

Table S3. Geometric means (pmol/L) and 95% confidence intervals (CI) of serum estrogens/estrogen metabolites by BMI at age 18 in postmenopausal women: the Women's Health Initiative Observational Study

	Never and former menopausal hormone therapy users						Current menopausal hormone therapy users					
	Geometric means (95% CI) ^a			p-trend ^b	%Δ ^c	p-diff ^d	Geometric means (95% CI) ^a			p-trend ^b	%Δ ^c	p-diff ^d
	<20 kg/m ²	20-21.9 kg/m ²	≥22 kg/m ²				<20 kg/m ²	20-21.9 kg/m ²	≥22 kg/m ²			
Median (kg/m ²)	18.7	20.9	23.9				18.8	20.8	23.4			
N	412	300	221				371	334	154			
Weighted N ^e	14325	9690	6133				10882	9510	4269			
Estrone	269 (223, 324)	300 (246, 364)	322 (260, 399)	0.27	19.7	0.09	2927 (2208, 3880)	3057 (2350, 3978)	3384 (2388, 4794)	0.42	15.6	0.36
Conjugated	206 (167, 254)	235 (189, 291)	248 (195, 314)	0.29	20.4	0.11	2649 (1981, 3542)	2844 (2171, 3726)	3097 (2151, 4460)	0.43	16.9	0.35
Unconjugated	55.7 (48.6, 63.9)	55.3 (47.8, 64.0)	65.1 (54.6, 77.6)	0.23	16.9	0.08	205 (167, 252)	211 (172, 259)	231 (176, 302)	0.54	12.7	0.32
Estradiol	49.8 (40.4, 61.5)	50.7 (40.8, 63.1)	64.1 (49.3, 83.4)	0.04	28.7	0.03	391 (296, 515)	444 (336, 588)	441 (311, 625)	0.50	12.8	0.42
Conjugated	32.6 (26.1, 40.8)	33.2 (26.7, 41.3)	42.3 (32.4, 55.1)	0.04	29.8	0.03	322 (237, 436)	370 (273, 501)	377 (257, 555)	0.47	17.1	0.34
Unconjugated	12.7 (10.0, 16.2)	13.3 (10.3, 17.2)	16.2 (12.0, 21.7)	0.08	27.6	0.08	40.1 (32.0, 50.3)	46.9 (37.0, 59.5)	43.6 (32.9, 57.9)	0.55	8.7	0.50
2-Hydroxyestrone	59.5 (50.3, 70.5)	67.5 (57.5, 79.2)	66.9 (56.2, 79.6)	0.32	12.4	0.16	434 (352, 534)	412 (335, 507)	449 (346, 583)	0.54	3.5	0.77
2-Hydroxyestradiol	15.2 (12.9, 17.9)	16.9 (14.3, 19.9)	16.4 (13.9, 19.4)	0.55	7.9	0.32	99.8 (82.2, 121)	98.9 (81.8, 120)	105 (82.0, 134)	0.39	5.2	0.65
2-Methoxyestrone	39.9 (34.9, 45.6)	39.2 (34.3, 44.8)	42.5 (36.4, 49.8)	0.42	6.5	0.43	251 (214, 296)	251 (211, 297)	253 (198, 324)	0.90	0.8	0.95
Conjugated	28.9 (24.9, 33.4)	28.6 (24.7, 33.1)	31.0 (26.1, 36.8)	0.34	7.3	0.43	158 (130, 192)	159 (129, 197)	152 (115, 201)	0.89	-3.8	0.75
Unconjugated	10.1 (8.76, 11.7)	9.83 (8.47, 11.4)	10.5 (8.89, 12.5)	0.90	4.0	0.69	68.6 (53.4, 88.1)	70.0 (54.2, 90.5)	72.2 (51.0, 102)	0.95	5.2	0.75
2-Methoxyestradiol	12.0 (10.0, 14.4)	13.1 (10.8, 15.9)	13.0 (10.6, 15.8)	0.39	8.3	0.42	83.4 (66.2, 105)	83.7 (65.6, 107)	87.1 (66.5, 114)	0.16	4.4	0.69
Conjugated	9.55 (7.82, 11.7)	10.4 (8.44, 12.9)	10.2 (8.25, 12.7)	0.47	6.8	0.49	71.2 (55.3, 91.8)	72.2 (55.3, 94.2)	73.0 (54.4, 97.9)	0.25	2.5	0.84
Unconjugated	1.95 (1.66, 2.28)	2.11 (1.76, 2.54)	2.19 (1.81, 2.65)	0.32	12.3	0.21	8.40 (7.16, 9.85)	8.91 (7.47, 10.6)	8.61 (6.77, 11.0)	0.55	2.5	0.83
