Research Report 192, Pt 1

Multicenter Ozone Study in oldEr Subjects (MOSES): Part 1. Effects of Exposure to Low Concentrations of Ozone on Respiratory and Cardiovascular Outcomes

Mark W. Frampton et al.

Appendix A. Missing Data and Distribution Statistics for MOSES Outcomes Across All Exposures

This Appendix was reviewed solely for spelling, grammar, and

cross-references to the main text. It has not been formatted or fully edited by HEI.

This document was reviewed by the HEI MOSES Review Panel.

Correspondence may be addressed to Dr. Mark W. Frampton, Pulmonary & Critical Care, University of Rochester Medical Center, 601 Elmwood Ave., Box 692, Rochester, NY 14642-8692; e-mail: *mark_frampton@urmc.rochester.edu*.

Although this document was produced with partial funding by the United States Environmental Protection Agency under Assistance Award CR–83467701 to the Health Effects Institute, it has not been subjected to the Agency's peer and administrative review and therefore may not necessarily reflect the views of the Agency, and no official endorsement by it should be inferred. The contents of this document also have not been reviewed by private party institutions, including those that support the Health Effects Institute; therefore, it may not reflect the views or policies of these parties, and no endorsement by them should be inferred.

Table A.1. Missing Data and Distribution Statistics for MOSES Outcomes Across All Exposures

Outcome	*N*	Missing	Mean	STD	Minimum	25th Percentile	Median	75th Percentile	Maximum
HF, 5 min avg (ms^2)	1012	32	941.6	3662.4	1.9	75.7	191.8	450.5	49486.0
LF, 5 min avg (ms^2)	1012	32	605.0	1045.9	2.2	132.8	283.5	619.4	15703.5
Ln of RMSSD, 24 hr avg (ms)	258	3	3.256	0.469	1.946	2.996	3.219	3.497	4.736
LF/HF, 5 min avg	1012	32	2.51	3.70	0.03	0.68	1.47	2.91	45.81
RMSSD, 5 min avg (ms)	1012	32	29.4	22.8	2.0	16.0	23.0	35.0	175.0
SDNN, 5 min avg (ms)	1012	32	53.2	43.5	6.0	31.0	41.0	60.0	366.0
SDNN, 24 hr avg (ms)	258	3	155.2	36.7	78.0	128.0	151.0	176.0	339.0
HR 5 min avg (beats/min)	1012	32	66.5	9.3	42.9	60.0	65.6	72.5	104.0
Ln of HF, 24 hr avg (ms^2)	258	3	5.443	1.080	3.069	4.748	5.360	5.966	9.781
Ln of LF, 24 hr avg (ms^2)	258	3	6.349	0.768	4.001	5.915	6.378	6.824	8.702
HR, 24 hr avg (beats/min)	258	3	70.7	8.1	47.8	65.4	71.5	75.6	93.8
T-wave amplitude, 5 min avg (μV)	1012	32	725.6	315.7	134.9	506.9	648.2	898.8	2089.3
T-wave amplitude, 24 hr avg (μV)	258	3	650.8	276.8	188.2	459.4	599.3	799.1	1792.1
QTc, 5 min avg (ms)	1012	32	422.4	18.1	370.0	411.0	421.0	435.0	503.0
ST in V2, 5 min avg (μV)	1012	32	97.8	65.2	-9.0	54.0	81.0	121.5	500.0
ST in V2, 24 hr avg (μV)	258	3	81.1	55.3	-7.0	46.0	66.0	93.0	372.0
ST in V5, 5 min avg (μV)	1012	32	28.4	36.5	-68.0	3.0	25.0	48.0	200.0
ST in V5, 24 hr avg (μV)	258	3	23.6	36.3	-61.0	-1.0	21.0	40.0	179.0
ST in lead II, 5 min avg (μV)	1012	32	37.4	43.0	-81.0	9.0	32.0	61.0	191.0
ST in lead II, 24 hr avg (μV)	258	3	29.9	41.7	-72.0	3.0	25.0	51.0	176.0
CRP (mg/L)*	768	15	2.72	3.64	0.05	0.63	1.49	3.27	23.10
IL-6 (pg/mL)*	768	15	3.10	2.80	1.00**	1.00	1.69	4.64	19.65
8-Isoprostane (pg/mL)*	768	15	60.22	29.56	16.00**	41.09	54.63	73.59	211.79
P-Selectin (ng/mL)*	768	15	73.11	118.08	2.93	33.41	50.58	76.22	2426.03
SBP (mmHg)	1044	0	111.8	10.9	85.0	105.0	111.0	118.0	153.0
DBP (mmHg)	1044	0	69.1	7.9	46.0	64.0	69.0	74.0	100.0
FMD % change	451	71	5.5	3.0	-1.4	3.2	5.0	7.6	19.8
VTI (cm)	502	20	76.2	25.1	17.1	58.0	74.5	92.2	156.1
BAD (mm)	485	37	3.45	0.69	2.22	2.94	3.32	3.96	5.12
ET-1 (pg/mL)*	768	15	1.22	0.42	0.41	0.96	1.15	1.38	4.32
Nitrotyrosine (nM)*	768	15	622.0	926.0	28.8	263.7	444.7	674.3	9961.9

