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Supplemental Material

Changes in Latina Women's Exposure to Cleaning Chemicals Associated with Switching from Conventional to "Green" Household Cleaning Products: The LUCIR Intervention Study

Kim G. Harley, Lucia Calderon, James E.S. Nolan, Randy Maddalena, Marion Russell, Katherine Roman, Stephanie Mayo-Burgos, Jessica Cabrera, Norma Morga, and Asa Bradman

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Table S1. “Green” products provided to participants by researchers, LUCIR Study, Salinas, California, 2019

Brand Name	Product Name	Scent	Participant use in post-intervention visit n (%)
Open Nature	All-Purpose Cleaner	Lemon	41 (82)
Method	All-Purpose Cleaner	Lavender	43 (86)
Seventh Generation	Toilet Bowl Cleaner	Emerald Cypress & Fir	45 (90)
Bon Ami	Powder Cleaner		32 (64)
Open Nature	Cleaning Wipes	Unscented	23 (46)
Seventh Generation	Dish Soap	Free and Clear	38 (76)
	Homemade Window Cleaner[a]		37 (74)

[a] Made with tap water, white vinegar, and Seventh Generation Dish Soap "Free and Clear"

Table S2. Distribution of personal air concentrations of select VOCs (µg/m3) and SVOCs (ng/m3) among women using regular cleaning products (pre-intervention visit) and green cleaning products (post-intervention visit), LUCIR Study, Salinas, California, 2019

		Pre-Intervention Visit (N=50)						Post-Intervention Visit (N=49-50)					
Chemical	MDL	DF (%)	25th	50th	75th	95th	Max	DF (%)	25th	50th	75th	95th	Max
Volatile Organic Compounds ($\mu g/m^3$):													
Halogenated hydrocarbons													
Chloroform[a,b,c]	0.46	50 (100)	0.26	3.62	12.87	52.15	397.95	49 (100)	0.15	0.22	0.59	2.82	160.35
Carbon tetrachloride[a,c]	0.11	50 (100)	0.88	1.12	5.74	15.91	50.73	46 (94)	0.75	0.84	0.92	1.36	2.53
Dichloromethane[a,c]	2.31	48 (96)	0.21	0.30	0.40	0.65	1.31	44 (90)	0.19	0.27	0.36	0.59	0.66
Trichloroethene[a,b,c]	0.05	4 (8)	ND	ND	ND	0.06	0.15	3 (6)	ND	ND	ND	0.01	0.17
Tetrachloroethylene[a,c]	0.72	47 (94)	0.03	0.03	0.07	0.39	1.12	43 (88)	0.02	0.03	0.07	0.29	1.09
1,1-Dichloroethane[a]	0.06	3 (6)	ND	ND	ND	0.05	0.11	1 (2)	ND	ND	ND	ND	0.07
1,2-Dichloroethane[a]	0.07	49 (98)	0.13	0.32	0.89	1.85	4.68	39 (80)	0.05	0.28	0.77	4.40	5.50
Other													
1,4-Dioxane[a]	0.09	50 (100)	0.19	0.54	1.95	4.89	7.38	47 (96)	0.13	0.32	0.76	1.24	3.48
Naphthalene[a,c]	0.22	50 (100)	0.08	0.11	0.21	0.85	1.83	47 (96)	0.05	0.09	0.13	0.39	0.76
2-Ethylhexanol[c]	0.18	50 (100)	1.26	2.21	5.41	24.49	48.93	46 (94)	0.46	1.82	3.64	18.99	32.54
TXIB/Kodaflex[c]	0.36	47 (94)	0.30	0.79	1.46	4.73	7.35	45 (92)	0.18	0.71	1.43	4.91	5.98
Benzene derivatives													
Benzene[a,b,c]	0.46	50 (100)	0.52	0.67	1.03	3.55	8.93	49 (100)	0.36	0.63	0.91	2.22	4.23
Toluene[b,c]	0.51	50 (100)	0.91	1.53	3.74	26.50	63.29	49 (100)	1.11	1.69	3.16	20.77	36.29
Ethylbenzene[a,c]	0.61	50 (100)	0.16	0.33	0.76	3.22	35.81	46 (94)	0.11	0.25	0.48	3.26	3.96
mpXylene[c]	0.60	50 (100)	0.46	0.89	1.76	12.31	175.03	47 (96)	0.36	0.73	1.38	11.66	18.25
oXylene[c]	0.69	50 (100)	0.14	0.33	0.62	4.04	65.97	46 (94)	0.12	0.25	0.49	3.48	8.30
Styrene[a,c]	0.23	50 (100)	0.57	0.84	1.36	4.78	9.62	47 (96)	0.31	0.68	1.14	3.54	8.12
Butylbenzene[c]	0.19	48 (96)	0.03	0.04	0.09	0.45	1.19	40 (82)	0.01	0.04	0.09	0.25	0.45
Nitrobenzene[a,b,c]	1.20	39 (78)	0.02	0.08	0.29	0.94	2.85	40 (82)	0.02	0.11	0.27	0.89	1.24
Phenol[c]	0.28	48 (96)	0.37	1.26	2.44	7.45	19.38	43 (88)	0.23	0.86	1.64	2.73	4.12
1,4-Dichlorobenzene[a]	0.20	47 (94)	0.02	0.04	0.11	17.94	39.06	39 (80)	0.01	0.02	0.06	6.89	18.49
Aldehydes													
Formaldehyde[a,c]	0.17	50 (100)	9.55	14.14	25.19	48.20	76.00	50 (100)[d]	8.20	13.72	19.38	30.31	47.45
Acetaldehyde[a,c]	0.35	50 (100)	8.62	13.61	27.59	67.54	613.15	49 (98)[d]	5.60	9.35	16.07	33.16	49.63

