

**Web Table 1. Correlations between metals in controls.**

	<b>As</b>	<b>Cd</b>	<b>Co</b>	<b>Cr</b>	<b>Cu</b>	<b>Hg</b>	<b>Mo</b>	<b>Pb</b>	<b>Sn</b>	<b>V</b>
<b>As</b>	1.00	0.23	0.29	0.21	0.14	0.12	0.23	0.30	0.13	0.35
<b>Cd</b>	<.0001	1.00	0.42	0.23	0.20	0.05	0.11	0.53	0.26	0.23
<b>Co</b>	<.0001	<.0001	1.00	0.33	0.21	0.02	0.25	0.39	0.25	0.48
<b>Cr</b>	<.0001	<.0001	<.0001	1.00	0.10	0.12	0.23	0.32	0.19	0.28
<b>Cu</b>	<.0001	<.0001	<.0001	0.0003	1.00	0.13	0.06	0.17	0.12	0.13
<b>Hg</b>	<.0001	0.11	0.38	<.0001	<.0001	1.00	-0.01	0.05	0.07	0.06
<b>Mo</b>	<.0001	0.0002	<.0001	<.0001	0.03	0.79	1.00	0.26	0.28	0.40
<b>Pb</b>	<.0001	<.0001	<.0001	<.0001	<.0001	0.07	<.0001	1.00	0.29	0.29
<b>Sn</b>	<.0001	<.0001	<.0001	<.0001	<.0001	0.02	<.0001	<.0001	1.00	0.29
<b>V</b>	<.0001	<.0001	<.0001	<.0001	<.0001	0.02	<.0001	<.0001	<.0001	1.00

**Web Table 2. Odds ratios (OR) and 95% confidence intervals (CI) for the association between each metal and young-onset breast cancer, with and without time-corrections.**

