Supplementary Information

Table S1. Summary of the results obtained in the papers included in this review. The data presented in this table corresponds to the biomarker concentrations from the nonsmokers studied that were exposed to sencondhand *(SHS)* or thirdhand smoke *(THS)*, including the main characteristics of the target population, the analyzed biomatrix and the biomarker concentration, expressed as reported in the original paper. The smokers *(S)* concentrations are also summarized, if available.

Reference	Target population	Biological matrix	Biomarkers	Concentrations
[1]	Pregnant women: n= 431, age: 18-35 years Low SHS: Low exposure to $PM_{2.5}$ High SHS: High exposure to $PM_{2.5}$ (Poland)	Serum	Cotinine *Not specified*	*Low SHS:* 0.16 ng/mL *High SHS:* 0.33 ng/mL
		Whole blood	Lead *GM (95% CI)*	*SHS:* 1.63 (1.63-1.75) μg/dL
[2]	Children: n= 122, age: 5-11 years, male and female Exposure to SHS and THS at home Low THS: If the cohabitants smoke outside the house High THS: If the cohabitants smoke inside the house when children are out (Italy)	Urine	Cotinine *Median ±IQR*	*Low THS:* 3.04 ± 4.19 μg/g cr *High THS:* 3.61 ± 21.92 μg/g cr *SHS:* 5.95 ± 51.23 μg/g cr
			Benzene *Median ±IQR*	*Low THS:* 282 ± 131 ng/L *High THS:* 314.5 ± 177 ng/L *SHS:* 596 ± 548 ng/L
[3]	Adults: n= 27-23, age: 21-37 years, male and female 3 hours of controlled SHS exposure in a terrace of a bar or a restaurant (Rest.) (USA)	Urine	NNAL *GM (min-max)*	*Bar (SHS):* 0.109 (0-3.60) pg/mL *Rest. (SHS):* 0.008 (0-2.1) pg/mL
		Saliva	Cotinine *GM (min-max)*	*Bar (SHS):* 0.161 (0.094-0.407) ng/mL *Rest. (SHS):* 0.075 (0.036-0.188) ng/mL
[4]	Adults (A): Smokers n = 25, SHS exposed n = 19 Children (C) exposed to SHS: n = 18, age: ≤ 2years (Greece)	Hair	Cotinine *A: Mean (min-max)* *C: Min-max*	*A (S):* 1.16 (0.08-2.49) ng/mg *A (SHS):* 0.13 (0.05-0.32) ng/mg *C (SHS):* 0.13-1.57 ng/mg
			Nicotine *A: Mean (min-max)* *C: min-max*	*A (S):* 27.97 (2.01-79.30) ng/mg *A (SHS):* 1.49 (0.12-2.58) ng/mg *C (SHS):* 0.69-28.71 ng/mg
[5]	Bar employees: n= 40, age: 21-73 years, 70% female Exposure before smoking ban (Bef.) and after ban (Aft.) (USA)	Urine	Cotinine *Mean (SD)*	*Bef. (SHS):* 35.9 (17.4) ng/mL *Aft.:* Non-quantifiable (<5 ng/mL)
			NNAL *Mean (SD)*	*Bef. (SHS):* 0.087 (0.065) pmol/mL *Aft.:* 0.035 (0.033) pmol/mL
[6]	Bar and restaurant employees: Smokers n = 21, SHS exposed n = 17, age: <25-≥35 years, male and female.	Urine	Cotinine *Mean (SD)*	*Bef. (S):* 67.26 (0.86) ng/mL *Aft. (S):* 63.16 (10.81) ng/mL

