

eTable 1. Association between genital talc use (ever/never and talc-years) and OVCA, stratified by menopausal status and potential effect modifiers<sup>a</sup>.

	Premenopausal						Postmenopausal							
	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	p-het	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	p-het
	<b>BMI &lt;24.9</b>			<b>BMI 24.9+</b>				<b>BMI &lt;24.9</b>			<b>BMI 24.9+</b>			
Never	440 (80.6)	383 (76.9)	1.00 (referent)	295 (76.4)	270 (67.2)	1.00 (referent)	0.19	358 (71.2)	344 (67.1)	1.00 (referent)	458 (68.9)	402 (64.0)	1.00 (referent)	0.94
Ever	106 (19.4)	115 (23.1)	1.17 (0.85, 1.61)	91 (23.6)	132 (32.8)	1.72 (1.22, 2.44)		145 (28.8)	169 (32.9)	1.24 (0.94, 1.66)	207 (31.1)	226 (36.0)	1.28 (1.00, 1.63)	
Never	440 (80.9)	383 (77.4)	1.00 (referent)	295 (76.6)	270 (67.3)	1.00 (referent)	0.45	358 (72.3)	344 (68.0)	1.00 (referent)	458 (69.2)	402 (64.4)	1.00 (referent)	0.36
≤1	41 (7.5)	25 (5.1)	0.66 (0.38, 1.15)	29 (7.5)	34 (8.5)	1.39 (0.78, 2.47)		31 (6.3)	42 (8.3)	1.60 (0.95, 2.72)	37 (5.6)	37 (5.9)	1.25 (0.76, 2.05)	
>1-5	23 (4.2)	31 (6.3)	1.72 (0.94, 3.12)	21 (5.5)	32 (8.0)	1.73 (0.93, 3.23)		28 (5.7)	34 (6.7)	1.33 (0.76, 2.32)	52 (7.9)	51 (8.2)	1.27 (0.83, 1.96)	
>5-24	30 (5.5)	35 (7.1)	1.15 (0.67, 1.98)	29 (7.5)	42 (10.5)	1.86 (1.07, 3.23)		31 (6.3)	40 (7.9)	1.35 (0.81, 2.27)	56 (8.5)	53 (8.5)	1.01 (0.66, 1.53)	
>24	10 (1.8)	21 (4.2)	2.21 (0.99, 4.95)	11 (2.9)	23 (5.7)	2.33 (1.03, 5.29)		47 (9.5)	46 (9.1)	0.95 (0.60, 1.51)	59 (8.9)	81 (13.0)	1.51 (1.04, 2.20)	
p-trend			0.04			0.01	0.80			0.82			0.05	0.14
	<b>Height &lt;1.63(m)</b>			<b>Height 1.63+(m)</b>				<b>Height &lt;1.63(m)</b>			<b>Height 1.63+(m)</b>			
Never	324 (79.2)	292 (70.7)	1.00 (referent)	411 (78.6)	361 (74.1)	1.00 (referent)	0.22	431 (88.5)	397 (66.1)	1.00 (referent)	384 (71.4)	349 (64.6)	1.00 (referent)	0.21
Ever	85 (20.8)	121 (29.3)	1.58 (1.11, 2.24)	112 (21.4)	126 (25.9)	1.24 (0.90, 1.70)		198 (31.5)	204 (33.9)	1.15 (0.89, 1.48)	154 (28.6)	191 (35.4)	1.43 (1.09, 1.88)	
Never	324 (79.4)	292 (70.9)	1.00 (referent)	411 (78.9)	361 (74.6)	1.00 (referent)	0.24	431 (89.2)	397 (67.1)	1.00 (referent)	384 (72.0)	349 (64.9)	1.00 (referent)	0.60
≤1	34 (8.3)	26 (6.3)	0.77 (0.40, 1.31)	36 (6.9)	33 (6.8)	1.12 (0.66, 1.92)		37 (5.9)	38 (6.4)	1.21 (0.73, 1.98)	31 (5.8)	41 (7.6)	1.68 (1.00, 2.83)	
>1-5	19 (4.7)	34 (8.3)	2.08 (1.09, 3.95)	25 (4.8)	29 (6.0)	1.36 (0.75, 2.46)		45 (7.2)	40 (6.8)	1.11 (0.69, 1.78)	35 (6.6)	45 (8.4)	1.56 (0.95, 2.55)	
>5-24	24 (5.9)	35 (8.5)	1.64 (0.88, 2.89)	35 (6.7)	42 (8.7)	1.23 (0.74, 2.05)		47 (7.5)	50 (8.4)	1.10 (0.71, 1.71)	40 (7.5)	43 (8.0)	1.15 (0.72, 1.86)	
>24	7 (1.7)	25 (6.1)	4.78 (1.89, 12.1)	14 (2.7)	19 (3.9)	1.35 (0.63, 2.89)		63 (10.1)	67 (11.3)	1.10 (0.75, 1.63)	43 (8.1)	60 (11.2)	1.52 (0.98, 2.36)	
p-trend			0.0003			0.33	0.04			0.66			0.10	0.33
	<b>Weight &lt;148(lbs)</b>			<b>Weight 148+(lbs)</b>				<b>Weight &lt;148(lbs)</b>			<b>Weight 148+(lbs)</b>			
Never	430 (81.4)	360 (77.8)	1.00 (referent)	305 (75.5)	292 (67.0)	1.00 (referent)	0.37	369 (72.1)	367 (68.5)	1.00 (referent)	440 (67.9)	378 (62.6)	1.00 (referent)	0.74
Ever	98 (18.6)	103 (22.2)	1.20 (0.86, 1.67)	99 (24.5)	144 (33.0)	1.64 (1.18, 2.29)		143 (27.9)	169 (31.5)	1.21 (0.91, 1.61)	208 (32.1)	226 (37.4)	1.28 (1.00, 1.64)	
Never	430 (81.7)	360 (78.1)	1.00 (referent)	305 (75.7)	292 (67.3)	1.00 (referent)	0.34	369 (73.2)	367 (69.5)	1.00 (referent)	440 (68.2)	378 (62.9)	1.00 (referent)	0.34
≤1	40 (7.6)	21 (4.6)	0.58 (0.32, 1.04)	30 (7.4)	38 (8.8)	1.44 (0.83, 2.50)		31 (6.2)	39 (7.4)	1.42 (0.84, 2.42)	37 (5.7)	40 (6.7)	1.41 (0.86, 2.31)	
>1-5	21 (4.0)	28 (6.1)	1.81 (0.97, 3.39)	23 (5.7)	35 (8.1)	1.68 (0.97, 3.04)		26 (5.2)	34 (6.4)	1.37 (0.78, 2.42)	54 (8.4)	51 (8.5)	1.21 (0.79, 1.86)	
>5-24	26 (4.9)	31 (6.7)	1.28 (0.70, 2.23)	33 (8.2)	46 (10.6)	1.64 (0.95, 2.76)		30 (6.0)	40 (7.6)	1.37 (0.82, 2.31)	56 (8.7)	53 (8.8)	1.01 (0.66, 1.54)	
>24	9 (1.7)	21 (4.6)	2.60 (1.12, 6.03)	12 (3.0)	23 (5.3)	2.08 (0.93, 4.59)		48 (9.5)	48 (9.1)	0.92 (0.59, 1.45)	58 (9.0)	79 (13.1)	1.52 (1.04, 2.23)	
p-trend			0.02			0.03	0.58			0.76			0.06	0.11
	<b>Nulliparous</b>			<b>Parous</b>				<b>Nulliparous</b>			<b>Parous</b>			
Never	188 (80.0)	293 (72.7)	1.00 (referent)	547 (78.5)	360 (72.4)	1.00 (referent)	0.81	96 (67.1)	162 (65.6)	1.00 (referent)	720 (70.2)	584 (65.3)	1.00 (referent)	0.82
Ever	47 (20.0)	110 (27.3)	1.35 (0.90, 2.02)	150 (21.5)	137 (27.6)	1.32 (0.99, 1.76)		47 (32.9)	85 (34.4)	1.23 (0.78, 1.95)	305 (29.8)	310 (34.7)	1.25 (1.03, 1.53)	
Never	188 (80.3)	293 (73.3)	1.00 (referent)	547 (78.7)	360 (72.6)	1.00 (referent)	0.44	96 (67.6)	162 (65.9)	1.00 (referent)	720 (70.9)	584 (66.1)	1.00 (referent)	0.41
≤1	22 (9.4)	26 (6.5)	0.74 (0.40, 1.38)	48 (6.9)	33 (6.7)	1.05 (0.64, 1.72)		8 (5.6)	24 (9.8)	2.78 (1.13, 6.85)	60 (5.9)	55 (6.2)	1.24 (0.83, 1.84)	
>1-5	9 (3.8)	23 (5.8)	1.33 (0.58, 3.03)	35 (5.0)	40 (8.1)	1.76 (1.07, 2.90)		10 (7.0)	21 (8.5)	1.31 (0.55, 3.09)	70 (6.9)	64 (7.2)	1.25 (0.87, 1.82)	
>5-24	12 (5.1)	39 (9.8)	1.86 (0.93, 3.72)	47 (6.8)	38 (7.7)	1.16 (0.72, 1.87)		16 (11.3)	17 (6.9)	0.66 (0.30, 1.44)	71 (7.0)	76 (8.6)	1.21 (0.85, 1.72)	
>24	3 (1.3)	19 (4.8)	3.96 (1.10, 14.3)	18 (2.6)	25 (5.0)	1.65 (0.85, 3.18)		12 (8.5)	22 (8.9)	1.17 (0.53, 2.60)	94 (9.3)	105 (11.9)	1.27 (0.93, 1.74)	
p-trend			0.009			0.12	0.10			0.91			0.14	0.51
	<b>Never breastfed</b>			<b>Breastfed</b>				<b>Never breastfed</b>			<b>Breastfed</b>			
Never	340 (78.5)	445 (74.8)	1.00 (referent)	395 (79.2)	208 (68.2)	1.00 (referent)	0.03	441 (68.5)	508 (64.5)	1.00 (referent)	375 (71.6)	238 (67.4)	1.00 (referent)	0.87
Ever	93 (21.5)	150 (25.2)	1.07 (0.78, 1.46)	104 (20.8)	97 (31.8)	1.92 (1.35, 2.73)		203 (31.5)	280 (35.5)	1.24 (0.99, 1.57)	149 (28.4)	115 (32.6)	1.29 (0.95, 1.76)	
Never	340 (78.7)	445 (75.2)	1.00 (referent)	395 (79.5)	208 (68.4)	1.00 (referent)	0.09	441 (68.8)	508 (65.0)	1.00 (referent)	375 (72.7)	238 (68.2)	1.00 (referent)	0.26
≤1	36 (8.3)	30 (5.1)	0.58 (0.34, 0.98)	34 (6.8)	29 (9.5)	1.74 (0.99, 3.06)		30 (4.7)	54 (6.9)	1.66 (1.02, 2.71)	38 (7.4)	25 (7.2)	1.16 (0.67, 2.02)	
>1-5	14 (3.2)	35 (5.9)	1.64 (0.84, 3.20)	30 (6.0)	28 (9.2)	1.82 (1.02, 3.23)		43 (6.7)	52 (6.7)	1.08 (0.70, 1.68)	37 (7.2)	33 (9.5)	1.68 (1.00, 2.83)	
>5-24	31 (7.2)	53 (9.0)	1.12 (0.69, 1.83)	28 (5.6)	24 (7.9)	2.05 (1.12, 3.78)		53 (8.3)	72 (9.2)	1.22 (0.82, 1.80)	34 (6.6)	21 (6.0)	0.86 (0.47, 1.55)	
>24	11 (2.5)	29 (4.9)	1.77 (0.84, 3.75)	10 (2.0)	15 (4.9)	2.76 (1.16, 6.58)		74 (11.5)	95 (12.2)	1.16 (0.82, 1.63)	32 (6.2)	32 (9.2)	1.64 (0.96, 2.83)	
p-trend			0.10			0.007	0.40			0.46			0.13	0.27
	<b>Never used OCs</b>			<b>Used OCs</b>				<b>Never used OCs</b>			<b>Used OCs</b>			
Never	152 (76.8)	224 (73.0)	1.00 (referent)	583 (79.6)	429 (72.3)	1.00 (referent)	0.44	407 (71.7)	448 (67.2)	1.00 (referent)	409 (68.2)	298 (62.9)	1.00 (referent)	0.84
Ever	46 (23.2)	83 (27.0)	1.10 (0.70, 1.74)	151 (20.4)	164 (27.7)	1.45 (1.11, 1.91)		161 (28.3)	219 (32.8)	1.25 (0.97, 1.62)	191 (31.8)	176 (37.1)	1.29 (0.99, 1.69)	
Never	152 (77.2)	224 (73.4)	1.00 (referent)	583 (79.6)	429 (72.6)	1.00 (referent)	0.30	407 (72.2)	448 (67.9)	1.00 (referent)	409 (69.0)	298 (63.4)	1.00 (referent)	0.38
≤1	20 (10.2)	16 (5.2)	0.45 (0.21, 0.99)	50 (6.8)	43 (7.3)	1.19 (0.76, 1.86)		28 (5.0)	28 (4.2)	1.00 (0.57, 1.76)	40 (6.7)	51 (10.9)	1.71 (1.07, 2.71)	
>1-5	8 (4.1)	23 (7.5)	1.68 (0.68, 4.14)	36 (4.9)	40 (6.8)	1.67 (1.02, 2.74)		29 (5.1)	47 (7.1)	1.52 (0.92, 2.52)	51 (8.6)	38 (8.1)	1.06 (0.66, 1.69)	
>5-24	12 (6.1)	28 (9.2)	1.47 (0.69, 3.14)	47 (6.4)	49 (8.3)	1.37 (0.88, 2.13)		43 (7.6)	59 (8.9)	1.25 (0.82, 1.92)	44 (7.4)	34 (7.2)	1.03 (0.63, 1.69)	
>24	5 (2.5)	14 (4.6)	1.80 (0.55, 5.92)	16 (2.2)	30 (5.1)	2.10 (1.09, 4.06)		57 (10.1)	78 (11.8)	1.19 (0.81, 1.74)	49 (8.3)	49 (10.4)	1.45 (0.93, 2.26)	
p-trend			0.16			0.01	0.93			0.35			0.19	0.69

eTable 1. Association between genital talc use (ever/never and talc-years) and OVCA, stratified by menopausal status and potential effect modifiers<sup>a</sup>. (continued)

