

**Supplemental Table 1. Major contributors of total niacin intake in the Nurses' Health Study (NHS) 1984 and Health Professionals Follow-Up Study (HPFS) 1986**

<b>Major contributors of total niacin intake</b>	<b>NHS 1984</b>	<b>HPFS 1986</b>
Multivitamins	31.4%	27.9%
B vitamin supplements	12.9%	12.0%
Red meat	9.8%	8.1%
Coffee	8.3%	2.6%
Poultry	7.0%	10.8%
Breakfast cereal	4.8%	5.7%
Fish	3.5%	4.1%

For Peer Review

Supplemental Table 2. Hazard ratios (and 95% confidence intervals) of skin cancer by dietary niacin intake in the Nurses' Health Study (NHS, 1984-2010), and Health Professionals Follow-Up Study (HPFS, 1986-2010)

	Quintile of dietary niacin intake					P for trend
	1	2	3	4	5	
<b>Basal cell carcinoma</b>						
<b>NHS</b>						
Mean dietary niacin, mg/d	15.9	18.6	20.3	22.1	26.0	
No. of cases/person-years	2420/276156	2763/295854	2776/299596	2820/300206	2557/281281	
Age-adjusted	1 (referent)	1.05 (0.99, 1.10)	1.03 (0.97, 1.09)	1.04 (0.99, 1.10)	1.01 (0.96, 1.07)	0.89
Multivariate-adjusted *	1 (referent)	1.00 (0.95, 1.06)	0.97 (0.92, 1.03)	0.98 (0.93, 1.04)	0.97 (0.92, 1.03)	0.22
<b>HPFS</b>						
Mean dietary niacin, mg/d	19.9	23.3	25.6	28.2	33.7	
No. of cases/ person-years	1771/151284	1931/159064	2061/159067	2081/155552	2076/151994	
Age-adjusted	1 (referent)	1.05 (0.99, 1.12)	1.12 (1.06, 1.20)	1.15 (1.08, 1.22)	1.16 (1.08, 1.23)	<0.001
Multivariate-adjusted *	1 (referent)	1.02 (0.95, 1.08)	1.07 (1.00, 1.14)	1.09 (1.02, 1.16)	1.11 (1.04, 1.19)	<0.001
<b>Pooled†</b>						
Age-adjusted	1 (referent)	1.05 (1.01, 1.09)	1.07 (0.99, 1.17)	1.09 (0.99, 1.20)	1.08 (0.95, 1.23)	0.27
Multivariate-adjusted *	1 (referent)	1.01 (0.97, 1.05)	1.02 (0.93, 1.11)	1.03 (0.93, 1.14)	1.04 (0.91, 1.19)	0.64
<b>Squamous cell cancer</b>						
<b>NHS</b>						
No. of cases/ person-years	242/277415	282/297273	271/301031	269/301675	261/282580	
Age-adjusted	1 (referent)	1.06 (0.89, 1.25)	0.99 (0.83, 1.17)	0.98 (0.82, 1.16)	1.02 (0.86, 1.22)	0.91
Multivariate-adjusted *	1 (referent)	1.00 (0.84, 1.19)	0.92 (0.77, 1.09)	0.91 (0.76, 1.08)	0.98 (0.82, 1.17)	0.55
<b>HPFS</b>						
No. of cases/ person-years	246/152758	237/160696	257/160789	255/157275	210/153810	
Age-adjusted	1 (referent)	0.93 (0.78, 1.12)	1.01 (0.85, 1.20)	1.02 (0.85, 1.21)	0.85 (0.71, 1.02)	0.19
Multivariate-adjusted *	1 (referent)	0.88 (0.74, 1.06)	0.94 (0.79, 1.13)	0.95 (0.79, 1.13)	0.84 (0.69, 1.01)	0.15
<b>Pooled†</b>						
Age-adjusted	1 (referent)	0.99 (0.88, 1.13)	1.00 (0.88, 1.13)	1.00 (0.88, 1.13)	0.93 (0.78, 1.12)	0.27
Multivariate-adjusted *	1 (referent)	0.94 (0.83, 1.07)	0.93 (0.82, 1.05)	0.93 (0.82, 1.05)	0.91 (0.78, 1.06)	0.13
<b>Melanoma</b>						
<b>NHS</b>						
No. of cases/ person-years	91/277535	96/297423	113/301164	105/301808	99/282728	
Age-adjusted	1 (referent)	0.97 (0.73, 1.29)	1.12 (0.85, 1.47)	1.03 (0.78, 1.36)	1.03 (0.78, 1.38)	0.72
Multivariate-adjusted *	1 (referent)	0.92 (0.69, 1.22)	1.03 (0.78, 1.36)	0.95 (0.71, 1.26)	0.98 (0.73, 1.30)	0.96

