

Online Data Supplement

Manuscript title:

Quantification of aerosol dispersal from suspected aerosol generating procedures

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Tables

Table E1. *Statistical pairwise comparisons between different experimental episodes of particle concentrations for all mesh sensors in number concentration per litre. 95% confidence intervals of the median differences are based on the bootstrap method, and the p-values are based on the Wilcoxon signed rank test. LF = LFNC, HF = HFNC.*

Sensor	C					B					A					
	Comparison	Median diff	Lower CI	Upper CI	p-value	Comparison	Median diff	Lower CI	Upper CI	p-value	Comparison	Median diff	Lower CI	Upper CI	p-value	
Sensor	Comparison	15.2	-125.2	135.4	0.748	Comparison	41.7	-53.8	131.4	0.314	Comparison	8.2	-13.2	111.2	0.227	
	HF - LF	19.9	-94.3	63.3	0.983	HF+cough - LF	21.1	-51.9	128.2	0.313	HF+cough - LF	99.5	-15.3	206.5	0.064	
	HF+cough - HF	94.9	6.3	112.3	0.179	HF+cough - HF	140.1	15.7	316.2	0.031	HF+cough - HF	104.3	-43.6	132.0	0.232	
	HF+cough - LF+cough	17.6	-50.2	114.5	0.573	HF+cough - LF+cough	-27.6	-194.8	49.7	0.227	HF+cough - LF+cough	-8.5	-131.6	58.1	0.445	
	HF - HF+mask	14.3	-54.9	108.6	0.313	HF - HF+mask	55.3	-25.3	117.9	0.079	HF - HF+mask	-23.1	-82.5	119.8	0.823	
	HF+cough - HF+mask+cough	51.7	-13.7	202.1	0.057	HF+cough - HF+mask+cough	-14.8	-47.5	74.8	0.940	HF+cough - HF+mask+cough	55.1	-149.4	106.9	0.911	
	HF+mask+cough - HF+mask	7.9	-22.7	44.5	0.709	HF+mask+cough - HF+mask	72.9	23.2	210.3	0.005	HF+mask+cough - HF+mask	125.2	-21.7	226.2	0.028	
	NIV - LF	2.7	-121.8	45.2	0.494	NIV - LF	95.2	-42.7	142.3	0.277	NIV - LF	-4.2	-82.9	40.2	0.778	
	NIV - HF	-13.5	-60.5	55.4	0.550	NIV - HF	-10.5	-91.3	114.0	0.881	NIV - HF	-31.2	-150.2	36.5	0.167	
	NIV+cough - NIV	4.7	-37.1	86.3	0.526	NIV+cough - NIV	-14.7	-153.0	56.9	0.184	NIV+cough - NIV	8.3	-26.9	61.6	0.575	
	LF+cough - NIV+cough	40.9	-25.9	53.1	0.184	LF+cough - NIV+cough	123.5	33.8	345.3	0.001	LF+cough - NIV+cough	63.8	20.8	128.4	0.044	
	HF+cough - NIV+cough	69.0	-8.0	182.2	0.145	HF+cough - NIV+cough	69.1	-29.0	136.5	0.070	HF+cough - NIV+cough	130.1	-15.4	231.5	0.126	
	Sensor	F					E					D				
		Comparison	28.4	-110.7	145.1	0.629	Comparison	0.5	-119.7	92.1	0.687	Comparison	-7.2	-99.2	222.6	0.658
		HF-LF	62.4	-2.5	109.3	0.078	HF-LF	93.8	10.9	261.4	0.064	HF-LF	86.2	-6.5	338.9	0.039
HF+cough - LF		9.6	-55.1	276.4	0.232	HF+cough - LF	97.7	53.9	204.0	0.004	HF+cough - LF	9.4	-62.2	89.1	0.970	
