Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts.

Supplementary Materials

Table S1. Estimates of percent change (95%CI) in daily mortality per 10μg/m^3 increase in PM_{10} concentration across temperature levels using different cut-offs. (A. cut-off 15.9℃; B. cut-off 20℃)

A.

			Lags for mean temperature						
Lags for PM10	Mortality	Temperature level	lag0	lag1	lag2	lag01	lag07	lag014	lag021
lag0	Non-accidental	low	0.09(-0.01,0.18)	**0.02(0.01,0.02)**	**0.02(0.01,0.02)**	**0.01(0,0.02)**	**0.15(0.06,0.23)**	**0.14(0.05,0.22)**	**0.01(0,0.02)**
lag0		high	0.1(-0.02,0.22)	0.01(0,0.02)	**0.02(0.01,0.03)**	0.01(0,0.02)	**0.21(0.1,0.32)**	**0.24(0.12,0.35)**	**0.02(0.01,0.04)**
lag0	Cardiovascular	low	**0.11(0,0.22)**	**0.01(0,0.02)**	**0.01(0,0.02)**	**0.01(0,0.02)**	**0.13(0.02,0.24)**	**0.12(0.02,0.23)**	**0.01(0,0.02)**
lag0		high	0.06(-0.11,0.23)	0.01(-0.01,0.03)	0.02(0,0.03)	0.01(-0.01,0.02)	**0.17(0.01,0.33)**	**0.17(0.01,0.34)**	**0.02(0,0.03)**
lag0	Respiratory	low	0.09(-0.11,0.3)	0.02(0,0.04)	0.02(0,0.04)	0.01(-0.01,0.04)	0.19(-0.03,0.41)	0.14(-0.06,0.34)	0.01(-0.01,0.04)
lag0		high	0.31(-0.02,0.65)	0.02(-0.02,0.05)	0.03(0,0.06)	0.02(-0.01,0.05)	**0.35(0.03,0.67)**	**0.45(0.13,0.78)**	**0.04(0.01,0.08)**
lag1	Non-accidental	low	0.03(-0.05,0.12)	0.01(0,0.02)	0.01(0,0.02)	0(0,0.01)	0.08(-0.01,0.16)	0.07(-0.01,0.16)	0.01(0,0.02)
lag1		high	0.09(-0.03,0.2)	0.01(0,0.02)	**0.01(0,0.03)**	0.01(-0.01,0.02)	**0.17(0.05,0.28)**	**0.16(0.04,0.27)**	**0.01(0,0.03)**
lag1	Cardiovascular	low	0.01(-0.1,0.12)	0(-0.01,0.01)	0(-0.01,0.01)	0(-0.01,0.01)	0.04(-0.07,0.15)	0.04(-0.07,0.15)	0(-0.01,0.01)
lag1		high	0.1(-0.06,0.27)	0.01(-0.01,0.03)	0.02(0,0.03)	0.01(-0.01,0.03)	**0.2(0.04,0.36)**	**0.18(0.01,0.34)**	0.02(0,0.03)
lag1	Respiratory	low	0.02(-0.18,0.23)	0.01(-0.02,0.03)	0.01(-0.01,0.03)	0(-0.02,0.02)	0.07(-0.14,0.27)	0.08(-0.12,0.28)	0.01(-0.01,0.03)
lag1		high	0.19(-0.13,0.51)	0.02(-0.02,0.05)	0.01(-0.02,0.05)	0.02(-0.02,0.05)	0.26(-0.07,0.58)	0.25(-0.08,0.58)	0.02(-0.02,0.05)
lag2	Non-accidental	low	-0.05(-0.13,0.04)	0(-0.01,0)	0(-0.01,0.01)	-0.01(-0.01,0)	-0.01(-0.1,0.08)	-0.01(-0.09,0.08)	0(-0.01,0.01)
lag2		high	0.1(-0.02,0.21)	0.01(0,0.02)	0.01(0,0.02)	0.01(0,0.02)	**0.14(0.02,0.26)**	**0.13(0.01,0.24)**	0.01(0,0.02)
lag2	Cardiovascular	low	-0.07(-0.18,0.04)	-0.01(-0.02,0)	0(-0.02,0.01)	-0.01(-0.02,0)	-0.03(-0.14,0.08)	-0.02(-0.13,0.09)	0(-0.01,0.01)
lag2		high	0.12(-0.04,0.28)	0.01(-0.01,0.03)	0.01(-0.01,0.03)	0.01(0,0.03)	0.15(-0.01,0.32)	0.12(-0.04,0.29)	0.01(-0.01,0.03)
lag2	Respiratory	low	0.11(-0.09,0.31)	0.01(-0.01,0.03)	0.01(-0.01,0.03)	0.01(-0.01,0.03)	0.13(-0.07,0.33)	0.15(-0.05,0.35)	0.02(0,0.04)
lag2		high	**0.33(0.01,0.65)**	0.03(0,0.06)	0.02(-0.02,0.05)	0.03(0,0.06)	0.31(-0.01,0.63)	0.31(-0.01,0.63)	0.02(-0.01,0.05)
lag01	Non-accidental	low	0.08(-0.03,0.19)	**0.02(0.01,0.03)**	**0.01(0,0.02)**	0.01(0,0.02)	**0.15(0.05,0.26)**	**0.14(0.04,0.24)**	**0.01(0,0.02)**
lag01		high	0.14(0,0.28)	0.01(0,0.03)	**0.02(0.01,0.04)**	0.01(0,0.03)	**0.27(0.14,0.41)**	**0.28(0.14,0.41)**	**0.03(0.01,0.04)**
lag01	Cardiovascular	low	0.09(-0.04,0.22)	0.01(0,0.02)	0.01(0,0.02)	0.01(0,0.02)	0.12(-0.01,0.25)	0.12(-0.01,0.25)	0.01(0,0.02)
lag01		high	0.12(-0.08,0.33)	0.01(-0.01,0.04)	**0.02(0,0.04)**	0.01(-0.01,0.03)	**0.27(0.07,0.46)**	**0.25(0.05,0.44)**	**0.02(0,0.04)**
lag01	Respiratory	low	0.08(-0.16,0.33)	0.02(-0.01,0.04)	0.02(-0.01,0.04)	0.01(-0.02,0.04)	0.16(-0.07,0.4)	0.16(-0.08,0.39)	0.02(-0.01,0.04)
lag01		high	0.36(-0.04,0.76)	0.02(-0.02,0.06)	0.03(-0.01,0.07)	0.03(-0.01,0.07)	**0.43(0.05,0.81)**	**0.49(0.11,0.88)**	**0.04(0,0.08)**

B.

