Puget Sount Lowlands	1.07 (1.03, 1.11)	1.16 (0.88, 1.53)	1.08 (1.02, 1.16)	1.08 (1, 1.16)	1.1 (1, 1.2)	1.13 (0.92, 1.39)	1.05 (0.93, 1.18)	1.01 (0.65, 1.58)	0.77 (0.25, 2.3)	1.04 (0.76, 1.42)
West Olympic Coast	1.08 (0.85, 1.38)	0.88 (0.12, 6.33)	1.22 (0.81, 1.85)	1.21 (0.76, 1.93)	1.27 (0.71, 2.25)	1.61 (0.31, 8.43)	1.02 (0.5, 2.08)	1.36 (0.05, 37.67)	–	1.31 (0.2, 8.48)
Fixed Effects Pooled OR	1.07 (1.04, 1.1)	1.25 (1.03, 1.52)	1.09 (1.04, 1.15)	1.09 (1.04, 1.16)	1.1 (1.03, 1.18)	1.21 (1.04, 1.41)	1.05 (0.96, 1.14)	1.04 (0.75, 1.45)	0.87 (0.39, 1.91)	1.08 (0.86, 1.37)

Table S7. Odds ratio (95% CI) of non-traumatic mortality comparing the 99th and 50th percentiles of humidex, for ages 85+ and for each climate division.

Climate Division	All Causes	Diabetes	Circulatory	Cardiovascular	Ischemic	Cerebrovascular	Respiratory	Nephritis and Nephrotic	Acute Renal Failure	Mental Disorders
Cascade Mountains West	1.94 (0.76, 4.92)	2.3 (0.06, 83.25)	4.55 (1.16, 17.88)	6.78 (1.39, 33.01)	3.35 (0.32, 35.28)	0 (0, 82204927.92)	3.97 (0.23, 69.37)	–	–	0.22 (0, 14.28)
Central Basin	0.98 (0.89, 1.09)	0.99 (0.44, 2.24)	1.02 (0.89, 1.18)	1.08 (0.91, 1.28)	1.11 (0.9, 1.37)	0.82 (0.53, 1.27)	0.96 (0.69, 1.34)	0.77 (0.29, 2.03)	0.81 (0.09, 7.16)	0.82 (0.45, 1.48)
E Olympic Cascade Foothills	1.11 (1, 1.22)	0.54 (0.2, 1.52)	1.15 (0.99, 1.34)	1.12 (0.94, 1.33)	1.28 (0.76, 2.15)	1.11 (0.8, 1.55)	1.03 (0.35, 3.05)	2.69 (0.24, 30.02)	1.04 (0.64, 1.69)
E Slope Cascades	1.01 (0.68, 1.5)	0.84 (0.02, 46.32)	0.77 (0.41, 1.45)	0.72 (0.35, 1.45)	0.8 (0.32, 2)	0.29 (0.01, 7.95)	1.51 (0.3, 7.45)	1.02 (0.02, 52.8)	–	4.46 (0.58, 34.52)
NE Olympic San Juan	1.24 (1, 1.55)	2.36 (0.28, 19.97)	1.35 (0.96, 1.89)	1.37 (0.96, 1.96)	1.21 (0.8, 1.81)	1.13 (0.33, 3.93)	1.15 (0.58, 2.31)	0.39 (0.01, 11.06)	–	1.37 (0.41, 4.54)
Northeastern	1.02 (0.92, 1.14)	2.29 (0.89, 5.93)	1.02 (0.87, 1.19)	1.02 (0.85, 1.23)	0.98 (0.78, 1.25)	0.77 (0.47, 1.26)	1.02 (0.72, 1.43)	0.63 (0.21, 1.9)	0.91 (0.07, 11.43)	1.34 (0.74, 2.4)
Okanogan Big Bend	1.06 (0.76, 1.48)	0.01 (0, 0.87)	0.99 (0.62, 1.59)	0.98 (0.48, 1.47)	0.87 (0.42, 1.79)	0.67 (0.16, 2.82)	0.88 (0.3, 2.59)	2.43 (0.1, 56.66)	–	0.74 (0.1, 5.36)
Palouse Blue Mountains	1.24 (0.94, 1.64)	2.74 (0.37, 20.04)	1.43 (0.97, 2.12)	1.63 (1.02, 2.61)	1.63 (0.88, 3.03)	1.25 (0.38, 4.1)	1.37 (0.56, 3.36)	2.1 (0.41, 10.79)	–	0.58 (0.1, 3.28)
Puget Sount Lowlands	1.12 (1.07, 1.18)	1.05 (0.65, 1.68)	1.13 (1.05, 1.22)	1.12 (1.03, 1.22)	1.1 (0.98, 1.23)	1.25 (1.01, 1.56)	1.23 (1.05, 1.43)	1.25 (0.77, 2.05)	1.25 (0.39, 4.02)	1.06 (0.83, 1.35)
West Olympic Coast	1.03 (0.72, 1.47)	3.56 (0.22, 57.11)	1.07 (0.65, 1.78)	1.11 (0.63, 1.98)	1.34 (0.63, 2.87)	0.94 (0.08, 10.62)	0.76 (0.22, 2.58)	10.75 (0.06, 2065.06)	–	0.49 (0.07, 3.53)
Fixed Effects Pooled OR	1.09 (1.06, 1.13)	1.11 (0.8, 1.55)	1.11 (1.05, 1.17)	1.11 (1.04, 1.18)	1.1 (1.02, 1.2)	1.1 (0.93, 1.3)	1.14 (1.02, 1.28)	1.09 (0.76, 1.57)	1.09 (0.76, 1.57)	1.05 (0.87, 1.27)