2-Hydroxyestrone-3-methyl ether	7.05 (6.11, 8.13)	7.50 (6.55, 8.59)	7.72 (6.56, 9.09)	0.51	9.5	0.26	40.2 (33.6, 48.1)	38.3 (31.5, 46.5)	38.5 (30.3, 49.0)	0.67	-4.2	0.69
4-Hydroxyestrone	7.31 (6.16, 8.68)	8.30 (7.03, 9.80)	8.24 (6.89, 9.84)	0.36	12.7	0.17	57.8 (46.7, 71.4)	54.7 (44.5, 67.3)	60.7 (46.5, 79.1)	0.46	5.0	0.69
4-Methoxyestrone	4.11 (3.56, 4.73)	4.18 (3.64, 4.79)	4.34 (3.70, 5.10)	0.56	5.6	0.50	25.8 (21.7, 30.7)	25.8 (21.7, 30.6)	27.1 (21.7, 34.0)	0.62	5.0	0.65
4-Methoxyestradiol	1.76 (1.48, 2.11)	1.83 (1.54, 2.18)	1.78 (1.47, 2.17)	0.75	1.1	0.92	11.4 (8.84, 14.8)	11.1 (8.56, 14.5)	11.2 (8.29, 15.1)	0.41	-1.8	0.87
16α-Hydroxyestrone	29.7 (24.8, 35.5)	33.9 (28.7, 40.1)	32.9 (27.4, 39.6)	0.44	10.8	0.23	229 (183, 285)	220 (178, 273)	245 (187, 321)	0.43	7.0	0.56
Estriol	125 (105, 149)	142 (120, 168)	140 (116, 170)	0.32	12.0	0.22	1062 (835, 1352)	1063 (843, 1340)	1128 (841, 1513)	0.48	6.2	0.66
Conjugated	96.7 (79.8, 117)	113 (94.1, 136)	109 (88.2, 134)	0.27	12.7	0.24	918 (713, 1181)	923 (724, 1177)	978 (715, 1337)	0.58	6.5	0.66
Unconjugated	25.1 (21.6, 29.3)	26.7 (23.0, 31.0)	28.3 (23.7, 33.7)	0.48	12.7	0.19	118 (96.9, 145)	123 (100, 152)	122 (94.3, 157)	0.86	3.4	0.81
16-Ketoestradiol	31.6 (26.4, 37.9)	36.1 (30.5, 42.8)	35.0 (28.9, 42.4)	0.51	10.8	0.27	263 (211, 328)	256 (206, 318)	291 (221, 384)	0.37	10.6	0.43
16-Epiestriol	14.0 (12.0, 16.5)	15.4 (13.2, 18.1)	14.9 (12.6, 17.6)	0.41	6.4	0.45	78.6 (64.6, 95.7)	80.9 (66.1, 98.9)	80.0 (62.3, 103)	0.67	1.8	0.88
17-Epiestriol	11.6 (9.97, 13.5)	13.1 (11.1, 15.4)	12.6 (10.7, 14.8)	0.46	8.6	0.32	52.7 (42.9, 64.9)	52.8 (42.7, 65.2)	59.0 (46.1, 75.6)	0.18	12.0	0.32

^a Adjusted for age at blood draw (<55, 55-59, 60-64, 65-69, 70-74, 75-79 years), blood draw year (1993-1996, 1997-1998), race (white, non-white), smoking status (never, former, current), time since menopause (<10, 10-19, ≥20 years, missing).

^b p-trend was estimated using the Wald test for continuous BMI at age 18 (kg/m²).

^c %Δ indicates the percent change in estrogens/estrogen metabolite levels comparing women with BMI at age 18 years ≥22 vs. <20 kg/m² and was estimated by taking the ratio of the geometric mean difference in estrogens/estrogen metabolite levels between women with BMI at age 18 years ≥22 vs. <20 kg/m² to the geometric mean of women with BMI at age 18 years <20 kg/m², multiplied by 100.

^d p-diff was estimated using the Wald test and indicates a p-value for comparing estrogens/estrogen metabolite levels of women with BMI at age 18 years ≥22 vs. <20 kg/m².

^e Weighted N reflects weighted counts and refer to the study cohort.

Note: All False Discovery Rate q-values>0.05.

Abbreviations: BMI=body mass index, CI=confidence interval.