			Lags for mean temperature						
Lags for PM10	Mortality	Temperature level	lag0	lag1	lag2	lag01	lag07	lag014	lag021
lag0	Non-accidental	low	**0.1(0.02,0.19)**	**0.01(0.01,0.02)**	**0.01(0,0.02)**	**0.01(0,0.02)**	**0.13(0.05,0.21)**	**0.14(0.07,0.22)**	**0.01(0.01,0.02)**
lag0		high	0.1(-0.04,0.24)	0.01(0,0.03)	**0.02(0.01,0.04)**	0.01(0,0.02)	**0.27(0.14,0.41)**	**0.3(0.15,0.44)**	**0.03(0.01,0.04)**
lag0	Cardiovascular	low	0.09(-0.02,0.2)	**0.01(0,0.02)**	**0.01(0,0.02)**	**0.01(0,0.02)**	**0.12(0.02,0.21)**	**0.12(0.02,0.22)**	**0.01(0,0.02)**
lag0		high	0.04(-0.16,0.24)	0(-0.02,0.02)	0.02(0,0.04)	0(-0.02,0.02)	**0.24(0.03,0.45)**	**0.25(0.05,0.46)**	**0.02(0,0.04)**
lag0	Respiratory	low	0.09(-0.13,0.3)	0.01(0,0.03)	0.02(0,0.04)	0.01(-0.01,0.03)	0.17(-0.02,0.35)	0.18(0,0.36)	0.02(0,0.04)
lag0		high	0.3(-0.08,0.68)	0.02(-0.02,0.06)	**0.04(0,0.08)**	0.03(-0.01,0.06)	**0.5(0.12,0.88)**	0.38(-0.02,0.77)	0.04(0,0.08)
lag1	Non-accidental	low	0.04(-0.05,0.12)	0.01(0,0.01)	0.01(0,0.01)	0(0,0.01)	0.07(-0.01,0.15)	**0.09(0.01,0.16)**	**0.01(0,0.02)**
lag1		high	0.11(-0.02,0.24)	0.01(-0.01,0.02)	0.01(0,0.03)	0.01(0,0.02)	**0.15(0.03,0.28)**	0.13(-0.01,0.27)	**0.02(0.01,0.04)**
lag1	Cardiovascular	low	0(-0.1,0.11)	0(-0.01,0.01)	0(-0.01,0.01)	0(-0.01,0.01)	0.03(-0.07,0.14)	0.05(-0.05,0.15)	0.01(0,0.02)
lag1		high	0.15(-0.05,0.34)	0.01(-0.01,0.03)	0.02(0,0.04)	0.01(-0.01,0.03)	**0.26(0.06,0.46)**	**0.25(0.04,0.46)**	**0.02(0,0.05)**
lag1	Respiratory	low	0.02(-0.18,0.21)	0(-0.01,0.02)	0.01(-0.01,0.03)	0(-0.02,0.02)	0.09(-0.1,0.28)	0.1(-0.09,0.28)	0.01(-0.01,0.03)
lag1		high	0.22(-0.15,0.6)	0.01(-0.03,0.05)	0.02(-0.02,0.06)	0.01(-0.02,0.05)	0.34(-0.01,0.7)	0.26(-0.13,0.66)	0.03(-0.01,0.07)
lag2	Non-accidental	low	-0.04(-0.12,0.04)	0(-0.01,0.01)	0(-0.01,0.01)	0(-0.01,0)	-0.02(-0.1,0.06)	0.01(-0.07,0.09)	0(-0.01,0.01)
lag2		high	0.12(-0.01,0.25)	0.01(0,0.02)	0.01(0,0.02)	0.01(0,0.02)	**0.14(0.02,0.27)**	0.06(-0.07,0.2)	**0.02(0,0.03)**
lag2	Cardiovascular	low	-0.05(-0.15,0.06)	-0.01(-0.02,0.01)	0(-0.01,0.01)	0(-0.02,0.01)	-0.04(-0.14,0.06)	-0.02(-0.12,0.08)	0(-0.01,0.01)
lag2		high	0.07(-0.12,0.26)	0.01(-0.01,0.03)	0.01(-0.01,0.03)	0.01(-0.01,0.03)	0.17(-0.04,0.37)	0.09(-0.1,0.28)	0.02(0,0.04)
lag2	Respiratory	low	0.09(-0.1,0.28)	0.01(-0.01,0.03)	0.01(-0.01,0.03)	0.01(-0.01,0.03)	0.15(-0.04,0.33)	0.15(-0.04,0.34)	0.01(0,0.03)
lag2		high	**0.39(0.02,0.76)**	0.03(0,0.07)	0.03(-0.01,0.07)	0.03(-0.01,0.07)	**0.39(0.04,0.75)**	0.3(-0.08,0.67)	0.03(-0.01,0.07)
lag01	Non-accidental	low	**0.1(0,0.2)**	**0.01(0,0.02)**	**0.01(0,0.02)**	**0.01(0,0.02)**	**0.14(0.04,0.23)**	**0.16(0.07,0.25)**	**0.02(0.01,0.03)**
lag01		high	0.15(-0.01,0.32)	0.01(0,0.03)	**0.03(0.01,0.05)**	0.01(0,0.03)	**0.28(0.13,0.43)**	**0.36(0.19,0.53)**	**0.03(0.02,0.05)**
lag01	Cardiovascular	low	0.07(-0.06,0.19)	0.01(0,0.02)	0.01(0,0.02)	0.01(0,0.02)	0.11(-0.01,0.22)	**0.12(0,0.23)**	**0.01(0,0.02)**
lag01		high	0.15(-0.1,0.39)	0.01(-0.01,0.04)	**0.03(0,0.05)**	0.01(-0.01,0.04)	**0.34(0.09,0.58)**	**0.36(0.11,0.61)**	**0.03(0.01,0.06)**
lag01	Respiratory	low	0.08(-0.15,0.31)	0.01(-0.01,0.04)	0.02(0,0.04)	0.01(-0.01,0.03)	0.19(-0.03,0.41)	0.19(-0.02,0.41)	0.02(0,0.04)
lag01		high	0.38(-0.08,0.84)	0.02(-0.03,0.07)	**0.05(0,0.1)**	0.03(-0.02,0.08)	**0.54(0.12,0.96)**	0.43(-0.03,0.88)	0.04(0,0.09)