Age/Cause of Death by Sex

Reproducing Table 4 for males and females separately.

Table S8. Odds ratio (95% CI) of non-traumatic mortality comparing the 99th and 50th percentiles of humidex, for males pooled across all climate divisions.

Cause of Death	All Ages	0–4	5–14	15–44	45–64	64–84	85+
All Non-Traumatic Causes	1.06 (1.03, 1.09)	0.91 (0.71, 1.15)	0.90 (0.47, 1.72)	1.03 (0.90, 1.19)	1.04 (0.98, 1.11)	1.05 (1.01, 1.09)	1.12 (1.05, 1.19)
Diabetes	1.23 (1.00, 1.52)	–	–	1.29 (0.48, 3.47)	1.08 (0.70, 1.68)	1.20 (0.91, 1.60)	1.43 (0.84, 2.43)
Circulatory	1.09 (1.04, 1.14)	0.77 (0.18, 3.29)	0.68 (0.05, 9.20)	1.11 (0.84, 1.45)	1.07 (0.97, 1.19)	1.07 (1.00, 1.14)	1.13 (1.04, 1.24)
Cardiovascular	1.09 (1.03, 1.14)	1.01 (0.21, 4.97)	0.41 (0.02, 6.98)	1.17 (0.87, 1.58)	1.07 (0.95, 1.19)	1.07 (1.00, 1.15)	1.13 (1.02, 1.26)
Ischemic	1.09 (1.02, 1.16)	–	–	1.05 (0.69, 1.62)	1.01 (0.88, 1.16)	1.10 (1.01, 1.20)	1.14 (1.01, 1.30)
Cerebrovascular	1.11 (0.94, 1.32)	0.24 (0.00, 54.18)	–	0.85 (0.27, 2.72)	1.23 (0.73, 2.07)	1.15 (0.92, 1.44)	1.14 (1.01, 1.30)
Respiratory	1.05 (0.96, 1.15)	0.27 (0.04, 1.70)	3.70 (0.18, 74.16)	0.82 (0.39, 1.71)	1.06 (0.83, 1.37)	1.05 (0.94, 1.18)	1.09 (0.92, 1.31)
Nephritis and Nephrotic	0.92 (0.66, 1.27)	2.70 (0.08, 92.42)	–	0.86 (0.09, 7.75)	0.74 (0.30, 1.84)	0.92 (0.57, 1.47)	0.96 (0.55, 1.68)
Acute Renal Failure	0.86 (0.38, 1.96)	–	–	–	0.74 (0.30, 1.84)	0.47 (0.14, 1.62)	0.96 (0.55, 1.68)
Mental Disorders	1.06 (0.87, 1.31)	–	–	0.69 (0.31, 1.54)	0.93 (0.58, 1.48)	1.20 (0.86, 1.67)	1.14 (0.80, 1.61)

