Respiratory Effects of Fine and Ultrafine Particles from Indoor Sources—A Randomized Sham-Controlled Exposure Study of Healthy Volunteers

Table S1. Mean effect estimates and 95% Confidence Intervall (CI) for changes (difference) associated with an increase in particulate metrics post 4 h and 24 h post exposure and for different exposure scenarios for PMC, PSC and PNC. Changes refer to an increase of 10 µg/m^3 (PMC), 100 µm^2/cm^3 (PSC) and 10,000.

Lung Function Measure	Exposure Scenario	PMC						PSC		PNC	
		PM$_{10}$		PM$_{2.5}$		PM$_1$				<100 nm	
		Mean (95%-CI)		Mean (95%-CI)		Mean (95%-CI)		Mean (95%-CI)		Mean (95%-CI)	
		Post 4 h	Post 24 h	Post 4 h	Post 24 h	Post 4 h	Post 24 h	Post 4 h	Post 24 h	Post 4 h	Post 24 h
FEV$_1$ (mL)	**Candle burning**										
	crude model	7 (−1; 15)	5 (−3; 13)	8 (0; 16)	5 (−3; 13)	8 (0; 16)	5 (−3; 13)	2 (0; 3)	1 (−1; 2)	0 (0; 0)	0 (0; 0)
	model 1	−3 (−19; 13)	−5 (−21; 11)	−2 (−18; 14)	−4 (−20; 12)	(−16; 16)	−3 (−19; 13)	−1 (−4; 2)	−2 (−5; 1)	0 (−1; 1)	0 (−1; 0)
	model 2	−8 (−24; 8)	−10 (−26; 6)	−7 (−23; 9)	−10 (−28; 8)	−6 (−22; 10)	−8 (−24; 8)	−1 (−4; 2)	−2 (−5; 1)	0 (−1; 1)	0 (−1; 0)
	full model *	−18 (−40; 4)	−19 (−41; 3)	−19 (−43; 5)	−20 (−44; 4)	−22 (−47; 3)	−23 (−48; 2)	**−13 (−20; −6)**	**−13 (−20; −6)**	−1 (−2; 1)	−1 (−2; 1)
	Toasting bread										
	crude model	0 (−2; 2)	0 (−2; 2)	4 (−2; 10)	2 (−4; 8)	**11 (1; 21)**	10 (0; 20)	**3 (1; 5)**	2 (0; 4)	1 (0; 1)	0 (0; 1)
	model 1	0 (−2; 2)	−1 (−3; 1)	0 (−6; 6)	−2 (−8; 4)	6 (−8; 20)	5 (−9; 19)	**4 (1; 7)**	3 (0; 6)	1 (0; 2)	1 (0; 2)
	model 2	0 (−2; 2)	0 (−2; 2)	1 (−5; 7)	−1 (−7; 5)	5 (−9; 19)	4 (−10; 18)	3 (0; 7)	3 (−1; 6)	1 (0; 2)	1 (0; 2)
	full model	0 (−2; 2)	0 (−8; 8)	1 (−5; 7)	−2 (−16; 12)	−6 (−26; 14)	−7 (−27; 13)	−2 (−10; 5)	−3 (−10; 5)	1 (−2; 4)	1 (−2; 4)
	Frying sausages										
	crude model	0 (−2; 2)	1 (−1; 3)	0 (−4; 4)	1 (−3; 5)	1 (−3; 5)	2 (−2; 6)	1 (−2; 3)	0 (−2; 3)	0 (−1; 2)	0 (−1; 2)
	model 1	1 (−3; 5)	1 (−3; 5)	1 (−3; 5)	2 (−2; 6)	1 (−3; 5)	3(−1; 7)	1 (−2; 4)	1 (−2; 4)	2 (−1; 4)	1 (−1; 4)
	model 2	1 (−3; 5)	2 (−2; 6)	1 (−3; 5)	2 (−2; 6)	1 (−3; 5)	3 (−1; 7)	1 (−2; 5)	1 (−2; 5)	2 (−1; 4)	2 (−1; 4)
	full model	−3 (−7; 1)	−2 (−8; 4)	−6 (−12; 0)	−5 (−13; 3)	−5 (−13; 3)	−3 (−11; 5)	−1 (−6; 4)	0 (−5; 5)	0 (−5; 5)	0 (−5; 6)
FVC (mL)	**Candle burning**										
	crude model	8 (−2; 18)	7 (−3; 17)	9 (−1; 19)	8 (−2; 18)	9 (−1; 19)	8 (−2; 18)	2 (0; 4)	0 (−2; 2)	0 (0; 0)	0 (0; 0)
	model 1	8 (−10; 26)	7 (−11; 25)	10 (−8; 28)	9 (−9; 27)	11 (−7; 29)	10 (−8; 28)	0 (−3; 4)	−1 (−4; 3)	0 (0; 1)	0 (−1; 0)
	model 2	1 (−17; 19)	0 (−18; 18)	2 (−18; 22)	1 (−19; 21)	5 (−13; 23)	3 (−17; 23)	1 (−3; 4)	−1 (−4; 3)	0 (−1; 1)	0 (−1; 1)
	full model	−13 (−38; 12)	−12 (−39; 15)	−12 (−39; 15)	−11 (−38; 16)	−13 (−44; 18)	−12 (−43; 19)	**−9 (−18; −1)**	**−10 (−18; −1)**	−1 (−3; 0)	−1 (−3; 0)