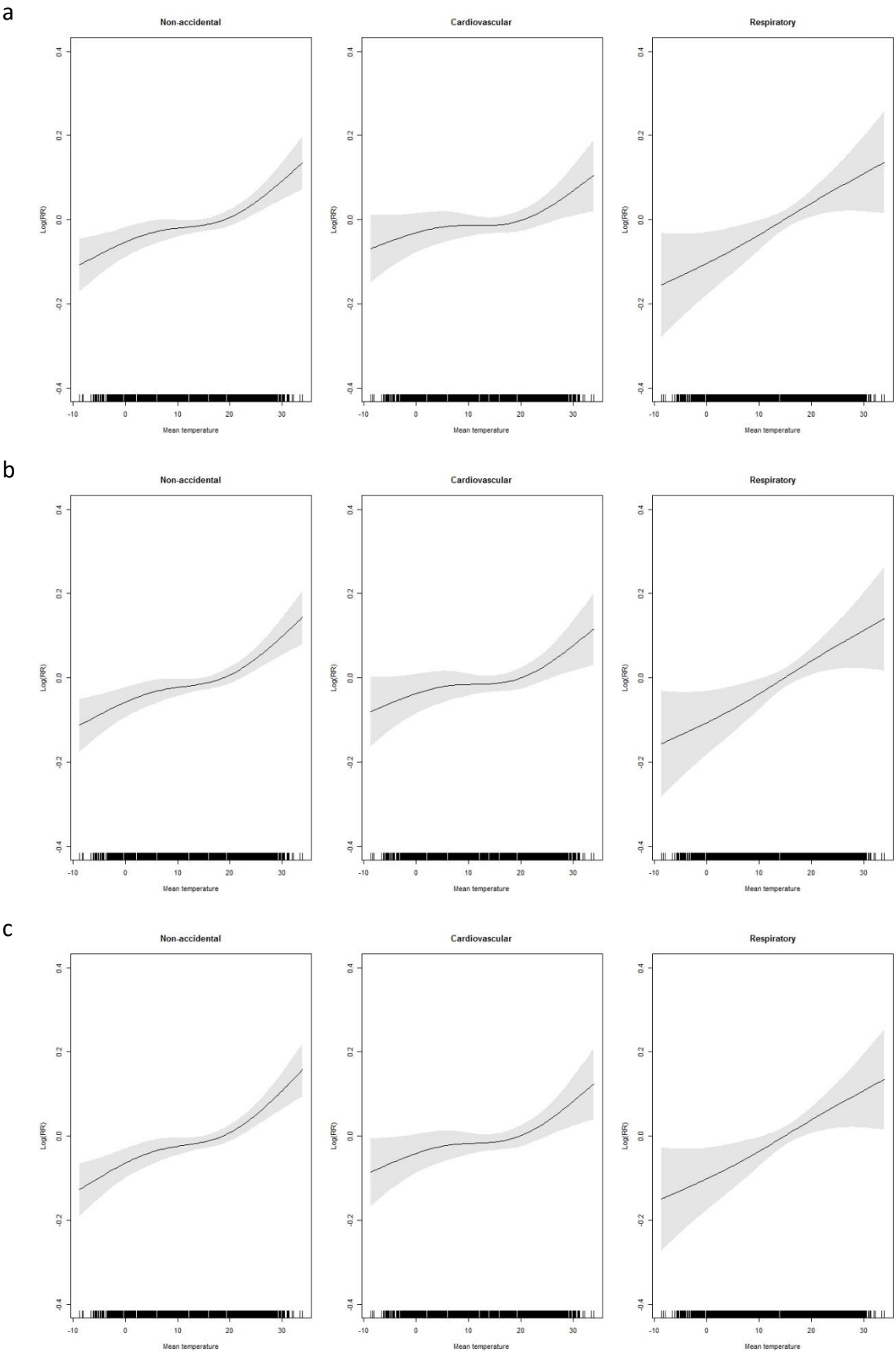


Fig.S1. Dose-response association between daily mean temperature (lag01) and cause-specific mortality in Beijing, China, 2006-2009. (a. lag0 for PM_{10}, b. lag1 for PM_{10}, c. lag2 for PM_{10})

