Contribution of AOD-PM$_{2.5}$ Surfaces to Respiratory-Cardiovascular Hospital Events in Urban and Rural Areas in Baltimore, Maryland, USA: New Analytical Method Correctly Identified True Positive Cases and True Negative Controls

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Supplemental File Table of Contents

Table S1: Comparison of Respiratory-Cardiovascular Chronic Disease Hospital Events for True Positive Cases, Identified as Elevated Odds Ratio (OR$^+$) Case Group and Higher Beta (ß$^+$) Case Group, or True Negative Controls, Identified as Not-Elevated OR$^-$ Case Group and Lower ß$^-$ Case Group, for AOD-PM$_{2.5}$ and PMB Fused Surfaces: All Grids.

OUTCOME[1]	SURFACE	OR[2]	OR$^-$	OR$^+$ (%)	ß$^-$	ß$^+$ (%)[3]
ED Asthma	PMB	1.021‡	11,102	238 (2.1)	11,094	246 (2.2)‡
	PMC	1.039‡	10,898	442 (3.9)	11,026	314 (2.8)‡
	PMCK	1.040‡	10,886	454 (4.0)	11,012	328 (2.9)‡
	PMCQ	1.027‡	11,034	306 (2.7)	11,081	259 (2.3)‡
	PMCKQ	1.033‡	10,966	374 (3.3)	11,066	274 (2.4)‡
IP Asthma	PMB	1.020‡	3,225	66 (2.0)	3,259	32 (1.0)‡
	PMC	1.039‡	3,163	128 (3.9)	3,258	33 (1.0)‡
	PMCK	1.041‡	3,156	135 (4.1)	3,260	31 (0.9)‡
	PMCQ	1.026‡	3,205	86 (2.6)	3,256	35 (1.1)‡
	PMCKQ	1.033‡	3,182	109 (3.3)	3,256	35 (1.1)‡
IP MI	PMB	1.019‡	4,624	90 (1.9)	4,634	80 (1.7)‡
	PMC	1.038‡	4,015	159 (3.8)	4,637	77 (1.6)‡
	PMCK	1.039‡	4,011	163 (3.9)	4,657	57 (1.2)‡
	PMCQ	1.025‡	4,070	104 (2.5)	4,634	80 (1.7)‡
	PMCKQ	1.031‡	4,045	129 (3.1)	4,633	81 (1.7)‡
IP HF	PMB	1.019‡	6,555	127 (1.9)	6,588	94 (1.4)‡
	PMC	1.035‡	6,448	234 (3.5)	6,599	83 (1.2)‡
	PMCK	1.036‡	6,441	241 (3.6)	6,600	82 (1.2)‡
	PMCQ	1.024‡	6,522	160 (2.4)	6,587	95 (1.4)‡
	PMCKQ	1.029‡	6,488	194 (2.9)	6,586	96 (1.4)‡

[1]Total observations for each respiratory-cardiovascular chronic disease linked group: ED asthma, 11,340; IP asthma, 3,291; IP MI, 4,714; IP HF, 6,682.
[2]Odds Ratio (OR) significance: $\dagger = p \leq 0.05$; $\ddagger = p \leq 0.01$.
[3]McNemar's chi square test of significance was applied to the four 2 x 2 cell totals formatted as shown in Figure 3: $\dagger = p \leq 0.05$; $\ddagger = p \leq 0.01$.

Table S2: Comparison of Respiratory-Cardiovascular Chronic Disease Hospital Events for True Positive Cases, Identified as Elevated Odds Ratio (OR$^+$) Case Group and Higher Beta (ß$^+$) Case Group, or True Negative Controls, Identified as Not-elevated OR$^-$ Case Group and Lower ß$^-$ Case Group, for AOD-PM$_{2.5}$ and PMB Fused Surfaces: Grids with Monitors.