	Premenopausal						Postmenopausal							
	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	p-het	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	p-het
	<b>Never used an IUD</b>			<b>Ever used an IUD</b>				<b>Never used an IUD</b>			<b>Ever used an IUD</b>			
Never	632 (79.9)	559 (72.3)	1.00 (referent)	103 (73.0)	94 (74.0)	1.00 (referent)	0.23	668 (69.9)	644 (65.9)	1.00 (referent)	148 (69.8)	102 (62.2)	1.00 (referent)	0.65
Ever	159 (20.1)	214 (27.7)	1.42 (1.10, 1.84)	38 (27.0)	33 (26.0)	0.98 (0.52, 1.86)		288 (30.1)	333 (34.1)	1.23 (1.00, 1.50)	64 (30.2)	62 (37.8)	1.36 (0.84, 2.19)	
Never	632 (80.1)	559 (72.7)	1.00 (referent)	103 (73.6)	94 (74.0)	1.00 (referent)	0.57	668 (70.5)	644 (66.6)	1.00 (referent)	148 (70.5)	102 (62.6)	1.00 (referent)	0.18
≤1	58 (7.4)	50 (6.5)	0.98 (0.64, 1.49)	12 (8.6)	9 (7.1)	0.66 (0.24, 1.84)		54 (5.7)	63 (6.5)	1.31 (0.88, 1.95)	14 (6.7)	16 (9.8)	1.54 (0.67, 3.56)	
>1-5	38 (4.8)	58 (7.5)	1.84 (1.16, 2.93)	6 (4.3)	5 (3.9)	1.05 (0.25, 4.46)		67 (7.1)	66 (6.8)	1.09 (0.75, 1.59)	13 (6.2)	19 (11.7)	2.40 (1.07, 5.36)	
>5-24	48 (6.1)	67 (8.7)	1.35 (0.89, 2.05)	11 (7.9)	10 (7.9)	1.38 (0.48, 3.95)		67 (7.1)	81 (8.4)	1.21 (0.85, 1.72)	20 (9.5)	12 (7.4)	0.78 (0.34, 1.80)	
>24	13 (1.6)	35 (4.6)	2.50 (1.26, 4.98)	8 (5.7)	9 (7.1)	1.18 (0.37, 3.74)		91 (9.6)	113 (11.7)	1.26 (0.93, 1.72)	15 (7.1)	14 (8.6)	1.19 (0.50, 2.81)	
p-trend			0.004			0.62	0.24			0.15			0.94	0.57
	<b>Ovulatory cycles &lt;366</b>			<b>Ovulatory cycles &gt;366</b>				<b>Ovulatory cycles &lt;366</b>			<b>Ovulatory cycles &gt;366</b>			
Never	513 (81.3)	376 (74.9)	1.00 (referent)	161 (72.2)	214 (67.5)	1.00 (referent)	0.56	235 (71.0)	166 (71.9)	1.00 (referent)	519 (70.3)	519 (63.4)	1.00 (referent)	0.18
Ever	118 (18.7)	126 (25.1)	1.45 (1.09, 1.95)	62 (27.8)	103 (32.5)	1.25 (0.85, 1.85)		96 (29.0)	65 (28.1)	1.03 (0.70, 1.53)	219 (29.7)	299 (36.6)	1.42 (1.14, 1.77)	
Never	513 (81.4)	376 (75.2)	1.00 (referent)	161 (72.5)	214 (67.9)	1.00 (referent)	0.76	235 (71.9)	166 (72.5)	1.00 (referent)	519 (71.0)	519 (64.2)	1.00 (referent)	0.01
≤1	41 (6.5)	31 (6.2)	1.06 (0.64, 1.75)	22 (9.9)	24 (7.6)	0.74 (0.39, 1.43)		18 (5.5)	22 (9.6)	1.72 (0.86, 3.46)	45 (6.2)	53 (6.6)	1.29 (0.84, 1.98)	
>1-5	29 (4.6)	30 (6.0)	1.41 (0.82, 2.42)	14 (6.3)	29 (9.2)	1.61 (0.81, 3.23)		29 (8.9)	9 (3.9)	0.52 (0.23, 1.16)	42 (5.7)	72 (8.9)	1.84 (1.22, 2.78)	
>5-24	37 (5.9)	42 (8.4)	1.58 (0.98, 2.53)	15 (6.8)	28 (8.9)	1.33 (0.67, 2.65)		17 (5.2)	17 (7.4)	1.53 (0.74, 3.17)	61 (8.3)	67 (8.3)	1.12 (0.76, 1.62)	
>24	10 (1.6)	21 (4.2)	2.64 (1.20, 5.81)	10 (4.5)	20 (6.3)	1.76 (0.78, 4.00)		28 (8.6)	15 (6.6)	0.80 (0.40, 1.59)	64 (8.8)	98 (12.1)	1.52 (1.07, 2.14)	
p-trend			0.003			0.12	0.24			0.63			0.04	0.16
	<b>No endo/painful periods</b>			<b>Endometriosis or painful periods</b>				<b>No endo/painful periods</b>			<b>Endometriosis or painful periods</b>			
Never	462 (78.7)	354 (75.5)	1.00 (referent)	273 (79.1)	299 (69.4)	1.00 (referent)	0.26	544 (71.2)	460 (66.1)	1.00 (referent)	272 (67.3)	286 (64.3)	1.00 (referent)	0.47
Ever	125 (21.3)	115 (24.5)	1.22 (0.89, 1.66)	72 (20.9)	132 (30.6)	1.54 (1.07, 2.21)		220 (28.8)	236 (33.9)	1.31 (1.04, 1.66)	132 (32.7)	159 (35.7)	1.16 (0.86, 1.56)	
Never	462 (79.0)	354 (75.5)	1.00 (referent)	273 (79.4)	299 (70.0)	1.00 (referent)	0.90	544 (71.9)	460 (67.0)	1.00 (referent)	272 (68.0)	286 (64.6)	1.00 (referent)	0.92
≤1	46 (7.9)	29 (6.2)	0.87 (0.52, 1.44)	24 (7.0)	30 (7.0)	1.03 (0.55, 1.93)		41 (5.4)	49 (7.1)	1.48 (0.94, 2.34)	27 (6.8)	30 (6.8)	1.17 (0.66, 2.10)	
>1-5	29 (5.0)	32 (6.8)	1.57 (0.90, 2.74)	15 (4.4)	31 (7.3)	1.65 (0.82, 3.30)		56 (7.4)	54 (7.9)	1.27 (0.84, 1.93)	24 (6.0)	31 (7.0)	1.25 (0.69, 2.25)	
>5-24	38 (6.5)	38 (8.1)	1.28 (0.77, 2.13)	21 (6.1)	39 (9.1)	1.45 (0.79, 2.65)		52 (6.9)	56 (8.2)	1.22 (0.80, 1.85)	35 (8.8)	37 (8.4)	0.99 (0.59, 1.65)	
>24	10 (1.7)	16 (3.4)	1.79 (0.77, 4.19)	11 (3.2)	28 (6.6)	2.59 (1.19, 5.64)		64 (8.5)	68 (9.9)	1.26 (0.86, 1.85)	42 (10.5)	59 (13.3)	1.28 (0.81, 2.02)	
p-trend			0.10			0.01	0.79			0.26			0.35	0.97
	<b>Non-Jewish</b>			<b>Jewish</b>				<b>Non-Jewish</b>			<b>Jewish</b>			
Never	680 (78.7)	603 (72.6)	1.00 (referent)	55 (80.9)	50 (72.5)	1.00 (referent)	0.58	775 (69.9)	674 (65.4)	1.00 (referent)	41 (69.5)	72 (65.5)	1.00 (referent)	0.82
Ever	184 (21.3)	228 (27.4)	1.33 (1.04, 1.69)	13 (19.1)	19 (27.5)	2.79 (1.03, 7.59)		334 (30.1)	357 (34.6)	1.25 (1.04, 1.51)	18 (30.5)	38 (34.5)	1.29 (0.59, 2.81)	
Never	680 (79.0)	603 (72.7)	1.00 (referent)	55 (80.9)	50 (74.6)	1.00 (referent)	0.05	775 (70.5)	674 (66.1)	1.00 (referent)	41 (70.7)	72 (65.5)	1.00 (referent)	0.11
≤24	164 (19.0)	183 (22.1)	1.21 (0.94, 1.57)	9 (13.2)	16 (23.9)	2.51 (0.87, 7.24)		229 (20.8)	233 (22.8)	1.20 (0.96, 1.50)	6 (10.3)	24 (21.8)	2.58 (0.86, 7.77)	
>24	17 (2.0)	43 (5.2)	2.50 (1.36, 4.61)	4 (5.9)	1 (1.5)	1.46 (0.10, 21.3)		95 (8.6)	113 (11.1)	1.35 (1.00, 1.83)	11 (19.0)	14 (12.7)	0.72 (0.26, 1.98)	
p-trend			0.003			0.68	0.06			0.07			0.41	0.19
	<b>No family history</b>			<b>Family history of early onset breast or ovarian cancer</b>				<b>No family history</b>			<b>Family history of early onset breast or ovarian cancer</b>			
Never	685 (78.9)	586 (72.6)	1.00 (referent)	50 (78.1)	67 (72.0)	1.00 (referent)	0.86	761 (69.9)	681 (65.2)	1.00 (referent)	55 (68.8)	65 (67.7)	1.00 (referent)	0.88
Ever	183 (21.1)	221 (27.4)	1.35 (1.06, 1.73)	14 (21.9)	26 (28.0)	1.25 (0.52, 3.02)		327 (30.1)	364 (34.8)	1.25 (1.03, 1.51)	25 (31.3)	31 (32.3)	1.38 (0.64, 2.98)	
Never	685 (79.2)	586 (72.9)	1.00 (referent)	50 (78.1)	67 (72.8)	1.00 (referent)	0.97	761 (70.7)	681 (65.9)	1.00 (referent)	55 (68.8)	65 (67.7)	1.00 (referent)	0.30
≤1	64 (7.4)	52 (6.5)	0.94 (0.62, 1.42)	6 (9.4)	7 (7.6)	0.80 (0.21, 2.98)		60 (5.6)	74 (7.2)	1.51 (1.04, 2.20)	8 (10.0)	5 (5.2)	0.48 (0.12, 1.90)	
>1-5	42 (4.9)	58 (7.2)	1.63 (1.05, 2.55)	2 (3.1)	5 (5.4)	3.23 (0.35, 29.5)		75 (7.0)	76 (7.4)	1.24 (0.87, 1.76)	5 (6.3)	9 (9.4)	2.43 (0.60, 9.87)	
>5-24	55 (6.4)	69 (8.6)	1.40 (0.94, 2.09)	4 (6.3)	8 (8.7)	0.80 (0.18, 3.49)		80 (7.4)	87 (8.4)	1.12 (0.80, 1.57)	7 (8.8)	6 (6.3)	0.82 (0.19, 3.62)	
>24	19 (2.2)	39 (4.9)	2.10 (1.15, 3.82)	2 (3.1)	5 (5.4)	2.31 (0.31, 17.1)		101 (9.4)	116 (11.2)	1.20 (0.89, 1.63)	5 (6.3)	11 (11.5)	3.40 (0.84, 13.7)	
p-trend			0.005			0.45	0.78			0.31			0.10	0.21
	<b>Non-Jewish and no family or personal history</b>			<b>Jewish, family or personal history</b>				<b>Non-Jewish and no family or personal history</b>			<b>Jewish, family or personal history</b>			
Never	626 (78.4)	528 (72.2)	1.00 (referent)	109 (81.3)	125 (74.0)	1.00 (referent)	0.65	688 (70.9)	567 (64.6)	1.00 (referent)	128 (64.6)	179 (68.1)	1.00 (referent)	0.17
Ever	172 (21.6)	203 (27.8)	1.33 (1.03, 1.72)	25 (18.7)	44 (26.0)	1.61 (0.88, 2.93)		282 (29.1)	311 (35.4)	1.33 (1.08, 1.64)	70 (35.4)	84 (31.9)	0.95 (0.62, 1.45)	
Never	626 (78.7)	528 (72.4)	1.00 (referent)	109 (81.3)	125 (74.9)	1.00 (referent)	0.20	688 (71.6)	567 (65.4)	1.00 (referent)	128 (65.3)	179 (68.1)	1.00 (referent)	0.39
≤1	61 (7.7)	50 (6.9)	0.96 (0.63, 1.46)	9 (6.7)	9 (5.4)	0.82 (0.29, 2.33)		58 (6.0)	61 (7.0)	1.37 (0.92, 2.04)	10 (5.1)	18 (6.8)	1.31 (0.55, 3.11)	
>1-5	41 (5.2)	50 (6.9)	1.42 (0.89, 2.27)	3 (2.2)	13 (7.8)	6.17 (1.49, 25.52)		67 (7.0)	65 (7.5)	1.30 (0.89, 1.89)	13 (6.6)	20 (7.6)	1.28 (0.58, 2.83)	
>5-24	52 (6.5)	63 (8.6)	1.37 (0.90, 2.08)	7 (5.2)	14 (8.4)	1.50 (0.54, 4.16)		65 (6.8)	76 (8.8)	1.27 (0.88, 1.83)	22 (11.2)	17 (6.5)	0.58 (0.28, 1.19)	
>24	15 (1.9)	38 (5.2)	2.61 (1.36, 5.01)	6 (4.5)	6 (3.6)	0.97 (0.27, 3.49)		83 (8.6)	98 (11.3)	1.34 (0.97, 1.86)	23 (11.7)	29 (11.0)	1.06 (0.56, 2.03)	
p-trend			0.002			0.83	0.21			0.09			0.87	0.25

eTable 1. Association between genital talc use (ever/never and talc-years) and OVCA, stratified by menopausal status and potential effect modifiers<sup>a</sup>. (continued)