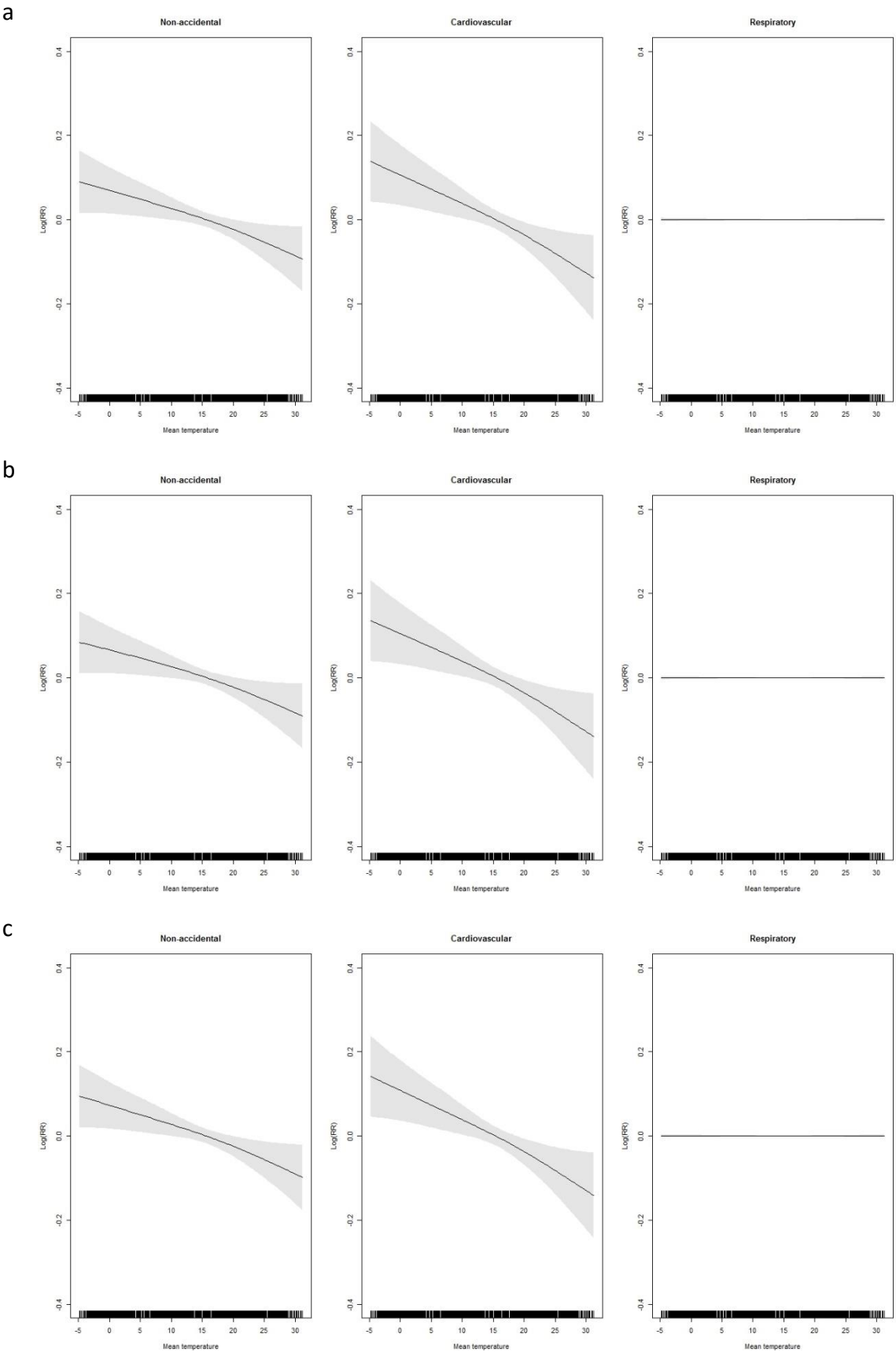
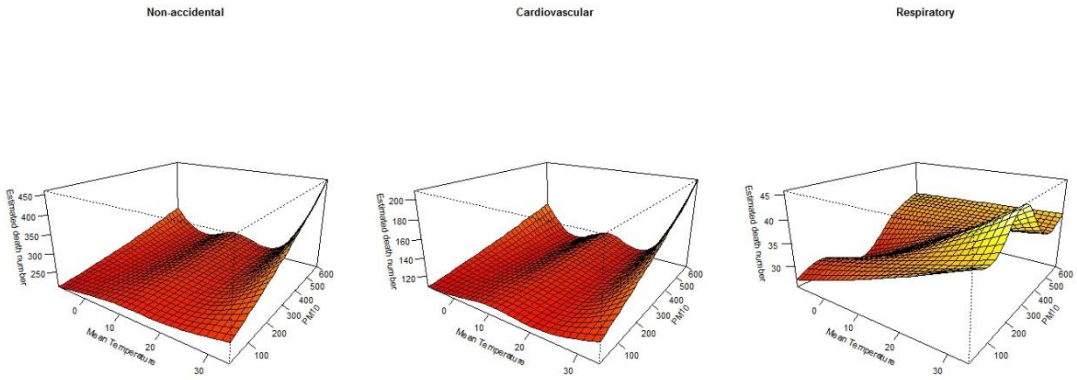


Fig.S2.Dose-response association between daily mean temperature (lag014) and cause-specific mortality in Beijing, China, 2006-2009. (a. lag0 for PM_{10}, b. lag1 for PM_{10}, c. lag2 for PM_{10})

a



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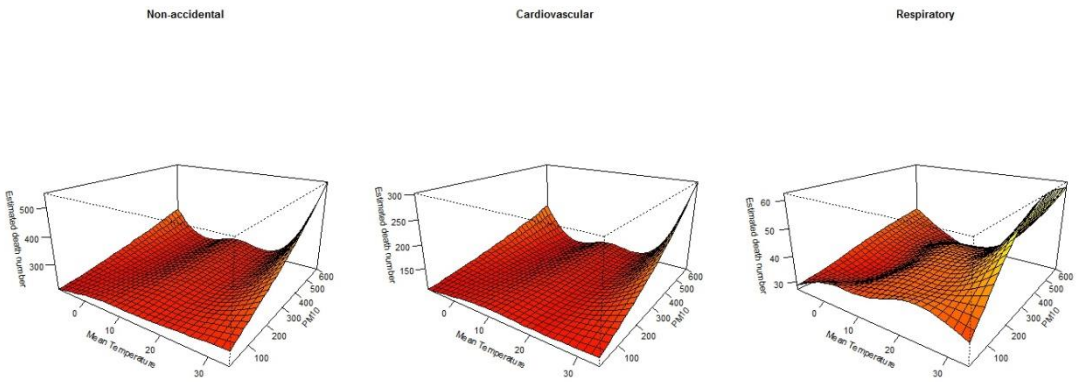