OUTCOME[1]	SURFACE	OR[2]	OR$^-$	OR$^+$ (%)	ß$^-$	ß$^+$ (%)[3]
ED Asthma	PMB	1.025‡	4,677	120 (2.5)	4,742	55 (1.2)‡
	PMC	1.033‡	4,639	158 (3.3)	4,747	50 (1.0)‡
	PMCK	1.034‡	4,634	163 (3.4)	4,747	50 (1.0)‡
	PMCQ	1.028‡	4,663	134 (2.8)	4,741	56 (1.2)‡
	PMCKQ	1.032‡	4,643	154 (3.2)	4,742	55 (1.2)‡
IP Asthma	PMB	1.026‡	1,304	35 (2.6)	1,326	13 (1.0)‡
	PMC	1.036‡	1,291	48 (3.6)	1,326	13 (1.0)‡
	PMCK	1.038‡	1,288	51 (3.8)	1,326	13 (1.0)‡
	PMCQ	1.030‡	1,299	40 (3.0)	1,326	13 (1.0)‡
	PMCKQ	1.034‡	1,293	46 (3.4)	1,326	13 (1.0)‡
IP MI	PMB	1.024‡	1,676	41 (2.4)	1,696	21 (1.2)‡
	PMC	1.031‡	1,664	53 (3.1)	1,696	21 (1.2)‡
	PMCK	1.034‡	1,659	58 (3.4)	1,696	21 (1.2)‡
	PMCQ	1.026‡	1,672	45 (2.6)	1,696	21 (1.2)‡
	PMCKQ	1.031‡	1,664	53 (3.1)	1,696	21 (1.2)‡
IP HF	PMB	1.023‡	2,735	64 (2.3)	2,778	21 (0.8)‡
	PMC	1.030‡	2,715	84 (3.0)	2,778	21 (0.8)‡
	PMCK	1.032‡	2,709	90 (3.2)	2,778	21 (0.8)‡
	PMCQ	1.026‡	2,726	73 (2.6)	2,778	21 (0.8)‡
	PMCKQ	1.029‡	2,718	81 (2.9)	2,778	21 (0.8)‡

[1]Total observations for each respiratory-cardiovascular chronic disease linked group: ED asthma, 4,797; IP asthma, 1,339; IP MI, 1,717; IP HF, 2,799.
[2]Odds Ratio (OR) significance: † = $p{\leq}0.05$; ‡ = $p{\leq}0.01$.
[3]McNemar's chi square test of significance was applied to the four 2 x 2 cell totals formatted as shown in Figure 3: † = $p{\leq}0.05$; ‡ = $p{\leq}0.01$.

Table S3: Comparison of Respiratory-Cardiovascular Chronic Disease Hospital Events for True Positive Cases, Identified as Elevated Odds Ratio (OR^+) Case Group and Higher Beta (β^+) Case Group, or True Negative Controls, Identified as Not-Elevated OR^- Case Group and Lower β^- Case Group, for AOD-$PM_{2.5}$ and PMB Fused Surfaces: Grids Without Monitors.

OUTCOME[1]	SURFACE	OR[2]	OR[-]	OR[+] (%)	ß[-]	ß[+] (%)[3]
ED Asthma	PMB	1.018‡	6,425	118 (1.8)	6,453	90 (1.4)‡
	PMC	1.054‡	6,190	353 (5.4)	6,473	70 (1.1)‡
	PMCK	1.058‡	6,164	379 (5.8)	6,472	71 (1.1)‡
	PMCQ	1.028‡	6,360	183 (2.8)	6,453	90 (1.4)‡
	PMCKQ	1.039‡	6,288	255 (3.9)	6,453	90 (1.4)‡
IP Asthma	PMB	1.017‡	1,919	33 (1.7)	1,942	10 (0.5)‡
	PMC	1.054‡	1,847	105 (5.4)	1,942	10 (0.5)‡
	PMCK	1.064‡	1,827	125 (6.4)	1,942	10 (0.5)‡
	PMCQ	1.026‡	1,901	51 (2.6)	1,942	10 (0.5)‡
	PMCKQ	1.039‡	1,876	76 (3.9)	1,942	10 (0.5)‡
IP MI	PMB	1.017‡	2,946	51 (1.7)	2,973	24 (0.8)‡
	PMC	1.054‡	2,835	162 (5.4)	2,970	27 (0.9)‡
	PMCK	1.060‡	2,817	180 (6.0)	2,971	26 (0.9)‡
	PMCQ	1.026‡	2,919	78 (2.6)	2,964	33 (1.1)‡
	PMCKQ	1.038‡	2,883	114 (3.8)	2,964	33 (1.1)‡
IP HF	PMB	1.017‡	3,817	66 (1.7)	3,845	38 (1.0)‡
	PMC	1.051‡	3685	198 (5.1)	3845	38 (1.0)‡
	PMCK	1.056‡	3,666	217 (5.6)	3,852	31 (0.8)‡
	PMCQ	1.025‡	3,786	97 (2.5)	3,842	41 (1.1)‡
	PMCKQ	1.036‡	3,743	140 (3.6)	3,841	42 (1.1)‡

[1]Total observations for each respiratory-cardiovascular chronic disease linked group: ED asthma, 6,543; IP asthma, 1,952; IP MI, 2,997; IP HF, 3,883.

