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Supplementary Material

Chemical Composition of $PM_{2.5}$ in Wood Fire and LPG Cookstove Homes of Nepali Brick Workers

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Table S1. Associations between the mean of samples inside[a] homes and home area and number of people in home at a brick kiln in Bhaktapur, Nepal, May 2019.

$PM_{2.5}$ Chemical Component, μg/m³	Home area[b], m²							Number of people in home		
	5.41-9.50		> 9.50-10.67		> 10.67-31.40					
	GM[c]	95% CI[c]	GM[c]	95% CI[c]	GM[c]	95% CI[c]	p-value[c]	GMR[c, d]	95% CI[c, d]	p-value[c]
Al	0.84	0.27, 2.62	0.17	0.048, 0.61	0.15	0.042, 0.51	0.08	0.86	0.50, 1.47	0.58
As	1.00	Reference	1.22[e]	0.013, 117.50[e]	1.20[e, f]	0.00, 22.80[e, f]	NA	0.85[e]	0.19, 2.50[e]	NA
Ba	0.032	0.012, 0.085	0.015	0.0048, 0.047	0.0061	0.0017, 0.022	0.13	0.92	0.55, 1.56	0.77
BC	66.45	11.71, 376.98	13.02	2.24, 75.75	7.93	1.41, 44.50	0.20	0.75	0.37, 1.52	0.43
Br	0.035[g]	0.020, 0.059[g]	0.023[g]	0.013, 0.042[g]	0.015[g]	0.0084, 0.027[g]	0.11[g]	0.94[g]	0.73, 1.20[g]	0.58[g]
BrC	14.67[g]	9.76, 22.06[g]	10.65[g]	7.48, 15.17[g]	12.68[g]	9.24, 17.39[g]	0.43[g]	0.98[g]	0.86, 1.12[g]	0.74[g]
Cs	0.010	0.0054, 0.020	0.0086	0.0042, 0.017	0.0037	0.0016, 0.0084	0.13	0.94	0.67, 1.30	0.69
Ca	0.49[g]	0.12, 2.03[g]	0.14[g]	0.029, 0.65[g]	0.070[g]	0.015, 0.33[g]	0.16[g]	0.80[g]	0.43, 1.51[g]	0.47[g]
Ce	1.00	Reference	1.20[e, f]	0.00, 22.80[e, f]	1.20[e, f]	0.00, 22.80[e, f]	NA	0.38[e]	0.0051, 2.67[e]	NA
Cl	2.95[g]	0.60, 14.48[g]	0.25[g]	0.044, 1.43[g]	0.14[g]	0.024, 0.77[g]	0.03[g, h]	0.63[g]	0.29, 1.36[g]	0.22[g]
Cr	0.0027	0.0015, 0.0048	0.0022	0.0011, 0.0046	0.00095	0.00036, 0.0025	0.17	0.97	0.69, 1.36	0.86
Co	1.00	Reference	1.22[e]	0.013, 117.50[e]	1.20[e, f]	0.00, 22.80[e, f]	NA	0.85[e]	0.19, 2.50[e]	NA
Cu	0.013	0.0065, 0.025	0.0024	0.0010, 0.0059	0.0035	0.0016, 0.0075	0.005[i]	0.77	0.54, 1.10	0.15
Fe	0.66[g]	0.18, 2.45[g]	0.17[g]	0.041, 0.72[g]	0.11[g]	0.026, 0.46[g]	0.15[g]	0.83[g]	0.46, 1.49[g]	0.51[g]
Pb	0.026	0.013, 0.053	0.0073	0.0030, 0.018	0.011	0.0049, 0.025	0.07	0.77	0.54, 1.12	0.17
Mg	0.065	0.023, 0.19	0.021	0.0061, 0.069	0.019	0.0057, 0.060	0.21	0.94	0.56, 1.57	0.80
Mn	0.018	0.0058, 0.054	0.0045	0.0011, 0.018	0.0050	0.0014, 0.017	0.20	0.94	0.56, 1.59	0.81
Ni	0.0023	0.0016, 0.0033	0.0016	0.0010, 0.0025	0.0011	0.00067, 0.0020	0.08	0.92	0.75, 1.13	0.43
P	0.023	0.0090, 0.060	0.0081	0.0027, 0.024	0.0056	0.0018, 0.017	0.13	0.79	0.49, 1.27	0.33
K	2.35[g]	1.06, 5.20[g]	1.24[g]	0.52, 2.95[g]	1.17[g]	0.49, 2.79[g]	0.38[g]	0.93[g]	0.67, 1.30[g]	0.66[g]
Rb	0.0094	0.0035, 0.025	0.0022	0.00049, 0.0099	0.0024	0.00064, 0.0088	0.15	0.84	0.49, 1.45	0.54
Se	0.0039	0.0029, 0.0054	0.0032	0.0020, 0.0051	0.00029	[j]	0.75	0.96	0.80, 1.15	0.63
Si	2.22[g]	0.82, 6.01[g]	0.79[g]	0.27, 2.36[g]	0.57[g]	0.19, 1.69[g]	0.15[g]	0.91[g]	0.58, 1.43[g]	0.67[g]
Na	0.075	0.037, 0.15	0.15	0.070, 0.31	0.16	0.077, 0.34	0.26	1.14	0.85, 1.53	0.39
Sr	1.00	Reference	1.20[e, f]	0.063, ∞[e, f]	[k]	[k]	NA	1.31[e]	0.24, 5.57[e]	NA
S	3.43[g]	2.37, 4.97[g]	2.28[g]	1.52, 3.42[g]	2.80[g]	1.87, 4.20[g]	0.31[g]	0.97[g]	0.83, 1.13[g]	0.66[g]
Ti	0.061	0.017, 0.21	0.015	0.0037, 0.058	0.0074	0.0018, 0.030	0.08	0.82	0.45, 1.49	0.51
V	0.0035	0.0014, 0.0088	0.0019	0.00063, 0.0058	0.0011	0.00033, 0.0034	0.26	0.85	0.52, 1.39	0.51
Zn	0.099[g]	0.047, 0.21[g]	0.038[g]	0.017, 0.084[g]	0.054[g]	0.024, 0.12[g]	0.19[g]	0.91[g]	0.65, 1.25[g]	0.52[g]