	Before smoking ban (Bef.) and after ban (Aft.) (Ankara, Turkey)			*Bef. (SHS):* 61.24 (4.66) ng/mL *Aft. :* 56.26 (7.66) ng/mL
		Breath	CO *Mean (SD)*	*Bef. (S):* 22.81 (12.23) ppm *Aft. (S):* 14.29 (7.41) ppm
				Bef. (SHS): 3.94 (5.26) ppm *Aft.:* 1.82 (1.98) ppm
[7]	Adults with self-reported asthma: Smokers and Nonsmokers with possible SHS exposure (NS) n = 456, age: 20->65 years, male and female. NHANES (USA)	Serum	Cotinine *Median (min-max)*	*S:* 265.5 (87-499) ng/mL
				NS: 0.048 (0.01-57) ng/mL
		Urine	NNAL *Median (min-max*)	*S:* 405.5 (49.6-1770) pg/mL
				NS: 0.55 (0.4-223) pg/mL
[8]	Children: n= 1541, age: 7-48 months, male and female. Assessment of SHS in DBS collected from children for lead screening. (USA)	Dried blood spots (DBS)	Cotinine *Median range*	*NS:* <0.3-5.06 ng/g
			Lead *Min-max*	*NS:* <1-9 µg/dL
[9]	Adults: Smokers n = 815-2146, SHS exposed n = 1651-1891 age: 18-99 years, male and female (UK)	Saliva	Cotinine *S: cutoff* *SHS: Min-max*	*S:* > 15 ng/mL
				SHS: 0.1-14.9 ng/mL
		Breath	CO *S: cutoff* *SHS: Min-max*	*S:* > 6 ppm
				SHS: 1.9-5.9 ppm
[10]	Preschool children: n= 329, age: 2-7 years, 45.9% female (China)	Urine	Cotinine *Mean (SD)*	*SHS:* 1.02 (0.56) log-transformed urinary cotinine-to-cr ratio
			Cadmium *Median (IQR)*	*SHS:* 0.28 (0.21-0.37) nmol/mmol Cd-to-cr
[11]	Adults (A): Smokers n = 83, SHS exposed n = 99, age: 18-80 years Children (C): 283, age: ≤4-10 years, male and female (USA) **Subjects with a mean plasma cotinine > 10 ng/mL (n=81).*	Dried blood spots (DBS) or plasma	Cotinine *A: min-max* *C: Median (min-max)*	*A (S):* 0.9-443 ng/mL *(plasma)*
				A (SHS): <0.02-56 ng/mL *(plasma)* *C (NS):* 0.42 (<0.3-55) ng/g *(DBS)*
			3HC *min-max*	*A (S)*:* 0.2-183 ng/mL *(plasma)* *A (S)*:* 0.4-42 ng/g *(DBS)*
			Lead *min-max*	*C (NS):* <2-9 µg/dL *(DBS)*
[12]	Pregnant women (A)*:* n= 55–384, mean age= 29.8 years Children (C): n= 116-233, age = birth, 1 and 2 years, 52.7 % female Polish Mother and Child Cohort Study	Urine	Cotinine *Mean (min-max)*	*C (NS)* *1 year:* 7.1 (<LOD-66.7) ng/mL *2 years:* 8.1 (<LOD-32.3) ng/mL
			1-OHPyr *Mean (min-max)*	*A*:* 0.5 (0.01-8.5) µg/g cr

	(Poland) **Possible smokers*	Cord blood	Lead *Mean (min-max)*	C *(NS)* *Birth:* 1.1 (0.4-5.7) µg/dL
		Hair	Mercury *Mean (min-max)*	*A*:* 0.3 (0.02-1.5) µg/g
		Saliva	Cotinine *Min-max*	*A*:* <LOD – 400 ng/mL