Benzaldehyde[c]	0.33	49 (98)	1.69	3.40	5.60	18.95	28.18	46 (94)	0.86	2.08	4.01	16.70	57.77
Hexaldehyde[c]	1.15	50 (100)	8.51	14.70	34.69	74.79	153.68	46 (94)	4.46	11.11	17.86	42.42	70.72
Crotonaldehyde[c]	0.39	18 (36)	ND	ND	3.28	6.65	10.95	8 (16)[d]	ND	ND	ND	3.46	4.60
Alkanes													
Hexane[b,c]	2.74	50 (100)	0.19	0.43	1.18	18.39	24.68	47 (96)	0.15	0.28	0.74	6.37	16.23
Heptane[c]	0.46	50 (100)	0.16	0.41	0.68	3.97	13.93	47 (96)	0.17	0.33	0.72	2.98	6.38
Glycol Ethers													
Diethylene glycol monobutyl ether (DGBE)[c]	14.27	33 (66)	ND	0.60	1.68	8.84	62.54	31 (63)	ND	0.75	3.26	9.16	42.46
Ethylene glycol monobutyl ether (EGBE)[c]	1.08	30 (60)	ND	0.11	2.16	354.84	533.85	36 (73)	ND	0.13	0.30	14.68	23.72
Propylene glycol methyl ether (PGME)[c]	14.91	32 (64)	ND	0.27	0.82	5.74	16.12	16 (33)	ND	ND	0.12	1.34	21.53
Siloxanes													
D4[c]	0.10	50 (100)	0.52	1.16	4.38	34.55	160.24	49 (100)	0.34	2.01	9.28	45.81	154.54
D5[c]	1.04	50 (100)	3.08	17.39	90.51	124.94	135.85	48 (98)	5.19	24.24	107.96	152.76	381.51
Alkylphenols													
Nonylphenol[c]	3.49	2 (4)	ND	ND	ND	ND	0.09	1 (2)	ND	ND	ND	ND	0.01
Octylphenol[c]	3.08	4 (8)	ND	ND	ND	0.01	0.02	9 (18)	ND	ND	ND	0.02	0.08
Terpenes													
b-Myrcene[a]	2.54	50 (100)	0.72	1.84	3.70	24.26	57.32	47 (96)	2.78	6.70	19.95	32.63	43.50
Semi-Volatile Organic Compounds (ng/m^3):													
Phthalates													
Diethyl phthalate[c]	22.62	50 (100)	108.60	180.90	283.41	537.22	2130.73	50 (100)[d]	112.30	156.99	242.35	656.17	2327.4
Dibutyl phthalate[b,c]	61.70	50 (100)	59.58	89.89	102.45	130.84	267.89	50 (100)[d]	61.94	72.53	105.40	158.60	172.19
Diisobutyl phthalate[c]	9.39	50 (100)	79.34	126.88	181.69	516.02	1296.25	50 (100)[d]	76.09	108.71	181.83	438.42	1263.9
Nitro musks													
Musk xylene[c]	0.36	49 (98)	0.49	0.73	1.12	64.28	120.42	50 (100)[d]	0.48	0.66	1.07	1.53	2.19
Musk ketone[c]	0.56	50 (100)	1.14	1.74	4.26	37.44	107.50	50 (100)[d]	0.97	1.99	5.38	26.01	87.95
Polycyclic musks													
Cashmeran (DPMI)[c]	0.44	47 (94)	4.19	15.12	42.09	153.35	282.56	49 (98)[d]	5.54	12.80	39.28	105.59	290.88
Celestolide (ADBI)[c]	0.40	50 (100)	1.62	2.96	5.60	17.80	65.87	50 (100)[d]	2.05	3.34	7.01	31.32	67.66
Phantolide (AHMI)[c]	1.35	49 (98)	0.37	0.54	1.16	9.60	15.45	50 (100)[d]	0.43	0.64	2.50	11.59	13.61
Galaxolide (HHCB)[c]	14.11	50 (100)	354.96	646.15	1181.93	2886.91	5111.35	50 (100)[d]	555.84	923.08	1738.31	3498.86	4533.0
Tonalide (AHTN)[c]	3.71	49 (98)	30.75	53.60	90.11	160.15	181.92	49 (98)[d]	31.41	58.89	97.22	246.45	300.72