[2]Odds Ratio (OR) significance: † = $p \leq 0.05$; ‡ = $p \leq 0.01$.

[3]McNemar's chi square test of significance was applied to the four 2 x 2 cell totals formatted as shown in Figure 3: † = $p \leq 0.05$; ‡ = $p \leq 0.01$.

Table S4: Correlations (r^2, %) Between Odds Ratio (OR) Case Group and Beta (ß) Case Group: All Grids.

	ΔOR%[1,3]	ß%[1,3]	S^{+}[1,3]	S^{-}[1,3]	Δ(S^{-} - S^{+})[1,3]	P^{+}[1,3]	P^{-}[1,3]
TOTAL	0.032 (0.1)	0.878 (77.1)‡	0.654 (42.8)‡	-0.365 (13.3)	-0.654 (42.8)‡	-0.365 (13.3)	0.384 (14.7)
ΔOR%		0.069 (0.5)	-0.569 (32.4)‡	0.299 (8.9)	0.569 (32.4)‡	0.299 (8.9)	-0.308 (9.5)
ß%			0.741 (54.9)‡	-0.230 (5.3)	-0.741 (54.9)‡	-0.230 (5.3)	0.160 (2.6)
S^{+}				-0.449 (20.2)†	-1.000 (100.0)‡	-0.449 (20.2)†	0.200 (4.0)
S^{-}					0.450 (20.3)†	1.000 (100.0)‡	-0.181 (3.3)
Δ(S^{-} - S^{+})						0.450 (20.3)†	-0.200 (4.0)
P^{+}							-0.181 (3.3)

[1]Abbreviations: ΔOR% = delta odds ratio (OR) percent case group; ß% = beta (ß) percent case group; S^{+} = sensitivity; S^{-} = specificity. Δ(S^{-} - S^{+}) = delta specificity - sensitivity; P^{+} = predictive value positive; P^{-} = predictive value negative.
[2]20 observations per cell.
[3]Significance: † = $p \leq 0.05$; ‡ = $p \leq 0.01$.

Table S5: Correlations (r^2, %) Between Odds Ratio (OR) Case Group and Beta (ß) Case Group: Grids with Monitors.

	ΔOR%[1,3]	ß%[1,3]	S+[1,3]	S-	Δ(S- - S+)[1,3]	P+	P-[1,3]
TOTAL[2]	-0.108 (1.2)	0.047 (0.2)	0.065 (0.4)	-	-0.065 (0.4)	-	0.108 (1.2)
ΔOR%		0.011 (0.0)	-0.565 (31.9)‡	-	0.565 (31.9)‡	-	-0.910 (82.8)‡
ß%			0.800 (64.0)‡	-	-0.800 (64.0)‡	-	0.393 (15.4)
S+				-	-1.000 (100.0)‡	-	0.846 (71.6)‡
S-					-	-	-
Δ(S- - S+)						-	-0.846 (71.6)‡
P+							-

[1]Abbreviations: ΔOR% = delta odds ratio (OR) percent case group; ß% = beta (ß) percent case group; S+ = sensitivity; S- = specificity.
Δ(S- - S+) = delta specificity - sensitivity; P+ = predictive value positive; P- = predictive value negative.
[2]20 observations per cell.
[3]Significance: † = $p \leq 0.05$; ‡ = $p \leq 0.01$.

Table S6: Correlations (r^2, %) Between Odds Ratio (OR) Case Group and Beta (ß) Case Group: Grids without Monitors.