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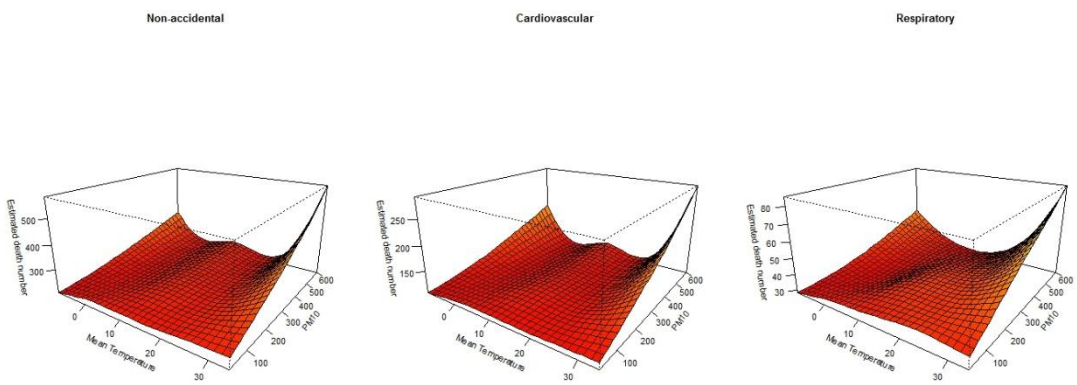

Fig.S3. Bivariate response surface of PM_{10} and mean temperature (lag01) on cause-specific mortality in Beijing, China, 2006-2009. (a. lag0 for PM_{10}, b. lag1 for PM_{10}, c. lag01 for PM_{10})

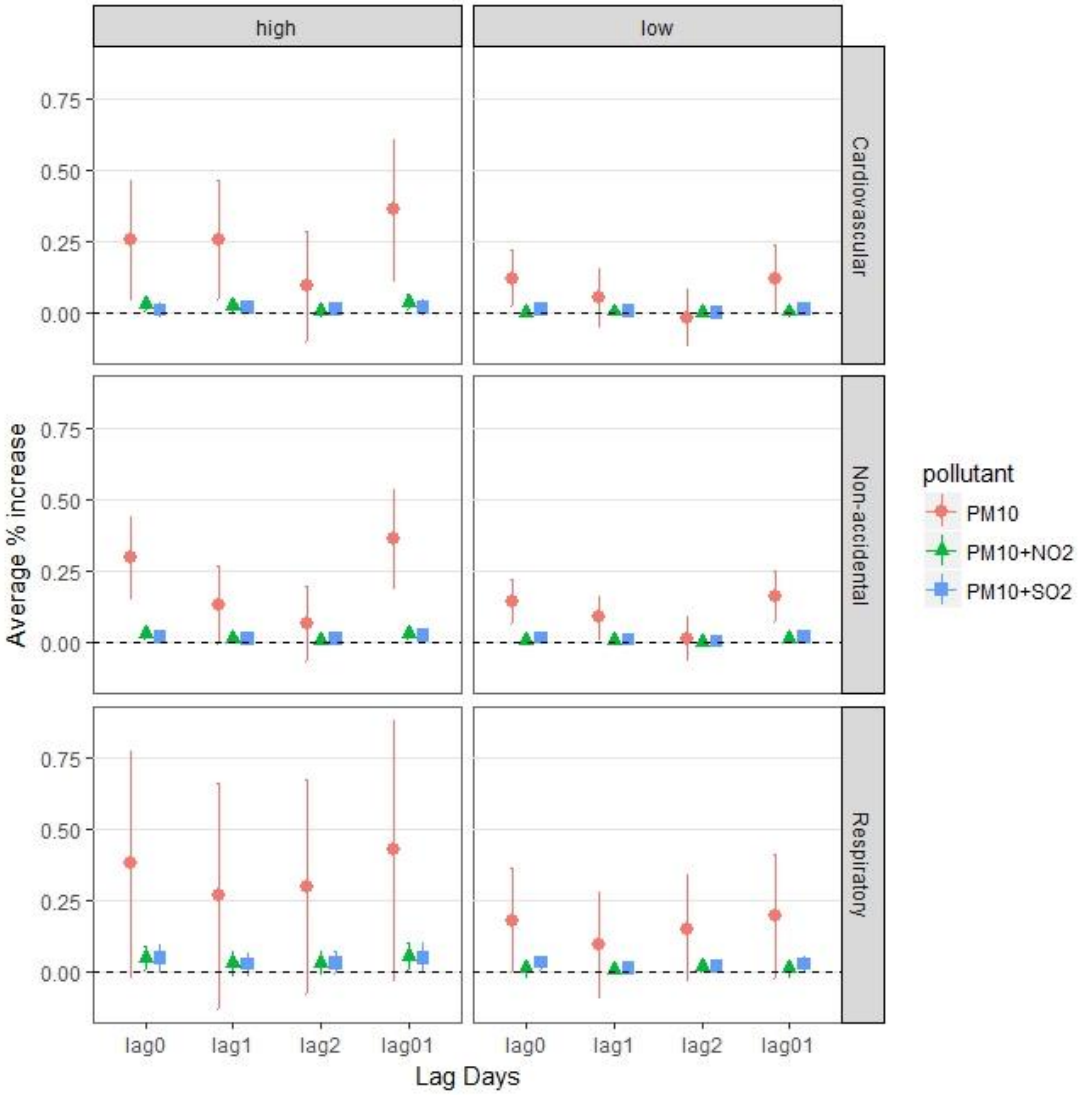

Fig.S4. Estimates of percent change in daily mortality per 10μg/m^3 increase in PM_{10} concentration in single- and two-pollutant models. (Figure is shown over lag 0 to 14 for daily mean temperature and using the cut-off 20℃.)