**HPFS**

No. of cases/ person-years	72/152900	77/160809	82/160960	68/157422	84/153901	
Age-adjusted	1 (referent)	1.03 (0.74, 1.41)	1.10 (0.80, 1.52)	0.94 (0.67, 1.31)	1.16 (0.84, 1.59)	0.48
Multivariate-adjusted *	1 (referent)	0.99 (0.72, 1.37)	1.06 (0.77, 1.46)	0.90 (0.65, 1.26)	1.15 (0.83, 1.58)	0.51
<b>Pooled<sup>†</sup></b>						
Age-adjusted	1 (referent)	0.99 (0.80, 1.23)	1.11 (0.90, 1.37)	0.99 (0.80, 1.23)	1.09 (0.88, 1.34)	0.44
Multivariate-adjusted *	1 (referent)	0.95 (0.77, 1.18)	1.04 (0.84, 1.29)	0.93 (0.75, 1.15)	1.05 (0.85, 1.30)	0.64

\* Adjusted for family history of melanoma (yes vs. no), natural hair color (red, blonde, light brown, dark brown, black), number of arm moles (0, 1-2, 3-9, ≥10), skin reaction to sun exposure as a child/adolescent (none/some redness, burn, painful burn/blisters), number of lifetime blistering sunburns (0, 1-4, 5-9, ≥10), average time spent in direct sunlight since high school (<2, 2-5, 6-9, ≥10 hrs/wk), cumulative UV flux since baseline (quintiles) body mass index (<25.0, 25.0-29.9, 30.0-34.9, ≥35.0 kg/m<sup>2</sup>), physical activity (quintiles), smoking status (never, past, current with 1-14, 15-24, or ≥25 cigarettes/d), intakes of total energy (quintiles), alcohol (0, 0.1-4.9, 5.0-9.9, 10.0-19.9, ≥20.0 g/d), and citrus intake (quintiles). Analyses for women were also adjusted for menopausal status and postmenopausal hormone use.

<sup>†</sup> The multivariate-adjusted hazard ratios from each cohort were combined with meta-analytic methods using random effects model.

**Supplemental Table 3. Hazard ratios (and 95% confidence intervals) of skin cancer by supplemental niacin intake in the Nurses' Health Study (NHS, 1984-2010), and Health Professionals Follow-Up Study (HPFS, 1986-2010)**

