United States
Environmental Protection Agency

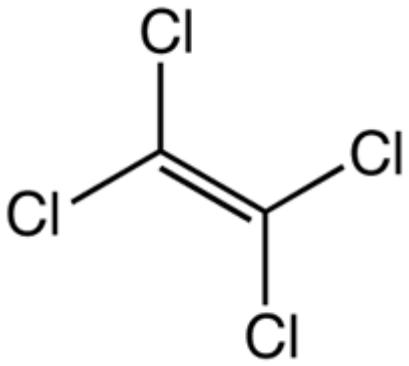
Office of Chemical Safety and
Pollution Prevention

Final Risk Evaluation for Perchloroethylene

Systematic Review Supplemental File:

Consumer and General Population Exposure Monitoring Data Extraction Tables

CASRN: 127-18-4



December 2020

Monitoring Data Extracted for Percloroethylene for Indoor Air, Personal Breathing Zone, Surface Water, and Wastewater

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
Indoor Air (µg/m^3)											
US	Michigan (south-east)	*Commercial/Public* Office area of commercial buildings (n=4), including two art museums, a university building and a tire store/auto service. Stationary samples collected from breathing height.	2005-2008	5 (0.8)	0.002	ND to 39.7	8.02 (mean); 0.1 (median)	0.91	2214330	(Jia et al., 2010)	High
US	Detroit, MI area	*Residential* Homes (n=126) with children with asthma	2009-2010	126 (0.91)	0.09	ND to 13.7	0.71 (mean); 0.26 (median)	--	2443355	(Chin et al., 2014)	High
US	California (statewide)	*Commercial/Public* Furniture/hardware stores (n=8)	2011-2013	58 (0.48)	0.32	0.32 to 22.2	5.6 (mean); NR (median)	--	2535652	(Chan et al., 2014)	High
US	California (statewide)	*Commercial/Public* Grocery stores (n=8)	2011-2013	76 (0.32)	0.32	0.32 to 5.9	1 (mean); NR (median)	--	2535652	(Chan et al., 2014)	High
US	California (statewide)	*Commercial/Public* Apparel stores (n=2)	2011-2013	20 (0.3)	0.32	0.32 to NR	0.2 (mean); NR (median)	--	2535652	(Chan et al., 2014)	High
US	Baltimore, MD	*Commercial/Public (Near Source: photocopy shop)* Personal samples from breathing zone. One from each of the three printing centers.	2000	4 (1)	NR	0.678 to 3.39	2.04 (mean); 1.36 (median)	4.75	1953674	(Stefaniak et al., 2000)	High
US	Baltimore, MD	*Commercial/Public (Near Source: photocopy shop)* Area samples from	2000	17 (0.94)	NR	ND to 21.7	2.04 (mean); 1.36 (median)	--	1953674	(Stefaniak et al., 2000)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		different locations within each of the three printing centers.									
US	Elizabeth, NJ; Houston, TX; and Los Angeles, CA	*Residential* Non-smoking households (n=310)	1999-2001	539 (NR)	0.21	NR	1.85 (mean); 0.82 (median)	7.29	2128575	(Su et al., 2013)	Medium
US	CA (five regions)	*Commercial/Public* Commercial buildings (n= 37), 1 m from floor: Fleet service / Gas station convenience store, Dentist office / Healthcare facility, Grocery / Restaurant, Hair salon / Gym, Office, Miscellaneous, Retail	2011	40 (0.94)	0.22	ND to 118	NR (mean); NR (median); 0.18 (GM)	--	1062239	(Wu et al., 2011)	High
US	Southeast Michigan	*Residential* Homes (n = 15) sampled in various locations in the home (upstairs, downstairs)	2005	15 (0.73)	0.07	NR to 4.4	0.6 (mean); NR (median)	--	1065558	(Batterman et al., 2007)	High
US	Southeast Michigan	*Residential* Garages of residences (n = 15)	2005	15 (0.33)	0.07	NR to 1.6	0.3 (mean); NR (median)	1.7	1065558	(Batterman et al., 2007)	High
US	Boston, MA	*Residential* Garage of residences	2004-2005	16 (0.81)	0.07	ND to NR	2.8 (mean); 0.3 (median)	3.4	1065844	(Dodson et al., 2008)	High
US	Boston, MA	*Residential* Apartment hallway of residences	2004-2005	10 (0.9)	0.07	ND to NR	1.9 (mean); 0.8 (median)	0.92	1065844	(Dodson et al., 2008)	High
US	Boston, MA	*Residential* Basement of residences	2004-2005	52 (0.98)	0.07	ND to NR	1.7 (mean); 0.5 (median)	3.1	1065844	(Dodson et al., 2008)	High
US	Boston, MA	*Residential*	2004-	83 (0.92)	0.07	ND to NR	1.9 (mean);	0.2	1065844	(Dodson et al., 2008)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		Interior room of residences	2005				0.6 (median)				
US	Los Angeles	*Residential* Homes (n=35) in inner-city neighborhood, sampled in the fall	2000	32 (1)	0.15	0.6 to 6.8	1.8 (mean); 1.3 (median)	1.9	1066049	(Sax et al., 2004)	High
US	Los Angeles, CA	*Residential* Homes (n=40) in inner-city neighborhood, sampled in the winter	2000	40 (1)	0.15	0.7 to 11	2.3 (mean); 1.9 (median)	8.7	1066049	(Sax et al., 2004)	High
US	New York, NY	*Residential* Homes (n=41) in inner-city neighborhood, sampled in the summer	1999	30 (0.78)	0.15	ND to 43	5.3 (mean); 2 (median)	13.1	1066049	(Sax et al., 2004)	High
US	New York, NY	*Residential* Homes (n=38) in inner-city neighborhood, sampled in the winter	1999	36 (1)	0.15	0.8 to 78	6.7 (mean); 3.5 (median)	1.2	1066049	(Sax et al., 2004)	High
US	Ann Arbor, Ypsilanti, and Dearborn Michigan	*Residential* Residences (n=159) in industrial, urban, and suburban cities over two seasons	2004-2005	252 (0.99)	0.02	ND to 27.8	0.93 (mean); 0.39 (median)	--	1488206	(Jia et al., 2008a)	Medium