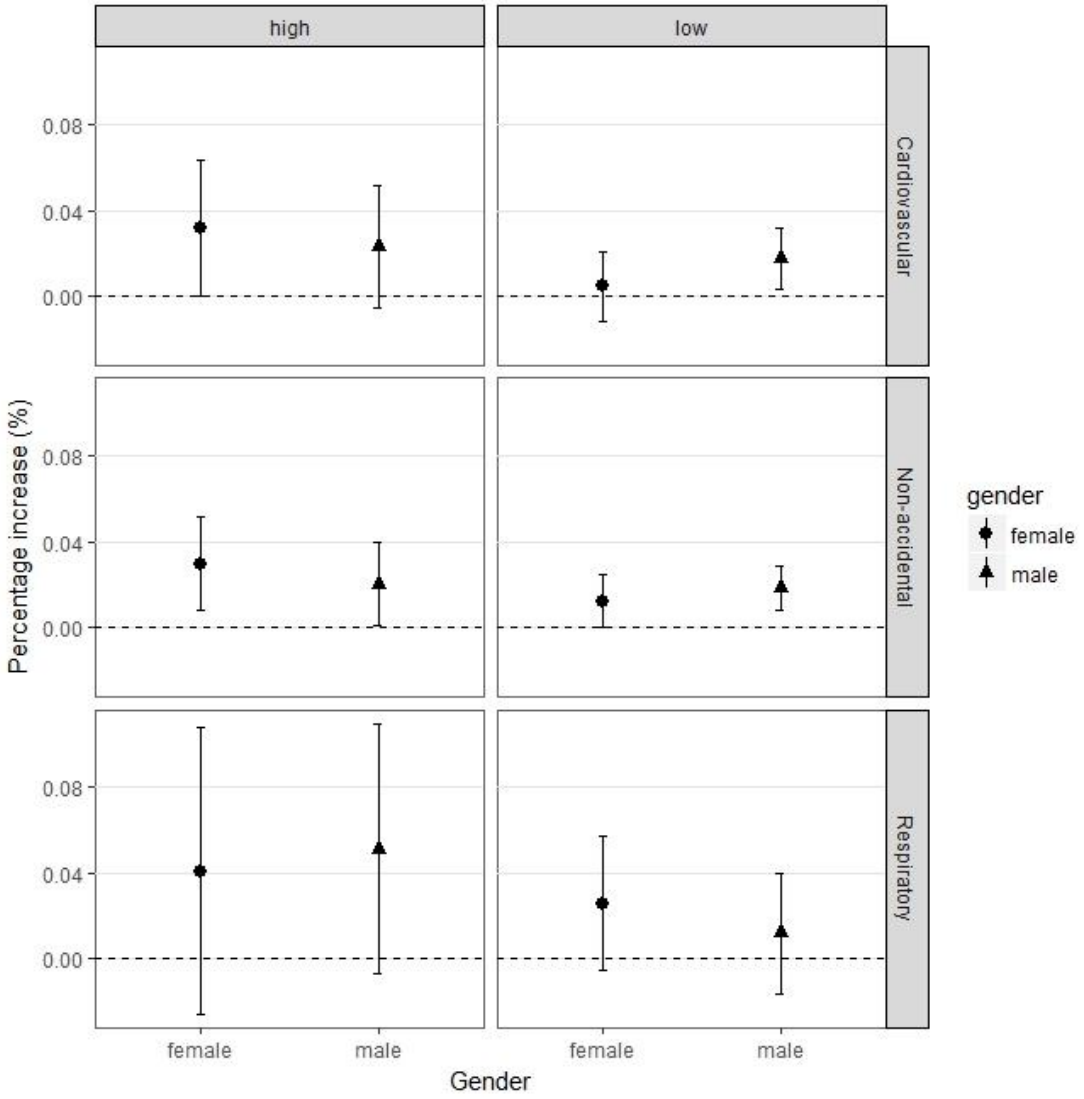

Fig.S5. Estimates of percent change in daily mortality per 10μg/m^3 increase in PM_{10} concentration in different gender groups. (Figures is shown over lag 0 to 14 for daily mean temperature and lag 0 to 1 for PM_{10}, using the cut-off 20℃.)

