

Supplementary Material

Title of the manuscript: “Childhood leukemia and residential proximity to industrial and urban sites”.

This document is available as supplementary data for inclusion as online documentation. It includes:

- a) Table S1, showing the industrial groups and amounts (in kg) released by facilities in 2009 by groups of carcinogenic substances (IARC classification) and other groups of toxic substances.
- b) Table S2, showing the specific pollutants released by industrial groups, both to air and water.

Supplementary Material, Table S1: industrial groups and amounts (in kg) released by facilities in 2009 by groups of carcinogenic substances (IARC classification) and other groups of toxic substances.

Industrial group	IARC groups ^a			Groups of toxic substances ^b								
	Group 1	Group 2A	Group 2B	Metals	Pesticides	PACs	Non-HPCs	Plasticizers	POPs	VOCs	Solvents	Other
Combustion installations	1258726	189	0	4363	0	531	0	0	531	324787	1676	1254890
Refineries and coke ovens	443462	206	22	18556	0	315	0	0	315	2810616	5177	422599
Production and processing of metals	1054242	5081	30	103342	35	1540	2	0	1548	820843	29411	1019808
Galvanization	1470	87	0	248	0	0.02	0	0	0.02	719	0	1451
Surface treatment of metals and plastic	62581	575	200	8113	87	12	0	200	99	2894499	1489	57093
Mining industry	1157035	0	0	0	0	0	0	0	0	48613	0	1157035
Cement and lime	1254815	218	1075	1511	0	412	0	560	332	297370	6138	1247945
Glass and mineral fibers	377383	1556	0.4	2943	0	5	0.001	0	5	2504724	791	375608
Ceramic	475048	73	2	1440	0	0.02	0	0	0.02	58465	280	473789
Organic chemical industry	374813	431	19137	3210	0.1	472	2042	0.2	465	2756228	22757	307769
Inorganic chemical industry	56575	77	18	1249	3	0.1	0	0	4	16041	19	55957
Fertilizers	23512	0	2	537	0	0	0	0	0	59	0	23512
Biocides	4601	81	0.2	21	0	0	0	0	0	2860	81	4601
Pharmaceutical products	2510	44968	177	333	0	0	0	0	0	1459288	45263	2479
Explosives and pyrotechnics	107	374	0	395	0	0	0	0	0	446	0	97
Hazardous waste	26361	347	11	1244	0.4	6	0	0	6	49088	246	25949
Non-hazardous waste	10588	324	64	8476	54	0.3	17	6	33	117960	357	8253
Disposal or recycling of animal waste	20922	0	0	2	0	0.2	0	0	0.2	4979	0	20922
Urban waste-water treatment plants	10834	1432	80	43128	174	49	554	0	48	173123	107	172
Paper and wood production	547721	146	1	1757	11	0.4	0	0.02	11	1372034	4494	542628
Food and beverage sector	243182	0	0	125	0	0	0	0	0	593505	0	243128
Pre-treatment or dyeing of textiles	2278	0	0	60	0	0	0	0	0	6238	0	2274
Tanning of hides and skins	18	0	0	18	0	0	0	0	0	139	0	0
Surface treatment using organic solvents	62946	71	2	2681	67	0	0	0	67	8221796	1689	62608
Production of carbon or electro-graphite	17037	0	0	0	0	37	0	0	37	8500	0	17000
TOTAL	7488769	56236	20823	203752	431	3381	2615	765	3502	24542923	119976	7327569

^aIARC carcinogenic classification: Group 1: carcinogens to humans (arsenic and compounds, cadmium and compounds, chromium and compounds, nickel and compounds, dioxins+furans, polychlorinated biphenyls, trichloroethylene, vinyl chloride, benzene, ethylene oxide, polycyclic aromatic hydrocarbons, particulate matter (PM₁₀), total suspended particulate matter, and benzo(a)pyrene); Group 2A: probably carcinogenic to humans (lead and compounds, dichloromethane, tetrachloroethylene, and hexabromobiphenyl); Group 2B: possibly carcinogenic to humans (chlordane, DDT, 1,2-dichloroethane, dichloromethane, heptachlor, hexachlorobenzene, 1,2,3,4,5,6-hexachlorocyclohexane, lindane, mirex, pentachlorophenol, tetrachloromethane, trichloromethane, ethyl benzene, naphthalene, di-(2-ethyl hexyl) phthalate, cobalt and compounds, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene).