HF+cough - HF		25.5	-23.3	94.5	0.355	HF+cough - HF	51.9	-68.8	226.9	0.520	HF+cough - HF	-35.5	-327.6	20.4	0.049	
HF+cough - LF+cough		-62.1	-199.4	34.3	0.247	HF+cough - LF+cough	-18.6	-313.8	46.0	0.117	HF+cough - LF+cough	15.6	-23.5	88.6	0.218	
HF - HF+mask		-4.4	-41.1	121.9	0.852	HF - HF+mask	27.3	-27.2	188.2	0.191	HF - HF+mask	18.5	-24.8	90.6	0.204	
HF+cough - HF+mask+cough		-49.7	-113.9	87.7	0.823	HF+cough - HF+mask+cough	-55.8	-137.2	28.4	0.279	HF+cough - HF+mask+cough	-10.6	-55.0	49.2	0.737	
HF+mask+cough - HF+mask		18.2	-54.9	133.4	0.243	HF+mask+cough - HF+mask	25.1	-56.7	127.6	0.520	HF+mask+cough - HF+mask	-29.2	-81.1	2.8	0.212	
NIV - LF		0.0	-50.1	164.2	0.627	NIV - LF	17.8	-32.8	87.0	0.204	NIV - LF	-64.0	-235.4	17.9	0.079	
NIV - HF		-37.1	-169.7	35.6	0.247	NIV - HF	60.1	-72.2	130.8	0.455	NIV - HF	38.7	-24.3	105.9	0.156	
NIV+cough - NIV		35.0	-19.2	133.6	0.049	NIV+cough - NIV	-16.8	-59.3	122.6	0.872	NIV+cough - NIV	184.8	28.8	401.6	0.027	
LF+cough - NIV+cough		50.2	4.7	183.1	0.030	LF+cough - NIV+cough	10.3	-49.6	132.1	0.433	LF+cough - NIV+cough	44.6	-46.4	174.8	0.296	
HF+cough - NIV+cough		H					I					G				
Comparison		43.6	-66.6	163.0	0.314	Comparison	11.5	-22.4	46.6	0.355	Comparison	13.7	-37.6	138.2	0.376	
HF-LF	40.9	-59.3	206.7	0.306	HF-LF	25.2	-25.9	118.5	0.306	HF-LF	38.7	-26.6	152.6	0.231		
HF+cough - LF	10.4	-95.8	65.8	0.940	HF+cough - LF	6.8	-73.2	57.5	0.794	HF+cough - LF	-17.4	-61.8	37.8	0.526		
HF+cough - HF	44.6	-195.7	21.3	0.084	HF+cough - HF	-51.3	-132.0	-18.4	0.059	HF+cough - HF	-54.3	-138.5	45.2	0.376		
HF+cough - LF+cough	-10.7	-93.5	26.9	0.526	HF+cough - LF+cough	23.8	-71.4	87.5	0.823	HF+cough - LF+cough	7.4	-65.8	111.3	0.627		
HF - HF+mask	-29.9	-82.3	6.2	0.204	HF - HF+mask	22.9	-42.2	94.7	0.658	HF - HF+mask	8.7	-25.1	102.8	0.601		
HF+cough - HF+mask+cough	20.7	-54.1	124.4	0.627	HF+cough - HF+mask+cough	-11.7	-44.1	37.8	1.000	HF+cough - HF+mask+cough	5.4	-33.4	116.3	0.455		
HF+mask+cough - HF+mask	5.1	-93.8	56.9	0.904	HF+mask+cough - HF+mask	29.0	-23.1	63.9	0.546	HF+mask+cough - HF+mask	0.6	-53.1	54.8	0.809		
NIV - LF	-8.9	-76.8	55.8	0.627	NIV - LF	-18.2	-77.0	14.3	0.167	NIV - LF	-47.9	-78.3	42.5	0.263		
NIV - HF	-2.4	-60.3	77.8	0.970	NIV - HF	14.9	-49.5	69.7	0.709	NIV - HF	-24.5	-51.0	27.7	0.411		
NIV+cough - NIV	18.1	-11.7	173.8	0.070	NIV+cough - NIV	45.2	-42.7	125.4	0.212	NIV+cough - NIV	35.6	-8.4	160.7	0.091		
LF+cough - NIV+cough	22.0	-37.8	87.0	0.391	LF+cough - NIV+cough	18.7	-45.9	89.3	0.654	LF+cough - NIV+cough	38.1	-4.1	113.0	0.086		