US	CA	*School* Early childhood education facilities (n=33) at sample height of 1 m.	2010-2011	33 (0.52)	NR	0.07 to 7.8	0.4 (mean); 0.1 (median); 0.1 (GM)	5.31	3453092	(Hoang et al., 2016)	High
US	Southern California	*Commercial/Public* Gene Autry Museum, sampled in various areas (an exhibit area,	1989	600 (NR)	NR	0.20 to 5.97	NR (mean); NR (median)	235	28104	(Hisham and Grosjean, 1991)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		hallway near truck delivery door, and conservation room)									
US	Southeast Chicago	*Residential* Urban homes (n=10) sampled over a 10-month period. Stationary samples were collected from the kitchen in the breathing zone.	1994-1995	48 (1)	NR	0.54 to 13.1	2.61 (mean); 2.17 (median)	--	31210	(Van Winkle and Scheff, 2001)	High
US	NR	*Commercial/Public* (Near Source: printmaking) Printmaking art studio at a university (n =1). Mechanically vented second-floor studio, with area samples collected near a cleaning station and in the middle of the studio during a printmaking session.	2002	18 (<1)	NR	ND to NR	0.4 (mean); 0.18 (median)	1.2	49414	(Ryan et al., 2002)	High
US	NR	*Commercial/Public* Non-art related floor at a university, three floors above a printmaking floor with separate ventilation (n =1). Area samples collected from hallway.	2002	18 (<1)	NR	ND to NR	0.4 (mean); 0.18 (median)	8.1	49414	(Ryan et al., 2002)	High
US	Washington, DC	*Coin Operated*	1980	18 (1)	NR	617 to 1357	882 (mean);	--	58127	(Howie, 1981)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
	area	*Laundry with Dry Cleaning Machines* Laundry facility (Site A), sampled at 6 to 7 ft above floor at three locations. Use of dry cleaning machine low, but dry-cleaned clothes stored on site. Large facility. Good airflow.					NR (median)				
US	Washington, DC area	*Coin Operated Laundry with Dry Cleaning Machines* Laundry facility (Site C), sampled at 6 to 7 ft above floor at three locations. Eight attendant operated dry cleaning machines on-site. Good air circulation because of floor plan, front door open at all times.	1980	18 (1)	NR	1696 to 18318	8820 (mean); NR (median)	--	58127	(Howie, 1981)	High
US	Washington, DC area	*Coin Operated Laundry with Dry Cleaning Machines* Laundry facility (Site B), sampled at 6 to 7 ft above floor at three locations. 2 attendant operated dry- cleaning machines on-site. Ventilation and circulation good, front door	1980	18 (1)	NR	509 to 4749	2171 (mean); NR (median)	--	58127	(Howie, 1981)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		open regularly.									
US	Washington, DC area	*Coin Operated Laundry with Dry Cleaning Machines* Laundry facility (Site D), sampled at 6 to 7 ft above floor at three locations. Four customer- operated dry- cleaning machines on-site. Limited air circulation, but front door open at all times.	1980	18 (1)	NR	3148 to 4206	39351 (mean); NR (median)	--	58127	(Howie, 1981)	High
US	Washington, DC area	*Coin Operated Laundry with Dry Cleaning Machines* Laundry facility (Site E), sampled at 6 to 7 ft above floor at three locations. Four attendant-operated dry-cleaning machines on-site. Air-conditioned site with re-circulated indoor air.	1980	18 (1)	NR	12891 to 94985	58348 (mean); NR (median)	--	58127	(Howie, 1981)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
US	Washington, DC area	*Coin Operated Laundry with Dry Cleaning Machines* Laundry facility (Site F), sampled at 6 to 7 ft above floor at three locations. Eight attendant-operated dry cleaning machines on-site. Limited air circulation because of floor plan; front door open at all times.	1980	18 (1)	NR	2239 to 21032	8820 (mean); NR (median)	--	58127	(Howie, 1981)	High
US	Denver, CO	*Residential* Homes, occupied (n=9)	1994	9 (0.89)	0.14	ND to 1.99	0.66 (mean); 0.33 (median)	2.63	78782	(Lindstrom et al., 1995)	Medium
US	Minneapolis, MN	*School* Indoors in five randomly selected classrooms in each school, during the spring.	2000	113 (0.86)	NR	NR	NR (mean); 0.3 (median)	--	632310	(Adgate et al., 2004)	Medium
US	Minneapolis, MN	*School* Indoors in five randomly selected classrooms in each school, during the winter.	2000	113 (0.96)	NR	NR	NR (mean); 0.3 (median)	--	632310	(Adgate et al., 2004)	Medium
US	Minneapolis, MN	*Residential* Indoors in the child's primary residence, during the spring.	2000	113 (0.95)	NR	NR	NR (mean); 0.4 (median)	--	632310	(Adgate et al., 2004)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
US	Minneapolis, MN	*Residential* Indoors in the child's primary residence, during the winter.	2000	113 (0.98)	NR	NR	NR (mean); 0.5 (median)	--	632310	(Adgate et al., 2004)	Medium
MX	Mexico City Metropolitan Area	*Residential* Homes	1998-1999	30 (1)	NR	NR to 43.6	5.5 (mean); 3 (median); 3.6 (GM)	--	56224	(Serrano-Trespalacios et al., 2004)	High