	Premenopausal							Postmenopausal						
	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	p-het	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	Controls N (%)	Cases N (%)	Adjusted OR <sup>b</sup> (95% CI)	p-het
	<b>No hysterectomy or tubal ligation</b>			<b>Hysterectomy or tubal ligation</b>				<b>No hysterectomy or tubal ligation</b>			<b>Hysterectomy or tubal ligation</b>			
Never	588 (78.8)	559 (72.8)	1.00 (referent)	147 (79.0)	94 (71.2)	1.00 (referent)	0.70	547 (69.2)	575 (68.0)	1.00 (referent)	269 (71.2)	171 (58.0)	1.00 (referent)	0.006
Ever	158 (21.2)	209 (27.2)	1.31 (1.01, 1.70)	39 (21.0)	38 (28.8)	1.59 (0.89, 2.84)		243 (30.8)	271 (32.0)	1.06 (0.85, 1.32)	109 (28.8)	124 (42.0)	1.85 (1.32, 2.60)	
Never	588 (79.1)	559 (73.2)	1.00 (referent)	147 (79.0)	94 (71.2)	1.00 (referent)	0.59	547 (69.9)	575 (68.4)	1.00 (referent)	269 (71.7)	171 (59.2)	1.00 (referent)	0.15
≤1	63 (8.5)	51 (6.7)	0.81 (0.54, 1.24)	7 (3.8)	8 (6.1)	1.60 (0.51, 5.02)		48 (6.1)	55 (6.5)	1.17 (0.77, 1.80)	20 (5.3)	24 (8.3)	2.21 (1.14, 4.30)	
>1-5	36 (4.8)	56 (7.3)	1.68 (1.05, 2.69)	8 (4.3)	7 (5.3)	2.01 (0.62, 6.55)		59 (7.5)	58 (6.9)	1.05 (0.70, 1.58)	21 (5.6)	27 (9.3)	2.20 (1.16, 4.14)	
>5-24	44 (5.9)	66 (8.6)	1.46 (0.95, 2.25)	15 (8.1)	11 (8.3)	1.23 (0.50, 3.06)		58 (7.4)	67 (8.0)	1.02 (0.69, 1.50)	29 (7.7)	26 (9.0)	1.4037 (0.78, 2.51)	
>24	12 (1.6)	32 (4.2)	2.38 (1.16, 4.87)	9 (4.8)	12 (9.1)	1.86 (0.70, 4.95)		70 (9.0)	86 (10.2)	1.08 (0.76, 1.53)	36 (9.6)	41 (14.2)	1.72 (1.03, 2.88)	
p-trend			0.004			0.24	0.40			0.72			0.08	0.13
	<b>Not currently smoking</b>			<b>Currently smoking</b>				<b>Not currently smoking</b>			<b>Currently smoking</b>			
Never	630 (79.2)	519 (71.9)	1.00 (referent)	105 (76.6)	134 (75.3)	1.00 (referent)	0.23	702 (69.5)	630 (65.3)	1.00 (referent)	114 (72.2)	116 (65.9)	1.00 (referent)	0.79
Ever	165 (20.8)	203 (28.1)	1.44 (1.11, 1.86)	32 (23.4)	44 (24.7)	1.00 (0.55, 1.82)		308 (30.5)	335 (34.7)	1.26 (1.03, 1.54)	44 (27.8)	60 (34.1)	1.23 (0.74, 2.04)	
Never	630 (79.4)	519 (72.1)	1.00 (referent)	105 (77.2)	134 (76.1)	1.00 (referent)	0.53	702 (70.3)	630 (66.0)	1.00 (referent)	114 (72.2)	116 (66.3)	1.00 (referent)	0.30
≤1	61 (7.7)	52 (7.2)	1.02 (0.67, 1.56)	9 (6.6)	7 (4.0)	0.53 (0.17, 1.63)		60 (6.0)	67 (7.0)	1.39 (0.95, 2.05)	8 (5.1)	12 (6.9)	1.24 (0.46, 3.38)	
>1-5	36 (4.5)	55 (7.6)	1.93 (1.20, 3.09)	8 (5.9)	8 (4.5)	0.65 (0.20, 2.07)		73 (7.3)	67 (7.0)	1.16 (0.80, 1.67)	7 (4.4)	18 (10.3)	2.60 (0.97, 6.92)	
>5-24	48 (6.1)	58 (8.1)	1.37 (0.89, 2.11)	11 (8.1)	19 (10.8)	1.44 (0.58, 3.60)		74 (7.4)	83 (8.7)	1.18 (0.84, 1.67)	13 (8.2)	10 (5.7)	0.75 (0.30, 1.91)	
>24	18 (2.3)	36 (5.0)	2.15 (1.16, 3.99)	3 (2.2)	8 (4.5)	2.44 (0.50, 11.8)		90 (9.0)	108 (11.3)	1.31 (0.96, 1.80)	16 (10.1)	19 (10.9)	1.02 (0.47, 2.22)	
p-trend			0.007			0.18	0.98			0.11			0.81	0.43
	<b>Never smoked</b>			<b>Ever smoked</b>				<b>Never smoked</b>			<b>Ever smoked</b>			
Never	391 (79.6)	328 (72.4)	1.00 (referent)	344 (78.0)	325 (72.7)	1.00 (referent)	0.46	368 (71.3)	341 (67.3)	1.00 (referent)	448 (68.7)	405 (63.9)	1.00 (referent)	0.95
Ever	100 (20.4)	125 (27.6)	1.50 (1.08, 2.11)	97 (22.0)	122 (27.3)	1.24 (0.89, 1.72)		148 (28.7)	166 (32.7)	1.24 (0.94, 1.65)	204 (31.3)	229 (36.1)	1.27 (1.00, 1.62)	
Never	391 (79.6)	328 (72.6)	1.00 (referent)	344 (78.5)	325 (73.2)	1.00 (referent)	0.48	368 (72.0)	341 (67.9)	1.00 (referent)	448 (69.3)	405 (64.5)	1.00 (referent)	0.18
≤1	31 (6.3)	30 (6.6)	1.25 (0.71, 2.20)	39 (8.9)	29 (6.5)	0.71 (0.41, 1.23)		33 (6.5)	35 (7.0)	1.16 (0.68, 1.98)	35 (5.4)	44 (7.0)	1.67 (1.02, 2.72)	
>1-5	24 (4.9)	36 (8.0)	1.91 (1.04, 3.51)	20 (4.6)	27 (6.1)	1.22 (0.64, 2.32)		35 (6.8)	27 (5.4)	0.92 (0.52, 1.62)	45 (7.0)	58 (9.2)	1.60 (1.04, 2.47)	
>5-24	34 (6.9)	36 (8.0)	1.28 (0.74, 2.21)	25 (5.7)	41 (9.2)	1.70 (0.97, 3.00)		32 (6.3)	39 (7.8)	1.29 (0.77, 2.18)	55 (8.5)	54 (8.6)	0.98 (0.64, 1.48)	
>24	11 (2.2)	22 (4.9)	2.03 (0.91, 4.54)	10 (2.3)	22 (5.0)	2.30 (1.02, 5.21)		43 (8.4)	60 (12.0)	1.53 (0.98, 2.38)	63 (9.8)	67 (10.7)	1.09 (0.74, 1.61)	
p-trend			0.07			0.01	0.45			0.05			0.94	0.13
	<b>No asthma</b>			<b>Asthma</b>				<b>No asthma</b>			<b>Asthma</b>			
Never	686 (79.9)	615 (73.2)	1.00 (referent)	49 (67.1)	38 (63.3)	1.00 (referent)	0.62	756 (70.3)	695 (65.8)	1.00 (referent)	60 (64.5)	51 (60.0)	1.00 (referent)	0.77
Ever	173 (20.1)	225 (26.8)	1.38 (1.08, 1.76)	24 (32.9)	22 (36.7)	1.22 (0.49, 3.04)		319 (29.7)	361 (34.2)	1.25 (1.03, 1.51)	33 (35.5)	34 (40.0)	1.40 (0.69, 2.85)	
Never	686 (80.1)	615 (73.6)	1.00 (referent)	49 (67.1)	38 (63.3)	1.00 (referent)	0.61	756 (71.0)	695 (66.4)	1.00 (referent)	60 (65.2)	51 (60.7)	1.00 (referent)	0.97
≤1	62 (7.2)	52 (6.2)	0.90 (0.60, 1.36)	8 (11.0)	7 (11.7)	1.11 (0.28, 4.39)		59 (5.5)	72 (6.9)	1.43 (0.98, 2.09)	9 (9.8)	7 (8.3)	0.90 (0.26, 3.16)	
>1-5	35 (4.1)	56 (6.7)	1.81 (1.13, 2.90)	9 (12.3)	7 (11.7)	1.08 (0.27, 4.30)		73 (6.9)	78 (7.5)	1.26 (0.89, 1.80)	7 (7.6)	7 (8.3)	1.32 (0.36, 4.84)	
>5-24	55 (6.4)	72 (8.6)	1.36 (0.91, 2.02)	4 (5.5)	5 (8.3)	1.73 (0.26, 11.8)		80 (7.5)	85 (8.1)	1.08 (0.78, 1.52)	7 (7.6)	8 (9.5)	1.28 (0.33, 4.95)	
>24	18 (2.1)	41 (4.9)	2.31 (1.27, 4.19)	3 (4.1)	3 (5.0)	1.36 (0.17, 10.8)		97 (9.1)	116 (11.1)	1.26 (0.93, 1.71)	9 (9.8)	11 (13.1)	1.86 (0.62, 5.58)	
p-trend			0.002			0.68	0.21			0.19			0.26	0.77
	<b>≤2.32 grams per day</b>			<b>&gt;2.32 grams per day</b>				<b>≤2.32 grams per day</b>			<b>&gt;2.32 grams per day</b>			
Never	326 (79.3)	318 (74.1)	1.00 (referent)	390 (78.8)	318 (71.8)	1.00 (referent)	0.70	427 (69.9)	420 (67.7)	1.00 (referent)	373 (70.8)	305 (64.8)	1.00 (referent)	0.38
Ever	85 (20.7)	111 (25.9)	1.21 (0.84, 1.73)	105 (21.2)	125 (28.2)	1.47 (1.06, 2.04)		184 (30.1)	200 (32.3)	1.15 (0.89, 1.49)	154 (29.2)	166 (35.2)	1.30 (0.98, 1.73)	
Never	326 (79.5)	318 (74.6)	1.00 (referent)	390 (78.9)	318 (71.9)	1.00 (referent)	0.88	427 (70.8)	420 (68.5)	1.00 (referent)	373 (71.2)	305 (65.0)	1.00 (referent)	0.07
≤1	22 (5.4)	20 (4.7)	0.78 (0.39, 1.54)	47 (9.5)	34 (7.7)	0.95 (0.57, 1.58)		32 (5.3)	31 (5.1)	1.14 (0.66, 1.97)	35 (6.7)	42 (9.0)	1.50 (0.90, 2.50)	
>1-5	21 (5.1)	28 (6.6)	1.45 (0.75, 2.82)	20 (4.0)	34 (7.7)	2.27 (1.22, 4.22)		43 (7.1)	39 (6.4)	0.91 (0.56, 1.47)	31 (5.9)	40 (8.5)	1.93 (1.14, 3.26)	
>5-24	29 (7.1)	37 (8.7)	1.14 (0.65, 2.00)	29 (5.9)	39 (8.8)	1.52 (0.88, 2.63)		51 (8.5)	49 (8.0)	0.95 (0.62, 1.46)	33 (6.3)	34 (7.2)	1.17 (0.69, 1.98)	
>24	12 (2.9)	23 (5.4)	1.71 (0.77, 3.78)	8 (1.6)	17 (3.8)	2.48 (0.99, 6.18)		50 (8.3)	74 (12.1)	1.59 (1.06, 2.38)	52 (9.9)	48 (10.2)	0.99 (0.64, 1.55)	
p-trend			0.16			0.02	0.34			0.03			0.83	0.13
								<b>Never used HT</b>			<b>Ever used HT</b>			
Never								507 (68.8)	549 (69.8)	1.00 (referent)	309 (71.7)	197 (55.6)	1.00 (referent)	0.0002
Ever								230 (31.2)	238 (30.2)	0.96 (0.76, 1.20)	122 (28.3)	157 (44.4)	2.11 (1.53, 2.92)	
Never								507 (69.5)	549 (70.5)	1.00 (referent)	309 (72.4)	197 (56.1)	1.00 (referent)	0.004
≤1								40 (5.5)	47 (6.0)	1.18 (0.75, 1.88)	28 (6.6)	32 (9.1)	1.83 (1.02, 3.26)	
>1-5								52 (7.1)	50 (6.4)	0.91 (0.59, 1.39)	28 (6.6)	35 (10.0)	2.32 (1.31, 4.11)	
>5-24								61 (8.4)	57 (7.3)	0.82 (0.55, 1.23)	26 (6.1)	36 (10.3)	2.00 (1.13, 3.55)	
>24								70 (9.6)	76 (9.8)	0.96 (0.67, 1.38)	36 (8.4)	51 (14.5)	2.35 (1.42, 3.89)	
p-trend										0.68			0.002	0.006

<sup>a</sup> There were too few African American, Hispanic, and Asian participants to stratify by both race and menopausal status.