^bMetals (arsenic and compounds, cadmium and compounds, chromium and compounds, copper and compounds, mercury and compounds, nickel and compounds, lead and compounds, zinc and compounds, thallium, antimony, cobalt, manganese, and vanadium); Pesticides (aldrin, dieldrin, atrazine, chlordane, chlorfenvinphos, chlorpyrifos, DDT, dieldrin, diuron, endosulfan, endrin, heptachlor, lindane, mirex, pentachlorobenzene, pentachlorophenol, simazine, isoproturon, organotin compounds, tributyltin and compounds, triphenyltin and compounds, trifluralin, and isodrin); PACs: Polycyclic aromatic chemicals (anthracene, polycyclic aromatic hydrocarbons, fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene); Non-HPCs: Non-halogenated phenolic chemicals (nonylphenol and nonylphenol ethoxylates, and octylphenols and octylphenol ethoxylates); Plasticizers (di-(2-ethyl hexyl) phthalate); POPs: Persistent organic pollutants (aldrin, chlordane, DDT, dieldrin, endosulfan, endrin, heptachlor, hexachlorobenzene, 1,2,3,4,5,6-hexachlorocyclohexane, lindane, mirex, dioxins+furans, pentachlorobenzene, polychlorinated biphenyls, brominated diphenylethers, organotin compounds, polycyclic aromatic hydrocarbons, hexabromobiphenyl, benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene); VOCs: Volatile organic compounds (non-methane volatile organic compounds, 1,2-dichloroethane, dichloromethane, hexachlorobutadiene, tetrachloroethylene, trichlorobenzenes, 1,1,1-trichloroethane, trichloroethylene, trichloromethane, vinyl chloride, benzene, ethyl benzene, ethylene oxide, and naphthalene); Solvents (1,2-dichloroethane, dichloromethane, tetrachloroethylene, trichlorobenzenes, 1,1,1-trichloroethane, trichloroethylene, trichloromethane, benzene, ethyl benzene, toluene, and xylenes); Other (tetrachloromethane, particulate matter (PM₁₀), and total suspended particulate matter).

Supplementary Material, Table S2: specific pollutants released by industrial groups, both to air and water.

Industrial group	Pollutants released by industrial groups	
	Air	Water
Combustion installations	NMVOC ^a , arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, dioxins+furans, trichloroethylene, benzene, PAHs ^b , PM ₁₀ ^c , TSP ^d , manganese, vanadium	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, dioxins+furans, PAHs ^b , toluene, fluoranthene, benzo(g,h,i)perylene
Refineries and coke ovens	NMVOC ^a , arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, dioxins+furans, polychlorinated biphenyls, 1,1,1-trichloroethane, trichloromethane, anthracene, benzene, naphthalene, PAHs ^b , PM ₁₀ ^c , TSP ^d , antimony, cobalt, manganese, vanadium, ethyl benzene	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, dioxins+furans, benzene, PAHs ^b , toluene, xylenes, fluoranthene, benzo(g,h,i)perylene
Production and processing of metals	NMVOC ^a , arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, hexachlorobenzene, lindane, dioxins+furans, polychlorinated biphenyls, anthracene, benzene, naphthalene, PAHs ^b , PM ₁₀ ^c , TSP ^d	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, pentachlorophenol, anthracene, nonylphenol, naphthalene, organotin compounds, PAHs ^b , octylphenols, fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene
Galvanization	NMVOC ^a , arsenic, cadmium, chromium, copper, nickel, lead, zinc, dioxins+furans, PM ₁₀ ^c , TSP ^d	Arsenic, cadmium, chromium, copper, nickel, lead, zinc, PAHs ^b
Surface treatment of metals and plastic	NMVOC ^a , cadmium, chromium, copper, nickel, lead, zinc, dichloromethane, 1,2,3,4,5,6-hexachlorocyclohexane, tetrachloroethylene, trichloroethylene, di-(2-ethyl hexyl) phtalate, PAHs ^b , PM ₁₀ ^c , TSP ^d , manganese	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, anthracene, naphthalene, organotin compounds, di-(2-ethyl hexyl) phtalate, PAHs ^b , fluoranthene
Mining industry	NMVOC ^a , PM ₁₀ ^c , TSP ^d	
Cement and lime	NMVOC ^a , arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, dioxins+furans, polychlorinated biphenyls, anthracene, benzene, naphthalene, di-(2-ethyl hexyl) phtalate, PAHs ^b , PM ₁₀ , TSP, thallium, antimony, cobalt, manganese, vanadium	Copper, zinc
Glass and mineral fibers	NMVOC ^a , arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, dioxins+furans, polychlorinated biphenyls, benzene, PAHs ^b , PM ₁₀ ^c , TSP ^d , manganese, vanadium	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, benzene, ethyl benzene, toluene, xylenes, octylphenols
Ceramic	NMVOC ^a , arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, benzene, PAHs ^b , PM ₁₀ ^c , TSP ^d , thallium, antimony, cobalt, manganese, vanadium	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc
Organic chemical industry	NMVOC ^a , arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, 1,2-dichloroethane, dichloromethane, dioxins+furans, tetrachloroethylene, tetrachloromethane, trichloromethane, vinyl chloride, anthracene, benzene, ethylene oxide, naphthalene, PAHs ^b , PM ₁₀ ^c , TSP ^d , antimony, cobalt, manganese, vanadium	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, aldrin, atrazine, chlordane, chlorfenvinphos, chlorpyrifos, DDT, 1,2-dichloroethane, dichloromethane, dieldrin, endosulfan, endrin, hexachlorobenzene, hexachlorobutadiene, 1,2,3,4,5,6-hexachlorocyclohexane, mirex, dioxins+furans, simazine, tetrachloroethylene, trichlorobenzenes, trichloroethylene, trichloromethane, vinyl chloride, anthracene, benzene, brominated diphenylethers, nonylphenol, ethyl benzene, naphthalene, organotin compounds, di-(2-ethyl hexyl) phtalate, PAHs ^b , toluene, tributyltin, xylenes, octylphenols, fluoranthene, isodrin
Inorganic chemical industry	NMVOC ^a , arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, dichloromethane, dioxins+furans, tetrachloromethane, trichloromethane, PM ₁₀ ^c , TSP ^d , antimony	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, hexachlorobenzene, dioxins+furans, trichloromethane, organotin compounds, PAHs ^b , fluoranthene
Fertilizers	NMVOC ^a , zinc, PM ₁₀ ^c , TSP ^d , cobalt	
Biocides	NMVOC ^a , dichloromethane, PM ₁₀ ^c	Copper, zinc, ethyl benzene, xylenes
Pharmaceutical products	NMVOC ^a , arsenic, cadmium, chromium, copper, mercury, nickel, lead, 1,2-dichloroethane, dichloromethane, trichloromethane, PM ₁₀ ^c , TSP ^d , thallium, antimony, cobalt, manganese, vanadium	Chromium, copper, lead, zinc, 1,2-dichloroethane, dichloromethane, tetrachloroethylene, tetrachloromethane, trichloroethylene, trichloromethane, benzene, ethyl benzene, toluene, xylenes
Explosives and pyrotechnics	NMVOC ^a , lead, PM ₁₀ ^c	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc,