Abbreviations: DF = Detection frequency; MDL = Method detection limit; ND = Not detected in instrumental analysis, DGBE = Diethylene glycol monobutyl ether, EGBE = Ethylene glycol monobutyl ether, PGME = Propylene glycol methyl ether, D4 = Octamethylcyclotetrasiloxane, D5 = Decamethylcyclopentasiloxane

[a] Prop 65 Carcinogen

[b] Prop 65 Reproductive/Developmental Toxicant

[c] Suspected EDC

[d] N=50

Table S3. Most frequently used cleaning products among participants in pre-intervention visit, LUCIR Study, Salinas, California, 2019

Brand Name	Product Name	Scent	Participant use in pre-intervention visit n (%)
Windex	Glass Cleaner with Ammonia-D		13 (26)
LA's Totally Awesome	All Purpose Cleaner, Degreaser & Spot Remover		10 (20)
Dawn	Ultra Dishwashing Liquid	Original	8 (16)
Dawn	Ultra Platinum Advanced Power Dishwashing Liquid	Fresh Scent	8 (16)
Clorox	Clean Up Cleaner + Bleach	Original	7 (14)
Clorox	Disinfecting Wipes	Crisp Lemon	6 (12)
Fabuloso	All Purpose Cleaner	Lavender	6 (12)
Palmolive	Ultra Dishwashing Liquid	Original	6 (12)
Ajax	Cleanser with Bleach		5 (10)
Ariel	Laundry Detergent[a]	Original	5 (10)
Kleen King	Stainless Steel & Copper Cleaner		5 (10)
Clorox	Regular Bleach		4 (8)
Comet	Cleaner with Bleach		4 (8)
Lysol	Power Toilet Bowl Cleaner		4 (8)
Pine Sol	Multi Purpose Cleaner	Original	4 (8)
Ajax	Triple Action	Orange	3 (6)
Dawn	Ultra Antibacterial Hand Soap	Apple Blossom Scent	3 (6)
Easy Off	Oven Cleaner, Heavy Duty		3 (6)
Lysol	Kitchen Pro Antibacterial Cleanser	Citrus	3 (6)
Windex	Ammonia-Free Glass Cleaner	Crystal Rain	3 (6)
409	Antibacterial All Purpose Cleaner		2 (4)
409	Multi-Surface Cleaner	Lemon Fresh	2 (4)
Bar Keepers Friend	Cleanser & Polish		2 (4)
Clorox	Clean-Up All-Purpose Cleaner	Fresh Scent	2 (4)
Clorox	Toilet Bowl Cleaner Clinging Bleach Gel	Cool Wave Scent	2 (4)

[a] This powdered laundry detergent was used as a cleaning product.