	ΔOR%[1,3]	ß%[1,3]	S⁺[1,3]	S⁻	Δ(S⁻ -S⁺)[1,3]	P⁺	P⁻[1,3]
TOTAL[2]	-0.008 (0.0)	0.849 (72.1)‡	0.442 (19.5)†	-	-0.442 (19.5)†	-	0.168 (2.8)
ΔOR%		-0.186 (3.5)	-0.804 (64.6)‡	-	0.804 (64.6)‡	-	-0.974 (94.9)‡
ß%			0.615 (37.8)‡	-	-0.615 (37.8)‡	-	0.321 (10.3)
S⁺					-1.000 (100.0)‡	-	0.859 (73.8)‡
S⁻					-	-	-
Δ(S⁻ - S⁺)						-	-0.859 (73.8)‡
P⁺							-

[1]Abbreviations: ΔOR% = delta odds ratio (OR) percent case group; ß% = beta (ß) percent case group; S⁺ = sensitivity; S⁻ = specificity; Δ(S⁻ - S⁺) = delta specificity - sensitivity; P⁺ = predictive value positive; P⁻ = predictive value negative.
[2]20 observations per cell.
[3]Significance: † = $p \leq 0.05$; ‡ = $p \leq 0.01$.

Table S7: Descriptive Statistics for Odds Ratio (OR) Case Group and Beta (ß) Case Group, by Grid Status.

GROUP	GRIDS-MON[1]	ΔOR% MEAN[1-3]	CI 95%[1]
OR	Both	3.1	2.7-4.3
	Yes	3.0	2.8-3.2
	No	*3.9	3.1-4.7
ß	Both	1.6	1.3-1.9
	Yes	[†]1.0	1.0-1.1
	No	*, [†]0.9	0.8-1.1

[1]Abbreviations: GRIDS-MON = grids with (Yes) or without (No) ambient PM$_{2.5}$ air monitors; 95% CI = 95% confidence interval. ΔOR% = delta odds ratio (OR) percent case group.

[2]Means for both groups are expressed as percentages.

[3]Significant differences at $p \leq 0.05$ between ambient air monitor groups:
*= No/Yes; † = No or Yes versus Both.

Table S8: Descriptive Statistics for Odds Ratio (OR) Case Group and Beta (ß) Case Group, by Fused Surface and Grid Status.

SURFACE	GROUP	GRIDS-MON[1]	MEAN[2-3]	95% CI[1]
PMB	OR	Both	2.0	1.8-2.1
		Yes	†2.4	2.2-2.7
		No	*, †1.7	1.6-1.8
	ß	Both	1.6	0.8-2.4
		Yes	1.1	0.8-1.4
		No	0.9	0.3-1.5
PMC	OR	Both	3.8	3.5-4.1
		Yes	†3.2	2.8-3.7
		No	*, †5.3	5.1-5.7
	ß	Both	1.6	0.4-2.9
		Yes	1.0	0.7-1.3
		No	0.9	0.5-1.3
PMCK	OR	Both	3.9	3.6-4.2
		Yes	†3.4	3.1-3.8
		No	*, †6.0	5.4-6.5
	ß	Both	1.6	0.1-3.0
		Yes	1.00	0.7-1.3
		No	0.8	0.4-1.2
PMCQ	OR	Both	2.6	2.3-2.8
		Yes	2.8	2.4-3.1
		No	2.6	2.4-2.8
	ß	Both	1.6	0.8-2.4
		Yes	1.1	0.8-1.4
		No	1.0	0.4-1.6
PMCKQ	OR	Both	3.2	2.8-3.4
		Yes	3.2	2.8-3.5
		No	*, †3.8	3.6-4.0
	ß	Both	1.6	0.8-2.5
		Yes	1.1	0.8-1.4
		No	1.0	0.4-1.6

[1]Abbreviations: GRIDS-MON = grids with (Yes) or without (No) Ambient $PM_{2.5}$ air monitors; 95% CI = 95% confidence interval.
[2]Means for both groups are expressed as percentages, ΔOR% and ß%.
[3]Significant differences at $p \leq 0.05$ between ambient air monitor groups: * = No/Yes; † = No or Yes versus Both.

Table S9: Descriptive Statistics for Odds Ratio (OR) Case Group and Beta (ß) Case Group, by Health Outcome and Grid Status.