[13]	Hospitality venue employees: n = 35-44, age: 18-65 years Before smoking ban (Bef.) and after ban (Aft.) (Switzerland)	Saliva	Cotinine *Mean (95% CI)*	*Bef. (SHS):* 0.67 (0.04-1.30) ng/mL *Aft. 3-6 months:* 2.75 (0.32-5.17) ng/mL *Aft. 9-12 months:* 0.81 (0.00-1.61) ng/mL
			Nicotine *Mean (95% CI)*	*Bef. (SHS):* 1.99 (0.98-3.00) ng/mL *Aft. 3-6 months:* 2.42 (0.01-4.86) ng/mL *Aft. 9-12 months A:* 2.81 (0.12-5.75) ng/mL
[14]	Adults: n = 26, age: 18-50 years, 15 female 30 min exposure to tobacco smoke. AE: After exposure BB: Before bed 1stAM: 1st moorning 22H: 22hours after exposure (USA)	Urine	Cotinine *Median (IQR)*	*AE (SHS):* 0.98 (0.37-1.48) ng/mg cr *BB:* 2.13 (1.55-3.35) ng/mg cr *1st AM:* 1.80 (1.26-3.29) ng/mg cr *22H:* 1.26 (1.10-1.87) ng/mg cr
			3HC *Median (IQR)*	*AE (SHS):* 1.34 (0.85-2.05) ng/mg cr *BB:* 6.29 (4.58-9.36) ng/mg cr *1st AM:* 7.55 (5.13-10.37) ng/mg cr *22H:* 7.74 (5.41-12.99) ng/mg cr
			NNAL *Median (IQR)*	*AE (SHS):* 4.45 (2.70-6.75) pg/mg cr *BB:* 3.99 (2.54-5.53) pg/mg cr *1st AM:* 2.73 (2.08-3.87) pg/mg cr *22H:* 2.44 (1.60 -3.52) pg/mg cr
[15]	Adults: Smokers n = 40, SHS exposed n = 25, mean age: 20.6 years, male and female Silesian Medical University (Poland)	Urine	Cotinine *Mean (SD)*	*S:* 523.10 (68.10) µg/g cr
				SHS: 40.89 (24.80) µg/g cr
			OH-Cot *Mean (SD)*	*S:* 653.81 (62.30) µg/g cr
				SHS: 60.79 (46.70) µg/g cr
[16]	Pregnant women: Smokers n = 57, SHS exposed n = 60-367 Low SHS: ≤2 sources of exposure High SHS: >2 sources of exposure Rhea, Mother Childbirth Cohort (Greece)	Urine	Cotinine (n=367) *GM (95% CI)*	*Low SHS:* 7.6 (6.45-8.76) ng/mL *High SHS:* 15.61 (13.03-18.2) ng/mL
			NNAL (n=60) *GM (95% CI)*	*S:* 0.612 (0.365-0.860) pmol/mL
				Low SHS: 0.049 (0.038-0.060) pmol/mL *High SHS:* 0.072 (0.055-0.089) pmol/mL
[17]	Adults: Smokers n = 102, Nonsmokers with possible SHS exposure (NS) n = 117, age: 18-60 years, male and female (Japan)	Urine	Nicotine *Median (IQ)*	*S*: 1635.2 (2222.2) ng/mL
				NS: 3.5 (5.3) ng/mL
			Cotinine *Median (IQ)*	*S:* 3948.1 (3512.2) ng/mL
				NS: 2.8 (4.2) ng/mL

[18]	Adults: Smokers n = 107 (BL) and n = 18 (Follow), SHS exposed n = 105 (BL) and n = 34 (Follow), age: 27-52 years, male and female BL: Baseline Follow: After 2 months follow-up (USA)	Saliva	Cotinine *Median (IQR)*	*BL (S):* 181.0 (76.3-290.2) ng/mL *Follow (S):* 135.1 (62.2-228.6) ng/mL
				BL (SHS): 0.27 (0.04-0.80) ng/mL (26% < LOD) *Follow (SHS):* 0.41(0.035-1.08) ng/mL (27% < LOD)
		Hair	Nicotine *Median (IQR)*	*BL (S):* 16.2 (4.0-40.6) ng/mg *Follow (S):* 16.4 (3.3-27.3) ng/mg