<sup>b</sup> Adjusted for reference age (continuous), study center, study phase (3, 4, 5), parity (nulliparous, 1, 2, ≥2), breast feeding (never, <4, 4-9, 10-19, >19 months), OC use (never, <23, 23-49, 50-96, >96 months), IUD (never, ever), endometriosis or painful periods, personal history of breast cancer, Jewish ethnicity, tubal ligation, and BMI (<22.2, 22.2-24.8, 24.9-28.6, >28.6).

**eAppendix 1.** SAS and STATA code to recreate Tables 1-5 and Figures 1-3 in:  
Cramer DW, Vitonis AF, Terry KL, Welch WT, Titus LJ. The association between talc use and ovarian cancer:  
a retrospective case-control study in two US states. Epidemiology. 2016.

```
/******  
/* SAS code */  
/******  
  
*proc import datafile='<<path to file>>\subject_consent_data.txt';  
proc import datafile='\\Sfal\obepidat$\Allison\Data and Programs\OVCA5\Talc, ovulatory cycles, and endo\Data uploaded to  
dbGap\subject_consent_data.txt'  
  out=subject_consent_data  
  dbms=dlm  
  replace;  
  delimiter='09'x;  
  datarow=2;  
run;  
proc sort; by subject_id; run;  
  
*proc import datafile='<<path to file>>\subject_phenotype_data.txt';  
proc import datafile='\\Sfal\obepidat$\Allison\Data and Programs\OVCA5\Talc, ovulatory cycles, and endo\Data uploaded to  
dbGap\subject_phenotype_data.txt'  
  out=subject_phenotype_data  
  dbms=dlm  
  replace;  
  delimiter='09'x;  
  datarow=2;  
run;  
proc sort; by subject_id; run;  
  
data manuscript_data;  
merge subject_consent_data subject_phenotype_data;  
by subject_id;  
run;  
  
/*Some cases and controls used talc in multiple areas for overlapping time periods. Reorganize  
the data to calculate summary variables without counting overlapping use more than once.*/  
  
data toreorganize;  
  set manuscript_data;  
  
*remove 99 codes for missing data;  
array allvars (16) othfreq othmoyr othage othyears genfreq genmoyr genage genyears napfreq napmoyr  
  napage napyrs undfreq undmoyr undage undyears;  
do i=1 to 16;  
  if allvars(i)=99 then allvars(i)=.;  
end;  
  
*remove brands that are cornstarch only;  
if othbrandcode1 in (17,33,41,54) then do; otherpowd=.; othfreq=.; othmoyr=.; othage=.; othyears=.; end;  
if genbrandcode1 in (17,33,41,54) then do; genpowd=.; genfreq=.; genmoyr=.; genage=.; genyears=.; end;  
if napbrandcode1 in (17,33,41,54) then do; nappowd=.; napfreq=.; napmoyr=.; napage=.; napyrs=.; end;  
if undbrandcode1 in (17,33,41,54) then do; undpowd=.; undfreq=.; undmoyr=.; undage=.; undyears=.; end;  
  
run;  
  
data nap;  
  set toreorganize;  
*keep only those who used talc on sanitary napkins and did not have missing info;  
  if nappowd=1 and napyrs ne . and napage ne . and napfreq ne .;  
*assume 12 months if months per year is missing but keep the data in the original variable;  
  orignapmoyr=napmoyr;  
  if napmoyr=. then napmoyr=12;  
*When the year-specific dataset is created below, a record is generated for each year which adds one extra  
year of use for each person in the dataset. For subjects who used talc for >1 year, subtract 1 from  
the duration of use variable (napyrs);  
  if napyrs>1 then napyrs=napyrs-1;  
  if napyrs=1 then napyrs=1;  
*create an age stopped variable;  
  napstp=napage+napyrs;  
*create a variable for average applications per month;  
  napappspermo=napfreq*(napmoyr/12);  
*create a variable for total applications per year;  
  napappsperyr=napfreq*(napmoyr);  
keep subject_id napage napyrs napyrs napstp napfreq napmoyr napappspermo napappsperyr orignapmoyr;  
run;  
data nap;  
  set nap;
```

```

do Iyear=napage to napstp;
  output;
end; run;
data nap;
  set nap;
  if napyears=1 and Iyear>napage then delete;
proc sort; by subject_id iyear; run;

data und;
  set toreorganize;
*keep only those who used talc on underwear and did not have missing info;
  if undpowd=1 and undyears ne . and undage ne . and undfreq ne .;
*assume 12 months if months per year is missing but keep the data in the original variable;
  origundmoyr=undmoyr;
  if undmoyr=. then undmoyr=12;
*When the year-specific dataset is created below, a record is generated for each year which adds one extra
year of use for each person in the dataset. For subjects who used talc for >1 year, subtract 1 from
the duration of use variable (undyrs).;
  if undyears>1 then undyrs=undyears-1;
  if undyears=1 then undyrs=1;
*create an age stopped variable (this may not be accurate if women didn't use talc continuously);
  undstp=undage+undyrs;
*create a variable for average applications per month;
  undappspermo=undfreq*(undmoyr/12);
*create a variable for total applications per year;
  undappsperyr=undfreq*(undmoyr);
keep subject_id undage undyears undyrs undstp undfreq undmoyr undappspermo undappsperyr origundmoyr;
run;
data und;
  set und;
  do Iyear=undage to undstp;
    output;
  end; run;
data und;
  set und;
  if undyears=1 and Iyear>undage then delete;
proc sort; by subject_id iyear; run;

data gen;
  set toreorganize;
*keep only those who used genital talc and did not have missing info;
  if genpowd=1 and genyears ne . and genage ne . and genfreq ne .;
*assume 12 months if months per year is missing but keep the data in the original variable;
  origgenmoyr=genmoyr;
  if genmoyr=. then genmoyr=12;
*When the year-specific dataset is created below, a record is generated for each year which adds one extra
year of use for each person in the dataset. For subjects who used talc for >1 year, subtract 1 from
the duration of use variable (genyrs).;
  if genyears>1 then genyrs=genyears-1;
  if genyears=1 then genyrs=1;
*create an age stopped variable (this may not be accurate if women didn't use talc continuously);
  genstp=genage+genyrs;
*create a variable for average applications per month;
  genappspermo=genfreq*(genmoyr/12);
*create a variable for total applications per year;
  genappsperyr=genfreq*(genmoyr);
keep subject_id genage genyears genyrs genstp genfreq genmoyr genappspermo genappsperyr origgenmoyr;
run;
data gen;
  set gen;
  do Iyear=genage to genstp;
    output;
  end; run;
data gen;
  set gen;
  if genyears=1 and Iyear>genage then delete;
proc sort; by subject_id iyear; run;

data reorganized;
merge gen nap und;
by subject_id iyear;

*create variables for maximum number of applications per month for any type of genital talc application;
maxtalcgenappspermo=max(genappspermo, napappspermo, undappspermo);

*create variables for maximum number of applications per year for any type of genital talc application;
maxtalcgenappsperyr=max(genappsperyr, napappsperyr, undappsperyr);

*create a variable for maximum months per year of use for any type of genital talc application;
maxtalcgenmoyr=max(origgenmoyr, originapmoyr, origundmoyr);

talcyar=maxtalcgenappsperyr/360;