CA	NR	*Residential* Homes (n=12), main floor	1986	12 (1)	NR	1 to 171	28.1 (mean); NR (median)	--	27974	(Chan et al., 1990)	Medium
CA	NR	*Residential* Homes (n=6), main floor	1987	6 (1)	NR	2 to 18	6.2 (mean); NR (median)	--	27974	(Chan et al., 1990)	Medium
IT	NR	*Residential* Control Homes - 25 private homes with individuals not occupationally exposed, but within the same district near the dry-cleaners' homes.	1994	25 (1)	1	ND to 16	3 (mean); 2 (median); 2 (GM)	--	21778	(Aggazzotti et al., 1994a)	Medium
IT	Modena	*Residential* Households (n=29) with no association with dry cleaning establishments.	1992-1993	58 (NR)	1	1 to 56	NR (mean); 6 (median); 0.006 (GM)	3	74875	(Aggazzotti et al., 1994b)	High
NL	Ede and Rotterdam	*Residential* Suburban homes built post WWII, Inner-city homes built prior to WWII, and newer homes < 6 years old. Samples collected in living room.	1981-1982	319 (0.3)	2	ND to 205	NR (mean); 1 (median)	--	22186	(Lebret et al., 1986)	Medium
FI	NR	*Residential* Normal houses (not "sick houses").	1995	50 (NR)	NR	ND to 5.65	0.46 (mean); 0.3 (median)	11	76241	(Kostiainen, 1995)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		50 "Normal houses" in this study.									
FI	NR	*Residential* "Sick houses" - houses in which people complained about the odor or they had symptoms, which resembled WHO's Sick Building Syndrome (headache, nausea, irritation of the eyes, mucous membranes, and the respiratory system, drowsiness, fatigue, and general malaise. 38 "sick houses" in this study.	1995	7 (NR)	NR	0.19 to 29.8	4.86 (mean); 0.73 (median)	0.66	76241	(Kostiainen, 1995)	Medium
SG	nation-wide	*School* Child-care centers (n=104), sampled from middle of the classroom near the breathing zone of children (approximately 0.5–0.7 m)	2007	84 (0.72)	0.6	ND to 8.5	NR (mean); 0.3 (median)	--	632758	(Zuraimi and Tham, 2008)	High
DE	Hamburg area	*Vehicle (Near Source: dry-cleaning)* Dry-cleaned down jacket placed into a car.	1990	3 (1)	NR	9300 to 24800	NR (mean); NR (median)	--	713690	(Gulyas and Hemmerling, 1990)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
SA	Kuwait	*Residential* Houses (n=20), sampled from living room	1998	226 (0.93)	0.26	ND to NR	NR (mean); NR (median)	--	1744157	(Bouhamra and Elkilani, 1999)	Medium
FR	nation-wide	*Residential* Main dwellings(n=490), samples collected from bedroom.	2003-2005	490 (0.84)	0.4	ND to 72.1	NR (mean); 1.3 (median)	--	733119	(Billionnet et al., 2011)	Medium
FR	Paris area	*Residential* Homes (n=196) of the PARIS birth cohort with sampling in the infant bedroom at 1, 6, 9, and 12 months old.. Annual levels averaged from hot and cold seasonal levels.	2003-2007	177 (1)	0.4	0.6 to 124.2	NR (mean); 2.3 (median); 2.8 (GM)	--	2128839	(Roda et al., 2013)	Medium
FR	Paris area	*Residential* Homes (n=196) of the PARIS birth cohort with sampling in the infant bedroom at 1, 6, 9, and 12 months old. Hot season levels.	2003-2008	177 (NR)	0.4	0.4 to 245	NR (mean); 2.1 (median); 2.4 (GM)	--	2128839	(Roda et al., 2013)	Medium
FR	Paris area	*Residential* Homes (n=196) of the PARIS birth cohort with sampling in the infant bedroom at 1, 6, 9, and 12 months old.. Cold season levels.	2003-2009	177 (1)	0.4	0.6 to 59.2	NR (mean); 2.4 (median); 2.8 (GM)	15.8	2128839	(Roda et al., 2013)	Medium
FR	nation-wide	*Residential*	2003-	98 (NR)	NR	NR	5.3 (mean);	10.6	2855333	(Brown et al., 2015)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		Dwellings with clothes that have been dry cleaned in the previous 4 weeks. (n=94)	2005				NR (median); 2.5 (GM)				
FR	nation-wide	*Residential* Dwellings without clothes that have been dry cleaned in the previous 4 weeks. (n=447)	2003-2005	456 (NR)	NR	NR	3.7 (mean); NR (median); 1.1 (GM)	32.6	2855333	(Brown et al., 2015)	Medium
RS	Novi Sad	*Commercial/Public (Near Source: photocopy shop)* Photocopy shop (n=1) with a desktop computer, laptop computer, 2 copiers, and a printer	2015	225 (0.64)	6.78	6.78 to 96342	4953 (mean); 6.78 (median)	--	3371701	(Kiurski et al., 2016)	Medium
SG	NR	*Commercial/Public* Office building (n=1), 6 months old with normal occupancy and steady state ventilation system, sampled in the middle	2004	8 (NR)	NR	NR	2321 (mean); NR (median)	78.5	3393192	(Tham et al., 2004)	Low
DE	Essen and Borken	*Residential* Residential homes, collected in room where inhabitants spent the most amount of time at a height of 1.5 to 2 meters.	1996	229 (1)	NR	0.03 to 7.33	2.21 (mean); NR (median)	--	3561656	(Begerow et al., 1996)	High
DE	Leipzig	*Residential* Homes (n=85), sampled from	1997-1999	85 (NR)	NR	NR	NR (mean); 1.8 (median)	--	34460	(Lehmann et al., 2002)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		bedroom of infants for 4 weeks after birth.									