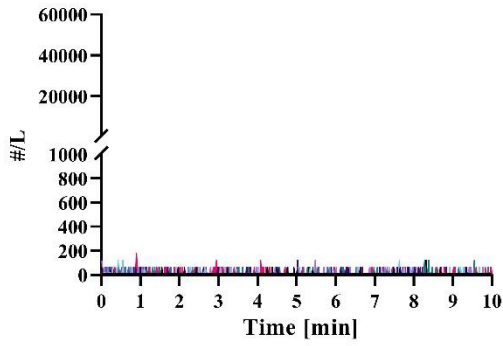
Table E2. Estimates of change in particle concentration (number/litre) per minute for all episodes, based on the measurements from all mesh sensors. LF = LFNC, HF = HFNC.

Sensor	C				B				A			
Episode	Estimate	Lower CI	Upper CI	p-value	Estimate	Lower CI	Upper CI	p-value	Estimate	Lower CI	Upper CI	p-value
LF	2.7	-27.1	32.6	0.86	20.6	-5.5	46.8	0.12	7.7	-8.5	23.8	0.35
LF+cough	9.4	-33.3	52.1	0.66	42.5	-3.9	88.9	0.07	16.3	-27.6	60.3	0.46
HF	-7.7	-36.3	21.0	0.60	-6.3	-32.5	19.9	0.64	-27.9	-52.7	-3.0	0.03
HF+ cough	14.4	-22.2	51.0	0.44	25.3	-23.3	74.0	0.31	6.5	-33.5	46.6	0.75
HF+mask	-2.9	-17.1	11.3	0.69	-7.5	-20.3	5.3	0.25	8.4	-4.0	20.8	0.18
HF+mask+cough	3.7	-7.3	14.7	0.51	-6.3	-40.8	28.2	0.72	13.6	-19.4	46.7	0.42
NIV	-1.0	-16.3	14.3	0.90	-1.5	-22.9	19.8	0.89	0.3	-10.1	10.6	0.96
NIV+cough	-4.5	-35.0	26.1	0.77	-7.9	-20.6	4.8	0.22	10.2	-11.1	31.5	0.35

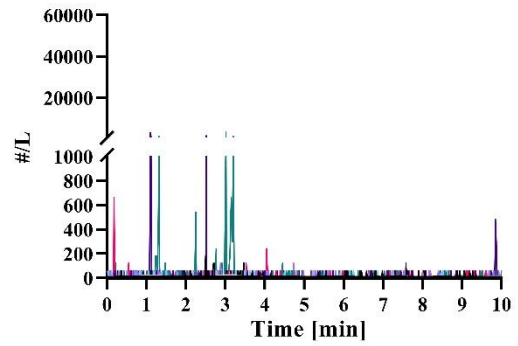
Sensor	F				E				D			
Episode	Estimate	Lower CI	Upper CI	p-value	Estimate	Lower CI	Upper CI	p-value	Estimate	Lower CI	Upper CI	p-value
LF	-12.3	-33.9	9.2	0.26	9.0	-22.6	40.7	0.57	-16.2	-41.8	9.3	0.21
LF+cough	27.2	-6.7	61.0	0.11	30.1	-15.5	75.7	0.19	22.9	-19.9	65.7	0.29
HF	-7.7	-26.0	10.6	0.41	-5.5	-14.0	2.9	0.20	-4.9	-27.9	18.1	0.68
HF+ cough	26.5	-11.9	64.9	0.18	37.3	-12.1	86.7	0.14	15.8	-4.1	35.7	0.12
HF+mask	2.0	-37.5	41.4	0.92	20.1	-18.1	58.2	0.30	-3.5	-24.4	17.4	0.74
HF+mask+cough	12.6	-22.3	47.6	0.48	-5.7	-27.7	16.3	0.61	5.0	-10.1	20.0	0.52
NIV	-4.6	-35.9	26.8	0.77	-21.9	-57.4	13.6	0.23	-3.2	-14.8	8.3	0.58
NIV+cough	-6.9	-33.1	19.2	0.60	2.3	-34.3	39.0	0.90	-7.1	-24.5	10.3	0.42

Sensor	H				I				G			
Episode	Estimate	Lower CI	Upper CI	p-value	Estimate	Lower CI	Upper CI	p-value	Estimate	Lower CI	Upper CI	p-value
LF	-5.6	-16.0	4.9	0.30	-7.6	-23.1	8.0	0.34	-9.4	-21.8	3.0	0.14
LF+cough	22.9	-7.0	52.8	0.13	21.3	-1.8	44.5	0.07	21.0	-9.2	51.1	0.17
HF	8.6	-11.3	28.5	0.39	12.9	-10.7	36.5	0.28	21.8	-1.2	44.8	0.06
HF+ cough	19.7	-10.2	49.6	0.19	15.3	-4.9	35.5	0.14	9.6	-8.7	27.9	0.30
HF+mask	-1.4	-27.6	24.7	0.91	-2.3	-30.9	26.3	0.87	-8.9	-27.7	9.9	0.35
HF+mask+cough	-10.6	-31.9	10.7	0.33	7.3	-8.4	23.1	0.36	-0.4	-21.9	21.0	0.97
NIV	-7.3	-20.8	6.2	0.29	-6.0	-21.2	9.3	0.44	-8.0	-33.6	17.6	0.54
NIV+cough	8.7	-2.3	19.8	0.12	-3.2	-30.0	23.5	0.81	-8.8	-25.2	7.6	0.29