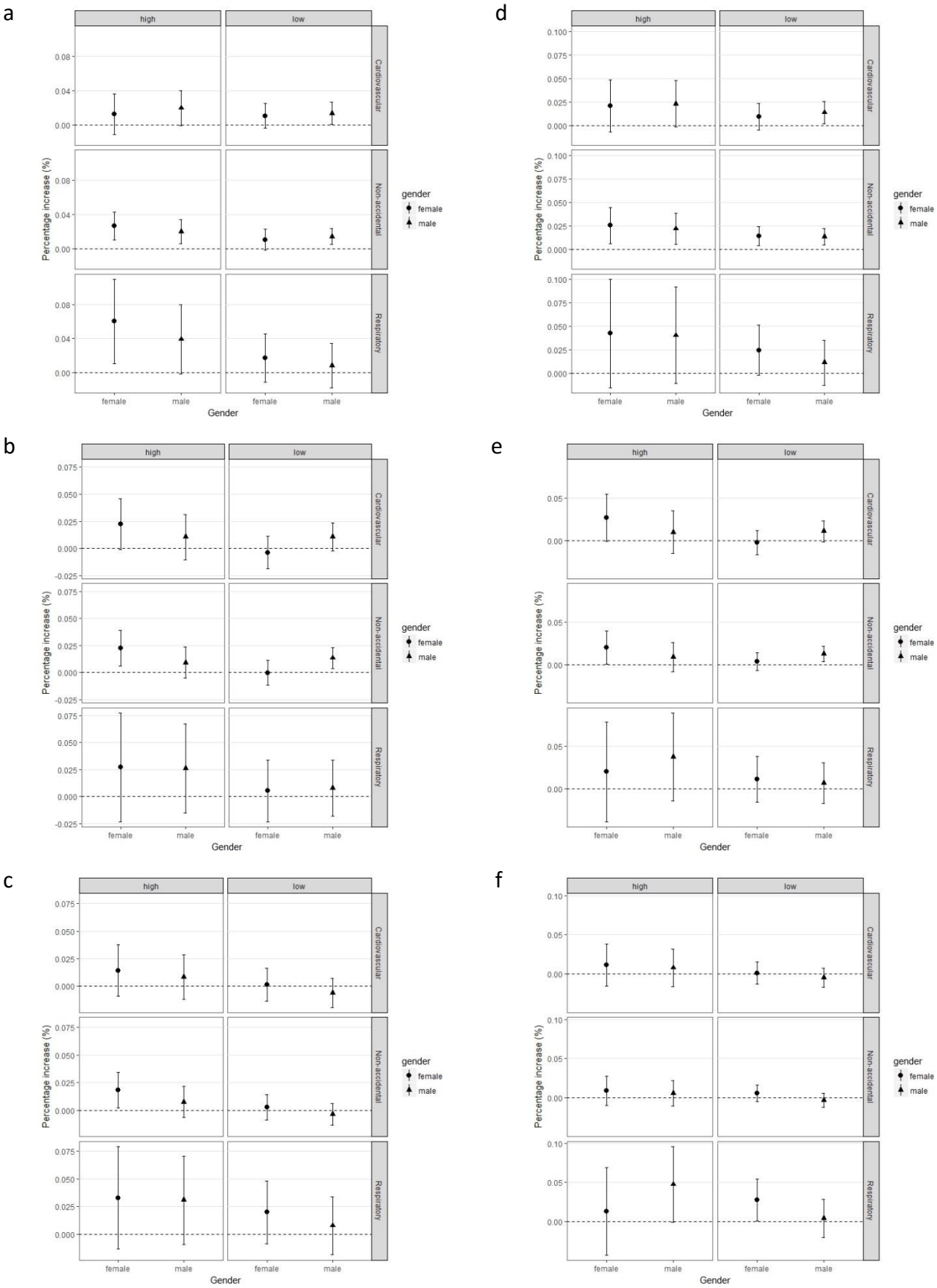

Fig.S6. Estimates of percent change in daily mortality per 10μg/m^3 increase in PM_{10} concentration in different gender groups. (Figures is shown over lag 0 to 14 for daily mean temperature, a. lag0 for PM_{10},

b. lag1 for PM_{10}, c. lag2 for PM_{10}, using the cut-off 15.9℃; d. lag0 for PM_{10}, e. lag1 for PM_{10}, f. lag2 for PM_{10}, using the cut-off 20℃.)