EU	Sweden, Finland, Estonia, Lithuania, Belgium, UK, France, Austria, Germany, Poland, Slovakia, Czech Republic, Hungary, Romania, Bulgaria, Serbia, Bosnia and Herzegovina, Italy, Portugal, Malta, Greece, Cyprus, and Albania	*School* Kindergartens (n=25).	2014	25 (NR)	NR	ND to 6	1 (mean); 0.18 (median)	2	4440449	(Ec, 2014)	High
EU	Sweden, Finland, Estonia, Lithuania, Belgium, UK, France, Austria, Germany, Poland, Slovakia, Czech Republic, Hungary, Romania, Bulgaria, Serbia, Bosnia and Herzegovina, Italy, Portugal, Malta, Greece, Cyprus, and Albania	*School* Primary schools (n=300).	2014	300 (NR)	NR	ND to 81	1 (mean); 0.18 (median)	2	4440449	(Ec, 2014)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
EU	Sweden, Finland, Estonia, Lithuania, Belgium, UK, France, Austria, Germany, Poland, Slovakia, Czech Republic, Hungary, Romania, Bulgaria, Serbia, Bosnia and Herzegovina, Italy, Portugal, Malta, Greece, Cyprus, and Albania	*School* Primary schools where teachers participated (n=106).	2014	106 (NR)	NR	ND to 31	1 (mean); 0.18 (median)	--	4440449	(Ec, 2014)	High
CN	NR	*Commercial/Public* Non-office premises (n=10) including one library, one social services center, two customer services centers, two shopping malls, two recreational building units, one reception area and one training center under renovation. 1.1 m above the floor level.	1998-2000	10 (0.6)	0.3	ND to 10.9	3 (mean); 2.2 (median); 1.4 (GM)	9.2	824555	(Chao and Chan, 2001)	Medium
CN	NR	*Commercial/Public* Office buildings (n=10), 1.1 m above the floor	1998-2000	10 (0.6)	0.3	ND to 30.5	5.2 (mean); 1.8 (median); 1.9 (GM)	--	824555	(Chao and Chan, 2001)	Medium
CN	Shanghai	*Residential* Eight residences that had been	2015	8 (NR)	NR	NR	2.38 (mean); 0.72 (median)	0.15	3453725	(Dai et al., 2017)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		renovated within the previous year. Three sampling sites were used in each participating residence (the living room, bedroom, and study).									
JP	Shimizu, Shizuoka Prefecture	*Residential* Single-family houses (n=25) in industrial harbor area, sampled in the main living area	2001	25 (1)	NR	NR	NR (mean); NR (median); 0.16 (GM)	--	632484	(Ohura et al., 2006)	High
JP	Shimizu, Shizuoka Prefecture	*Residential* Single-family houses (n=21) in industrial harbor area, sampled in the main living area	2001	21 (1)	NR	NR	NR (mean); NR (median); 0.16 (GM)	0.33	632484	(Ohura et al., 2006)	High
JP	Katsushika Ward, Tokyo	*Residential* 30 houses' bathrooms, sampled for 4 consecutive 24 hour periods. n=119	1995	119 (1)	NR	0.363 to 22.5	2.56 (mean); NR (median); 1.83 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* 13 houses' living rooms, sampled for 4 consecutive 24 hour periods. n=52	1995	52 (1)	NR	0.294 to 8.13	1.42 (mean); NR (median); 0.986 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* 13 houses' kitchens, sampled for 4 consecutive 24 hour periods. n=52	1995	52 (1)	NR	0.295 to 8.25	1.17 (mean); NR (median); 0.829 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward,	*Residential*	1995	52 (1)	NR	0.215 to 10.6	1.64 (mean);	--	3545469	(Amagai et al., 1999)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
	Tokyo	13 houses' bedrooms, sampled for 4 consecutive 24 hour periods. n=52					NR (median); 0.998 (GM)				
JP	Katsushika Ward, Tokyo	*Residential* 13 houses' bathrooms, sampled for 4 consecutive 24 hour periods. n=52	1995	52 (1)	NR	0.172 to 5.36	1.06 (mean); NR (median); 0.774 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* 30 houses' living rooms, sampled for 4 consecutive 24 hour periods. n=238	1995	238 (1)	NR	0.292 to 57	3.69 (mean); NR (median); 2.36 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* 30 houses' kitchens, sampled for 4 consecutive 24 hour periods. n=119	1995	119 (1)	NR	0.339 to 30.8	3.03 (mean); NR (median); 2.02 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* 30 houses' bedrooms, sampled for 4 consecutive 24 hour periods. n=238	1995	238 (1)	NR	0.358 to 71	4.24 (mean); NR (median); 2.42 (GM)	--	3545469	(Amagai et al., 1999)	Medium