Abbreviations: Al, aluminum; As, arsenic; Ba, barium; BC, black carbon; Br, bromine; BrC, brown carbon; Cs, caesium; Ca, calcium; Ce, cerium; Cl, chlorine; Cr, chromium; Co, cobalt; CI, confidence interval; Cu, copper; GM, geometric mean; GMR, geometric mean ratio; Fe, iron; Pb, lead; Mg, magnesium; Mn, manganese;

Ni, nickel; NA, not applicable; $PM_{2.5}$, particulate matter with an aerodynamic diameter less than 2.5 μm; P, phosphorus; K, potassium; Rb, rubidium; Se, selenium; Si, silicon; Na, sodium; Sr, strontium; S, sulfur; Ti, titanium; V, vanadium; Zn, zinc.

[a] The filter of one sample tore and could not be analyzed, so the home from whence that sample came was excluded from analyses.

[b] Categories based on tertiles.

[c] Estimated via simple (i.e., unadjusted) Tobit regression models of the natural logarithm transformed values.

[d] Exponentiated regression coefficient and 95% CI (i.e., GM $PM_{2.5}$ chemical component concentration ratio for a specified change in the independent variable or $\exp(\beta) - 1$ = percent change in GM $PM_{2.5}$ chemical component concentration for a specified change in the independent variable).

[e] Exact odds ratio and 95% CI; estimated via simple (i.e., unadjusted) exact unconditional logistic regression models.

[f] Median unbiased estimate.

[g] Estimated via simple (i.e., unadjusted) linear regression models of the natural logarithm transformed values.

[h] Using the Tukey method to adjust for multiple comparisons, p-values for tests of pairwise differences among categories of home area were as follows: 5.41-9.50 vs. > 9.50–10.67: 0.10, 5.41-9.50 vs. > 10.67–31.40: 0.04, and > 9.50-10.67 vs. > 10.67–31.40: 0.85.