				BL (SHS): 0.36 (0.17-3.03) ng/mg (52% < LOD) *Follow (SHS):* 0.29 (0.20-3.30) ng/mg (59% < LOD)
[19]	Adults: n = 8, age: 18-34 years, 4 females Before (BE) and after (AE) exposure to 1h of SHS exposure in a vehicle (USA)	Plasma	Cotinine *Average (SD)*	*BE:* 0.04 (0.03) ng/mL *AE (SHS):* 0.17 (0.05) ng/mL
		Urine	Cotinine *Average (SD)*	*BE:* 0.38 (0.25) ng/mg cr *AE (SHS):* 2.41 (1.79) ng/mg cr
			Oh-Cot + Cotinine *Average (SD)*	*BE:* 0.006 (0.005) nmol/mg cr *AE (SHS):* 0.025 (0.020) nmol/mg cr
			NNAL *Average (SD)*	*BE:* 0.10 (0.19) pg/mg cr *AE (SHS):* 2.68 (1.36) pg/mg cr
[20]	Adults: Smokers n = 47, SHS exposed n = 15, mean age: 24.9 years, male and female Before (BE) and after (AE) smoking or 30 min of being exposed to water pipe smoke (Israel)	Plasma	Nicotine *Mean (SD)*	*BE (S):* 1.1 (4.1) ng/mL *AE (S):* 19.1 (13.9) ng/mL
				BE (SHS): 0.44 (1.7) ng/mL *AE (SHS):* 0.4 (1.4) ng/mL
			Cotinine *Mean (SD)*	*BE (S):* 61.2 (96.7) ng/mL *AE (S):* 78.2 (93.7) ng/mL
				BE (SHS): 9.2 (25) ng/mL *AE (SHS):* 13.9 (46) ng/mL
		Urine	Nicotine *Mean (SD)*	*BE (S):* 70.4 (232.2) ng/mL *AE (S):* 290.8 (319.6) ng/mL
			Cotinine *Mean (SD)*	*BE (S):* 146.2 (232.2) ng/mL *AE (S):* 165.3 (243.6) ng/mL
		Whole blood	COHb *Mean (SD)*	*BE (S):* 2.02% (2.89) *AE (S):* 17.57% (8.79)
				BE (SHS): 0.8% (0.2) *AE (SHS):* 1.2% (0.8)
[21]	Children: n = 1985, age: 6-18 years, 49.4% female. NHANES (USA)	Serum	Cotinine *Cut-off range*	*Low SHS*: 0.015-0.1 ng/mL *Medium SHS*: 0.1-1.0 ng/mL *High SHS*: 1.0-10.0 ng/mL

		Urine	1-OHNap, 2-OHNap *GM*	*Low SHS*: 4587.6 ng/L *Medium SHS*: 5439.8 ng/L *High SHS*: 6045.6 ng/L
			2-OHFLu, 3-OHFlu, 9-OHFlu *GM*	*Low SHS*: 571.0 ng/L *Medium SHS*: 677.2 ng/L *High SHS*: 824.8 ng/L
			1-OHPA,2-OHPA, 3-OHPA *GM*	*Low SHS*: 288.1 ng/L *Medium SHS*: 352.4 ng/L *High SHS*: 351.2 ng/L
			1-OHPyr *GM*	*Low SHS*: 118.1 ng/L *Medium SHS*: 139.6 ng/L *High SHS*: 165.1 ng/L
[22]	Adults: n = 10 – 30 rooms Low THS: Overnight in nonsmoking rooms of hotels without smoking ban n = 30 High THS: Overnight in smoking rooms of hotels without smoking ban n = 29 NE: Not exposure - Overnight in hotels with complete smoking ban n = 9 BE: Before overnight exposure AE: After overnight exposure (USA)	Finger	Nicotine *Median (min-max)*	*Low THS:* 13.6 (0-226.9) ng/wipe *High THS:* 93.7 (0-1713.5) ng/wipe *NE*: 2.5 (0-17.7) ng/wipe
		Urine	Cotinine *Median (min-max)*	*Low THS:* 0.10 (0-0.41) ng/mL *High THS:* 0.64 (0-2.64) ng/mL *NE:* 0.05 (0-0.88) ng/mL
			NNAL *GM* (10 most polluted smoking rooms)	*BE*: 0.86 pg/mg cr *AE (THS)*: 1.24 pg/mg cr