Table S1. *Cont.*

Lung Function Measure	Exposure Scenario	PMC						PSC		PNC	
		PM$_{10}$		PM$_{2.5}$		PM$_1$				<100 nm	
		Mean (95%-CI)		Mean (95%-CI)		Mean (95%-CI)		Mean (95%-CI)		Mean (95%-CI)	
		Post 4 h	Post 24 h	Post 4 h	Post 24 h	Post 4 h	Post 24 h	Post 4 h	Post 24 h	Post 4 h	Post 24 h
FVC (mL)	**Toasting bread**										
	crude model	0 (−2; 2)	−1 (−3; 1)	4 (−2; 10)	1 (−5; 7)	**14 (4; 24)**	**14 (4; 24)**	**3 (1; 5)**	2 (0; 5)	1 (0; 1)	0 (0; 1)
	model 1	0 (−2; 2)	−1 (−3; −1)	1 (−5; 7)	−1 (−7; 5)	**18 (4; 32)**	**17 (3; 31)**	**6 (3; 9)**	**6 (2; 9)**	2 (1; 3)	2 (1; 3)
	model 2	0 (−2; 2)	−1 (−3; −1)	2 (−6; 10)	−1 (−9; 7)	15 (−1; 31)	14 (−2; 30)	**6 (2; 9)**	**5 (1; 8)**	2 (1; 3)	2 (1; 3)
	full model	0 (−2; 2)	−2 (−10; 6)	1 (−7; 9)	−2 (−16; 12)	0 (−22; 22)	0 (−21; 19)	1 (−7; 9)	1 (−7; 8)	1 (−2; 4)	1 (−2; 4)
	Frying sausages										
	crude model	0 (−2; 2)	0 (−2; 2)	0 (−4; 4)	0 (−4; 4)	1 (−3; 5)	0 (−4; 4)	0 (−2; 3)	−1 (−3; 1)	0 (−1; 2)	−1 (−2; 1)
	model 1	0 (−2; 2)	0 (−2; 2)	1 (−3; 5)	0 (−4; 4)	1 (−3; 5)	1 (−3; 5)	0 (−3; 3)	−1 (−4; 2)	0 (−3; 2)	−1 (−3; 1)
	model 2	0 (−2; 2)	0 (−2; 2)	0 (−4; 4)	0 (−4; 4)	1 (−3; 5)	1 (−3; 5)	0 (−2; 3)	−1 (−4; 2)	0 (−2; 2)	−1 (−3; 1)
	full model	2 (−2; 6)	1 (−3; 5)	3 (−3; 9)	2 (−4; 8)	5 (−1; 11)	4 (−4; 12)	3 (−1; 7)	2 (−3; 7)	4 (−1; 8)	3 (−2; 8)
FEV$_1$/FVC (%); Percentage Point * 1000	**Candles burning**										
	crude model	0 (−2; 2)	0 (−2; 2)	0 (−2; 2)	0 (−2; 2)	0 (−2; 2)	0 (−2; 2)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)
	model 1	−2 (−4; 0)	−2 (−4; 0)	−2 (−4; 0)	−2 (−4; 0)	−2 (−4; 0)	−2 (−4; 0)	0 (−1; 0)	0 (−1; 0)	0 (0; 0)	0 (0; 0)
	model 2	−2 (−4; 0)	−2 (−4; 0)	−2 (−4; 0)	−2 (−4; 0)	−2 (−4; 0)	−2 (−4; 0)	0 (−1; 0)	0 (−1; 0)	0 (0; 0)	0 (0; 0)
	full model	−2 (−6; 2)	−3 (−7; 1)	−3 (−7; 1)	−3 (−7; 1)	−3 (−7; 1)	−4 (−8; 0)	−1 (−2; 0)	1 (−2; 0)	0 (0; 0)	0 (0; 0)
	Toasting bread										
	crude model	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (−2; 2)	0 (−2; 2)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)
	model 1	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	−2 (−4; 0)	2 (−4; 0)	0 (−1; 0)	0 (−1; 0)	0 (0; 0)	0 (0; 0)
	model 2	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	2 (−4; 0)	2 (−4; 0)	0 (−1; 0)	0 (−1; 0)	0 (0; 0)	0 (0; 0)
	full model	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (−2; 2)	−1 (−3; 1)	−1 (−3; 1)	−1 (−2; 0)	−1 (−2; 0)	0 (0; 0)	0 (0; 0)