[i] Using the Tukey-Kramer method to adjust for multiple comparisons, p-values for tests of pairwise differences among categories of home area were as follows: 5.41-9.50 vs. > 9.50–10.67: 0.01, 5.41-9.50 vs. > 10.67–31.40: 0.03, and > 9.50-10.67 vs. > 10.67–31.40: 0.82.

j Unable to estimate.

[k] Degenerate, unable to estimate.

Table S2. Associations between the mean of samples inside[a] homes and occupant density and number of children in home at a brick kiln in Bhaktapur, Nepal, May 2019.

$PM_{2.5}$ Chemical Component, μg/m³	Occupant density, number of people/100 m²			Number of children in home				
				0-1		2-3		
	GMR[b, c]	95% CI[b, c]	p-value[b]	GM[b]	95% CI[b]	GM[b]	95% CI[b]	p-value[b]
Al	1.02	0.97, 1.07	0.39	0.37	0.14, 1.01	0.20	0.053, 0.75	0.47
As	1.00[d]	0.91, 1.09[d]	NA	1.00	Reference	0.65[d, e]	0.00, 5.81[d, e]	NA
Ba	1.02	0.98, 1.07	0.26	0.017	0.0066, 0.042	0.012	0.0034, 0.042	0.67
BC	1.02	0.96, 1.09	0.52	33.72	8.97, 126.71	8.53	1.65, 44.07	0.20
Br	1.01[f]	0.99, 1.03[f]	0.37[f]	0.025[f]	0.016, 0.040[f]	0.022[f]	0.012, 0.039[f]	0.69[f]
BrC	1.00[f]	0.99, 1.01[f]	0.93[f]	12.67[f]	9.64, 16.64[f]	12.06[f]	8.73, 16.65[f]	0.80[f]
Cs	1.01	0.99, 1.04	0.39	0.0079	0.0044, 0.014	0.0058	0.0026, 0.013	0.54
Ca	1.02[f]	0.96, 1.08[f]	0.52[f]	0.24[f]	0.075, 0.79[f]	0.11[f]	0.023, 0.49[f]	0.38[f]
Ce	0.96[d]	0.76, 1.10[d]	NA	1.00	Reference	1.67[d, e]	0.00, 31.67[d, e]	NA
Cl	1.02[f]	0.94, 1.09[f]	0.63[f]	0.82[f]	0.19, 3.62[f]	0.24[f]	0.036, 1.63[f]	0.29[f]
Cr	1.02	1.00, 1.05	0.08	0.0017	0.00094, 0.0031	0.0020	0.00090, 0.0046	0.72
Co	1.00[d]	0.91, 1.09[d]	NA	1.00	Reference	0.65[d, e]	0.00, 5.81[d, e]	NA
Cu	1.01	0.98, 1.04	0.57	0.0061	0.0030, 0.012	0.0036	0.0014, 0.0093	0.38
Fe	1.02[f]	0.97, 1.07[f]	0.46[f]	0.31[f]	0.10, 0.94[f]	0.17[f]	0.041, 0.71[f]	0.48[f]
Pb	1.01	0.98, 1.04	0.70	0.017	0.0088, 0.031	0.0096	0.0039, 0.023	0.32
Mg	1.02	0.97, 1.06	0.54	0.032	0.012, 0.080	0.028	0.0081, 0.094	0.86
Mn	1.02	0.98, 1.07	0.37	0.0091	0.0034, 0.024	0.0058	0.0016, 0.021	0.59
Ni	1.00	0.98, 1.02	0.87	0.0017	0.0012, 0.0025	0.0014	0.00081, 0.0025	0.57
P	1.01	0.97, 1.05	0.65	0.013	0.0055, 0.030	0.0079	0.0026, 0.024	0.50
K	1.01[f]	0.98, 1.04[f]	0.41[f]	1.86[f]	1.01, 3.42[f]	1.14[f]	0.52, 2.50[f]	0.31[f]
Rb	1.02	0.97, 1.06	0.44	0.0053	0.0021, 0.013	0.0023	0.00058, 0.0093	0.30
Se	1.01	0.99, 1.02	0.58	0.0028	0.0019, 0.0041	0.0036	0.0023, 0.0055	0.32
Si	1.02	0.98, 1.06[f]	0.35[f]	1.14[f]	0.49, 2.67[f]	0.92[f]	0.31, 2.76[f]	0.75[f]
Na	0.99	0.97, 1.02	0.62	0.12	0.068, 0.21	0.12	0.055, 0.24	0.94
Sr	1.01[d]	0.87, 1.13[d]	NA	1.00	Reference	1.67[d, e]	0.00, 31.67[d, e]	NA
S	1.00[f]	0.99, 1.02[f]	0.57[f]	3.11[f]	2.33, 4.14[f]	2.44[f]	1.68, 3.53[f]	0.29[f]
Ti	1.03	0.97, 1.08	0.36	0.026	0.0085, 0.078	0.013	0.0031, 0.057	0.48
V	1.02	0.98, 1.06	0.41	0.0022	0.00096, 0.0053	0.0014	0.00041, 0.0050	0.54
Zn	1.01[f]	0.98, 1.04[f]	0.50[f]	0.072[f]	0.039, 0.13[f]	0.046[f]	0.021, 0.099[f]	0.34[f]