Table A.1. Missing Data and Distribution Statistics for MOSES Outcomes Across All Exposures

Outcome	*N*	Missing	Mean	STD	Minimum	25th Percentile	Median	75th Percentile	Maximum
Fibrinogen (µg/mL)*	768	15	1551.2	1814.0	469.3	780.7	1026.3	1489.5	11880.0
WBC count (1000/µL)	770	13	5.7	1.6	2.7	4.6	5.5	6.5	12.9
Monocyte–platelet conjugate count	685	98	48.6	41.3	2.4	21.7	34.3	60.2	250.6
Activated platelet count	732	51	18172.0	19459.7	273.2	8477.8	12570.3	20711.5	322807.4
MP-TFA (pg/mL)***	766	17	0.146	0.174	0.000	0.024	0.090	0.195	1.253
Platelet MP count	726	57	4898.7	3297.3	416.3	2755.2	4293.6	5892.6	30109.1
Activated platelet MP count	726	57	697.0	635.1	10.1	347.2	560.3	839.9	8411.7
CD142+MP count	723	60	21001.5	36846.6	172.7	6548.3	11776.7	19732.6	406376.4
CD40 Ligand MP count	723	60	27982.2	45170.9	647.0	10099.1	16469.2	27269.6	455131.1
Platelet count (1000/µL)	761	22	231.5	55.8	37.0	192.0	229.0	266.0	460.0
vWF (ng/mL)*	768	15	22665.1	25751.3	1125.5	7034.5	13836.3	30063.9	323205.7
FEV_1 (L)	782	1	2.98	0.63	1.86	2.51	2.86	3.40	4.98
FVC (L)	782	1	3.93	0.87	2.39	3.19	3.75	4.58	6.76
FEV_1/FVC	782	1	76.3	4.7	62.5	73.3	76.2	79.6	89.5
FEF_{25-75} (L/sec)	782	1	2.59	0.80	1.01	1.99	2.51	3.09	5.95
CC16 (ng/mL)*	768	15	18.18	8.53	1.02	12.57	16.83	21.66	55.80
PMN % of total	185	76	51.3	22.2	0.0	36.5	52.4	68.2	92.6
Ln of PMN count/mg	184	77	6.4	2.2	-6.9	6.0	6.7	7.4	9.6
Ln of IL-6 (sputum) (pg/mL)	233	28	-0.53	2.10	-6.91	-1.08	-0.11	0.72	3.72
Ln of IL-8 (pg/mL)	234	27	4.75	1.96	-6.91	4.04	4.98	5.75	10.05
Ln of TNF-α (pg/mL)	234	27	-2.29	2.22	-6.91	-3.07	-1.75	-0.94	3.04
Ln of total protein (µg/mL)	233	28	5.51	1.00	1.76	4.87	5.49	6.18	10.24
V_E (L/min/m^2 BSA [BTPS])	260	1	16.2	1.7	11.1	15.1	16.0	17.1	25.1

*Lower limit of detection (LOD): CRP: 0.0014 (mg/L), N<LOD: 0; CC16: 0.48 (ng/mL), N<LOD: 0; ET-1: 0.087 (pg/mL), N<LOD: 0; fibrinogen: 0.320 (ug/mL), N<LOD: 0; IL-6: 1.0 (pg/mL), N<LOD: 310; 8-isoprostane: 16.0 (pg/mL), N<LOD: 23/768; nitrotyrosine: 25.8 (nM), N<LOD: 0; P-selectin: 2.4 (ng/mL), N<LOD: 0; vWF: 1118 (ng/mL), N<LOD: 0.

**Value was below the LOD and was assigned the LOD value.

***MP-TFA: 0.43 pg/mL; values below the LOD were retained. 9% of the values were above the LOD.

ABBREVATIONS AND OTHER TERMS

BAD	brachial artery diameter
BSA	body surface area
BTPS	body temperature, pressure saturated with water vapor
CC16	club cell protein 16
CD142+	tissue factor expressing microparticle
CRP	C-reactive protein
DPB	diastolic blood pressure
ET-1	endothelin 1
FEF_{25-75}	forced expiratory flow between 25 and 75% of FEV
FEV_1	forced expiratory volume in 1 second
FMD	flow-mediated dilation
FVC	forced vital capacity
HF	high frequency power (0.15–0.40 Hz)
HR	heart rate
IL-6	interleukin 6
IL-8	interleukin 8
LF	low frequency power (0.04–0.15 Hz)
Ln	natural logarithm
LOD	limit of detection
MOSES	Multicenter Ozone Study in oldEr Subjects

MP	microparticle
MP-TFA	microparticle-associated tissue factor activity
PMN	polymorphonuclear (leukocytes)
QTc	rate-corrected QT interval (based on QT:RR regression)
RMSSD	root mean square of successive differences in normal -to-normal sinus beat intervals
SBP	systolic blood pressure
SDNN	standard deviation of normal-to-normal sinus beat intervals
ST	ST segment
TNF-α	tumor necrosis factor alpha l
V_E	minute ventilation
VTI	velocity-time integral
vWF	von Willebrand factor
WBC	white blood cell