```

```

run;

*calculate total talc-years;
data talcyear; set reorganized;
  by subject_id ;
  if first.subject_id then talcyyears=0;
  talcyyears+talcyear;
run;
data talcyear; set talcyear;
  by subject_id ;
  if last.subject_id=1;
  talcyyears=round(talcyyears,.01);
  label talcyyears='talc-years';
  keep subject_id talcyyears;
run;

*create total duration of use;
data duration;
  set reorganized;
  yearsused + 1;
  by subject_id;
  if first.subject_id then yearsused = 1;
run;
data duration;
  set duration;
  by subject_id;
  if last.subject_id=1;
  label yearsused='years of genital talc use';
  keep subject_id yearsused;
run;

*get the average apps per month for each individual's genital talc use;
proc means noprint data=reorganized;
var maxtalcgenappspermo;
output out=aveappspermo mean=aveappspermo;
by subject_id ;
run;
data aveappspermo; set aveappspermo;
label aveappspermo='average apps per month of genital talc use';
keep subject_id aveappspermo;
proc sort; by subject_id; run;

*get the average months per year for each individual's genital talc use;
proc means noprint data=reorganized;
var maxtalcgenmoyr;
output out=avemoperyr mean=avemoperyr;
by subject_id;
run;
data avemoperyr; set avemoperyr;
label avemoperyr='average months per year of genital talc use';
keep subject_id avemoperyr;
proc sort; by subject_id; run;

*merge the talc-years and summary variables back in with all other variables;
data final;
merge manuscript_data(in=a) talcyear duration aveappspermo avemoperyr;
by subject_id;
if a=1;

*add 99s when months per year of use was not asked;
if genpowd=1 and genmoyr=. then genmoyr=99;
if undpowd=1 and undmoyr=. then undmoyr=99;
if nappowd=1 and napmoyr=. then napmoyr=99;
if otherpowd=1 and othmoyr=. then othmoyr=99;

*indicator for any genital use when including people who used cornstarch only;
if genpowd=1 or nappowd=1 or undpowd=1 then gentalc_inclcorn=1;
else gentalc_inclcorn=0;

*remove cornstarch use;
*(cornstarch use was removed above to create the reorganized dataset and the summary variables
(talcyyears, etc) but needs to be removed again here to prevent cornstach users from being
included in the variables created below);
if othbrandcode1 in (17,33,41,54) then do; otherpowd=0; othfreq=.; othmoyr=.; othage=.; othyears=.; end;
if genbrandcode1 in (17,33,41,54) then do; genpowd=0; genfreq=.; genmoyr=.; genage=.; genyears=.; end;

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if napbrandcode1 in (17,33,41,54) then do; nappowd=0;   napfreq=. ; napmoyr=. ; napage=. ; napyears=. ; end;
if undbrandcode1 in (17,33,41,54) then do; undpowd=0;   undfreq=. ; undmoyr=. ; undage=. ; undyears=. ; end;

*personal use;
if otherpowd=0 and   genpowd=0 and nappowd=0 and undpowd=0 then personal=0; *no use;
if otherpowd=1 and   genpowd=0 and nappowd=0 and undpowd=0 then personal=1; *body use only;
if otherpowd=0 and   (genpowd=1 or nappowd=1 or undpowd=1) then personal=2; *genital use only;
if otherpowd=1 and   (genpowd=1 or nappowd=1 or undpowd=1) then personal=3; *genital AND body use;

*potential exposure in those with no personal use;
if personal=0 then do;
  potential=0;
  if diaph=1 then potential=1; *diaphragm only;
  if condoms=1 then potential=2; *condoms, with or without diaphragm;
  if husbtalc=1 then potential=3; *partner exposure, with or without diaphragm and condoms;
end;

*any genital talc exposure;
if genpowd=1 or nappowd=1 or undpowd=1 then anygenital=1;
else anygenital=0;

*type of powder used, when two brands were recorded, code the first;

*code brand used;
if genbrandcode1 = . and napbrandcode1 = . and undbrandcode1 ne . then genbrand=undbrandcode1;
if genbrandcode1 = . and napbrandcode1 ne . and undbrandcode1 = . then genbrand=napbrandcode1;
if genbrandcode1 ne . and napbrandcode1 = . and undbrandcode1 = . then genbrand=genbrandcode1;
if genbrandcode1 = . and napbrandcode1 = . undbrandcode1 = . then genbrand=napbrandcode1;
if genbrandcode1 = . undbrandcode1 = . and napbrandcode1 = . then genbrand=genbrandcode1;
if genbrandcode1 = . napbrandcode1 = . and undbrandcode1 = . then genbrand=genbrandcode1;
if genbrandcode1 = . napbrandcode1 = . undbrandcode1 = . then genbrand=genbrandcode1;

*when more than one brand was used, decide which to code based on which was used longest or more frequently;
if subject_id=363 then genbrand=2; *used brand 2 more often per month, so choose that one;
if subject_id=2206 then genbrand=2; *brands for other uses are unknown, so code the one that is known;
if subject_id=412 then genbrand=3; *used brand 3 more often per month, so choose that one;
if subject_id=2230 then genbrand=6; *used both brands for the same duration and frequency, randomly choose one;
if subject_id=411 then genbrand=2; *brand for other use is unknown, so code the one that is known;
if subject_id=2451 then genbrand=2; *brand for other use is unknown, so code the one that is known;
if subject_id=267 then genbrand=2; *brand for other use is unknown, so code the one that is known;
if subject_id=1063 then genbrand=7; *used this brand longer;
if subject_id=1101 then genbrand=1; *used this brand longest and most frequently;
if subject_id=707 then genbrand=4; *used this brand longest and more frequently;
if subject_id=562 then genbrand=31; *used this brand more frequently;
if subject_id=1984 then genbrand=2; *used this brand more frequently;
if subject_id=1905 then genbrand=7; *used this brand longer;
if subject_id=856 then genbrand=4; *used this brand longer;
if subject_id=2348 then genbrand=2; *used this brand longer;
if subject_id=2161 then genbrand=19; *used this brand longer;
if subject_id=891 then genbrand=2; *used two brands for for same freq and dur for genital and underwear,
but also used one brand on napkins, so choose that one;
if subject_id=2634 then genbrand=28; *used this brand longer;
if subject_id=3759 then genbrand=10; *used this brand longer;
if subject_id=1703 then genbrand=31; *used this brand longer;
if subject_id=3942 then genbrand=10; *used this brand longer and more frequently;
if subject_id=1749 then genbrand=2; *used 3 different brands but used this one the longest and most frequently;
if subject_id=2123 then genbrand=7; *duration of use of the other brand is unknown, so choose this brand;
if subject_id=3669 then genbrand=2; *used this brand longer;
if subject_id=3722 then genbrand=6; *used both brands for same number of years, but used this brand slightly
more frequently;
if subject_id=4076 then genbrand=2; *used this brand for more applications;
if subject_id=273 then genbrand=2; *used both brands for the same number of applications, so randomly chose one;
if subject_id=1971 then genbrand=2; *used this brand for more applications;
if subject_id=1520 then genbrand=1; *used both brands equally so randomly chose one;
if subject_id=916 then genbrand=18; *used this brand longer;
if subject_id=1788 then genbrand=7; *used this brand longer;
if subject_id=3275 then genbrand=2; *used this brand longer and more frequently;
if subject_id=604 then genbrand=1; *used this brand longer;
if subject_id=2395 then genbrand=4; *used this brand longer;
if subject_id=2730 then genbrand=26; *used both brands for same amount of time so randomly chose one;
if subject_id=181 then genbrand=7; *used this brand for more applications;
if subject_id=2619 then genbrand=7; *used this brand for more applications;
if subject_id=254 then genbrand=4; *used both brands the same, randomly chose one;
if subject_id=2551 then genbrand=21; *used this brand for more applications;
if subject_id=3249 then genbrand=2; *pt could not recall frequency for genital use, so use the brand where
frequency was known;
if subject_id=3325 then genbrand=2; *used both brands the same, randomly chose one;
if subject_id=55 then genbrand=2; *used this brand for more applications;
if subject_id=2546 then genbrand=6; *used this brand for more applications;
if subject_id=1350 then genbrand=2; *used this brand for more applications;
if subject_id=1810 then genbrand=2; *used this brand for more applications;
if subject_id=501 then genbrand=31; *used this brand for more applications;
if subject_id=4005 then genbrand=2; *used this brand for more applications;
if subject_id=2538 then genbrand=2; *used two brands for the same number of apps, randomly chose one;
if subject_id=3665 then genbrand=2; *used this brand for more applications;
if subject_id=2114 then genbrand=10; *used this brand for more applications;
if subject_id=1236 then genbrand=31; *used this brand for more applications;
if subject_id=192 then genbrand=7; *used this brand for more applications;
if subject_id=2583 then genbrand=4; *used both brands the same, randomly chose one;

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if subject_id=3276 then genbrand=6; *used both brands the same, randomly chose one;
if subject_id=2246 then genbrand=6; *used this brand for more applications;
if subject_id=1026 then genbrand=4; *used this brand for more applications;
if subject_id=737 then genbrand=4; *used this brand for more applications;
if subject_id=1854 then genbrand=7; *used this brand for more applications;
if subject_id=662 then genbrand=54; *years of use unknown for genital use so choose napkin use brand;
if subject_id=1547 then genbrand=7; *used this brand for more applications;
if subject_id=3803 then genbrand=26; *used both brands the same, so randomly chose one;
if subject_id=3830 then genbrand=31; *used this brand for more applications;
if subject_id=1209 then genbrand=4; *used this brand for more applications;
if subject_id=2754 then genbrand=2; *used this brand for more applications;

if genitalc_inclcorn=0 then powdtype=0; *none;
if genitalc_inclcorn=1 then do;
  if genitalc_inclcorn=1 and anygenital=0 then powdtype=1; *constarch only;
  else if genbrand in (2,4) then powdtype=2; *J&J or Shower to Shower;
  else powdtype=3;
end;

*age at first genital talc use;
agefirst=min(genage, napage, undage);
if anygenital=0 then agefirstcat=0;
if 0< agefirst< 20 then agefirstcat=1;
if 20<=agefirst< 30 then agefirstcat=2;
if 30<=agefirst< 99 then agefirstcat=3;

*time since exposure ended;
if genage ne 99 and genyears ne 99 then genagestp=genage+genyears;
if napage ne 99 and napyears ne 99 then napagestp=napage+napyears;
if undage ne 99 and undyears ne 99 then undagestp=undage+undyears;
agestop=max(genagestp, napagestp, undagestp);

if anygenital=0 then timesincecat=0;
if anygenital=1 and agestop ne . then do;
  if refage-agestop< 5 then timesincecat=5; *current and recently stopped;
  if 5<=refage-agestop<15 then timesincecat=4; *5-14 years;
  if 15<=refage-agestop<25 then timesincecat=3; *15-24 years;
  if 25<=refage-agestop<35 then timesincecat=2; *25-34 years;
  if refage-agestop>=35 then timesincecat=1; *35+ years;
end;

*frequency of use;
if anygenital=0 then frequency=0;
if 0< aveappspermo<= 7 then frequency=1;
if 7< aveappspermo< 30 then frequency=2;
if aveappspermo>=30 then frequency=3;
if frequency=0 then frequencytr=0;
if frequency=1 then frequencytr=3;
if frequency=2 then frequencytr=12;
if frequency=3 then frequencytr=30;

*years used;
if anygenital=0 then duration=0;
if 0< yearsused< 8 then duration=1;
if 8<=yearsused< 20 then duration=2;
if 20<=yearsused< 36 then duration=3;
if yearsused>=36 then duration=4;
*trend variable based on the median of each category;
if duration=0 then durationtr=0;
if duration=1 then durationtr=3;
if duration=2 then durationtr=12;
if duration=3 then durationtr=26;
if duration=4 then durationtr=44;

*months per year of use;
if anygenital=0 then mo_per_year=0;
if 1<=avemoperyr<=3 then mo_per_year=1;
if 3< avemoperyr<12 then mo_per_year=2;
if avemoperyr=12 then mo_per_year=3;
if mo_per_year=0 then mo_per_yeartr=0;
if mo_per_year=1 then mo_per_yeartr=3;
if mo_per_year=2 then mo_per_yeartr=6;
if mo_per_year=3 then mo_per_yeartr=12;

*genital talc total lifetime applications;
totalapps=(aveappspermo*12)*yearsused;

*create cut points based on years of use if used daily;
if anygenital=0 then totalappscat=0;
if 0 < totalapps<=360 then totalappscat=1; *up to 1 year;
if 360 < totalapps<=1800 then totalappscat=2; *up to 5 years;
if 1800< totalapps<=7200 then totalappscat=3; *up to 20 years;
if totalapps> 7200 then totalappscat=4; *>20 years;
if totalappscat=0 then totalappscattr=0;
if totalappscat=1 then totalappscattr=120;
if totalappscat=2 then totalappscattr=858;

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if totalappscat=3 then totalappscattr=3924;
if totalappscat=4 then totalappscattr=13140;

*categories of talc-years;
if anygenital=0 then talcyearscat=0;
if 0<talcyears<=1 then talcyearscat=1;
if 1<talcyears<=5 then talcyearscat=2;
if 5<talcyears<=24 then talcyearscat=3;
if talcyears> 24 then talcyearscat=4;
if talcyearscat ne . then do;
    talcyearscat1=(talcyearscat=1);
    talcyearscat2=(talcyearscat=2);
    talcyearscat3=(talcyearscat=3);
    talcyearscat4=(talcyearscat=4);
end;
if talcyearscat=0 then talcyearscattr=0;
if talcyearscat=1 then talcyearscattr=.33;
if talcyearscat=2 then talcyearscattr=2.39;
if talcyearscat=3 then talcyearscattr=12;
if talcyearscat=4 then talcyearscattr=38;

*categories 3-4 collapsed;
talcyearscata=talcyearscat;
if talcyearscata=4 then talcyearscata=3;
if talcyearscata ne . then do;
    talcyearscata1=(talcyearscata=1);
    talcyearscata2=(talcyearscata=2);
    talcyearscata3=(talcyearscata=3);
end;
if talcyearscata=0 then talcyearscatatr=0.;
if talcyearscata=1 then talcyearscatatr=0.33;
if talcyearscata=2 then talcyearscatatr=2.39;
if talcyearscata=3 then talcyearscatatr=23.77;

*categories 1-2 collapsed;
talcyearscatb=talcyearscat;
if talcyearscatb=2 then talcyearscatb=1;
if talcyearscatb=3 then talcyearscatb=2;
if talcyearscatb=4 then talcyearscatb=3;
if talcyearscatb ne . then do;
    talcyearscatb1=(talcyearscatb=1);
    talcyearscatb2=(talcyearscatb=2);
    talcyearscatb3=(talcyearscatb=3);
end;
if talcyearscatb=0 then talcyearscatbtr=0;
if talcyearscatb=1 then talcyearscatbtr=1;
if talcyearscatb=2 then talcyearscatbtr=12;
if talcyearscatb=3 then talcyearscatbtr=38;

*categorize talc use before and after a hysterectomy or tubal ligation;
agehysttubal=min(hystage,tubage);
if anygenital=1 and (hyst=1 or tubal=1) and agefirst ne . and agestop ne . then do;
    if 0<agefirst<=agehysttubal then anygenitalbefore=1; else anygenitalbefore=0;
    if agestop>agehysttubal then anygenitalafter=1; else anygenitalafter=0;
end;
if anygenital=0 then usebfaf=0;
else if anygenitalbefore=1 and anygenitalafter=1 then usebfaf=1;
else if anygenitalbefore=1 and anygenitalafter=0 then usebfaf=2;
else if anygenitalbefore=0 and anygenitalafter=1 then usebfaf=3;

*create dichotomous variables;
if parcat=0 then pardi=0;
if parcat>0 then pardi=1;

if mosbrfedcat=0 then brstfd=0;
if mosbrfedcat>0 then brstfd=1;

if htq in (1,2) then htqdi=0;
if htq in (3,4) then htqdi=1;

if wtrefq in (1,2) then wtrefqdi=0;
if wtrefq in (3,4) then wtrefqdi=1;

if ocomnscat=0 then ocuse=0;
if ocomnscat>0 then ocuse=1;

if ovulcyqc in (1,2) then ovulcyqcqi=0;
if ovulcyqc in (3,4) then ovulcyqcqi=1;

if bmiq in (1,2) then bmiqdi=0;
if bmiq in (3,4) then bmiqdi=1;

if hyst=1 or tubal=1 then hysttubal=1;
else hysttubal=0;

if smoke3=0 then everSmoke=0;
if smoke3 in (1,2) then everSmoke=1;

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if smoke3 in (0,1) then currsmoke=0;
if smoke3=2 then currsmoke=1;

if 0<refage<50 then refagecat=1;
if 50<=refage<65 then refagecat=2;
if refage>=65 then refagecat=3;

if meno=0 then hrtcat=0; *premenopausal;
if meno=1 and everhrt=0 then hrtcat=1; *postmenopausal, never used hormone therapy;
if meno=1 and everhrt=1 then hrtcat=2; *postmenopausal and used hormone therapy;

if affection_status=1 then caco=1;
if affection_status=2 then caco=0;

*remove 9 from alcodi;
if alcodi=9 then alcodi=.;

run;
*end dataset creation;

/* TABLE 1 */
proc freq data=final;
table (personal potential anygenital powdtype agefirstcat timesincecat frequency
duration mo_per_year totalappscat)*caco /nopercent norow;
run;
proc freq data=final;
where mo_per_year ne .;
table (totalappscat)*caco /nopercent norow;
run;

proc logistic data=final; class personal (ref='0') study / param=ref;
model affection_status =personal refage study center; run;

proc logistic data=final; class potential (ref='0') study / param=ref;
model affection_status =potential refage study center; run;

proc logistic data=final; class anygenital (ref='0') study / param=ref;
model affection_status =anygenital refage study center; run;

proc logistic data=final; class powdtype (ref='0') study / param=ref;
model affection_status =powdtype refage study center; run;

proc logistic data=final; class agefirstcat (ref='0') study / param=ref;
model affection_status =agefirstcat refage study center; run;

proc logistic data=final; class timesincecat (ref='0') study / param=ref;
model affection_status =timesincecat refage study center; run;

proc logistic data=final;
model affection_status =timesincecat refage study center; run;

proc logistic data=final; class frequency (ref='0') study / param=ref;
model affection_status =frequency refage study center; run;

proc logistic data=final;
model affection_status =frequencytr refage study center; run;

proc logistic data=final; class duration (ref='0') study / param=ref;
model affection_status =duration refage study center; run;

proc logistic data=final;
model affection_status =durationtr refage study center; run;

proc logistic data=final; class mo_per_year (ref='0') study / param=ref;
model affection_status =mo_per_year refage study center; run;

proc logistic data=final;
model affection_status =mo_per_yeartr refage study center; run;

proc logistic data=final; class totalappscat (ref='0') study / param=ref;
model affection_status =totalappscat refage study center; run;

proc logistic data=final;
model affection_status =totalappscattr refage study center; run;

proc logistic data=final; class totalappscat (ref='0') study / param=ref;
model affection_status =totalappscat refage study center; where mo_per_year ne .; run;

proc logistic data=final;
model affection_status =totalappscattr refage study center; where mo_per_year ne .; run;

/*Table 2 - confounding and effect modification for ever/never talc use*/
proc freq;
table (refagecat center study racecat bmiqdi htqdi wtrefqdi pardi brstfd ocuse iud ovulcycqdi
endopain jewish fhxebrov pershxrbrca hysttubal hrtcat currsmoke eversmoke asthmadx alcodi