Abbreviations: Al, aluminum; As, arsenic; Ba, barium; BC, black carbon; Br, bromine; BrC, brown carbon; Cs, caesium; Ca, calcium; Ce, cerium; Cl, chlorine; Cr, chromium; Co, cobalt; CI, confidence interval; Cu, copper; GM, geometric mean; GMR, geometric mean ratio; Fe, iron; Pb, lead; Mg, magnesium; Mn, manganese; Ni, nickel; NA, not applicable; $PM_{2.5}$, particulate matter with an aerodynamic diameter less than 2.5 μm; P, phosphorus; K, potassium; Rb, rubidium; Se, selenium; Si, silicon; Na, sodium; Sr, strontium; S, sulfur; Ti, titanium; V, vanadium; Zn, zinc.

[a] The filter of one sample tore and could not be analyzed, so the home from whence that sample came was excluded from analyses.

[b] Estimated via simple (i.e., unadjusted) Tobit regression models of the natural logarithm transformed values.

[c] Exponentiated regression coefficient and 95% CI (i.e., GM $PM_{2.5}$ chemical component concentration ratio for a specified change in the independent variable or $\exp(\beta) - 1$ = percent change in GM $PM_{2.5}$ chemical component concentration for a specified change in the independent variable).

[d] Exact odds ratio and 95% CI; estimated via simple (i.e., unadjusted) exact unconditional logistic regression models.

[e] Median unbiased estimate.

[f] Estimated via simple (i.e., unadjusted) linear regression models of the natural logarithm transformed values.

Table S3. Associations between the mean of samples inside[a] homes and home area, smokers in home, number of smokers in home, and fuel type mutually adjusted for each other at a brick kiln in Bhaktapur, Nepal, May 2019.

	Home area, m^2	Smokers in home	Number of smokers in home	Fuel type
$PM_{2.5}$ Chemical Component	**p-value[b]**	**p-value[b]**	**p-value[b]**	**p-value[b]**
Cl	0.29[c]	0.0005[c]		
Cl	0.02[c]		0.005[c]	
Cl	0.47[c]			0.02[c]
Cl	0.58[c]	0.005[c]		0.17[c]
Cl	0.19[c]		0.10[c]	0.43[c]
Cu	0.03	< 0.0001		
Cu	0.002		0.02	
Cu	0.10			0.02
Cu	0.05	0.0009		0.36
Cu	0.06		0.22	0.44

Abbreviations: Cl, chlorine; Cu, copper; $PM_{2.5}$, particulate matter with an aerodynamic diameter less than 2.5 μm.

[a] The filter of one sample tore and could not be analyzed, so the home from whence that sample came was excluded from analyses.

[b] Estimated via multivariable Tobit regression models of the natural logarithm transformed values adjusted for home area, smokers in home, number of smokers in home, and/or fuel type.

[c] Estimated via multivariable linear regression models of the natural logarithm transformed values adjusted for home area, smokers in home, number of smokers in home, and/or fuel type.