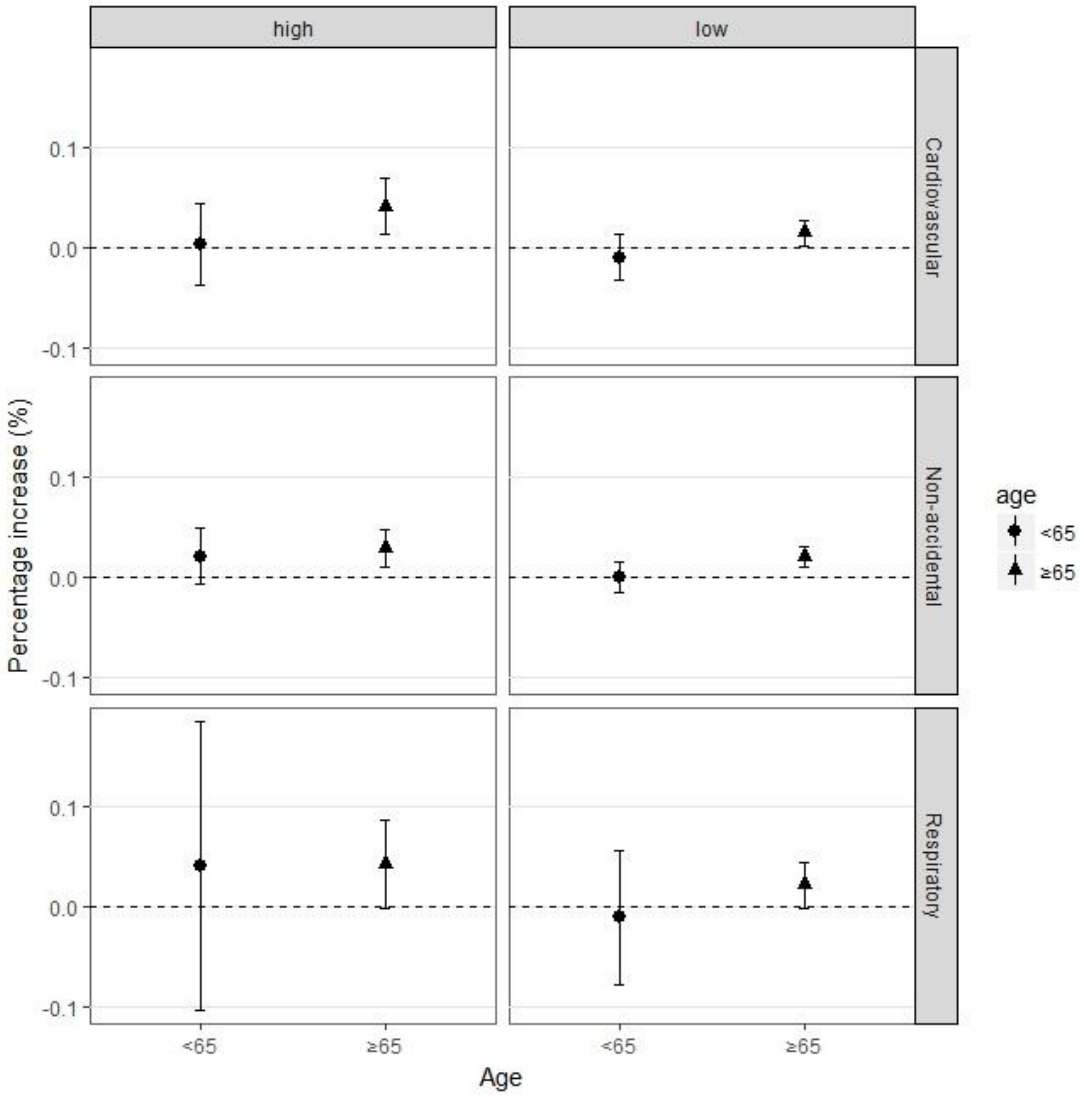

Fig.S7. Estimates of percent change in daily mortality per 10μg/m^3 increase in PM_{10} concentration in different age groups. (Figures is shown over lag 0 to 14 for daily mean temperature and lag 0 to 1 for PM_{10}, using the cut-off 20℃.)

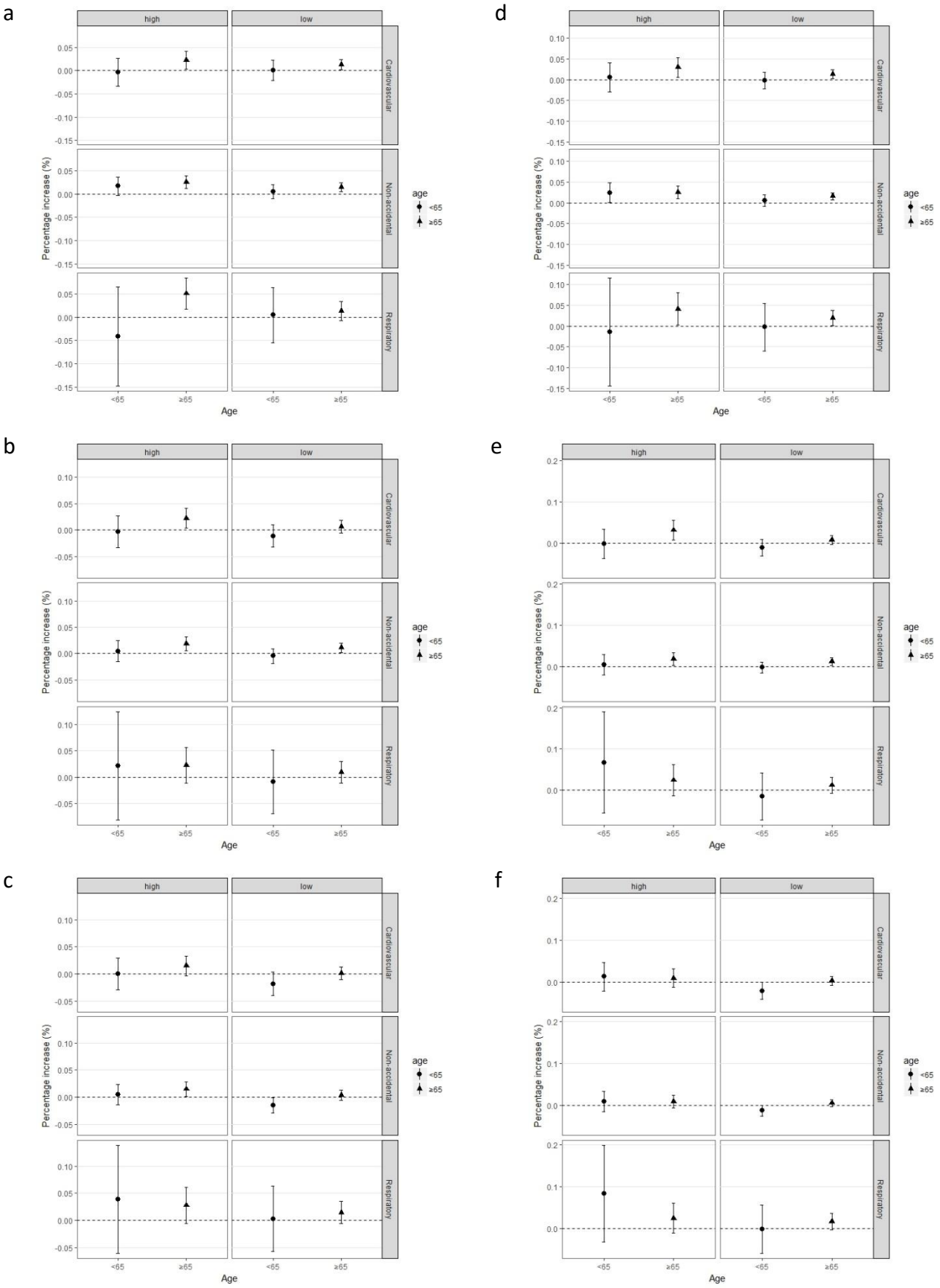

Fig.S8. Estimates of percent change in daily mortality per 10μg/m^3 increase in PM_{10} concentration in different age groups. (Figures is shown over lag 0 to 14 for daily mean temperature, a. lag0 for PM_{10}, b.

lag1 for PM_{10}, c. lag2 for PM_{10}, using the cut-off 15.9℃; d. lag0 for PM_{10}, e. lag1 for PM_{10}, f. lag2 for PM_{10}, using the cut-off 20℃.)