[23]	Adults: n = 83, age: 25-62 years, 59 female Before smoking ban (Bef.) in 2010 and after ban (Aft.) in 2011 (Spain)	Urine	Cotinine *Median (p25,p50)*	*Bef. (S):* 839.8 (318.0-1167.2) μg/g cr *Aft. (S):* 865.7 (443.2-1262.2) μg/g cr
				Bef. (SHS): 0.8 (0.5-1.2) μg/g cr *Aft.:* 0.7 (0.4-1.0) μg/g cr
			Cadmium *Median (p25,p50)*	*Bef. (S):* 0.25 (0.17-0.43) μg/g cr *Aft. (S):* 0.24 (0.17-0.38) μg/g cr
				Bef. (SHS): 0.17 (0.11-0.29) μg/g cr *Aft.:* 0.10 (0.06-0.22) μg/g cr
[24]	Adults: Smokers n = 404-420, SHS exposed n = 116-118, age: >20 years, male and female NHANES (USA)	Serum	Cotinine *GM (95%CI)*	*S*: 149.205 (133.602-166.63) ng/mL
				SHS: 0.717 (0.254-2.022) ng/mL
		Urine	NNAL *GM (95%CI)*	*S*: 0.212 (0.184-0.246) ng/mL
				SHS: 0.0109 (0.0059-0.0201) ng/mL
[25]	Staff in pub and restaurants (Rest.): n = 101, mean age: 47.4 years, 69% female Sampling based on the type (Rest. and Pubs) and size (<150 m^2 and ≥150 m^2) of facilities	Urine	Cotinine *GM (GSD)*	Rest. < 150 m^2 *Bef. (SHS)*: 1.5 (2.0) ng/mg cr *Aft.*: 1.9 (2.4) ng/mg cr Rest. ≥ 150 m^2

	Before smoking ban (Bef.) and after ban (Aft.) (Korea)			*Bef. (SHS)*: 1.3 (1.9) ng/mg cr *Aft.:* 1.4 (2.4) ng/mg cr Pub < 150 m² *Bef. (SHS)*: 2.6 (3.1) ng/mg cr *Aft.:* 3.5 (3.1) ng/mg cr Pub ≥ 150 m² *Bef. (SHS)*: 1.9 (2.9) ng/mg cr *Aft.:* 3.0 (4.1) ng/mg cr
			NNAL *GM (GSD)*	Rest. < 150 m² *Bef. (SHS)*: 6.4 (1.9) pg/mg cr *Aft.:* 6.2 (2.1) pg/mg cr Rest. ≥ 150 m² *Bef. (SHS)*:4.3 (2.3) pg/mg cr *Aft.:* 4.9 (2.1) pg/mg cr Pub <150 m² *Bef. (SHS)*: 9.8 (2.3) pg/mg cr *Aft.:* 10.4 (2.3) pg/mg cr Pub ≥ 150 m² *Bef. (SHS)*: 12.1 (2.0) pg/mg cr *Aft.:* 7.3 (1.7) pg/mg cr
[26]	Adults: Smokers n = 166 (quantificable: 70-163), Nonsmokers with possible SHS exposure (NS) n = 529 (quantificable: 8-81), female median age: 58 years, male median age: 55 years, 54% female (Spain)	Oral Fluid	Cotinine *Median (IQR)*	*S*: 358 (74-653) ng/mL
				NS: 0.17 (0.13-0.31) ng/mL
			NNN *Median (IQR)*	*S*: 17 (3.9-91) pg/mL
				NS: 1.6 (1.2-2.9) pg/mL
			NNK *Median (IQR)*	*S*: 4.0 (2.8-7.1) pg/mL
				NS: 3.0 (2.4-5.2) pg/mL
			NNAL *Median (IQR)*	*S*: 1.7 (0.98-3.5) pg/mL
				NS: 1.2 (0.83-1.8) pg/mL
[27]	Newborns (C) in ICU with smoker mothers (A) n = 5 (USA)	Finger	Nicotine *min-max*	*A (S)*: 44-1160 ng/wipe
		Urine	Cotinine *min-max*	*C (THS)*: 0.17-5.01 ng/mL
			OH-Cot *min-max*	*C (THS)*: 0.63-31.58 ng/mL
			NNAL *min-max*	*C (THS)*: 0.47-12.38 pg/mL