Table S1. *Cont.*

Lung Function Measure	Exposure Scenario	PMC						PSC		PNC	
		PM$_{10}$		PM$_{2.5}$		PM$_{1}$				<100 nm	
		Mean (95%-CI)		Mean (95%-CI)		Mean (95%-CI)		Mean (95%-CI)		Mean (95%-CI)	
		Post 4 h	Post 24 h	Post 4 h	Post 24 h	Post 4 h	Post 24 h	Post 4 h	Post 24 h	Post 4 h	Post 24 h
FEV$_1$/FVC (%); Percentage Point * 1000	**Frying sausages**										
	crude model	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 1)	0 (0; 0)	0 (0; 0)
	model 1	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 1)	0 (0; 1)	0 (0; 1)	0 (0; 1)
	model 2	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	0 (0;0)	0 (0; 1)	0 (0; 1)	0 (0; 1)	0 (0; 1)
	full model	−1 (−1; −1)	−1 (−1; −1)	−2 (−4; 0)	−2 (−4; 0)	−2 (−4; 0)	−2 (−4; 0)	−1 (−2; 0)	0 (−1; 0)	−1 (−2; 0)	−1 (−1; 0)
MEF$_{25\%-75\%}$ (mL/s)	**Candles burning**										
	crude model	9 (−7; 25)	−3 (−19; 13)	10 (−6; 26)	−2 (−18; 14)	10 (−6; 26)	−2 (−20; 16)	2 (−1; 6)	1 (−3; 4)	0 (0; 1)	0 (0; 1)
	model 1	−9 (−40; 22)	−21 (−52; 10)	−8 (−39; 23)	−21 (−52; 10)	−7 (−38; 24)	−19 (−50; 12)	−1 (−7; 5)	−3 (−9; 4)	0 (−1; 2)	0 (−1; 1)
	model 2	−17 (−50; 16)	−29 (−62; 4)	−17 (−50; 16)	−29 (−64; 6)	−15 (−48; 18)	−27 (−60; 6)	−1 (−8; 5)	−3 (−9; 4)	0 (−1; 2)	0 (−1; 2)
	full model	−23 (−70; 24)	−37 (−84; 10)	−26 (−75; 23)	−39 (−88; 10)	−31 (−84; 22)	−45 (−100; 10)	−13 (−28;2)	−14 (−29;1)	1 (−2; 4)	1 (−2; 4)
	Toasting bread										
	crude model	1 (−3; 5)	0 (−4; 4)	5 (−5; 15)	0 (−10; 10)	11 (−7; 29)	2 (−16; 20)	3 (−1; 7)	1 (−3; 5)	1 (0; 2)	0 (0; 1)
	model 1	0 (−4; 4)	−1 (−5; 3)	−1 (−13; 11)	−6 (−18; 6)	−9 (−34; 16)	−18 (−43; 7)	0 (−5; 6)	−2 (−7; 4)	0 (−1; 2)	0 (−2; 2)
	model 2	0 (−4; 4)	−1 (−5; 3)	1 (−11; 13)	−4 (−16; 8)	−6 (−33; 21)	−12 (−39; 15)	1 (−5; 7)	0 (−6; 6)	1 (−1; 3)	1 (−1; 3)
	full model	1 (−3; 5)	0 (−14; 14)	1 (−11; 13)	−6 (−30; 18)	−14 (−49; 21)	−22 (−57; 13)	−8 (−22;6)	−9 (−23;5)	1 (−4; 6)	1 (−4; 6)
	Frying sausages										
	crude model	0 (−6; 6)	2 (−4; 8)	−1 (−9; 7)	1 (−7; 9)	0 (−8; 8)	2 (−8; 12)	0 (−5; 6)	1 (−4; 7)	1 (−3; 4)	1 (−3; 4)
	model 1	2 (−6; 10)	3 (−5; 11)	0 (−10; 10)	2 (−8; 12)	1 (−9; 11)	4 (−8; 16)	2 (−5; 9)	3 (−4; 10)	3 (−2; 9)	4 (−2; 9)
	model 2	2 (−6; 10)	3 (−5; 11)	0 (−10; 10)	2 (−8; 12)	1 (−9; 11)	4 (−8; 16)	2 (−5; 9)	3 (−4; 10)	4 (−2; 9)	4 (−1; 10)
	full model	**−11 (−21; −1)**	−8 (−20; 4)	**−23 (−37; −9)**	**−20 (−36;−4)**	**−22 (−38; −6)**	−19 (−39; 1)	−8 (−18; 3)	−5 (−17; 7)	−7 (−18; 5)	−5 (−17; 6)

Notes: model 1: adjusted for age, height and sex; model 2: adjusted for age, height, sex, temperature and humidity; full model: adjusted for age, height, sex, temperature, humidity, travel time and means of transportation; Abbreviations: FEV1: forced expiratory volume at 1 s, FVC: forced vital capacity, MEF$_{25\%-75\%}$: averaged forced expiratory flow between the full expiration of 25% and 75% of the total FVC, CI: confidence interval; marked in bold: effect estimates where CI did not include the null effect. PMC: particle mass concentration, PSC: particle surface concentration, PNC: particle number concentration, LDSA: lung deposited surface area.