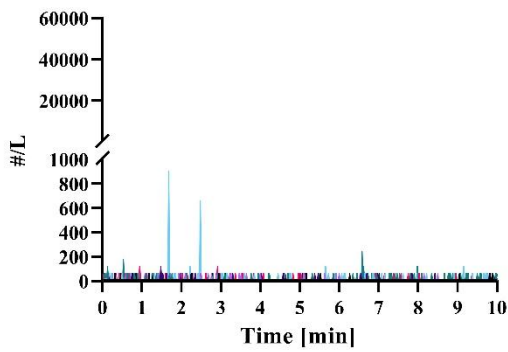
LFNC



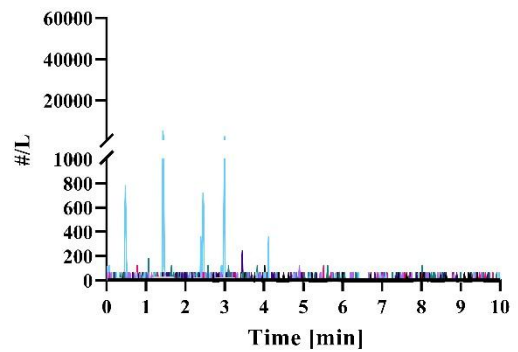
HFNC



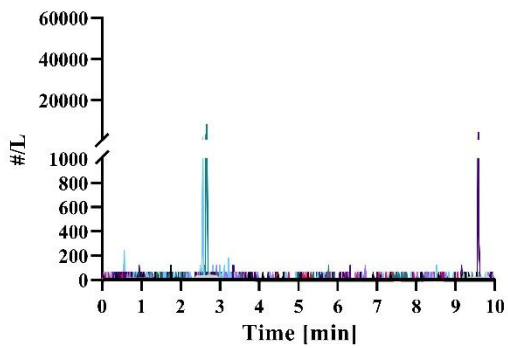
LFNC + cough



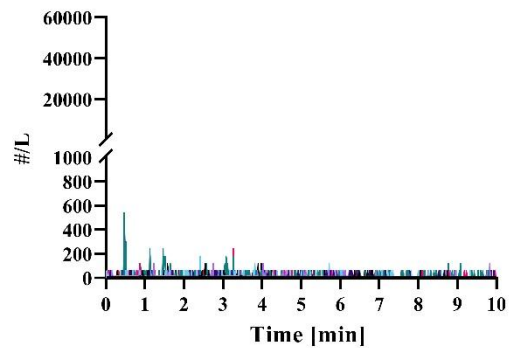
HFNC+ cough



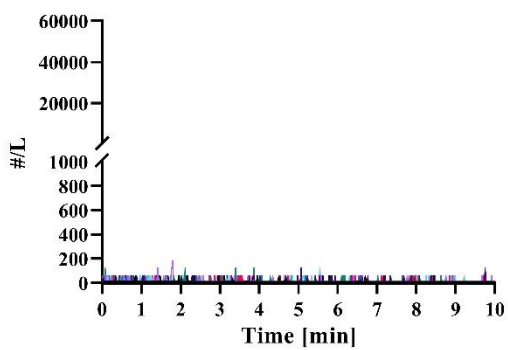
HFNC + mask



HFNC + mask + cough



NIV



NIV + cough

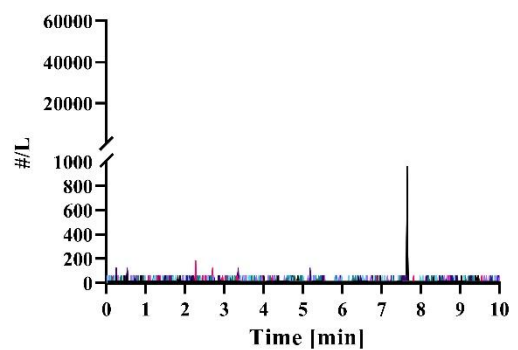


Figure E1. Raw data (particles per litre of air $>5 \mu\text{m}$) from 20 participants measured with the breathing zone single sensor (APS 3321) for each of the 10-minute durations of the 8 episodes in the experiments. The black and grey lines show the median and mean respectively, of smoothed (moving mean with a 30 second window) time series from each experiment.