Table S9. Odds ratio (95% CI) of non-traumatic mortality comparing the 99th and 50th percentiles of humidex, for females pooled across all climate divisions.

Cause of Death	All Ages	0–4	5–14	15–44	45–64	64–84	85+
All Non-Traumatic Causes	1.08 (1.05, 1.11)	0.89 (0.68, 1.17)	0.95 (0.46, 1.92)	1.06 (0.90, 1.25)	1.10 (1.02, 1.18)	1.09 (1.04, 1.14)	1.03 (1.04, 1.13)
Diabetes	1.16 (0.95, 1.43)	–	–	1.18 (0.31, 4.53)	1.16 (0.71, 1.89)	1.29 (0.99, 1.70)	0.91 (0.58, 1.41)
Circulatory	1.11 (1.06, 1.16)	1.82 (0.38, 8.77)	0.74 (0.03, 16.76)	1.04 (0.69, 1.57)	1.14 (0.98, 1.34)	1.13 (1.05, 1.21)	1.10 (1.03, 1.17)
Cardiovascular	1.11 (1.05, 1.17)	1.62 (0.26, 10.23)	0.39 (0.01, 13.56)	1.03 (0.63, 1.70)	1.16 (0.97, 1.39)	1.13 (1.04, 1.22)	1.09 (1.01, 1.18)
Ischemic	1.10 (1.02, 1.18)	–	–	1.39 (0.57, 3.40)	1.11 (0.88, 1.41)	1.10 (1.00, 1.23)	1.08 (0.97, 1.20)
Cerebrovascular	1.20 (1.04, 1.37)	–	–	1.39 (0.57, 4.00)	1.32 (0.75, 2.33)	1.27 (1.03, 1.55)	1.13 (0.94, 1.37)
Respiratory	1.11 (1.02, 1.22)	0.61 (0.10, 3.79)	1.18 (0.04, 31.58)	0.88 (0.40, 1.94)	1.28 (0.98, 1.68)	1.04 (0.92, 1.18)	1.18 (1.02, 1.38)
Nephritis and Nephrotic	1.12 (0.82, 1.54)	–	–	2.62 (0.30, 22.72)	0.65 (0.25, 1.69)	1.18 (0.73, 1.91)	1.18 (0.73, 1.91)
Acute Renal Failure	1.38 (0.65, 2.91)	–	–	2.62 (0.30, 22.72)	0.55 (0.03, 11.03)	1.18 (0.39, 3.55)	1.59 (0.50, 5.04)
Mental Disorders	0.99 (0.83, 1.18)	–	–	1.18 (0.31, 4.53)	0.81 (0.40, 1.66)	0.98 (0.70, 1.36)	1.01 (0.81, 1.26)

Race/Ethnicity

The effect modification results for race/ethnicity given in Table 2 are pooled across all climate zones, and no consideration was given for the interaction between race/ethnicity and other individual-level variables. This section gives the all-age, all non-traumatic causes results for each racial/ethnic category in each climate division. It also provides the results pooled across the entire state for racial/ethnic categories stratified further by age, sex, and cause of death.