[28]	Employees exposed to SHS in public places: GB: Government buildings n = 10	Urine	Cotinine *GM*	*GB (SHS):* 4.99 μg/g cr *LB (SHS):* 1.00 μg/g cr

	LB: Large Buildings n = 11 N: Nurseries n = 6 EI: Private educational institutions n=8 (Korea)			*N (SHS):* 0.78 µg/g cr *EI (SHS):* 5.28 µg/g cr
		Hair	Nicotine *GM*	*GB (SHS):* 0.86 ng/mg *LB (SHS):* 0.47 ng/mg *N (SHS):* 0.14 ng/mg *EI (SHS):* 1.62 ng/mg
		Urine	NNAL *GM*	*GB (SHS):* 2.93 µg/g cr *LB (SHS):* 0.84 µg/g cr *N (SHS):* 0.34 µg/g cr *EI (SHS):* 1.84 µg/g cr
[29]	Adults: n = 20, age: >18 years, 9 female SHS exposed at home and/or hopatility venues (USA)	Hair	Nicotine *Median (min-max)*	*SHS:* 0.1 (0-5.5) ng/mg
		Saliva	Cotinine *Min-max* *Cut-off value*	*SHS:* 0 - 11 ng/mL *Cutoff low SHS:* < 10 ng/mL *Cutoff high SHS:* > 10 ng/mL - 13 ng/mL
[30]	Adults: SHS exposed at home n = 24, Non-exposed at home (NE) n = 24, male and female (Spain)	Hair	Nicotine *Median (IQR)*	*SHS*: 2040 (1200-4650) pg/mg *NE*: 623 (221-1160) pg/mg
			Cotinine *Median (IQR)*	*SHS*: 49 (26-106) pg/mg *NE*: 26 (16-43) pg/mg
			NNN *Median (IQR)*	*SHS*: 0.54 (0.29-0.60) pg/mg *NE*: 0.41 (NO IQR) pg/mg
			NNK *Median (IQR)*	*SHS*: 1.3 (0.92-2.7) pg/mg *NE*: 0.74 (0.31-1.1) pg/mg
			NNAL	*SHS*: Not quantified *NE*: Not quantified
[31]	Children: n = 559, age : 12-19 years old, 48.2% female NHANES (USA)	Serum	Cotinine *Cutoff range*	*Low SHS*: 0.05-0.268 ng/mL *High SHS*: 0.268-14.6 ng/mL
		Urine	NNAL *Cutoff range*	*Low SHS* : 0.001-0.005 ng/mL cr *High SHS*: ≥0.005-≤0.082 ng/mL cr
[32]	Adults: n = 6-25, mean age: 49 years, 51% female Non smokers living with former smokers BL: Baseline n = 9-25 W1: Week 1 postquit n = 9-17 M1: Month 1 postquit n = 9 M3: Month 3 postquit n = 8 M6: Month 6 postquit n = 6 (USA)	Finger	Nicotine *GM (95% CI)*	*BL (SHS):* 25.6 (13.2-48.9) ng/wipe *W1 (THS):* 9.1 (3.8-20.2)ng/wipe *M1 (THS):* 10.2 (4.7-21.2) ng/wipe *M3 (THS):* 5.2 (0.9-19.9)ng/wipe *M6 (THS):* 2.9 (0-46.1) ng/wipe
		Urine	Cotinine *GM (95% CI)*	*BL (SHS):* 9.9 (2.6-32.5) ng/mL *W1 (THS):* 6.0 (1.2-20.8) ng/mL *M1 (THS):* 1.5 (0.5-3.4) ng/mL *M3 (THS):* 1.7 (0.4-4.2)ng/mL

				M6 (THS): 2.7 (0-6.3) ng/mL
			NNAL *GM (95% CI)*	*BL (SHS):* 10.7 (4.7-24.2) pg/mL *W1 (THS):* 6.7 (2.5-15.9) pg/mL *M1 (THS):* 6.7 (3.5-12.2) pg/mL *M3 (THS):* 3.2 (1.1-7.4)pg/mL *M6 (THS):* 2.7 (0.5-8.1) pg/mL
[33]	Adults and children: Smokers and Nonsmokers with possible SHS exposure (NS) n = 5792, age: 6 - >60 years, 2964 female 06-11 years (NS n = 769) 12-19 (S n = 66, NS n=824) 20-59 (S n= 703, NS n=2123) >60 (S n= 192, NS n=1115) NHANES (USA)	Serum	Cotinine *Cut-off value*	*SHS:* <10 ng/mL