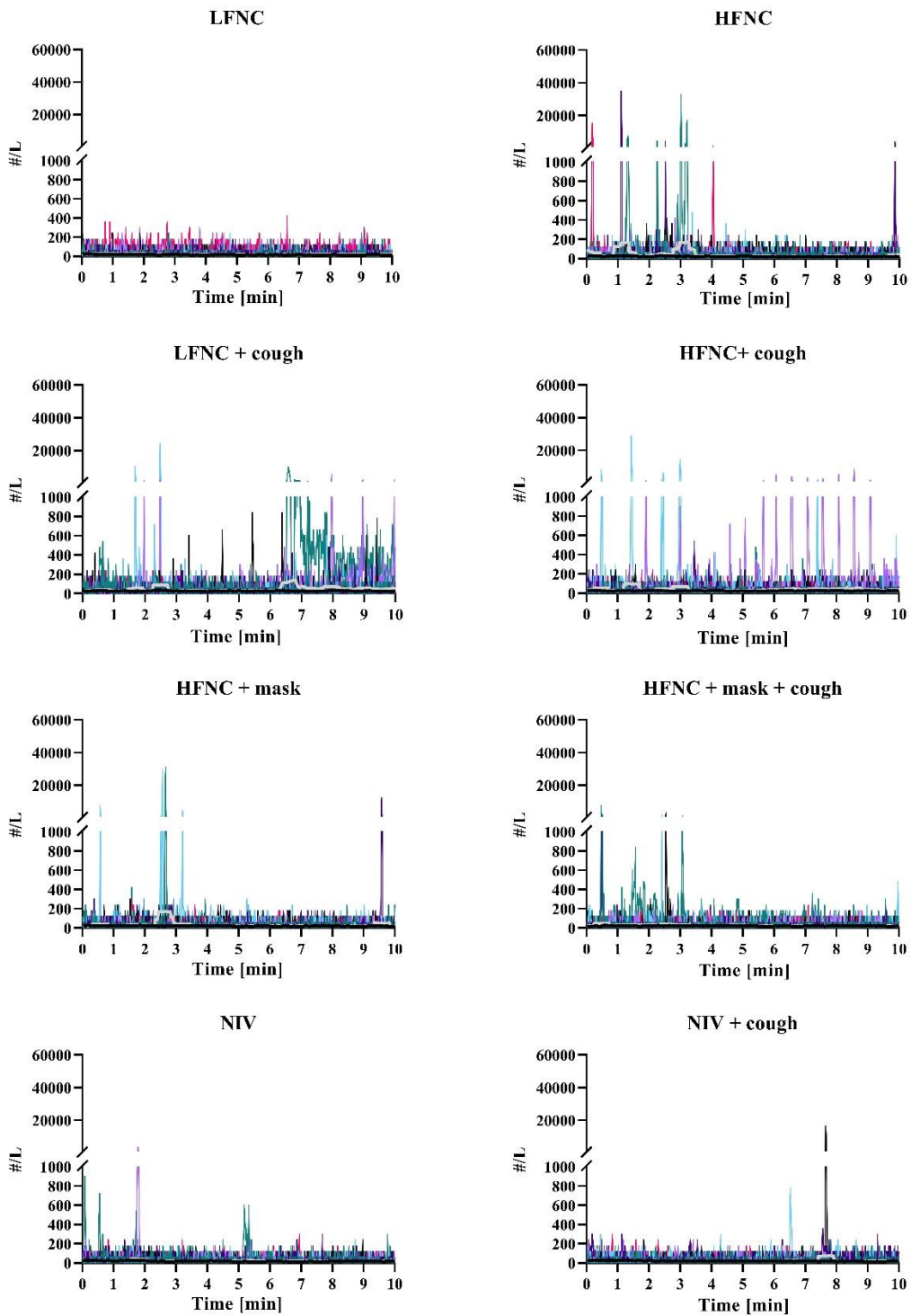


Figure E2. Raw data (particles per litre of air $> 1 \mu\text{m}$ & $\leq 5 \mu\text{m}$) from 20 participants measured with the breathing zone single sensor (APS 3321) for each of the 10-minute durations of the 8 episodes in the experiments. The black and grey lines show the median and mean respectively, of smoothed (moving mean with a 30 second window) time series from each experiment.