```

```

ace aspibu)*anygenital / nopercnt nocol ;
where affection_status=2;
run;
proc freq;
table (refagecat center study racecat bmiqdi htqdi wtrefqdi pardi brstfd ocuse iud ovulcycqdi
endopain jewish fhxebrov pershxrbrca hystttubal hrtcat currrsmoke eversmoke asthmadx alcodi
ace aspibu)*anygenital / nopercnt nocol ;
where affection_status=1;
run;

*for likelihood ratio tests;
%macro lrt (dset=, main1=, main2=, Xterm=, adjvars=, classvar=, df=, where=);
proc logistic data=&dset;
class &classvar / param=ref;
model affection_status = &main1 &main2 &adjvars;
ods output fitstatistics=fit_main;
where &where;
title "main effects only: &main1 and &main2";
run;
data fit_main; set fit_main (rename=(interceptandcovariates=LLmain));
if criterion='-2 Log L';
keep LLmain;
run;
proc logistic data=&dset;
class &classvar / param=ref;
model affection_status = &main1 &main2 &Xterm &adjvars;
ods output fitstatistics=fit_int;
where &where;
title "main effects and interaction terms: &main1 and &main2";
run;
data fit_int; set fit_int (rename=(interceptandcovariates=LLint));
if criterion='-2 Log L';
keep LLint;
run;
title "LRT p value";
data _null_; merge fit_main fit_int;
p=1-probchi((LLmain-LLint),&df); file print; put p=; run;
proc datasets lib = work nolist;
delete fit_main fit_int;
quit;

title ;
%mend lrt;

*macro to produce stratum specific ORs;
%macro lrtable2(dset=, main1=, main2=, classvar=, adjvars=, df=, where=);
proc logistic data=&dset; class &classvar/param=ref; model affection_status=&main1 &adjvars; where &main2=0; title "&main2=0"; run;
proc logistic data=&dset; class &classvar/param=ref; model affection_status=&main1 &adjvars; where &main2=1; title "&main2=1"; run;
proc logistic data=&dset; class &classvar/param=ref; model affection_status=&main1 &adjvars; where &main2=2; title "&main2=2"; run;
proc logistic data=&dset; class &classvar/param=ref; model affection_status=&main1 &adjvars; where &main2=3; title "&main2=3"; run;
proc logistic data=&dset; class &classvar/param=ref; model affection_status=&main1 &adjvars; where &main2=4; title "&main2=4"; run;
proc logistic data=&dset; class &classvar/param=ref; model affection_status=&main1 &adjvars; where &main2=5; title "&main2=5"; run;
title ;
%lrt (dset=&dset, main1=&main1, main2=&main2, classvar=&classvar, Xterm=&main1*&main2, adjvars=&adjvars, df=&df, where=&where);
%mend lrtable2;

*Use macro to produce stratum specific ORs and LRTs for each variable in Table 2;

*by age in 3 categories;
%lrtable2(dset=final, main1=anygenital, main2=refagecat, classvar=anygenital(ref='0') refagecat center study,
adjvars=refage center study, df=2);

*by center;
%lrtable2(dset=final, main1=anygenital, main2=center, classvar=anygenital(ref='0') center study,
adjvars=refage study, df=1);

*by study phase;
%lrtable2(dset=final, main1=anygenital, main2=study, classvar=anygenital(ref='0') center study,
adjvars=refage center, df=2);

*by race;
%lrtable2(dset=final, main1=anygenital, main2=racecat, classvar=anygenital(ref='0') racecat center study,
adjvars=refage center study, df=3, where=racecat in (1 2 3 4));

*by bmi;
%lrtable2(dset=final, main1=anygenital, main2=bmiqdi, classvar=anygenital(ref='0') bmiqdi center study,
adjvars=refage center study, df=1);

*by height;
%lrtable2(dset=final, main1=anygenital, main2=htqdi, classvar=anygenital(ref='0') htqdi center study,
adjvars=refage center study, df=1);

*by weight;
%lrtable2(dset=final, main1=anygenital, main2=wtrefqdi, classvar=anygenital(ref='0') wtrefqdi center study,
adjvars=refage center study, df=1);

*by parity;
%lrtable2(dset=final, main1=anygenital, main2=pardi, classvar=anygenital(ref='0') pardi center study,
adjvars=refage center study, df=1);

```

```

*by breastfeeding;
%lrtable2(dset=final, main1=anygenital, main2=brstfd, classvar=anygenital(ref='0') brstfd center study,
adjvars=refage center study, df=1);

*by ocuse;
%lrtable2(dset=final, main1=anygenital, main2=ocuse, classvar=anygenital(ref='0') ocuse center study,
adjvars=refage center study, df=1);

*by iud;
%lrtable2(dset=final, main1=anygenital, main2=iud, classvar=anygenital(ref='0') iud center study,
adjvars=refage center study, df=1);

*by oulatory cycles;
%lrtable2(dset=final, main1=anygenital, main2=ovulcycqdi, classvar=anygenital(ref='0') ovulcycqdi center study,
adjvars=refage center study, df=1);

*by endometriosis or painful periods;
%lrtable2(dset=final, main1=anygenital, main2=endopain, classvar=anygenital(ref='0') endopain center study,
adjvars=refage center study, df=1);

*by jewish ethnicity;
%lrtable2(dset=final, main1=anygenital, main2=jewish, classvar=anygenital(ref='0') jewish center study,
adjvars=refage center study, df=1);

*by family history;
%lrtable2(dset=final, main1=anygenital, main2=fhxebrov, classvar=anygenital(ref='0') fhxebrov center study,
adjvars=refage center study, df=1);

*by personal history of breast cancer;
%lrtable2(dset=final, main1=anygenital, main2=pershxrca, classvar=anygenital(ref='0') pershxrca center study,
adjvars=refage center study, df=1);

*by hysterectomy or tubal ligation;
%lrtable2(dset=final, main1=anygenital, main2=hysttubal, classvar=anygenital(ref='0') hysttubal center study,
adjvars=refage center study, df=1);

*by menopausal status and hormone therapy use;
%lrtable2(dset=final, main1=anygenital, main2=hrtcat, classvar=anygenital(ref='0') hrtcat center study,
adjvars=refage center study, df=2);

*by current smoking;
%lrtable2(dset=final, main1=anygenital, main2=currsmoke, classvar=anygenital(ref='0') currsmoke center study,
adjvars=refage center study, df=1);

*by ever smoked;
%lrtable2(dset=final, main1=anygenital, main2=eversmoke, classvar=anygenital(ref='0') eversmoke center study,
adjvars=refage center study, df=1);

*by asthma;
%lrtable2(dset=final, main1=anygenital, main2=asthmadx, classvar=anygenital(ref='0') asthmadx center study,
adjvars=refage center study, df=1);

*by alcohol;
%lrtable2(dset=final, main1=anygenital, main2=alcodi, classvar=anygenital(ref='0') alcodi center study,
adjvars=refage center study, df=1);

*by acetaminophen use;
%lrtable2(dset=final, main1=anygenital, main2=ace, classvar=anygenital(ref='0') ace center study,
adjvars=refage center study, df=1);

*by aspirin or ibuprofen use;
%lrtable2(dset=final, main1=anygenital, main2=aspibu, classvar=anygenital(ref='0') aspibu center study,
adjvars=refage center study, df=1);

*evaluating potential confounders;
proc logistic data=final; class anygenital (ref='0') / param=ref;
model affection_status = anygenital refage ; run;

proc logistic data=final; class anygenital (ref='0') center / param=ref;
model affection_status = anygenital refage center; run;

proc logistic data=final; class anygenital (ref='0') center study / param=ref;
model affection_status = anygenital refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study racecat / param=ref;
model affection_status = anygenital racecat refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study bmiq / param=ref;
model affection_status = anygenital bmiq refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study htq / param=ref;
model affection_status = anygenital htq refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study wtrefq / param=ref;
model affection_status = anygenital wtrefq refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study parcat / param=ref;

```

```

model affection_status = anygenital parcat          refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study mosbrfedcat / param=ref;
model affection_status = anygenital mosbrfedcat    refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study ocomnscat / param=ref;
model affection_status = anygenital ocomnscat      refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study iud          / param=ref;
model affection_status = anygenital iud          refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study ovulcycq     / param=ref;
model affection_status = anygenital ovulcycq     refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study endopain     / param=ref;
model affection_status = anygenital endopain     refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study jewish        / param=ref;
model affection_status = anygenital jewish        refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study fhxebrov      / param=ref;
model affection_status = anygenital fhxebrov      refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study pershxbrcra    / param=ref;
model affection_status = anygenital pershxbrcra    refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study hyst tubal     / param=ref;
model affection_status = anygenital hyst tubal     refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study hrtcat        / param=ref;
model affection_status = anygenital hrtcat        refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study currsmoke      / param=ref;
model affection_status = anygenital currsmoke      refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study eversmoke      / param=ref;
model affection_status = anygenital eversmoke      refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study asthmadx       / param=ref;
model affection_status = anygenital asthmadx       refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study alcocat       / param=ref;
model affection_status = anygenital alcocat       refage study center; where alcocat in (0 1 2 3); run;

proc logistic data=final; class anygenital (ref='0') center study ace            / param=ref;
model affection_status = anygenital ace            refage study center; run;

proc logistic data=final; class anygenital (ref='0') center study aspibu        / param=ref;
model affection_status = anygenital aspibu        refage study center; run;

*fully adjusted model;
proc logistic data=final;
class anygenital (ref='0') center study bmiq parcat mosbrfedcat ocomnscat iud hrtcat endopain
    pershxbrcra fhxebrov jewish tubal hyst smoke3 alcocat ace aspibu racecat asthmadx / param=ref;
model affection_status = anygenital refage center study bmiq parcat mosbrfedcat ocomnscat iud hrtcat
    endopain pershxbrcra fhxebrov jewish tubal hyst smoke3 alcocat ace aspibu racecat asthmadx;
run;

/*Table 3 - use before and after hysterectomy or tubal ligation*/
proc freq data=final;
table usebfaf*affection_status / nopercnt norow;
where (hyst=1 or tubal=1) and meno=0;
run;
proc logistic data=final;
class usebfaf (ref='0') center study bmiq parcat mosbrfedcat ocomnscat iud endopain pershxbrcra jewish tubal;
model affection_status = usebfaf refage center study bmiq parcat mosbrfedcat ocomnscat iud endopain pershxbrcra jewish tubal;
where (hyst=1 or tubal=1) and meno=0;
run;

proc freq data=final;
table usebfaf*affection_status / nopercnt norow;
where (hyst=1 or tubal=1) and everhrt=0;
run;
proc logistic data=final;
class usebfaf (ref='0') center study center study bmiq parcat mosbrfedcat ocomnscat iud endopain pershxbrcra jewish tubal;
model affection_status=usebfaf refage center study center study bmiq parcat mosbrfedcat ocomnscat iud endopain pershxbrcra
    jewish tubal;
where (hyst=1 or tubal=1) and everhrt=0;
run;

proc freq data=final;
table usebfaf*affection_status / nopercnt norow;
where (hyst=1 or tubal=1) and everhrt=1;
run;

```

```

proc logistic data=final;
class usebfaf (ref='0') center study center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
model affection_status=usebfaf refage center study center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca
jewish tubal;
where (hyst=1 or tubal=1) and everhrt=1;
run;

/*Table 4 - frequencies and create dataset to be used in Stata*/

data PLR_data; set final;

*create a variable for invasive cases (excluding the "other" category) and controls;
if affection_status=2 then casecont_inv=0;
if histology=4 then casecont_inv=1; *serous invasive;
if histology=5 then casecont_inv=2; *mucinous invasive;
if histology=6 then casecont_inv=3; *endometrioid invasive;
if histology=7 then casecont_inv=4; *clear cell invasive;

*create a variable for borderline cases (excluding the "other" category) and controls;
if affection_status=2 then casecont_bord=0;
if histology=1 then casecont_bord=1; *serous borderline;
if histology=2 then casecont_bord=2; *mucinous borderline;

*create indicator variables;
study2=(study=2);
study3=(study=3);
parcat1=(parcat=1);
parcat2=(parcat=2);
parcat3=(parcat=3);
mosbrfedcat1=(mosbrfedcat=1);
mosbrfedcat2=(mosbrfedcat=2);
mosbrfedcat3=(mosbrfedcat=3);
mosbrfedcat4=(mosbrfedcat=4);
ocmonscat1=(ocmonscat=1);
ocmonscat2=(ocmonscat=2);
ocmonscat3=(ocmonscat=3);
ocmonscat4=(ocmonscat=4);
hrtcat1=(hrtcat=1);
hrtcat2=(hrtcat=2);
bmiq2=(bmiq=2);
bmiq3=(bmiq=3);
bmiq4=(bmiq=4);

keep casecont_inv casecont_bord meno anygenital talcyarscat: talcyarscata: talcyarscatb:
refage center study2 study3 parcat1-parcat3 mosbrfedcat1-mosbrfedcat4 ocmonscat1-ocmonscat4 hrtcat1 hrtcat2
iud endopain pershxrbrca jewish tubal bmiq2-bmiq4;
run;
/*
PROC EXPORT DATA= WORK.PLR_data
OUTFILE= "<<PATH>>\PLR_data.dta"
DBMS=STATA REPLACE;
RUN;
*/

proc freq data=PLR_data;
table (anygenital talcyarscat)*(casecont_inv casecont_bord) / nopercnt norow;
run;
proc freq data=PLR_data;
where meno=0;
table (anygenital talcyarscata)*(casecont_inv casecont_bord) / nopercnt norow;
run;
proc freq data=PLR_data;
where meno=1;
table (anygenital talcyarscatb)*(casecont_inv casecont_bord) / nopercnt norow;
run;

*see end of document for polytomous logistic regression code for Table 4;

/*Table 5*/
/*Among premenopausal cases and controls, cases restricted to serous and endometrioid invasive
and serous and mucinous borderline types*/
proc freq data=final;
table (anygenital talcyarscat)*affection_status / nopercnt norow;
where meno=0 and (affection_status=2 or histology in (1,2,4,6));
run;
proc logistic data=final;
where meno=0 and (affection_status=2 or histology in (1,2,4,6));
class anygenital (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;