OUTCOME	GROUP	GRIDS-MON[1]	MEAN[2-3]	95% CI[1]
ED Asthma	OR	Both	3.2	2.2-4.2
		Yes	3.0	2.6-3.5
		No	[*]3.9	1.8-6.0
	ß	Both	2.5	2.1-2.9
		Yes	[†]1.1	1.0-1.3
		No	[†]1.3	1.1-1.5
IP Asthma	OR	Both	3.2	2.1-4.3
		Yes	3.3	2.7-3.9
		No	[*]4.0	1.6-6.4
	ß	Both	1.0	0.9-1.1
		Yes	[†]1.0	-
		No	[†]0.5	-
IP MI	OR	Both	3.0	2.0-4.1
		Yes	2.9	2.4-3.4
		No	[*]3.9	1.6-6.2
	ß	Both	1.6	1.3-1.8
		Yes	[†]1.2	-
		No	[†]1.0	0.8-1.1
IP HF	OR	Both	2.9	2.0-3.8
		Yes	2.8	2.4-3.2
		No	[*]3.7	1.6-5.8
	ß	Both	1.3	1.2-1.5
		Yes	[†]0.8	-
		No	[†]1.0	0.8-1.2

[1]Abbreviations: GRIDS-MON = grids with (Yes) or without (No) Ambient $PM_{2.5}$ air monitors; 95% CI = 95% confidence interval.
[2]Means for both groups are expressed as percentages, ΔOR% and ß%.
[3]Significant differences at $p \leq 0.05$ between ambient air monitor groups: * = No/Yes; † = No or Yes versus Both.

Table S10: Descriptive Statistics for Sensitivity (S$^+$)/True Positive Cases and Specificity (S$^-$)/True Negative Controls for Odds Ratio (OR) Case Group Probabilities, and Predictive Value Positive (P$^+$)/True Positive Cases and Predictive Value Negative (P$^-$)/True Negative Controls for Beta (ß) Case Group Probabilities, by Grid Status.

GROUP	GRIDS-MON[1]	S$^+$ MEAN[1-3]	P$^+$ MEAN[1-3]	P$^+$ 95% CI[1]	S$^-$ MEAN[1-3]	P$^-$ MEAN[1-3]	P$^-$ 95% CI[1]	Δ(S$^-$ - S$^+$) MEAN[1-3]	Δ(S$^-$ - S$^+$) 95% CI[1]
OR	Both	0.57	-	0.46-0.67	1.00	-	1.00-1.00	0.43	0.33-0.54
	Yes	†0.34	-	0.31-0.38	1.00	-	-	†0.66	0.62-0.69
	No	*,†0.30	-	0.21-0.38	1.00	-	-	*,†0.70	0.62-0.79
ß	Both	-	1.00	0.99-1.00	-	0.96	0.94-0.99	-	-
	Yes	-	1.00	-	-	0.98	0.98-0.98	-	-
	No	-	1.00	-	-	*0.97	0.96-0.98	-	-

[1]Abbreviations: GRIDS-MON = grids with (Yes) or without (No) PM$_{2.5}$ ambient air monitors; 95% CI = 95% Confidence Interval; Δ(S$^-$ - S$^+$) = delta specificity – sensitivity; P$^+$ = predictive value positive/true positive; P$^-$ = predictive value negative/true negative.

[2]Means for both groups are expressed as probabilities.

[3]Significant differences at $p \leq 0.05$ between ambient air monitor groups: * = No/Yes; † = No or Yes versus Both within each group.

Table S11: Descriptive Statistics for Sensitivity (S^+)/True Positive Cases and Specificity (S^-)/True Negative Controls for Odds Ratio (OR) Case Group Probabilities, by Fused Surface and Grid Status.

SURFACE	GRIDS-MON[1]	S^+ MEAN[1-3]	S^+ 95% CI[1]	S^- MEAN[1-3]	S^- 95% CI[1]	$\Delta(S^- - S^+)$ MEAN[1-3]	$\Delta(S^- - S^+)$ 95% CI[1]
PMB	BOTH	0.78	0.42-1.13	1.00	1.00-1.00	0.22	-0.13-0.58
	YES	0.42	0.28-0.55	1.00	-	0.58	0.45-0.72
	NO	0.53	0.22-0.83	1.00	-	0.47	0.17-0.78
PMC	BOTH	0.45	0.14-0.76	1.00	-	0.55	0.24-0.86
	YES	0.31	0.21-0.41	1.00	-	0.69	0.59-0.79
	NO	*0.17	0.09-0.24	1.00	-	*0.84	0.76-0.91
PMCK	BOTH	0.41	0.07-0.75	1.00	-	0.59	0.25-0.93
	YES	0.29	0.20-0.38	1.00	-	0.71	0.62-0.80
	NO	*0.14	0.07-0.21	1.00	-	*0.86	0.79-0.93
PMCQ	BOTH	0.65	0.34-0.97	1.00	-	0.35	0.03-0.66
	YES	0.37	0.24-0.51	1.00	-	0.63	0.49-0.76
	NO	0.38	0.18-0.58	1.00	-	0.62	0.42-0.82
PMCKQ	BOTH	0.54	0.26-0.83	1.00	-	0.46	0.17-0.74
	YES	0.32	0.22-0.43	1.00	-	0.68	0.57-0.78
	NO	0.27	0.12-0.42	1.00	-	0.73	0.58-0.88