Table S10. Odds ratio (95% CI) of non-traumatic mortality comparing the 99th and 50th percentiles of humidex, by race/ethnicity for each climate division.

Climate Division	White	Black	Asian	Hispanic	Native American	Native Hawaiian or Other Pacific Islander
Cascade Mountains West	1.17 (0.75, 1.83)	–	–	–	–	–
Central Basin	1.04 (0.98, 1.1)	0.99 (0.6, 1.66)	0.96 (0.43, 2.13)	1.05 (0.82, 1.35)	1.07 (0.68, 1.69)	0.84 (0.24, 2.99)
E Olympic Cascade Foothills	1.07 (1.01, 1.13)	1 (0.55, 1.83)	1 (0.58, 1.73)	1.12 (0.51, 2.47)	0.77 (0.41, 1.42)	0.96 (0.46, 1.98)
E Slope Cascades	1.01 (0.81, 1.25)	0.01 (0, 20.58)	–	2.73 (0.16, 45.18)	1.66 (0.08, 34.55)	–
NE Olympic San Juan	1.16 (1.02, 1.34)	–	0.85 (0.12, 6.04)	0.74 (0.05, 11.63)	1.29 (0.3, 5.5)	–
Northeastern	1.06 (1, 1.12)	1.08 (0.6, 1.93)	1.01 (0.47, 2.15)	0.75 (0.14, 4)	1.04 (0.59, 1.83)	0.85 (0.24, 3.01)
Okanogan Big Bend	1.04 (0.86, 1.25)	1.13 (0.09, 14.73)	1.41 (0.05, 37.85)	0.45 (0.06, 3.16)	1.18 (0.5, 2.76)	–
Palouse Blue Mountains	1.02 (0.86, 1.21)	1.74 (0.11, 26.51)	0.91 (0.08, 10.69)	2.84 (0.11, 70.94)	2.1 (0.09, 48.85)	–
Puget Sount Lowlands	1.08 (1.05, 1.12)	1.17 (1.03, 1.34)	1.07 (0.93, 1.23)	0.95 (0.7, 1.29)	1.2 (0.91, 1.59)	0.98 (0.77, 1.25)
West Olympic Coast	1.06 (0.88, 1.27)	–	0.84 (0.01, 103.98)	1.37 (0.03, 73.3)	0.47 (0.14, 1.52)	1.07 (0.03, 33.56)
Fixed Effects Pooled OR	1.07 (1.05, 1.09)	1.15 (1.02, 1.3)	1.06 (0.93, 1.21)	1.01 (0.84, 1.21)	1.08 (0.89, 1.32)	0.97 (0.77, 1.2)

Table S11. Odds ratio (95% CI) of non-traumatic mortality comparing the 99th and 50th percentiles of humidex, for each racial/ethnic category by age, sex, and cause of death.