	Category of supplemental niacin intake					P for trend
	None	0.1-2.0 mg/d	2.1-10.0 mg/d	10.1-18.0 mg/d	> 18.0 mg/d	
<b>Basal cell carcinoma</b>						
<b>NHS</b>						
Mean supplemental niacin, mg/d	0	0.3	5.8	13.5	46.0	
No. of cases/ person-years	2137/289169	2256/290097	2774/279937	1855/180775	4314/413116	
Age-adjusted	1 (referent)	1.03 (0.97, 1.09)	1.13 (1.06, 1.20)	1.17 (1.10, 1.25)	1.23 (1.17, 1.30)	<0.001
Multivariate-adjusted *	1 (referent)	1.02 (0.96, 1.08)	1.06 (1.00, 1.12)	1.07 (1.00, 1.14)	1.10 (1.04, 1.16)	<0.001
<b>HPFS</b>						
Mean supplemental niacin, mg/d	0	0.5	5.8	13.4	57.4	
No. of cases/ person-years	3199/304171	725/53100	1642/115065	1038/76411	3316/228213	
Age-adjusted	1 (referent)	1.05 (0.96, 1.14)	1.16 (1.09, 1.23)	1.10 (1.03, 1.19)	1.21 (1.15, 1.27)	<0.001
Multivariate-adjusted *	1 (referent)	0.98 (0.90, 1.07)	1.08 (1.01, 1.15)	0.99 (0.92, 1.07)	1.07 (1.02, 1.13)	0.02
<b>Pooled†</b>						
Age-adjusted	1 (referent)	1.03 (0.98, 1.08)	1.14 (1.09, 1.19)	1.14 (1.08, 1.20)	1.22 (1.18, 1.26)	0.001
Multivariate-adjusted *	1 (referent)	1.00 (0.96, 1.05)	1.07 (1.02, 1.11)	1.03 (0.96, 1.11)	1.08 (1.04, 1.12)	<0.001
<b>Squamous cell cancer</b>						
<b>NHS</b>						
No. of cases/ person-years	182/290299	209/291287	322/281326	201/181745	411/415317	
Age-adjusted	1 (referent)	1.03 (0.84, 1.26)	1.07 (0.89, 1.29)	1.08 (0.88, 1.32)	1.12 (0.93, 1.33)	0.23
Multivariate-adjusted *	1 (referent)	1.01 (0.82, 1.23)	0.97 (0.80, 1.17)	0.93 (0.75, 1.14)	0.92 (0.76, 1.10)	0.24
<b>HPFS</b>						
No. of cases/ person-years	321/306927	124/53707	212/116433	134/77314	414/230947	
Age-adjusted	1 (referent)	1.25 (1.00, 1.56)	1.13 (0.94, 1.35)	1.08 (0.88, 1.33)	1.25 (1.07, 1.45)	0.03
Multivariate-adjusted *	1 (referent)	1.07 (0.86, 1.34)	0.98 (0.82, 1.18)	0.88 (0.72, 1.09)	1.00 (0.86, 1.17)	0.66
<b>Pooled†</b>						
Age-adjusted	1 (referent)	1.13 (0.93, 1.36)	1.10 (0.96, 1.25)	1.08 (0.93, 1.25)	1.19 (1.06, 1.33)	0.12
Multivariate-adjusted *	1 (referent)	1.03 (0.89, 1.20)	0.97 (0.85, 1.11)	0.90 (0.78, 1.05)	0.96 (0.86, 1.09)	0.21
<b>Melanoma</b>						
<b>NHS</b>						
No. of cases/ person-years	69/290391	115/291358	97/2815285	75/181851	148/415530	
Age-adjusted	1 (referent)	1.61 (1.19, 2.17)	1.18 (0.86, 1.62)	1.47 (1.05, 2.06)	1.33 (1.00, 1.78)	0.69
Multivariate-adjusted *	1 (referent)	1.61 (1.20, 2.18)	1.11 (0.80, 1.53)	1.37 (0.98, 1.91)	1.23 (0.92, 1.65)	0.85

**HPFS**

No. of cases/ person-years	124/307076	29/53789	66/116554	39/77386	125/231187	
Age-adjusted	1 (referent)	1.04 (0.68, 1.59)	1.19 (0.87, 1.63)	1.06 (0.73, 1.53)	1.19 (0.92, 1.53)	0.25
Multivariate-adjusted *	1 (referent)	0.94 (0.61, 1.45)	1.09 (0.80, 1.50)	0.92 (0.63, 1.34)	1.02 (0.79, 1.33)	0.95
<b>Pooled<sup>†</sup></b>						
Age-adjusted	1 (referent)	1.33 (0.87, 2.03)	1.19 (0.95, 1.48)	1.26 (0.91, 1.74)	1.25 (1.03, 1.51)	0.40
Multivariate-adjusted *	1 (referent)	1.26 (0.75, 2.13)	1.10 (0.88, 1.38)	1.13 (0.77, 1.66)	1.11 (0.91, 1.35)	0.88

\* Adjusted for family history of melanoma (yes vs. no), natural hair color (red, blonde, light brown, dark brown, black), number of arm moles (0, 1-2, 3-9,  $\geq 10$ ), skin reaction to sun exposure as a child/adolescent (none/some redness, burn, painful burn/blisters), number of lifetime blistering sunburns (0, 1-4, 5-9,  $\geq 10$ ), average time spent in direct sunlight since high school (<2, 2-5, 6-9,  $\geq 10$  hrs/wk), cumulative UV flux since baseline (quintiles) body mass index (<25.0, 25.0-29.9, 30.0-34.9,  $\geq 35.0$  kg/m<sup>2</sup>), physical activity (quintiles), smoking status (never, past, current with 1-14, 15-24, or  $\geq 25$  cigarettes/d), intakes of total energy (quintiles), alcohol (0, 0.1-4.9, 5.0-9.9, 10.0-19.9,  $\geq 20.0$  g/d), and citrus intake (quintiles). Analyses for women were also adjusted for menopausal status and postmenopausal hormone use.

<sup>†</sup> The multivariate-adjusted hazard ratios from each cohort were combined with meta-analytic methods using random effects model.