		Urine	NNAL *GM(95% CI)*	*S (12-19 years):* 60.5 (46.2-79) pg/ mg cr *S (20-59 years):* 209 (171-256) pg/ mg cr *S (>60 years):* 365 (328-405) pg/ mg cr
				NS (6-11 years): 2.43 (1.96-3.02) pg/mg cr *NS (12-19 years):* 1.38 (1.21-1.57) pg/mg cr *NS (20-59 years):* 1.09 (1.00-1.19) pg/ mg cr *NS (>60 years):* NA
[34]	Staff working in smoking hospitality venues: n= 62, 44 female (Korea)	Urine	Cotinine *GM (SD)*	*SHS:* 1.8 (2.8) ng/mg cr
			NNAL *GM (SD)*	*SHS:* 7.3 (2.5) pg/mg cr
[35]	Adults: Smokers n = 69, SHS exposed n = 123, mean age: 56.7 years, men (Japan)	Hair	Cotinine *Mean (SD)*	*S*: 1.9 (2.1) ng/mg
				SHS: 0.2 (0.6) ng/mg
			Nicotine *Mean (SD)*	*S*: 26.6 (24.7) ng/mg
				SHS: 3.6 (8.4) ng/mg
[36]	Adults: n = 10, mean age: 24.6 years, 20% female Before exposure (BE) and after exposure (AE) during the work shift in waterpipe smoking bars (USA)	Saliva	Cotinine *Mean*	*BE (SHS):* 23.8 ng/mL *AE(SHS):* 27.9 ng/mL
		Breath	CO *Mean (SD)*	*BE (SHS):* 8.3 (6.9) ppm *AE (SHS):* 49.4 (32.7) ppm
[37]	Mothers (A): Smokers n = 41, Nonsmokers n = 76 Daily S: Daily smokers n = 12 Oc. S: Ocassional smokers n = 11 Former S: Former smokers n = 18 NE: Not exposed - Nonsmoker n = 76 Children (C): n = 120, age: 6-11 years Low SHS: less than daily exposure to SHS n = 6 High SHS: Daily exposure to SHS n = 6	Urine	Cotinine *GM (95%CI)*	*A (Daily S)*: 489.15 (127.78-1872.44) µg/L *A (Oc. S)*: 34.50 (6.35-187.55) µg/L
				A (Former S): 2.58 (1.51-4-39) µg/L *A (NE)*: 1.41 (1.23-1.61) µg/L *C (High SHS):* 10.77 (3.27-35.45) µg/L *C (Low SHS):* 2.44 (1.26-4.71) µg/L *C (NE)*: 1.39 (1.25-1.55) µg/L
			Cadmium *GM (95%CI)*	*A (Daily S)*: 0.36 (0.30-0.44) µg/L *A (Oc. S)*: 0.22 (0.15-0.33) µg/L

	NE: Not exposed n = 108 COPHES/DEMOCOPHES Projects (Czech Republic)			*A (Former S):* 0.21 (0.16-0.28) µg/L *A (NE)*: 0.21 (0.18-0.25) µg/L *C (High SHS):* 0.180 (0.110-0.294) µg/L *C (Low SHS):* 0.061 (0.028-0.131) µg/L *C (NE)*: 0.110 (0.097-0.124) µg/L
[38]	Adults: n = 1398, age: 19-65 years, male and female KNHANES (Korea)	Urine	Cotinine *Cut-off value*	*SHS:* < 550 µg/L
		Whole blood	Cadmium *Age adjusted blood cadmium level*	*SHS*: 1.07 µg/L
[39]	Adolescents: n = 338, mean age: 12.9 years, 53% female AdoQuest II longitudinal cohort (Canada)	Saliva	Cotinine *Mean (SD)*	*SHS*: 0.48 (1.21) ng/mL
		Hair	Nicotine *Mean (SD)*	*SHS*: 0.38 (1.40) ng/mg