| Category	White	Black	Asian	Native American	Hispanic	Native Hawaiian or Other Pacific Islander
All Non-Traumatic Causes	1.07 (1.05, 1.09)	1.15 (1.02, 1.3)	1.06 (0.93, 1.21)	1.01 (0.84, 1.21)	1.08 (0.89, 1.32)	0.97 (0.77, 1.2)
Age	–	–	–	–	–	–
0–4	0.88 (0.71, 1.08)	0.82 (0.45, 1.49)	0.96 (0.26, 3.49)	1.39 (0.51, 3.8)	0.92 (0.5, 1.7)	1.66 (0.59, 4.69)
5–14	1 (0.58, 1.72)	0.31 (0.06, 1.6)	1.66 (0.18, 15.46)	0.52 (0.03, 8.4)	1.1 (0.11, 11.32)	1.46 (0.09, 22.83)
15–44	1.02 (0.91, 1.15)	1.12 (0.74, 1.69)	1.23 (0.63, 2.41)	1.17 (0.64, 2.14)	1.26 (0.74, 2.15)	0.89 (0.46, 1.72)
45–64	1.05 (1, 1.11)	1.14 (0.92, 1.43)	1.26 (0.92, 1.74)	1.3 (0.94, 1.79)	1.09 (0.76, 1.55)	0.95 (0.62, 1.44)
65–84	1.07 (1.04, 1.1)	1.27 (1.05, 1.54)	0.98 (0.81, 1.2)	0.95 (0.71, 1.28)	0.96 (0.71, 1.31)	0.94 (0.66, 1.35)
85+	1.1 (1.06, 1.14)	1.14 (0.81, 1.6)	1.06 (0.84, 1.35)	0.86 (0.47, 1.58)	0.84 (0.5, 1.42)	1.04 (0.52, 2.05)
Sex	–	–	–	–	–	–
Female	1.08 (1.05, 1.11)	1.26 (1.05, 1.52)	1.12 (0.93, 1.34)	1.18 (0.9, 1.54)	0.93 (0.7, 1.24)	0.96 (0.69, 1.34)
Male	1.06 (1.03, 1.09)	1.09 (0.92, 1.28)	1 (0.83, 1.21)	1 (0.77, 1.3)	1.08 (0.84, 1.39)	0.98 (0.72, 1.34)
Cause of Death	–	–	–	–	–	–
Diabetes	1.19 (1.02, 1.39)	1.41 (0.71, 2.81)	1.37 (0.5, 3.79)	1.4 (0.47, 4.17)	1.08 (0.38, 3.03)	1.09 (0.28, 4.18)
Circulatory	1.1 (1.06, 1.13)	1.19 (0.97, 1.47)	1.07 (0.86, 1.34)	1.25 (0.89, 1.76)	1.09 (0.78, 1.52)	1.25 (0.85, 1.85)
Cardiovascular	1.09 (1.05, 1.14)	1.18 (0.93, 1.5)	1.1 (0.83, 1.46)	1.24 (0.84, 1.83)	1.09 (0.73, 1.62)	1.24 (0.78, 1.97)
Ischemic	1.09 (1.04, 1.14)	1.18 (0.86, 1.63)	1.25 (0.87, 1.78)	1.29 (0.78, 2.14)	1.14 (0.68, 1.92)	1.14 (0.61, 2.11)
Cerebrovascular	1.16 (1.04, 1.29)	1.26 (0.61, 2.58)	1.2 (0.53, 2.73)	1.08 (0.29, 4)	0.91 (0.25, 3.38)	2.92 (0.73, 11.6)
Respiratory	1.08 (1.02, 1.16)	1.25 (0.77, 2.02)	1.08 (0.66, 1.77)	0.73 (0.39, 1.38)	0.82 (0.38, 1.76)	1.38 (0.56, 3.37)
Nephritis and Nephrotic	1.02 (0.8, 1.29)	1.06 (0.39, 2.88)	1.44 (0.46, 4.54)	0.92 (0.04, 22.86)	0.56 (0.09, 3.56)	0.55 (0.06, 5.21)
Acute Renal Failure	1.21 (0.69, 2.13)	0.77 (0.02, 34.53)	0.26 (0, 20.77)	–	–	–
Mental Disorders	1.03 (0.9, 1.19)	0.78 (0.3, 2.04)	0.7 (0.26, 1.88)	1.23 (0.41, 3.72)	0.59 (0.12, 2.78)	1.53 (0.15, 15.54)

Results are pooled across all climate divisions using fixed-effects meta-analysis.

King County Sensitivity Analysis

A sensitivity analysis was conducted in King County to compare results from a case-crossover analysis to results from a time series analysis.

- The case-crossover approach, implemented using a conditional logistic regression model, incorporates individual-level humidex using a quadratic polynomial. Time is controlled for by design.

- The time series approach, implemented using a generalized additive quasi-Poisson model, incorporates daily averages of individual-level humidex values using a quadratic polynomial. Time is controlled for by using a spline for year, indicator variables for month and day-of-week (to mimic the case-crossover format), and post-censal population data from the Office of Financial Management.