Personal Breathing Zone (µg/m³)											
US	IL, IN, OH, MI, MN, WI (Great Lakes Region)	*Residential* Non-institutionalized persons residing in households in six states	1995-1997	386 (0.61)	NR	ND to NR	31.9 (mean); 1.98 (median)	--	14003	(Clayton et al., 1999)	High
US	Columbus, OH	*Residential* Non-smoking women (n=24) with non-smoking	1991	24 (NR)	NR	ND to 5.13	1.24 (mean); 0.7 (median)	1.46	22045	(Heavner et al., 1995)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		husbands									
US	Columbus, OH	*Residential* Non-smoking (n=25) women with smoking husbands	1991	25 (NR)	NR	ND to 3.78	0.89 (mean); 0.68 (median)	0.96	22045	(Heavner et al., 1995)	Medium
US	NR	*Commercial/Public (Near Source: printmaking)* 12 students and 1 faculty member in university art (printmaking) studio. Mechanically ventilated second-floor.	2002	90 (NR)	NR	ND to NR	0.7 (mean); 0.5 (median)	2.3	49414	(Ryan et al., 2002)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
US	NR	*General* Personal VOC exposures of 851 adults, who were part of the NHANES study (no additional exclusion criteria), sampled via badge-type passive exposure monitors for 48–72 h. Additionally, participants were administered a short questionnaire regarding the length of time they wore their badge and 30 other questions on factors potentially related to VOC exposures, *e.g.*, contact with dry cleaning, tobacco smoke and gasoline vapor over the past several days.	1999-2000	665 (0.69)	0.42	ND to 659	5.2 (mean); 0.7 (median); 1 (GM)	31.2	484177	(Jia et al., 2008b)	High
US	Minneapolis, MN	*Residential* In personal breathing zones, during the winter.	2000	113 (1)	NR	NR	0.4 (median)	--	632310	(Adgate et al., 2004)	Medium
US	Minneapolis, MN	*Residential* In personal breathing zones, during the spring.	2000	113 (0.97)	NR	NR	0.4 (median)	--	632310	(Adgate et al., 2004)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
US	Minneapolis-St. Paul, MN	*General* Adults, non-smoking (n=70) living in three neighborhoods: (inner-city/economically disadvantaged, blue-collar/near manufacturing plants, and affluent)	1999	333 (1)	NR	NR	27.8 (mean); 0.9 (median)	--	730121	(Sexton et al., 2007)	High
US	Elizabeth, NJ; Houston, TX; and Los Angeles, CA	*General* Adults (n=309) and children (n=118) from 310 non-smoking households.	1999-2001	544 (NR)	0.21	NR	7.17 (mean); 0.89 (median)	112.35	2128575	(Su et al., 2013)	Medium
US	Greater Boston Metropolitan Area	*Commercial/Public* Drug Stores (n=8)	2003	7 (NR)	0.22	0.45 to 2.16	0.86 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Furniture Stores (n=11)	2003	6 (NR)	0.22	0.49 to 6.35	1.34 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Grocery Stores (n=16)	2003	12 (NR)	0.22	0.42 to 4.83	0.95 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Hardware Stores (n=32)	2003-2004	23 (NR)	0.22	0.22 to 21.1	1.79 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Housewares Stores (n=16)	2003	7 (NR)	0.22	1.27 to 7.41	1.48 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Multipurpose Stores (n= 24)	2003-2005	43 (NR)	0.22	0.52 to 43.8	1.18 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Sporting Goods Stores (n=14)	2003	7 (NR)	0.22	1.24 to 11.6	2.96 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston	*Commercial/Public*	2004	20 (NR)	0.22	0.24 to 83.4	NR	--	2442846	(Loh et al., 2006)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
	Metropolitan Area	Dining Stores (n=20)									
US	Greater Boston Metropolitan Area	*Commercial/Public* Transportation Stores (n=5)	2003-2004	21 (NR)	0.22	0.32 to 5.17	0.78 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Department Stores (n=10)	2004	5 (NR)	0.22	1.27 to 4.89	2.04 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Electronics Stores (n=9)	2004	7 (NR)	0.22	ND to 8.49	0.47 (GM)	--	2442846	(Loh et al., 2006)	High
US	CA and NJ	*General* Adults conducting normal daily activities	1981-1984	772 (NR)	0	NR	5.6 to 45 (mean)	--	23081	(Wallace, 1986)	High