[1]Abbreviations: GRIDS-MON = grids with (Yes) or without (No) ambient $PM_{2.5}$ air monitors; 95% CI = 95% confidence interval; $\Delta(S^- - S^+)$ = delta specificity - sensitivity.

[2]Means for both groups are expressed as probabilities.

[3]Significant differences at $p \leq 0.05$ between ambient $PM_{2.5}$ air monitor groups: * = No/Yes; † = No or Yes versus Both within each group.

Table S12: Descriptive Statistics for Predictive Value Positive (P⁺)/True Positive Cases and Predictive Value Negative (P⁻)/True Negative Controls for Beta (ß) Case Group Probabilities, by Fused Surface and Grid Status

SURFACE	GRIDS-MON[1]	P⁺ MEAN[1-3]	P⁺ 95% CI[1]	P⁻ MEAN[1-3]	P⁻ 95% CI[1]
PMB	BOTH	0.99	0.97-1.00	1.00	0.99-1.00
	YES	1.00	-	0.99	0.98-0.99
	NO	1.00	-	0.99	0.98-1.00
PMC	BOTH	1.00	-	0.95	0.86-1.00
	YES	1.00		0.98	0.97-0.98
	NO	1.00	-	*0.96	0.95-0.96
PMCK	BOTH	1.00	-	0.95	0.85-1.00
	YES	1.00	-	0.98	0.97-0.98
	NO	1.00	-	*0.95	0.94-0.96
PMCQ	BOTH	1.00	-	0.96	0.87-1.00
	YES	1.00	-	0.98	0.98-0.99
	NO	1.00	-	0.99	0.98-0.99
PMCKQ	BOTH	1.00	-	0.96	0.87-1.00
	YES	1.00	-	0.98	0.97-0.98
	NO	1.00	-	0.97	-

[1]Abbreviations: GRIDS-MON = grids with (Yes) or without (No) ambient $PM_{2.5}$ air monitors; P⁺ = predictive value positive/true positive cases; P⁻ = predictive value negative/true negative cases; 95% CI=95% confidence interval.

[2]Means for both groups are expressed as probabilities.

[3]Significant differences at $p \leq 0.05$ between ambient air monitor groups: * = No/Yes; † = No or Yes versus Both within each group.

Table S13: Descriptive Statistics for Sensitivity (S[+])/True Positive Cases and Specificity (S[-])/True Negative Controls for Odds Ratio (OR) Case Group Probabilities, by Health Outcome and Grid Status.

OUTCOME	GRIDS-MON[1]	S[+] MEAN[1-3]	S[+] 95% CI[1]	S[-] MEAN[1-3]	S[-] 95% CI[1]	Δ(S[-] - S[+]) MEAN[1-3]	Δ(S[-] - S[+]) 95% CI[1]
ED ASTHMA	BOTH	0.80	0.65-0.96	1.00	1.00-1.00	0.20	0.04-0.35
	YES	[†]0.37	0.29-0.45	1.00	-	[†]0.63	0.55-0.71
	NO	[†]0.40	0.10-0.69	1.00	-	[†]0.60	0.31-0.90
IP ASTHMA	BOTH	0.34	0.21-0.47	1.00	-	0.66	0.53-0.79
	YES	0.30	0.24-0.36	1.00	-	0.70	0.64-0.76
	NO	[*, †]0.16	0.05-0.27	1.00	-	[*, †]0.84	0.73-0.95
IP MI	BOTH	0.62	0.36-0.89	1.00	-	0.38	0.11-0.64
	YES	0.43	0.45-0.50	1.00	-	0.57	0.50-0.65
	NO	[*, †]0.30	0.12-0.48	1.00	-	[*, †]0.70	0.52-0.88
IP HF	BOTH	0.50	0.30-0.71	1.00	-	0.50	0.29-0.70
	YES	[†]0.27	0.23-0.32	1.00	-	[†]0.73	0.68-0.77
	NO	[*]0.33	0.10-0.55	1.00	-	[*]0.67	0.45-0.90