The dose–response curves for each analysis are given in Figure S1.
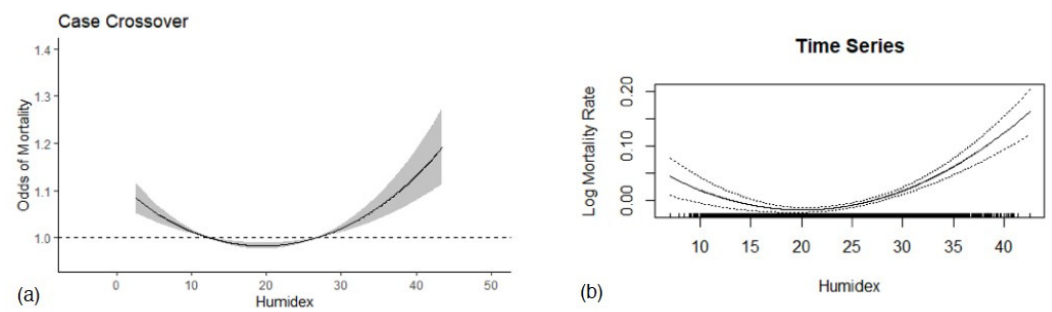
Figure S1. Humidex–mortality exposure–response curves for King County: (a) case-crossover analysis and (b) time series analysis. Comparing the 99th to 50th percentiles of humidex, the case-crossover analysis yielded an OR of 1.10 (1.06, 1.14), whereas the time series analysis yielded an RR of 1.10 (1.08, 1.12).

Yearly Extreme Heat Events

Descriptive statistics of humidex are provided in Table 2. However, that table gives no indication of when extreme heat days occured. The figure below shows the distribution of the number of extreme heat days per year for each climate zone, defined as any day in which the average humidex across a climate zone exceeds that zone's 99th percentile of humidex.
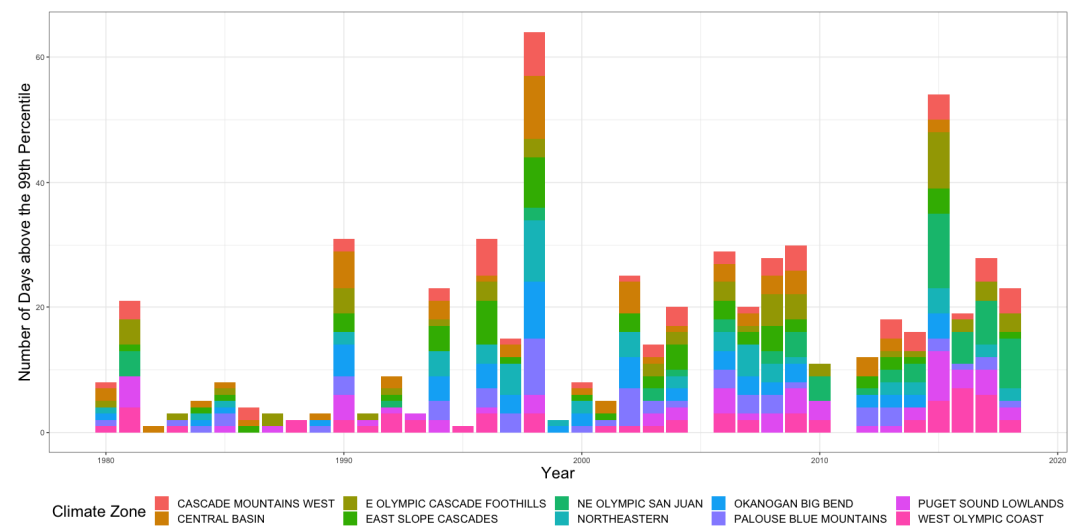
Figure S2. The number of days each year where the average climate zone-level humidex exceeds the 99th percentile.