Industrial group	Pollutants released by industrial groups	
	Air	Water
Hazardous waste	NM VOC, arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, dioxins+furans, tetrachloroethylene, trichloroethylene, benzene, PAHs ^b , PM ₁₀ ^c , TSP ^d , thallium, antimony, cobalt, manganese, vanadium	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, dichloromethane, polychlorinated biphenyls, tetrachloroethylene, trichloroethylene, trichloromethane, ethyl benzene, organotin compounds, PAHs ^b , toluene, xylenes
Non-hazardous waste	NM VOC ^a , mercury, dichloromethane, tetrachloroethylene, tetrachloromethane, trichloroethylene, vinyl chloride, PM ₁₀ ^c , TSP ^d	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, alachlor, aldrin, atrazine, chlordane, chlorfenvinphos, chlorpyrifos, DDT, 1,2-dichloroethane, dichloromethane, dieldrin, diuron, endosulfan, endrin, heptachlor, hexachlorobenzene, hexachlorobutadiene, 1,2,3,4,5,6-hexachlorocyclohexane, lindane, mirex, dioxins+furans, pentachlorobenzene, pentachlorophenol, polychlorinated biphenyls, simazine, tetrachloroethylene, trichlorobenzenes, trichloroethylene, trichloromethane, vinyl chloride, anthracene, benzene, brominated diphenylethers, nonylphenol, ethyl benzene, isoproturon, naphthalene, organotin compounds, di-(2-ethyl hexyl) phtalate, PAHs ^b , toluene, tributyltin, triphenyltin, trifluralin, xylenes, octylphenols, flouranthene, isodrin, hexabromobiphenyl
Disposal or recycling of animal waste	NM VOC ^a , PAHs ^b , PM ₁₀ ^c , TSP ^d	Zinc
Urban waste-water treatment plants	NM VOC ^a , cadmium, chromium, copper, mercury, nickel, lead, dioxins+furans, PM ₁₀ ^c	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, atrazine, 1,2-dichloroethane, diuron, lindane, pentachlorophenol, simazine, tetrachloroethylene, tetrachloromethane, trichloromethane, anthracene, benzene, nonylphenol, ethyl benzene, isoproturon, naphthalene, organotin compounds, di-(2-ethyl hexyl) phtalate, PAHs ^b , toluene, tributyltin, xylenes, octylphenols, fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene
Paper and wood production	NM VOC ^a , arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, di-(2-ethyl hexyl) phtalate, PM ₁₀ ^c , TSP ^d	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, tetrachloroethylene, trichlorobenzenes, trichloroethylene, trichloromethane, organotin compounds, di-(2-ethyl hexyl) phtalate, PAHs ^b , toluene
Food and beverage sector	NM VOC ^a , arsenic, cadmium, mercury, nickel, PM ₁₀ ^c , TSP ^d	Copper, nickel, zinc
Pre-treatment or dyeing of textiles	NM VOC ^a , PM ₁₀ ^c	Chromium, copper, mercury, nickel, zinc,
Tanning of hides and skins	NM VOC ^a	Chromium
Surface treatment using organic solvents	NM VOC ^a , chromium, copper, lead, dichloromethane, naphthalene, PM ₁₀ ^c , TSP ^d	Arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc, 1,2-dichloroethane, trichloroethylene, organotin compounds, toluene
Production of carbon or electro-graphite	NM VOC ^a , PAHs ^b , PM ₁₀ ^c	

^aNon-methane volatile organic compounds.

^bPolycyclic aromatic hydrocarbons.

^cParticulate matter.

^dTotal suspended particulate matter.