[40]	Children: n = 25, mean age: 5.4 years, male and female Children with a potentially SHS-related illness with smoker parents (USA)	Saliva	Cotinine *Median (IQR)*	*SHS*: 5.3 (2.3-9.1) ng/mL
		Hand (wipes)	Nicotine *Median (IQR)*	*SHS*: 91.6 (57.2-121.6) ng/wipe
[41]	Adults: Smokers n = 90/105, SHS exposed n = 91/103, S median age: 22 years, SHS meadian age: 27 years, male and female Daily S: Daily smokers n= 17/20 Oc. S: Ocassional smokers n = 73/85 Before exposure (BE) and after exposure (AE) to waterpipe smoke in a waterpipe social event (USA)	Saliva	Cotinine *Cut-off value*	*SHS:* ≤ 10 ng/mL
		Urine	HPMA *Median (IQR)*	*BE (Daily S):* 1443 (1131-3639) pmol/mg cr *AE (Daily S)*: 3686 (2502-4046) pmol/mg cr *BE (Oc. S):* 1660 (940-2890) pmol/mg cr *AE (Oc. S)*: 2039 (1203-4898) pmol/mg cr
				BE: 1770 (1001-2787) pmol/mg cr *AE (SHS):* 2498 (1580-3964) pmol/mg cr
[42]	Adolescents: Smokers n = 55, SHS exposed n = 410, age: 13-19 years, male and female (USA)	Urine	Cotinine *Median (IQR)*	*S:* > 30 ng/ mL
				Low SHS: 0.05-0.25 ng/mL *High SHS:* 0.25-30 ng/ mL
			NNAL *Median (IQR)*	*S*: 80.9 (42.6-151.3) pg/mL
				SHS: 1.2 (0.5-3.2) pg/mL
[43]	Adults and children: Smokers n = 867, Nonsmokers with possible SHS exposure (NS) n = 3825, age: 6->60 years, 53.4% female NHANES (USA)	Serum	Cotinine *Cut-off range*	*SHS:* 0.05-10 ng/mL
		Urine	HPMM *Median (IQR)*	*S*: 1.63 (0.680-3.29) mg/g cr
				NS: 0.313 (0.231-0.451) mg/g cr
[44]	Adults: n = 52-73, age: 24-40 years, male and female Waterpipe Tobacco employees	Urine	Cotinine *Median (IQR)*	*SHS*: 1.1 (0.2-40.9) µg/g cr

	(Turkey, Russia, Egipt)		NNAL *Median (IQR)*	*SHS*: 1.48 (0.98-3.97) pg/mg cr
			1-OHPG (1-hydroxy-pyrene glucuronide) *Median (IQR)*	*SHS*: 0.54 (0.25-0.97) pmol/mg cr
		Saliva	Cotinine *Median (IQR)*	*SHS*: 5.5 (2.0-15.0) ng/mL
		Hair	Nicotine *Median (IQR)*	*SHS*: 0.95 (0.36-5.02) ng/mg
		Breath	CO *Median (IQR)*	*SHS*: 1.67 (1.33-2.33) ppm

Abbreviations:

A: Adults; C: Children; NE: Nonsmokers not exposed to tobacco smoke; NS: Nonsmokers whose tobacco smoke exposure was not specified in the study; S: Smokers; SHS: Nonsmokers exposed to SHS; THS: Nonsmokers exposed to THS; AE: After exposure; Aft.: After smoking ban; BE: Before exposure; Bef.: Before smoking ban; BL: Baseline; Rest.: Restaurant; CI: Confidence interval; GM: Geometric mean; GSD: Geometric standard deviation; IQR: Interquartile range; LOD: Limit of detection; SD: Standard deviation; cr: Creatinine.

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