```

```

model affection_status=anygenital refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=0 and (affection_status=2 or histology in (1,2,4,6));
class talyearscat(ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
model affection_status=talyearscat refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=0 and (affection_status=2 or histology in (1,2,4,6));
class center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
model affection_status=talyearscattr refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;

/*Among postmenopausal cases and controls who never used hormone therapy, cases restricted to
serous and endometrioid invasive types*/
proc freq data=final;
table (anygenital talyearscat)*affection_status / nopercnt norow;
where meno=1 and everhrt=0 and (affection_status=2 or histology in (4,6));
run;
proc logistic data=final;
where meno=1 and everhrt=0 and (affection_status=2 or histology in (4,6));
class anygenital (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
model affection_status = anygenital refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=1 and everhrt=0 and (affection_status=2 or histology in (4,6));
class talyearscat(ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
model affection_status=talyearscat refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=1 and everhrt=0 and (affection_status=2 or histology in (4,6));
class center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
model affection_status=talyearscattr refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;

/*Among postmenopausal cases and controls who ever used hormone therapy, cases restricted to
serous and endometrioid invasive types*/
proc freq data=final;
table (anygenital talyearscat)*affection_status / nopercnt norow;
where meno=1 and everhrt=1 and (affection_status=2 or histology in (4,6));
run;
proc logistic data=final;
where meno=1 and everhrt=1 and (affection_status=2 or histology in (4,6));
class anygenital (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
model affection_status = anygenital refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=1 and everhrt=1 and (affection_status=2 or histology in (4,6));
class talyearscat(ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
model affection_status=talyearscat refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=1 and everhrt=1 and (affection_status=2 or histology in (4,6));
class center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
model affection_status=talyearscattr refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;

*Figure 1;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=1 and refage<30; run;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=1 and 30<=refage<40; run;

proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=2 and refage<30; run;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=2 and 30<=refage<40; run;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=2 and 40<=refage<50; run;

proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=3 and 30<=refage<40; run;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=3 and 40<=refage<50; run;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=3 and 50<=refage<60; run;

proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=4 and 40<=refage<50; run;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=4 and 50<=refage<60; run;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=4 and 60<=refage<70; run;

proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=5 and 50<=refage<60; run;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=5 and 60<=refage<70; run;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=5 and refage>=70; run;

proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=6 and 60<=refage<70; run;
proc freq data=final; table anygenital*affection_status / nopercnt norow; where doyearcat=6 and refage>=70; run;

/*Figure 2*/
/*Premenopausal cases and controls*/

```

```

proc logistic data=final;
where meno=0;
class anygenital (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal / param=ref;
model affection_status = anygenital refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=0;
class talyearsctat (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal / param=ref;
model affection_status = talyearsctat refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=0;
class center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal / param=ref;
model affection_status=talyearsctatr refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;

/*Postmenopausal cases and controls who never used hormone therapy*/
proc logistic data=final;
where meno=1 and everhrt=0;
class anygenital (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal / param=ref;
model affection_status = anygenital refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=1 and everhrt=0;
class talyearsctat (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal / param=ref;
model affection_status = talyearsctat refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=1 and everhrt=0;
class center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal / param=ref;
model affection_status=talyearsctatr refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;

/*Postmenopausal cases and controls who ever used hormone therapy*/
proc logistic data=final;
where meno=1 and everhrt=1;
class anygenital (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal / param=ref;
model affection_status = anygenital refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=1 and everhrt=1;
class talyearsctat (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal / param=ref;
model affection_status = talyearsctat refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=1 and everhrt=1;
class center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal / param=ref;
model affection_status=talyearsctatr refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;

*LRT for categories of use;
%lrt (dset=final, main1=talyearsctat, main2=hrtcat, Xterm=talyearsctat*hrtcat,
adjvars= refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal,
classvar=talyearsctat hrtcat center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal, df=8);

/*Figure 3*/

/*Talc association stratified by BMI in premenopausal cases and controls*/
proc sort data=final; by bmiqdi; run;
proc logistic data=final;
where meno=0;
by bmiqdi;
class anygenital (ref='0') center study parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal/param=ref;
model affection_status=anygenital refage center study parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=0;
by bmiqdi;
class talyearsctat (ref='0') center study parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal/param=ref;
model affection_status=talyearsctat refage center study parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;
proc logistic data=final;
where meno=0;
by bmiqdi;
class center study parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal/param=ref;
model affection_status=talyearsctatr refage center study parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal;
run;

*LRTs;
%lrt (dset=final, main1=anygenital, main2=bmiqdi,
classvar=anygenital bmiqdi center study parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal,
Xterm=anygenital*bmiqdi, adjvars=refage center study parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal,
df=1, where=meno=0);
%lrt (dset=final, main1=talyearsctat, main2=bmiqdi,
classvar=talyearsctat bmiqdi center study parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal,
Xterm=talyearsctat*bmiqdi, adjvars=refage center study parcat mosbrfedcat ocmonscat iud endopain pershxrbrca jewish tubal,
df=4, where=meno=0);

```

```

/*Talc association stratified by ever/never breastfed in premenopausal cases and controls*/
proc sort data=final; by brstfd; run;
proc logistic data=final;
where meno=0;
by brstfd;
class anygenital (ref='0') center study parcat bmiq ocmonscat iud endopain pershxrca jewish tubal / param=ref;
model affection_status = talyearsref center study parcat bmiq ocmonscat iud endopain pershxrca jewish tubal;
run;
proc logistic data=final;
where meno=0;
by brstfd;
class talyearsref (ref='0') center study parcat bmiq ocmonscat iud endopain pershxrca jewish tubal / param=ref;
model affection_status = talyearsref refage center study parcat bmiq ocmonscat iud endopain pershxrca jewish tubal;
run;
proc logistic data=final;
where meno=0;
by brstfd;
class affection_status = talyearsreftr refage center study parcat bmiq ocmonscat iud endopain pershxrca jewish tubal / param=ref;
model affection_status = talyearsreftr refage center study parcat bmiq ocmonscat iud endopain pershxrca jewish tubal;
run;

*LRTs;
%lrt (dset=final, main1=anygenital, main2=brstfd,
classvar=anygenital brstfd center study parcat bmiq ocmonscat iud endopain pershxrca jewish tubal,
Xterm=anygenital*brstfd, adjvars=refage center study parcat bmiq ocmonscat iud endopain pershxrca jewish tubal,
df=1, where=meno=0);
%lrt (dset=final, main1=talyearsref, main2=brstfd,
classvar=talyearsref brstfd center study parcat bmiq ocmonscat iud endopain pershxrca jewish tubal,
Xterm=talyearsref*brstfd, adjvars=refage center study parcat bmiq ocmonscat iud endopain pershxrca jewish tubal,
df=4, where=meno=0);

/*Talc association stratified by current smoking in premenopausal cases and controls*/
proc sort data=final; by currsmoke; run;
proc logistic data=final;
where meno=0;
by currsmoke;
class anygenital (ref='0') study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal / param=ref;
model affection_status = anygenital refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal;
run;
proc logistic data=final;
where meno=0;
by currsmoke;
class talyearsref (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal / param=ref;
model affection_status = talyearsref refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal;
run;
proc logistic data=final;
where meno=0;
by currsmoke;
class center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal / param=ref;
model affection_status=talyearsreftr refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal;
run;

*LRTs;
%lrt (dset=final, main1=anygenital, main2=currsmoke,
classvar=anygenital currsmoke center study bmiq parcat mosbrfedcat ocmonscat iud endopain
pershxrca jewish tubal,
Xterm=anygenital*currsmoke, adjvars=refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain
pershxrca jewish tubal,
df=1, where=meno=0);
%lrt (dset=final, main1=talyearsref, main2=currsmoke,
classvar=talyearsref currsmoke center study bmiq parcat mosbrfedcat ocmonscat iud endopain
pershxrca jewish tubal,
Xterm=talyearsref*currsmoke, adjvars=refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain
pershxrca jewish tubal,
df=4, where=meno=0);

/*Talc association stratified by alcohol in premenopausal cases and controls*/
proc sort data=final; by alcodi; run;
proc logistic data=final;
where meno=0 and alcodi ne .;
by alcodi;
class anygenital (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal / param=ref;
model affection_status = anygenital refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal;
run;
proc logistic data=final;
where meno=0 and alcodi ne .;
by alcodi;
class talyearsref (ref='0') center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal / param=ref;
model affection_status = talyearsref refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal;
run;
proc logistic data=final;
where meno=0 and alcodi ne .;
by alcodi;
class center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal / param=ref;
model affection_status=talyearsreftr refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain pershxrca jewish tubal;
run;

```

```

*LRTs;
%lrt (dset=final, main1=anygenital, main2=alcodi,
      classvar=anygenital alcodi          center study bmiq parcat mosbrfedcat ocmonscat iud endopain
      pershxrca jewish tubal,
      Xterm=anygenital*alcodi, adjvars=refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain
      pershxrca jewish tubal,
      df=1, where=memo=0 and alcodi ne .);
%lrt (dset=final, main1=talyearsca1, main2=alcodi,
      classvar=talyearsca1 alcodi          center study bmiq parcat mosbrfedcat ocmonscat iud endopain
      pershxrca jewish tubal,
      Xterm=talyearsca1*alcodi, adjvars=refage center study bmiq parcat mosbrfedcat ocmonscat iud endopain
      pershxrca jewish tubal,
      df=4, where=memo=0 and alcodi ne .);

/*****
/* STATA code for Table 4 */
*****/

*PLR analysis for invasive ovarian cancers (serous, mucinous, endometrioid, clear cell) compared to controls
*not restricted by menopausal status
clear
use "<<path to file>>\PLR_data.dta", clear
drop if missing(casecont_inv)
tab casecont_inv

constraint 1 [1=2]:anygenital
constraint 2 [1=3]:anygenital
constraint 3 [1=4]:anygenital
constraint 4 [1=2]:talyearsca1
constraint 5 [1=3]:talyearsca1
constraint 6 [1=4]:talyearsca1
constraint 7 [1=2]:talyearsca2
constraint 8 [1=3]:talyearsca2
constraint 9 [1=4]:talyearsca2
constraint 10 [1=2]:talyearsca3
constraint 11 [1=3]:talyearsca3
constraint 12 [1=4]:talyearsca3
constraint 13 [1=2]:talyearsca4
constraint 14 [1=3]:talyearsca4
constraint 15 [1=4]:talyearsca4
constraint 16 [1=2]:talyearsca1tr
constraint 17 [1=3]:talyearsca1tr
constraint 18 [1=4]:talyearsca1tr

*-----
*   Any genital talc use
*-----
* base model, all constrained
mlogit casecont_inv anygenital          refage center study2 study3 parcat1 parcat2 parcat3 ///
              mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ///
              ocmonscat1 ocmonscat2 ocmonscat3 ocmonscat4 hrtcat1 hrtcat2 iud ///
              endopain pershxrca jewish tubal bmiq2 bmiq3 bmiq4, constraint (1,2,3) rrr

estimates store modelgentalc

* gentalc allowed to vary
mlogit casecont_inv anygenital          refage center study2 study3 parcat1 parcat2 parcat3 ///
              mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ///
              ocmonscat1 ocmonscat2 ocmonscat3 ocmonscat4 hrtcat1 hrtcat2 iud ///
              endopain pershxrca jewish tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
lrtest modelgentalc

*-----
*   Talc-years
*-----
* base model, all constrained
mlogit casecont_inv talyearsca1 talyearsca2 talyearsca3 talyearsca4 ///
              refage center study2 study3 parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 ///
              mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ocmonscat3 ocmonscat4 ///
              hrtcat1 hrtcat2 iud endopain pershxrca jewish tubal ///
              bmiq2 bmiq3 bmiq4, constraint (4,5,6,7,8,9,10,11,12,13,14,15) rrr

estimates store modeltalcapps

* gentalc allowed to vary
mlogit casecont_inv talyearsca1 talyearsca2 talyearsca3 talyearsca4 ///
              refage center study2 study3 parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 ///
              mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ocmonscat3 ocmonscat4 ///
              hrtcat1 hrtcat2 iud endopain pershxrca jewish tubal ///
              bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
lrtest modeltalcapps

*-----
*   Talc-years trend