		<b>OR (95% CI) for observed metal levels (n=1217 sister pairs)</b>	<b>OR (95% CI) for time-corrected metal level (n=1217 sister pairs)</b>	<b>OR (95% CI) for time-corrected metal level, ER+ breast cancer (961 sister pairs)</b>	<b>OR (95% CI) for time-corrected metal level, invasive breast cancer (1044 sister pairs)</b>
<b>Arsenic</b>	Quartile 1	1.00	1.00	1.00	1.00
	Quartile 2	0.75 (0.59, 0.95)	0.79 (0.60, 1.05)	0.78 (0.57, 1.07)	0.86 (0.64, 1.15)
	Quartile 3	0.93 (0.74, 1.18)	1.13 (0.80, 1.60)	1.08 (0.76, 1.54)	1.21 (0.83, 1.77)
	Quartile 4	0.80 (0.64, 1.02)	1.07 (0.72, 1.57)	1.05 (0.71, 1.55)	1.13 (0.77, 1.66)
	P-trend	0.25	0.40	0.47	0.29
<b>Cadmium</b>	Quartile 1	1.00	1.00	1.00	1.00
	Quartile 2	0.95 (0.76, 1.19)	1.26 (0.99, 1.61)	1.42 (1.08, 1.87)	1.30 (1.00, 1.69)
	Quartile 3	0.74 (0.58, 0.94)	1.06 (0.80, 1.42)	1.08 (0.79, 1.47)	1.05 (0.77, 1.42)
	Quartile 4	0.64 (0.50, 0.82)	1.15 (0.82, 1.60)	1.26 (0.88, 1.81)	1.25 (0.88, 1.78)
	P-trend	<0.001	0.67	0.50	0.44
<b>Cobalt</b>	Quartile 1	1.00	1.00	1.00	1.00
	Quartile 2	0.92 (0.72, 1.17)	1.02 (0.74, 1.43)	0.99 (0.71, 1.38)	1.14 (0.81, 1.60)
	Quartile 3	0.94 (0.74, 1.19)	1.08 (0.79, 1.49)	1.04 (0.75, 1.44)	1.13 (0.80, 1.61)
	Quartile 4	0.93 (0.73, 1.18)	1.31 (0.82, 2.08)	1.24 (0.76, 2.02)	1.41 (0.87, 2.27)
	P-trend	0.61	0.22	0.34	0.17
<b>Chromium</b>	Quartile 1	1.00	1.00	1.00	1.00
	Quartile 2	0.76 (0.60, 0.96)	0.94 (0.70, 1.28)	0.94 (0.69, 1.28)	0.88 (0.64, 1.22)
	Quartile 3	0.74 (0.59, 0.94)	1.00 (0.71, 1.41)	0.97 (0.66, 1.41)	0.94 (0.65, 1.35)
	Quartile 4	0.76 (0.61, 0.96)	1.08 (0.69, 1.69)	0.93 (0.59, 1.45)	1.02 (0.64, 1.63)
	P-trend	0.02	0.70	0.78	0.87
<b>Copper</b>	Quartile 1	1.00	1.00	1.00	1.00
	Quartile 2	0.84 (0.66, 1.06)	0.84 (0.63, 1.11)	0.72 (0.52, 1.00)	0.86 (0.63, 1.18)
	Quartile 3	0.98 (0.77, 1.24)	0.97 (0.70, 1.36)	0.86 (0.60, 1.23)	0.94 (0.67, 1.32)
	Quartile 4	1.09 (0.87, 1.38)	1.09 (0.73, 1.62)	0.93 (0.62, 1.40)	1.11 (0.72, 1.70)
	P-trend	0.26	0.52	0.99	0.56
<b>Mercury</b>	Quartile 1	1.00	1.00	1.00	1.00
	Quartile 2	0.89 (0.70, 1.12)	0.90 (0.71, 1.14)	0.95 (0.72, 1.24)	0.99 (0.77, 1.28)
	Quartile 3	0.87 (0.69, 1.10)	0.90 (0.67, 1.21)	1.04 (0.74, 1.45)	0.96 (0.70, 1.31)
	Quartile 4	0.87 (0.69, 1.10)	0.99 (0.68, 1.45)	1.01 (0.68, 1.50)	1.05 (0.70, 1.57)
	P-trend	0.26	0.98	0.86	0.88
<b>Molybdenum</b>	Quartile 1	1.00	1.00	1.00	1.00
	Quartile 2	1.12 (0.88, 1.41)	1.22 (0.85, 1.75)	1.12 (0.77, 1.64)	1.22 (0.83, 1.79)
	Quartile 3	1.10 (0.87, 1.40)	1.36 (0.90, 2.06)	1.25 (0.81, 1.92)	1.35 (0.86, 2.12)
	Quartile 4	1.06 (0.83, 1.35)	1.33 (0.84, 2.12)	1.25 (0.77, 2.00)	1.33 (0.81, 2.16)
	P-trend	0.75	0.20	0.33	0.24
<b>Lead</b>	Quartile 1	1.00	1.00	1.00	1.00
	Quartile 2	0.68 (0.54, 0.85)	0.85 (0.65, 1.12)	0.80 (0.60, 1.06)	0.91 (0.68, 1.23)
	Quartile 3	0.54 (0.42, 0.68)	0.85 (0.59, 1.21)	0.84 (0.59, 1.20)	0.93 (0.63, 1.37)
	Quartile 4	0.67 (0.53, 0.84)	1.11 (0.76, 1.61)	1.14 (0.78, 1.68)	1.13 (0.77, 1.68)
	P-trend	<0.001	0.64	0.48	0.56
<b>Tin</b>	Quartile 1	1.00	1.00	1.00	1.00
	Quartile 2	0.85 (0.67, 1.07)	0.92 (0.69, 1.21)	0.95 (0.70, 1.30)	0.93 (0.70, 1.24)
	Quartile 3	0.93 (0.74, 1.18)	1.19 (0.84, 1.68)	1.16 (0.80, 1.67)	1.33 (0.93, 1.90)
	Quartile 4	0.92 (0.73, 1.17)	1.22 (0.78, 1.90)	1.24 (0.79, 1.94)	1.20 (0.76, 1.90)
	P-trend	0.70	0.23	0.26	0.22
<b>Vanadium</b>	Quartile 1	1.00	1.00	1.00	1.00
	Quartile 2	1.07 (0.84, 1.35)	1.00 (0.76, 1.29)	1.06 (0.79, 1.43)	1.05 (0.80, 1.40)
	Quartile 3	1.10 (0.87, 1.39)	1.21 (0.87, 1.66)	1.16 (0.84, 1.62)	1.28 (0.92, 1.78)
	Quartile 4	1.12 (0.88, 1.42)	1.36 (0.84, 2.21)	1.31 (0.79, 2.19)	1.39 (0.83, 2.33)
	P-trend	0.33	0.17	0.28	0.17

All models adjusted for age and education.