US	NR	*Mixed Use* NHANES study measured exposures on adults aged 20–59 years to TCE. Participants wore passive exposure monitors. Returned 2–3 days later at which time a short survey was administered regarding activities potentially related to exposures.	1999-2000	633 (0.686)	NR	0.1 to 659.1	0.7 (median); 1 (GM)	--	2331366	(D'Souza et al., 2009)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
MX	Mexico City Metropolitan Area	*General* General - different activity patterns: Three individuals from each family were selected to represent different activity patterns: a long commuter, another engaged in some activities outside the home during the day but with no routine long commutes, and one staying at or near the home most of the day	1998-1999	90 (1)	NR	NR to 84.4	5.9 (mean); 3.7 (median); 4.1 (GM)	9.9	56224	(Serrano-Trespalacios et al., 2004)	Low
Indoor Air, Personal Breathing Zones, and Breath from Exposure Studies with Dry-Cleaned Textiles (µg/m3)											
US	Bayonne and Elizabeth, NJ	*Residential* Indoor air of living rooms and bedrooms of nine homes with two to ten sets of dry-cleaned clothes were brought into the homes.	NR	18	NR	NR to 297	NR	--	28307	(Thomas et al., 1991)	High
US	Bayonne and Elizabeth, NJ	*Residential* Personal air two to ten sets of dry-cleaned clothes were brought into the homes.	NR	7	1	NR to 303	NR	--	28307	(Thomas et al., 1991)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
US	Bayonne and Elizabeth, NJ	*Residential* Exhaled breath, two to ten sets of dry-cleaned clothes were brought into the homes.	NR	7	1	NR to 303	NR	--	28307	(Thomas et al., 1991)	High
US	NR	*Residential* Single story residential house with dry-cleaning placed in closet. Samples collected from closet.	NR	NR	1	NR	100-2,900 (daily avg)	--	27401	(Tichenor et al., 1990)	High
US	NR	*Residential* Single story residential house with dry-cleaning placed in closet. Samples collected from the bedroom.	NR	NR	1	NR	20-195 (daily avg)	--	27401	(Tichenor et al., 1990)	High
US	NR	*Residential* Single story residential house with dry-cleaning placed in closet. Samples collected from the den.	NR	NR	1	NR	10-80 (daily avg)	--	27401	(Tichenor et al., 1990)	High
US	Washington, DC	*Residential* In late summer; Private home in rural residential area. Samples collected over 7 days after placing dry-cleaned clothing in the house.	1980	7(1)	NR	42.0 to 692	NR	--	58127	(Howie, 1981)	High
US	NR	*Automobile* Modeled air concentration in	NR	NR	NR	NR to 2,300	NR	--	85812	(Park et al., 1998)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		vehicle with dry- cleaned jacket.									
DE	NR	*Automobile* Car with a dry- cleaned down jacket placed in the car.	1990	3(1)	NR	9,300 to 24,800	NR	--	713690	(Gulyas and Hemmerling, 1990)	Medium
CN	Hong Kong	*Residential* Home (Site A) with dry cleaned clothes in closet of urban 5th floor apartment bedroom.	1996	28 (1)	NR	4.6 to 76	NR	--	3559311	(Chao et al., 1999)	Medium
CN	Hong Kong	*Residential* Home (Site B) with dry cleaned clothes in closet of suburban 2nd floor apartment bedroom.	1996	28 (1)	NR	21 to 494	NR	--	3559311	(Chao et al., 1999)	Medium
CN	Hong Kong	*Residential* Home (Site C) with dry cleaned clothes in closet of urban 10th floor apartment bedroom.	1996	28 (1)	NR	0.93 to 100	NR	--	3559311	(Chao et al., 1999)	Medium
JP	NR	*Residential* Homes in Japan, dry cleaned clothes sampled in chest of drawers.	NR	9 (1)	NR	2.9 to 326.6	NR	--	3563210	(Kawauchi and Nishiyama, 1989)	Medium
JP	NR	*Residential* Homes in Japan, dry cleaned clothes sampled in same room as chest of drawers.	NR	6 (1)	NR	1.3 to 7.4	NR	--	3563210	(Kawauchi and Nishiyama, 1989)	Medium
Surface Water (µg/L)											
US	Anchorage, AK	Background	1998-	11 (0)	0.2	All ND	ND	NR	3975042	(USGS, 2006)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		Chester Creek (6 urban sampling sites)	2001								
US	Nation-wide	*Background* Surface water for drinking water sources (rivers and reservoirs)	1999-2000	375 (0.008)	0.2	ND to 5.5	NR	NR	3975046	(USGS, 2003)	Medium