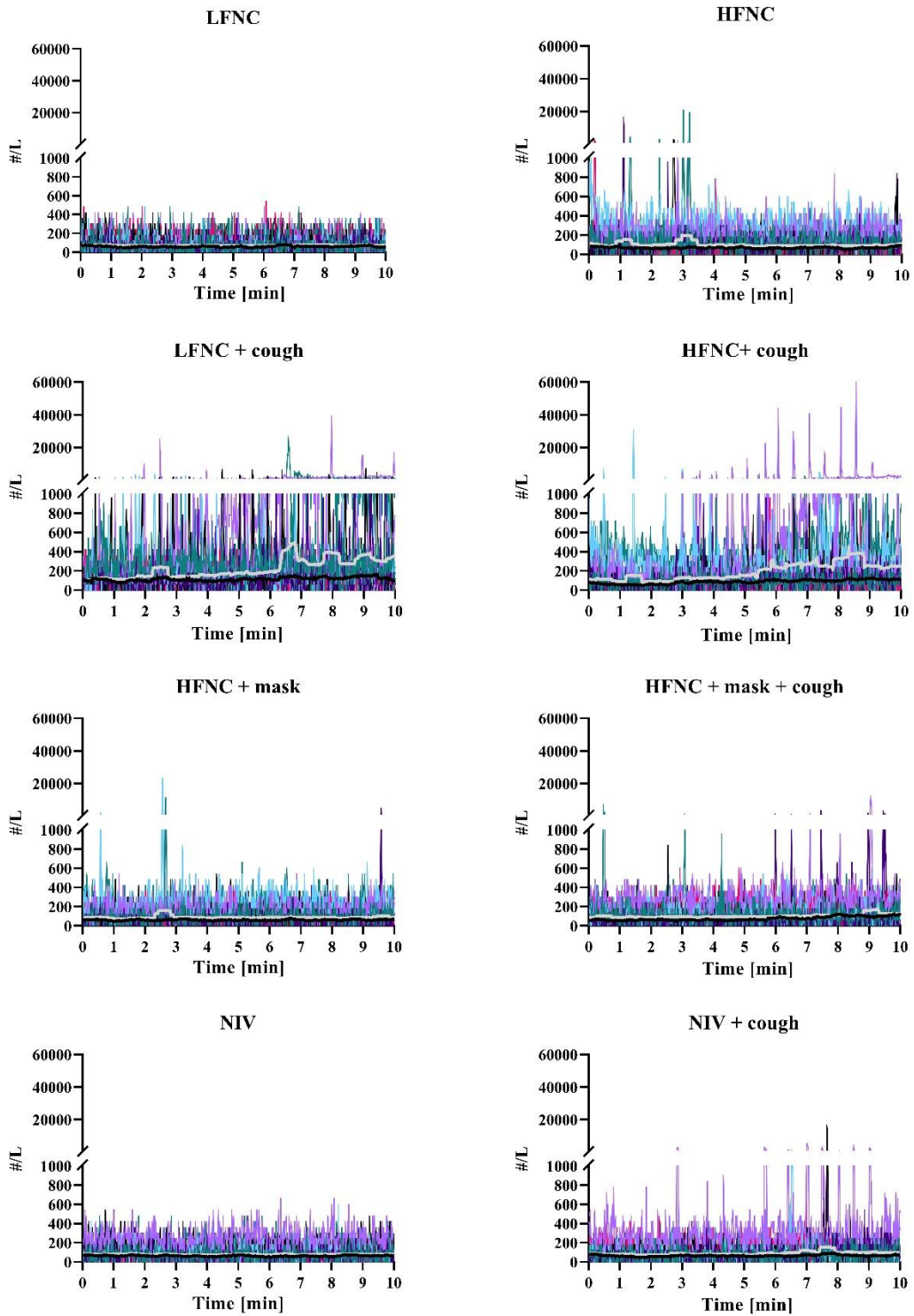


Figure E3. Raw data (particles per litre of air $\leq 1.0 \mu\text{m}$) from 20 participants measured with the breathing zone single sensor (APS 3321) for each of the 10-minute durations of the 8 episodes in the

experiments. The black and grey lines show the median and mean respectively, of smoothed (moving mean with a 30 second window) time series from each experiment.