[1]Abbreviations: GRIDS-MON = grids with (Yes) or without (No) ambient $PM_{2.5}$ air monitors; S[+] = sensitivity/true positive cases; S[-] = specificity/true negative cases; 95% CI = 95% Confidence Interval; Δ(S[-] - S[+]) = delta specificity - sensitivity.
[2]Means for both groups are expressed as probabilities.
[3]Significant differences at $p \leq 0.05$ between ambient air monitor groups:
* = No/Yes; † = No or Yes versus Both within each group.

Table S14: Descriptive Statistics for Predictive Value Positive (P^+)/True Positive Cases and Predictive Value Negative (P^-)/True Negative Controls for Beta (ß) Case Group Probabilities, by Health Outcome and Grid Status.

OUTCOME	GRIDS-MON[1]	P^+ MEAN[1-3]	P^+ 95% CI[1]	P^- MEAN[1-3]	P^- 95% CI[1]
ED ASTHMA	BOTH	0.99	0.98-1.00	0.99	0.99-1.00
ED ASTHMA	YES	1.00	-	[†]0.98	0.97-0.99
ED ASTHMA	NO	1.00	-	[†]0.97	0.95-1.00
IP ASTHMA	BOTH	1.00	-	0.98	0.97-0.99
IP ASTHMA	YES	1.00	-	0.98	0.97-0.98
IP ASTHMA	NO	1.00	-	0.97	0.94-0.99
IP MI	BOTH	1.00	-	0.90	0.82-0.97
IP MI	YES	1.00	-	[†]0.98	0.98-0.99
IP MI	NO	1.00	-	[*]0.97	0.95-0.99
IP HF	BOTH	1.00	-	0.98	0.97-0.99
IP HF	YES	1.00	-	0.98	0.97-0.98
IP HF	NO	1.00	-	0.97	0.95-0.99

[1]Abbreviations: GRIDS-MON = grids with (Yes) or without (No) ambient $PM_{2.5}$ air monitors; P^+ = predictive value positive/true positive cases; P^- = predictive value negative/true negative cases; 95% CI = 95% confidence interval.

[2]Means for both groups are expressed as probabilities.

[3]Significant differences at $p \leq 0.05$ between ambient air monitor groups:
* = No/Yes; † = No or Yes versus Both within each group.

Table S15: Total Health Outcome Observations Required to Attain Higher Sensitivity (S^+) Probabilities for the Odds Ratio (OR) Case Group, by Monitor Grid Status.

S^{+1}	GRIDS WITH MONITORS[1]			TOTAL[5]	Δ[6]	Δ%[7]
	Both[2]	Yes[3]	No[4]			
0.700	7,697	3,066	5,577	8,643	946	12.3
0.750	8,147	3,122	5,792	8,914	767	9.4
0.800	8,597	3,179	6,006	9,185	588	6.8
0.850	9,047	3,235	6,221	9,456	409	4.5
0.900	9,497	3,292	6,435	9,727	230	2.4
0.950	9,947	3,348	6,650	9,998	51	0.5
0.964	10,073	3,364	6,710	10,074	1	0.0
1.000	10,397	3,404	6,864	10,268	-129	-1.2

[1]Regression analyses, stratified on monitor grid status, were used to determine the number of observations (outcome) based on a predictor (sensitivity) value.
[2]Both, $p \leq 0.01$; predictor, $p \leq 0.01$; $r^2 = 0.427$; adjusted $r^2 = 0.395$.
[3]Yes, $p > 0.05$; predictor, $p > 0.05$; $r^2 = 0.004$; adjusted $r^2 = -0.051$.
[4]No, $p \leq 0.05$; predictor, $p = 0.05$; $r^2 = 0.196$; adjusted $r^2 = 0.151$.
[5]Total column is the sum for Yes and No columns.
[6]The difference (Δ) column value was obtained by subtracting Both column value from the Total column value.
[7]The delta percent (Δ%) column was obtained by computing the percentage difference between the Δ column value (numerator) and the Both column value (denominator).