US	Nation-wide	Surface water for drinking water sources (rivers and reservoirs)	1999-2000	375 (0.0027)	0.2	ND to 2.6	NR	NR	3975046	(USGS, 2003)	Medium
US to CL	NR	*Background* Eastern Pacific Ocean (California, US to Valparaiso, Chile)	1979-1981	30 (0.90)	0.0001	ND to 0.0028	0.7 (mean); 0.0004 (median)	0.0007	29192	(Singh et al., 1983)	Medium
US to CL	NR	Eastern Pacific Ocean (California, US to Valparaiso, Chile)	1979-1981	30 (0.93)	0.0004	ND to 0.008	0.0031 (mean)	0.0032	29192	(Singh et al., 1983)	Medium
BR	NR	*Background* Santo Antonio da Patrulha, Tres Coroas, and Parobe in the Sinos River Basin; River samples collected from seven points on the three main rivers of the Sinos River Basin	2012-2013	60 (0.083)	NR	ND to 0.8	0.03 (mean)	NR	3489827	(Bianchi et al., 2017)	Medium
BR	NR	Santo Antonio da Patrulha, Tres Coroas, and Parobe in the Sinos River Basin; River samples collected from seven points on the three main rivers of the Sinos River Basin	2012-2013	60 (0.72)	NR	ND to 0.0588	0.0019 (mean)	NR	3489827	(Bianchi et al., 2017)	Medium
CN	NR	*Background* Yellow Sea and East China Sea (53	2011	53 (1.0)	NR	0.00022 to 0.0051	0.0019 (mean)	NR	2128010	(He et al., 2013a)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		stations)									
CN	NR	*Background* Daliao River (n=20 sites), heavily industrialized	2011	20 (0.1)	NR	NR to 0.11	0.016 (mean)	NR	3488897	(Ma et al., 2014)	High
CN	NR	*Background* East China Sea; Seawater (41 stations)	2010	41 (1)	NR	0.000065 to 0.0015	0.0004 (mean)	NR	1940132	(He et al., 2013b)	High
ES	North-Western area	*Background* River Duero (11 stations)	2007	11 (NR)	NR	NR to 0.09	0.01 (mean)	NR	3501965	(Blanco and Bécares, 2010)	Medium
GB	NR	*Background* Irish Sea; Liverpool Bay and River Mersey (18 stations)	2006	18 (NR)	0.000025	ND to 0.0455	NR	NR	2277377	(Bravo-Linares et al., 2007)	Medium
RU	NR	*Background* Kalmykian Steppe; Rivers, springs, lakes, salt lakes (n=23); polluted and remote areas	1999-2003	23 (0.83)	0.005	ND to 310	24.6 (mean)	81.8	104106	(Weissflog et al., 2004)	Medium
PT	Nation-wide	*Background* sea, estuarine, river water and industrial effluents (46 water sample locations)	1999-2000	644 (0.20)	0.4	ND to 13	NR	NR	659075	(Martinez et al., 2002)	Medium
BE	NR	*Background* Southern North Sea; Southern Bight, Belgian Continental Shel, the mouth of the Scheldt estuary, and the Channel (10 stations total)	1998-2000	47 (NR)	NR	NR to 0.28	0.023 (mean); 0.0015 (median)	NR	660096	(Huybrechts et al., 2005)	High
EU	NR	*Background* Estuaries of the Scheldt (n=2), Thames, Loire, Rhine	1997-1999	73 (NR)	0.000099	ND to 1.2	NR	NR	3242836	(Christof et al., 2002)	High
EU	NR	Estuaries of the	1997-	73 (1)	NR	0.0003 to 4.98	NR	NR	3242836	(Christof et al., 2002)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		Scheldt (n=2), Thames, Loire, Rhine	1999								
GR	Northern Greece	*Background* Rivers (n=4) and lakes (n=5). Rivers sampled at the estuary and near the frontier. Lakes - Vegoritida, Volvi, Vistonida, Large Prespa and Small Prespa. Rivers - Evros, Nestos, Strimonas, and Axios	1996-1998	104 (NR)	0.02	ND to 0.19	NR	NR	1024859	(Kostopoulou et al., 2000)	High
JP	Osaka	*Background* Rivers in heavily industrialized area (n=10 stations). Wastewater treatments upstream from the sampling sites.	1995-1997	106 (0.85)	NR	0.47 to 86.2	4.83 (mean); 2.44 (median)	9.32	2310570	(Yamamoto et al., 2001)	Medium
FR	Paris	*Background* River samples (raw) collected from the River Seine (n=14 stations), River Marne (n=1 station) and River Oise (n=1 station). Wastewater treatment plants are located on the river.	1994-1995	43 (1)	NR	0.068 to 1.037	0.31 (mean); 0.196 (median)	0.248	3587944	(Duclos et al., 2000)	Medium
FR	Paris	River samples (raw) collected from the River Seine (n=14 stations), River Marne (n=1 station) and River Oise (n=1 station). Wastewater	1994-1995	43 (1)	NR	0.016 to 4.92	1.004 (mean); 0.473 (median)	1.218	3587944	(Duclos et al., 2000)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		treatment plants are located on the river.									