Supplemental Table 4. Pooled multivariate hazard ratios\* (and 95% confidence intervals) of skin cancer by total niacin intake stratified by sun exposure related factors in the Nurses' Health Study (NHS) and Health Professionals Follow-Up Study (HPFS)

	Quintile of total niacin intake					P for trend
	1	2	3	4	5	
<b>Annual UV flux at residence &lt;= 113</b>						
BCC	1 (referent)	0.98 (0.93, 1.04)	0.99 (0.94, 1.05)	1.06 (0.96, 1.16)	1.00 (0.94, 1.06)	0.65
SCC	1 (referent)	0.85 (0.70, 1.01)	0.92 (0.67, 1.29)	0.94 (0.78, 1.12)	0.81 (0.67, 0.97)	0.08
Melanoma	1 (referent)	1.11 (0.84, 1.47)	1.14 (0.60, 2.17)	0.93 (0.69, 1.25)	1.28 (0.93, 1.76)	0.20
<b>Annual UV flux at residence &gt; 113</b>						
BCC	1 (referent)	1.03 (0.96, 1.11)	1.06 (1.00, 1.13)	1.10 (1.03, 1.17)	1.10 (1.03, 1.17)	0.06
SCC	1 (referent)	0.90 (0.70, 1.15)	0.83 (0.70, 1.00)	0.81 (0.51, 1.29)	0.85 (0.71, 1.01)	0.26
Melanoma	1 (referent)	0.92 (0.55, 1.54)	0.89 (0.39, 2.03)	0.91 (0.65, 1.28)	1.01 (0.47, 2.17)	0.12
<b>Average time spent in direct sunlight since high school=Below median</b>						
BCC	1 (referent)	1.02 (0.87, 1.20)	1.05 (0.92, 1.20)	1.12 (0.92, 1.37)	1.12 (0.99, 1.26)	0.002
SCC	1 (referent)	0.83 (0.67, 1.03)	0.78 (0.64, 0.97)	0.88 (0.63, 1.23)	0.83 (0.68, 1.02)	0.48
Melanoma	1 (referent)	0.94 (0.62, 1.42)	0.92 (0.43, 1.99)	0.98 (0.64, 1.48)	1.41 (0.78, 2.55)	0.01
<b>Average time spent in direct sunlight since high school=Above median</b>						
BCC	1 (referent)	1.00 (0.93, 1.07)	1.05 (0.97, 1.12)	1.09 (0.99, 1.19)	1.04 (0.94, 1.14)	0.49
SCC	1 (referent)	0.93 (0.62, 1.41)	0.89 (0.64, 1.23)	0.96 (0.79, 1.18)	0.90 (0.68, 1.19)	0.66
Melanoma	1 (referent)	1.21 (0.84, 1.73)	1.06 (0.73, 1.53)	1.02 (0.70, 1.48)	1.29 (0.89, 1.85)	0.23
<b>History of blistering sunburns=Yes</b>						
BCC	1 (referent)	1.00 (0.95, 1.05)	1.00 (0.96, 1.05)	1.06 (1.01, 1.11)	1.03 (0.99, 1.08)	0.06
SCC	1 (referent)	0.87 (0.70, 1.09)	0.83 (0.72, 0.96)	0.88 (0.75, 1.03)	0.86 (0.75, 0.98)	0.31
<b>History of blistering sunburns=No</b>						
BCC	1 (referent)	1.02 (0.60, 1.75)	1.23 (0.91, 1.65)	1.20 (0.77, 1.88)	1.08 (0.80, 1.46)	0.63
SCC	1 (referent)	0.85 (0.56, 1.30)	0.81 (0.53, 1.25)	0.95 (0.63, 1.43)	0.64 (0.41, 1.00)	0.08

\*The multivariate-adjusted hazard ratios from each cohort were combined with meta-analytic methods using random effects model. The hazard ratios from each cohorts were adjusted for family history of melanoma (yes vs. no), natural hair color (red, blonde, light brown, dark brown, black), number of arm moles (0, 1-2, 3-9, ≥10), skin reaction to sun exposure as a child/adolescent (none/some redness, burn, painful burn/blisters), number of lifetime blistering sunburns (0, 1-4, 5-9, ≥10), average time spent in direct sunlight since high school (<2, 2-5, 6-9, ≥10 hrs/wk), cumulative UV flux since baseline (quintiles), body mass index (<25.0, 25.0-29.9, 30.0-34.9, ≥35.0 kg/m<sup>2</sup>), physical activity (quintiles), smoking status (never, past, current with 1-14, 15-24, or ≥25 cigarettes/d), intakes of total energy (quintiles), alcohol (0, 0.1-4.9, 5.0-9.9, 10.0-19.9, ≥20.0 g/d), and citrus intake (quintiles). Analyses for women were also adjusted for menopausal status and postmenopausal hormone use (premenopausal, postmenopausal never, past, or current use)