```

```

*-----
* base model, all constrained
  mlogit casecont_inv talcyyearsccattr      refage center study2 study3 parcat1 parcat2 parcat3 ///
      mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
      ocmnscat3 ocmnscat4 hrtcat1 hrtcat2 iud endopain pershxrba jewish ///
      tubal bmiq2 bmiq3 bmiq4, constraint (16,17,18) rrr

  estimates store modeltalcapstr

* genitalc allowed to vary
  mlogit casecont_inv talcyyearsccattr      refage center study2 study3 parcat1 parcat2 parcat3 ///
      mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
      ocmnscat3 ocmnscat4 hrtcat1 hrtcat2 iud endopain pershxrba jewish ///
      tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for genitalc
  lrtest modeltalcapstr

*PLR analysis for invasive ovarian cancers (serous, mucinous, endometrioid, clear cell) compared to controls
*restricted to premenopausal cases and controls
clear
use "<<path to file>>\PLR_data.dta", clear
drop if missing(casecont_inv)
keep if meno=0
tab casecont_inv

constraint 1 [1=2]:anygenital
constraint 2 [1=3]:anygenital
constraint 3 [1=4]:anygenital
constraint 4 [1=2]:talcyyearsccatal
constraint 5 [1=3]:talcyyearsccatal
constraint 6 [1=4]:talcyyearsccatal
constraint 7 [1=2]:talcyyearsccata2
constraint 8 [1=3]:talcyyearsccata2
constraint 9 [1=4]:talcyyearsccata2
constraint 10 [1=2]:talcyyearsccata3
constraint 11 [1=3]:talcyyearsccata3
constraint 12 [1=4]:talcyyearsccata3
constraint 13 [1=2]:talcyyearsccatatr
constraint 14 [1=3]:talcyyearsccatatr
constraint 15 [1=4]:talcyyearsccatatr

*-----
*   Any genital talc use
*-----
* base model, all constrained
  mlogit casecont_inv anygenital      refage center study2 study3 parcat1 parcat2 parcat3 ///
      mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
      ocmnscat3 ocmnscat4 iud endopain pershxrba jewish tubal ///
      bmiq2 bmiq3 bmiq4, constraint (1,2,3) rrr

  estimates store modelgenitalc

* genitalc allowed to vary
  mlogit casecont_inv anygenital      refage center study2 study3 parcat1 parcat2 parcat3 ///
      mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
      ocmnscat3 ocmnscat4 iud endopain pershxrba jewish tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for genitalc
  lrtest modelgenitalc

*-----
*   Talc-years
*-----
* base model, all constrained
  mlogit casecont_inv talcyyearsccatal talcyyearsccata2 talcyyearsccata3      refage center study2 study3 ///
      parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ///
      ocmnscat1 ocmnscat2 ocmnscat3 ocmnscat4 iud endopain pershxrba jewish tubal ///
      bmiq2 bmiq3 bmiq4, constraint (4,5,6,7,8,9,10,11,12) rrr

  estimates store modeltalcapps

* genitalc allowed to vary
  mlogit casecont_inv talcyyearsccatal talcyyearsccata2 talcyyearsccata3      refage center study2 study3 ///
      parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ///
      ocmnscat1 ocmnscat2 ocmnscat3 ocmnscat4 iud endopain pershxrba jewish tubal ///
      bmiq2 bmiq3 bmiq4, rrr

* lrt for genitalc
  lrtest modeltalcapps

*-----
*   Talc-years trend
*-----
* base model, all constrained
  mlogit casecont_inv talcyyearsccatatr      refage center study2 study3 parcat1 parcat2 parcat3 ///
      mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
      ocmnscat3 ocmnscat4 iud endopain pershxrba jewish tubal ///
      bmiq2 bmiq3 bmiq4, constraint (13,14,15) rrr

  estimates store modeltalcapstr

* genitalc allowed to vary
  mlogit casecont_inv talcyyearsccatatr      refage center study2 study3 parcat1 parcat2 parcat3 ///

```

```

mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
ocmonscat3 ocmonscat4 iud endopain pershxrbrca jewish tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
  lrtest modeltalcappstr

*PLR analysis for invasive ovarian cancers (serous, mucinous, endometrioid, clear cell) compared to controls
*restricted to postmenopausal cases and controls
clear
use "<<path to file>>\PLR_data.dta", clear
drop if missing(casecont_inv)
keep if meno==1
tab casecont_inv

constraint 1 [1=2]:anygenital
constraint 2 [1=3]:anygenital
constraint 3 [1=4]:anygenital
constraint 4 [1=2]:talcyyearscatb1
constraint 5 [1=3]:talcyyearscatb1
constraint 6 [1=4]:talcyyearscatb1
constraint 7 [1=2]:talcyyearscatb2
constraint 8 [1=3]:talcyyearscatb2
constraint 9 [1=4]:talcyyearscatb2
constraint 10 [1=2]:talcyyearscatb3
constraint 11 [1=3]:talcyyearscatb3
constraint 12 [1=4]:talcyyearscatb3
constraint 13 [1=2]:talcyyearscatbtr
constraint 14 [1=3]:talcyyearscatbtr
constraint 15 [1=4]:talcyyearscatbtr

*-----
*   Any genital talc use
*-----
* base model, all constrained
  mlogit casecont_inv anygenital refage center study2 study3 parcat1 parcat2 parcat3 ///
  mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
  ocmonscat3 ocmonscat4 iud endopain pershxrbrca jewish tubal ///
  bmiq2 bmiq3 bmiq4, constraint (1,2,3) rrr
  estimates store modelgentalc

* gentalc allowed to vary
  mlogit casecont_inv anygenital refage center study2 study3 parcat1 parcat2 parcat3 ///
  mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
  ocmonscat3 ocmonscat4 iud endopain pershxrbrca jewish tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
  lrtest modelgentalc

*-----
*   Talc-years
*-----
* base model, all constrained
  mlogit casecont_inv talcyyearscatb1 talcyyearscatb2 talcyyearscatb3 refage center study2 study3 ///
  parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ///
  ocmonscat1 ocmonscat2 ocmonscat3 ocmonscat4 iud endopain pershxrbrca jewish tubal ///
  bmiq2 bmiq3 bmiq4, constraint (4,5,6,7,8,9,10,11,12) rrr
  estimates store modeltalcapps

* gentalc allowed to vary
  mlogit casecont_inv talcyyearscatb1 talcyyearscatb2 talcyyearscatb3 refage center study2 study3 ///
  parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ///
  ocmonscat1 ocmonscat2 ocmonscat3 ocmonscat4 iud endopain pershxrbrca jewish tubal ///
  bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
  lrtest modeltalcapps

*-----
*   Talc-years trend
*-----
* base model, all constrained
  mlogit casecont_inv talcyyearscatbtr refage center study2 study3 parcat1 parcat2 parcat3 ///
  mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
  ocmonscat3 ocmonscat4 iud endopain pershxrbrca jewish tubal ///
  bmiq2 bmiq3 bmiq4, constraint (13,14,15) rrr
  estimates store modeltalcappstr

* gentalc allowed to vary
  mlogit casecont_inv talcyyearscatbtr refage center study2 study3 parcat1 parcat2 parcat3 ///
  mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
  ocmonscat3 ocmonscat4 iud endopain pershxrbrca jewish tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
  lrtest modeltalcappstr

```

```

*PLR analysis for borderline ovarian cancers (serous and mucinous) compared to controls
*not restricted by menopausal status
clear
use "<path to file>\PLR_data.dta", clear
drop if missing(casecont_bord)
tab casecont_bord

constraint 1 [1=2]:anygenital
constraint 2 [1=2]:talcyyearsca1
constraint 3 [1=2]:talcyyearsca2
constraint 4 [1=2]:talcyyearsca3
constraint 5 [1=2]:talcyyearsca4
constraint 6 [1=2]:talcyyearsca6tr

*-----
*   Any genital talc use
*-----
* base model, all constrained
  mlogit casecont_bord anygenital refage center study2 study3 parcat1 parcat2 parcat3 ///
    mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
    ocmonscat3 ocmonscat4 hrtcat1 hrtcat2 iud endopain pershxrbrca jewish tubal ///
    bmiq2 bmiq3 bmiq4, constraint (1) rrr
  estimates store modelgentalc

* gentalc allowed to vary
  mlogit casecont_bord anygenital refage center study2 study3 parcat1 parcat2 parcat3 ///
    mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
    ocmonscat3 ocmonscat4 hrtcat1 hrtcat2 iud endopain pershxrbrca jewish tubal ///
    bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
  lrtest modelgentalc

*-----
*   Talc-years
*-----
* base model, all constrained
  mlogit casecont_bord talcyyearsca1 talcyyearsca2 talcyyearsca3 talcyyearsca4 refage center ///
    study2 study3 parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 ///
    mosbrfedcat4 ocmonscat1 ocmonscat2 ocmonscat3 ocmonscat4 hrtcat1 hrtcat2 iud ///
    endopain pershxrbrca jewish tubal bmiq2 bmiq3 bmiq4, constraint (2,3,4,5) rrr
  estimates store modeltalcapps

* gentalc allowed to vary
  mlogit casecont_bord talcyyearsca1 talcyyearsca2 talcyyearsca3 talcyyearsca4 refage center ///
    study2 study3 parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 ///
    mosbrfedcat4 ocmonscat1 ocmonscat2 ocmonscat3 ocmonscat4 hrtcat1 hrtcat2 iud ///
    endopain pershxrbrca jewish tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
  lrtest modeltalcapps

*-----
*   Talc-years trend
*-----
* base model, all constrained
  mlogit casecont_bord talcyyearsca6tr refage center study2 study3 parcat1 parcat2 parcat3 ///
    mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
    ocmonscat3 ocmonscat4 hrtcat1 hrtcat2 iud endopain pershxrbrca jewish tubal ///
    bmiq2 bmiq3 bmiq4, constraint (6) rrr
  estimates store modeltalcappstr

* gentalc allowed to vary
  mlogit casecont_bord talcyyearsca6tr refage center study2 study3 parcat1 parcat2 parcat3 ///
    mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
    ocmonscat3 ocmonscat4 hrtcat1 hrtcat2 iud endopain pershxrbrca jewish tubal ///
    bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
  lrtest modeltalcappstr

```

```

*PLR analysis for borderline ovarian cancers (serous and mucinous) compared to controls
*restricted to premenopausal cases and controls
clear
use "<path to file>\PLR_data.dta", clear
drop if missing(casecont_bord)
keep if meno=0

```

```

tab casecont_bord

constraint 1 [1=2]:anygenital
constraint 2 [1=2]:talcyyearsca1
constraint 3 [1=2]:talcyyearsca2
constraint 4 [1=2]:talcyyearsca3
constraint 5 [1=2]:talcyyearsca6tr

```

```

*-----
*   Any genital talc use
*-----
* base model, all constrained

```

```

mlogit casecont_bord anygenital refage center study2 study3 parcat1 parcat2 parcat3 ///
mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
ocmnscat3 ocmnscat4 iud endopain pershxrbrca jewish tubal ///
bmiq2 bmiq3 bmiq4, constraint (1) rrr
estimates store modelgentalc

* gentalc allowed to vary
mlogit casecont_bord anygenital refage center study2 study3 parcat1 parcat2 parcat3 ///
mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
ocmnscat3 ocmnscat4 iud endopain pershxrbrca jewish tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
lrtest modelgentalc

*-----
* Talc-years
*-----
* base model, all constrained
mlogit casecont_bord talcyarscatal talcyarscata2 talcyarscata3 refage center study2 study3 ///
parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ///
ocmnscat1 ocmnscat2 ocmnscat3 ocmnscat4 iud endopain pershxrbrca jewish tubal ///
bmiq2 bmiq3 bmiq4, constraint (2,3,4) rrr
estimates store modeltalcapps

* gentalc allowed to vary
mlogit casecont_bord talcyarscatal talcyarscata2 talcyarscata3 refage center study2 study3 ///
parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ///
ocmnscat1 ocmnscat2 ocmnscat3 ocmnscat4 iud endopain pershxrbrca jewish tubal ///
bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
lrtest modeltalcapps

*-----
* Talc-years trend
*-----
* base model, all constrained
mlogit casecont_bord talcyarscatatr refage center study2 study3 parcat1 parcat2 parcat3 ///
mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
ocmnscat3 ocmnscat4 iud endopain pershxrbrca jewish tubal bmiq2 bmiq3 bmiq4, constraint (5) rrr
estimates store modeltalcappstr

* gentalc allowed to vary
mlogit casecont_bord talcyarscatatr refage center study2 study3 parcat1 parcat2 parcat3 ///
mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
ocmnscat3 ocmnscat4 iud endopain pershxrbrca jewish tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
lrtest modeltalcappstr

*PLR analysis for borderline ovarian cancers (serous and mucinous) compared to controls
*restricted to postmenopausal cases and controls
clear
use "<path to file>\PLR_data.dta", clear
drop if missing(casecont_bord)
keep if meno=1
tab casecont_bord

constraint 1 [1=2]:anygenital
constraint 2 [1=2]:talcyarscatb1
constraint 3 [1=2]:talcyarscatb2
constraint 4 [1=2]:talcyarscatb3
constraint 5 [1=2]:talcyarscatbtr

*-----
* Any genital talc use
*-----
* base model, all constrained
mlogit casecont_bord anygenital refage center study2 study3 parcat1 parcat2 parcat3 ///
mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
ocmnscat3 ocmnscat4 iud endopain pershxrbrca jewish tubal ///
bmiq2 bmiq3 bmiq4, constraint (1) rrr
estimates store modelgentalc

* gentalc allowed to vary
mlogit casecont_bord anygenital refage center study2 study3 parcat1 parcat2 parcat3 ///
mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmnscat1 ocmnscat2 ///
ocmnscat3 ocmnscat4 iud endopain pershxrbrca jewish tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
lrtest modelgentalc

*-----
* Talc-years
*-----
* base model, all constrained
mlogit casecont_bord talcyarscatb1 talcyarscatb2 talcyarscatb3 refage center study2 study3 ///
parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ///
ocmnscat1 ocmnscat2 ocmnscat3 ocmnscat4 iud endopain pershxrbrca jewish tubal ///
bmiq2 bmiq3 bmiq4, constraint (2,3,4) rrr
estimates store modeltalcapps

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* gentalc allowed to vary
  mlogit casecont_bord talcyyearsca1 talcyyearsca2 talcyyearsca3          refage center study2 study3 ///
        parcat1 parcat2 parcat3 mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ///
        ocmonscat1 ocmonscat2 ocmonscat3 ocmonscat4 iud endopain pershxrca jewish
tubal ///
        bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
  lrtest modeltalcapps

*-----
*   Talc-years trend
*-----
* base model, all constrained
  mlogit casecont_bord talcyyearsca1          refage center study2 study3 parcat1 parcat2 parcat3 ///
        mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
        ocmonscat3 ocmonscat4 iud endopain pershxrca jewish tubal ///
        bmiq2 bmiq3 bmiq4, constraint (5) rrr
  estimates store modeltalcappstr

* gentalc allowed to vary
  mlogit casecont_bord talcyyearsca1          refage center study2 study3 parcat1 parcat2 parcat3 ///
        mosbrfedcat1 mosbrfedcat2 mosbrfedcat3 mosbrfedcat4 ocmonscat1 ocmonscat2 ///
        ocmonscat3 ocmonscat4 iud endopain pershxrca jewish tubal bmiq2 bmiq3 bmiq4, rrr

* lrt for gentalc
  lrtest modeltalcappstr

```