JP	Osaka	Rivers and estuaries (30 sites) in industrialized city	1993-1995	136 (NR)	NR	NR to 134	1.7 (median)	NR	645789	(Yamamoto et al., 1997)	High
BE	NR	*Background* Southern North Sea and Scheldt Estuary; Seven sites in the southern North Sea and Scheldt Estuary.	1994-1995	38 (NR)	NR	NR	0.00268 (median)	NR	644857	(Dewulf et al., 1998)	High
EU	NR	*Background* Mersey Estuary; Freshwater input collected from the Howley Weir.	1987-1989	5 (NR)	NR	NR	0.6 (mean); 0.6 (median)	NR	2802879	(Rogers et al., 1992)	Medium
GR	Thermaikos and Kavala, Northern Greece	*Background* Seawater collected from Thermaikos Gulf (6 stations; near large city and industrial area) and Kavala Gulf stations (4 stations; near small city and off-shore oil-wells).	1981-1982	10 (1)	NR	0.00027 to 0.003	0.00131 (mean); 0.00116 (median)	0.00099	4149731	(Fytianos et al., 1985)	Low
CH	Background	*Background* River Aare; River samples collected at River Aare.	1980-1981	12 (NR)	NR	NR	0.24 (mean)	0.12	3797825	(Schwarzenbach et al., 1983)	Medium
CH	Background	*Background* River Glatt; River samples collected at River Glatt.	1979-1980	16 (NR)	NR	NR	0.6 (mean)	0.70	3797825	(Schwarzenbach et al., 1983)	Medium
GB	NR	*Background* Estuaries, docks, channels, bays, and inshore (n=48)	1992	48 (0.44)	NR	0.01 to 0.274	0.04491 (mean); 0.0125 (median)	0.0645	2803418	(Dawes and Waldock, 1994)	Medium
SE	Stenungsund area	*Background* Seawater (n=13	1988	52 (NR)	NR	NR	0.0025 (mean)	NR	658636	(Abrahamsson et al., 1989)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
		stations), sampled on two occasions (depths of 1-10 m) in area of petrochemical centre									
GB	NR	*Background and Near Facility (Ship Tanker Cleaning Operations)* North Sea; North Sea: 32 sampling stations in the Thames, Humber, Tees, Forth, and Felixstowe (0 to 20 miles from shore) and the Central North Sea (distance from shore not provided). Tank cleaning operations at North Sea ports.	1986	32 (0.47)	0.002	ND to 0.16	15 (mean); 0.002 (median)	0.037	4149734	(Hurford et al., 1989)	Medium
IT	Emilia-Romagna region	*Background* Canal (n=1) which receives wastewater.	1984	6 (0.574)	NR	18 to 168	136 (mean)	NR	4149721	(Aggazzotti and Predieri, 1986)	Low
AQ	NR	*Background* Northern Victoria Land; Five lakes (Carezza Lake, Edmonson Point Lakes, Tarn Flat Lake, Inexpressible Island Lake and Gondwana Lake)	2011-2012	6 (1)	NR	0.0056 to 0.0166	0.0097 (mean)	0.0038	2800175	(Insogna et al., 2014)	High
AQ	NR	*Background* Ross Sea	1997-1998	48 (NR)	NR	0.0002 to 0.071	0.02 (mean); 0.0056 (median)	0.023	2189687	(Zoccolillo et al., 2004)	Medium
AQ	NR	*Background* Lakes at Tarn Flat and Edmonson Point; Two freshwater lakes	1998	4 (NR)	NR	0.0023 to 0.0041	0.0032 (mean); 0.0031 (median)	0.0007	2189687	(Zoccolillo et al., 2004)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
AQ	NR	*Background* Lake water collected from 3 sites (Carezza Lake, Tarn Flat, Inexpressible Island at altitude m 100) and Ice water collected from 3 sites (Corner Glacier, Edmonson Point, Onyx River)	1988-1989	6 (NR)	NR	0.0011 to 0.0099	NR	NR	3544414	(Zoccolillo and Rellori, 1994)	Medium
AQ	NR	*Background* Lake water collected from 5 sites (Carezza Lake, Edmonson Point at altitude m 190, Tarn Flat, Inexpressible Island at altitude m 100 & altitude m 50) and Ice water collected from 3 sites (Corner Glacier, Inexpressible Island, Wood Bay)	1989-1990	8 (NR)	NR	0.0014 to 0.0043	NR	NR	3544414	(Zoccolillo and Rellori, 1994)	Medium
AQ	NR	*Background* Lake water collected from 5 sites (Carezza Lake, Edmonson Point at altitude m 190 & altitude m 20, Tarn Flat, Inexpressible Island at altitude m 100) and Sea water collected from 1 site (Icarus Field)	1990-1991	6 (NR)	NR	0.0002 to 0.0011	NR	NR	3544414	(Zoccolillo and Rellori, 1994)	Medium
Wastewater (µg/L)											
KR	Nation-wide	*Near Facility (industrial WWTPs)* Influent/Effluent	2012	81 (NR)	1	1 to 23	1 (median)	--	3580141	(Lee et al., 2015)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		
						Range	Central Tendency	Standard Deviation	HERO	Citation	Data Eval. Score
KR	Nation-wide	*Near Facility (industrial WWTPs)* Effluent	2012	81 (0)	1	ND	--	--	3580141	(Lee et al., 2015)	Medium
Biota (µg/kg)											
BE	Nation-wide	*Background* Eel, skin	2003	20 (0.5)	0.1	0.1 to 89	13.4 (mean); 0.78 (median)	NR	1066543	(Roose et al., 2003)	Medium

Study Info: The information provided includes the HERO ID and citation; country and year samples collected; number of samples and detection frequency.

Abbreviations: If a value was applicable, it is shown in this table as "—"; ND = not detected at the reported detection limit; GM = geometric mean; NR = not reported.

The following abbreviations are for countries/continents: AQ = Antarctica, BE = Belgium, BR = Brazil, CA = Canada, CH = Switzerland, CL = Chile, CN = China, DE = Germany, ES = Spain, EU = Europe, FI
= Finland, FR = France, GB = Great Britain, GR = Greece, IT = Italy, JP = Japan, KR = Korea, MX = Mexico, NL = Netherlands, PT = Portugal, RS = Serbia, RU = Russia, SA = Saudi Arabia, SE = Sweden, SG
= Singapore, US = United States.

Parameters: All statistics are shown as reported in the study. All minimum values determined to be less than the detection limit are shown in this table as "ND". If a maximum value was not provided, the highest percentile available is shown (as indicated in parentheses); if a minimum value was not provided, the lowest percentile available is shown (as indicated in parentheses).

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