## Supplemental Material

Vulnerability to temperature-related mortality in Seoul, Korea

Ji-Young Son, Jong-Tae Lee, G. Brooke Anderson, and Michelle L. Bell

Environmental Research Letters

Supplemental Figure 1. Risk of mortality for (A) heat (comparison of 99th vs. 90th percentile of mean temperature) and (B) cold (comparison of 1st vs. 10th percentile of mean temperature) for different lag structures.

Note: Lag 0 represents exposure on the same day. Other lags represent exposure averaged across the same day and previous days.

(A)

(B)

Supplemental Table 1. Summary statistics of the study population, by sex

|  | Male <br> $\mathrm{N}(\%$ of male <br> subjects $)$ | Female <br> $\mathrm{N}(\%$ of female <br> subjects $)$ | Total <br> N (\% of total <br> subjects) |
| :--- | :---: | :---: | :---: |
| All observations | 145,902 | 126,003 | 272,040 |
| Cause of death |  |  |  |
| Respiratory | $9,017(6.2 \%)$ | $6,809(5.4 \%)$ | $15,840(5.8 \%)$ |
| Cardiovascular | $37,280(25.6 \%)$ | $37,326(29.6 \%)$ | $74,629(27.4 \%)$ |
| Other non-accidental | $99,605(68.3 \%)$ | $81,868(65.0 \%)$ | $181,571(66.7 \%)$ |

Age

| $0-14$ | $2,406(1.7 \%)$ | $1,943(1.5 \%)$ | $4,349(1.6 \%)$ |
| :---: | :---: | :---: | :---: |
| $15-64$ | $64,113(43.9 \%)$ | $26,841(21.3 \%)$ | $90,954(33.4 \%)$ |
| $65-74$ | $36,796(25.2 \%)$ | $23,171(18.4 \%)$ | $59,967(22.0 \%)$ |
| $\geq 75$ | $42,587(29.2 \%)$ | $74,048(58.8 \%)$ | $116,770(42.9 \%)$ |

Education (for those $\geq 20$ years)

| None | $12,800(8.9 \%)$ | $52,311(42.3 \%)$ | $65,213(24.4 \%)$ |
| :---: | :---: | :---: | :---: |
| $\leq 12$ years | $101,975(71.3 \%)$ | $65,198(52.7 \%)$ | $167,204(62.6 \%)$ |
| $>12$ years | $27,240(19.0 \%)$ | $5,317(4.3 \%)$ | $32,557(12.2 \%)$ |
| Unknown | $1,112(0.8 \%)$ | $990(0.8 \%)$ | $2,104(0.8 \%)$ |

Place of death

| Out of hospital | $59,551(40.9 \%)$ | $62,747(49.9 \%)$ | $122,407(45.1 \%)$ |
| :---: | :--- | :--- | :--- |
| In hospital | $86,106(59.1 \%)$ | $63,036(50.1 \%)$ | $149,168(54.9 \%)$ |

Supplemental Table 2. Summary statistics of the study population, by age

|  | $0-14$ $\mathrm{~N}(\%$ of subjects $0-$ $14 \mathrm{y})$ | 15-64 <br> N (\% of subjects 15$64 y)$ | 65-74 <br> N (\% of subjects 65$74 y)$ | $\begin{gathered} \geq 75 \\ \mathrm{~N}(\% \text { of } \\ \text { subjects } \geq 75 \mathrm{y}) \end{gathered}$ | Total <br> N (\% of total subjects) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| All observations | 4,349 (1.6\%) | $\begin{gathered} 90,954 \\ (33.4 \%) \end{gathered}$ | $\begin{gathered} 59,967 \\ (22.0 \%) \end{gathered}$ | $\begin{aligned} & 116,770 \\ & (42.9 \%) \end{aligned}$ | $\begin{gathered} \hline 272,040 \\ (100 \%) \end{gathered}$ |
| Cause of death |  |  |  |  |  |
| Respiratory | 171 (3.9\%) | 2,490 (2.7\%) | 3,369 (5.6\%) | 9,810 (8.4\%) | 15,840 (5.8\%) |
| Cardiovascular | 185 (4.3\%) | $\begin{aligned} & 20,059 \\ & (22.1 \%) \end{aligned}$ | $\begin{gathered} 18,643 \\ (31.1 \%) \end{gathered}$ | 35,742 (30.6\%) | $\begin{gathered} 74,629 \\ (27.4 \%) \end{gathered}$ |
| Other non-accidental | $\begin{gathered} 3,993 \\ (91.8 \%) \end{gathered}$ | $\begin{gathered} 68,405 \\ (75.2 \%) \end{gathered}$ | $\begin{gathered} 37,955 \\ (63.3 \%) \end{gathered}$ | 71,218 (61.0\%) | 181,571 (66.7\%) |
| Sex |  |  |  |  |  |
| Male | $\begin{gathered} 2,406 \\ (55.3 \%) \end{gathered}$ | $\begin{gathered} 64,113 \\ (70.5 \%) \end{gathered}$ | $\begin{gathered} 36,796 \\ (61.4 \%) \end{gathered}$ | 42,587 (36.5\%) | $\begin{aligned} & 145,902 \\ & (53.6 \%) \end{aligned}$ |
| Female | $\begin{gathered} 1,943 \\ (44.7 \%) \end{gathered}$ | $\begin{gathered} 26,841 \\ (29.5 \%) \end{gathered}$ | $\begin{gathered} 23,171 \\ (38.6 \%) \end{gathered}$ | 74,048 (63.4\%) | $\begin{aligned} & 126,003 \\ & (46.3 \%) \end{aligned}$ |
| Education <br> (\% of those $\geq 20 \mathrm{yrs}$ ) |  |  |  |  |  |
| None | - | 3,930 (4.3\%) | $\begin{gathered} 9,565 \\ (16.0 \%) \end{gathered}$ | 51,788 (44.4\%) | $\begin{gathered} 65,213 \\ (24.4 \%) \end{gathered}$ |
| $\leq 12$ years | - | $\begin{gathered} 69,744 \\ (76.6 \%) \end{gathered}$ | $\begin{gathered} 41,724 \\ (69.6 \%) \end{gathered}$ | 56,269 (48.2\%) | $\begin{aligned} & 167,204 \\ & (62.6 \%) \end{aligned}$ |
| $>12$ years | - | $\begin{gathered} 16,688 \\ (18.3 \%) \end{gathered}$ | $\begin{gathered} 8,227 \\ (13.7 \%) \end{gathered}$ | 7,652 (6.6\%) | $\begin{gathered} 32,557 \\ (12.2 \%) \end{gathered}$ |
| Unknown | - | 592 (0.7\%) | 451 (0.8\%) | 1,061 (0.9\%) | 2,104 (0.8\%) |
| Place of death |  |  |  |  |  |
| Out of hospital | 913 (21.8\%) | $\begin{gathered} 28,714 \\ (31.6 \%) \end{gathered}$ | $\begin{gathered} 24,250 \\ (40.5 \%) \end{gathered}$ | 68,530 (58.8\%) | $\begin{aligned} & 122,407 \\ & (45.1 \%) \end{aligned}$ |
| In hospital | $\begin{gathered} 3,278 \\ (78.2 \%) \end{gathered}$ | $\begin{gathered} 62,131 \\ (68.4 \%) \end{gathered}$ | $\begin{gathered} 35,647 \\ (59.5 \%) \end{gathered}$ | 48,112 (41.3\%) | $\begin{aligned} & 149,168 \\ & (54.9 \%) \end{aligned}$ |

