

**Supplemental Table 1. Baseline characteristics of study participants according to quintile of ambient ultraviolet radiation exposure in Health Professionals Follow-up Study (1986)**

	UVR exposure				
	Q1	Q2	Q3	Q4	Q5
<b>Participants, n</b>	5380	5269	5486	5481	5117
<b>Ambient UVR, mW/m<sup>2</sup>, median (IQR)</b>	164 (162-167)	172 (183-202)	183 (181-186)	202 (195-211)	237 (228-245)
<b>Age, years, mean (SD)</b>	52.3 (8.9)	52.3 (8.6)	51.5 (8.5)	51.6 (8.5)	52.0 (9.0)
<b>Body mass index, kg/m<sup>2</sup>, mean (SD)</b>	25.0 (4.5)	25.0 (4.7)	25.0 (4.5)	24.8 (4.9)	24.7 (4.7)
<b>Physical activity, METs/week, mean (SD)</b>	21.8 (28.6)	21.5 (30.1)	20.4 (26.8)	21.8 (33.0)	22.6 (27.4)
<b>AMED diet score, mean (SD)</b>	4.4 (1.9)	4.3 (1.9)	4.3 (1.9)	4.3 (1.9)	4.5 (1.9)
<b>Current smoking, %</b>	6.9	7.1	7.5	7.2	5.8
<b>Asthma, %</b>	5.9	5.6	5.7	6.5	7.6
<b>Cancer, %</b>	2.3	2.3	2.3	2.5	2.6
<b>Rheumatoid arthritis, %</b>	1.8	1.5	1.8	1.6	2.0
<b>Inflammatory Bowel Disease, %</b>	1.0	1.2	0.9	0.7	0.8
<b>Chronic obstructive pulmonary disease, %</b>	0.4	0.5	0.6	0.6	0.7
<b>Corticosteroid use, %</b>	0.5	0.4	0.6	0.4	0.5
<b>History of diabetes mellitus, %</b>	1.7	1.8	1.7	1.6	1.5
<b>Depression, %</b>	1.1	0.9	1.2	1.0	1.0
<b>Skin reaction to the sun, painful/blistering sunburn, %</b>	23.4	24.3	25.7	26.1	27.6
<b>Number of lifetime severe sunburns, %</b>					
None	9.3	8.6	8.1	7.5	6.4
1 - 4	41.4	39.2	36.5	35.3	34.1
5 - 9	17.3	18.8	20.0	19.5	19.9
≥10	32.1	33.4	35.3	37.7	39.5
<b>Natural hair color, dark brown or black, %</b>	57.2	55.5	51.4	47.8	50.3

Based on 26,733 participants who completed the questionnaire in 1986.

Abbreviations: UVR, ultraviolet radiation; METs, metabolic equivalent task hours; AMED, alternate Mediterranean diet score (range 0 to 9, with higher score indicating a healthier diet); Q, quintile.

**Supplemental Table 2. Baseline characteristics of study participants according to quintile of ambient ultraviolet radiation exposure in Nurses' Health Study (1996)**

	UVR exposure				
	Q1	Q2	Q3	Q4	Q5
<b>Participants, n</b>	15632	15007	15692	15744	14696
<b>Ambient UVR, mW/m<sup>2</sup>, median (IQR)</b>	165 (163-168)	176 (174-178)	185 (182-188)	197 (194-206)	248 (221-261)
<b>Age, years, mean (SD)</b>	61.3 (7.0)	61.2 (7.0)	61.4 (7.0)	61.5 (7.1)	63.3 (7.0)
<b>Body mass index, kg/m<sup>2</sup>, mean (SD)</b>	26.9 (5.3)	26.8 (5.4)	26.6 (5.2)	26.4 (5.2)	26.1 (5.2)
<b>Physical activity, METs/week, mean (SD)</b>	17.2 (21.3)	17.1 (22.1)	18.1 (21.9)	18.8 (23.0)	18.1 (22.5)
<b>AMED diet score, mean (SD)</b>	4.3 (1.9)	4.4 (1.9)	4.4 (1.9)	4.6 (1.9)	4.6 (1.9)
<b>Current smoking, %</b>	12.1	13.1	12.1	12.1	11.1
<b>Asthma, %</b>	7.9	8.3	8.4	9.3	10.3
<b>Cancer, %</b>	10.9	11.6	11.4	11.5	13.1
<b>Rheumatoid arthritis, %</b>	8.8	9.5	8.7	7.9	8.1
<b>Inflammatory Bowel Disease, %</b>	2.0	1.8	1.8	1.7	2.0
<b>Chronic obstructive pulmonary disease, %</b>	4.7	5.4	5.5	5.3	5.5
<b>Corticosteroid use, %</b>	1.8	2.0	2.0	1.8	2.1
<b>History of diabetes mellitus, %</b>	7.0	7.1	6.8	6.2	6.2
<b>Depression, %</b>	5.5	5.2	5.6	5.9	6.3
<b>Skin reaction to the sun, painful/blistering sunburn, %</b>	13.5	15.0	13.6	15.0	15.7
<b>Number of lifetime severe sunburns, %</b>					
<b>None</b>	11.5	11.1	10.9	10.5	8.7
<b>1 - 4</b>	31.3	30.4	31.3	28.8	27.7
<b>5 - 9</b>	22.6	22.5	22.0	21.9	21.8
<b>≥10</b>	34.6	36.1	35.8	38.8	41.8
<b>Natural hair color, dark brown or black, %</b>	46.0	46.2	46.0	45.2	43.5

Based on 76,771 participants who completed the questionnaire in 1996.

Abbreviations: UVR, ultraviolet radiation; METs, metabolic equivalent task hours; AMED, alternate Mediterranean diet score (range 0 to 9, with higher score indicating a healthier diet); Q, quintile.

**Supplemental Table 3. Baseline characteristics of study participants according to quintile of ambient ultraviolet radiation exposure in Nurses' Health Study II (1991)**

	UVR exposure				
	Q1	Q2	Q3	Q4	Q5
<b>Participants, n</b>	18644	19565	19548	19024	17327
<b>Ambient UVR, mW/m<sup>2</sup>, median (IQR)</b>	162 (159-166)	172 (171-174)	177 (176-179)	195 (188-201)	221 (212-242)
<b>Age, years, mean (SD)</b>	35.7 (4.8)	36.1 (4.6)	36.1 (4.6)	35.9 (4.7)	36.6 (4.6)
<b>Body mass index, kg/m<sup>2</sup>, mean (SD)</b>	24.6 (5.3)	24.7 (5.3)	24.8 (5.5)	24.6 (5.4)	24.1 (5.0)
<b>Physical activity, METs/week, mean (SD)</b>	21.5 (28.5)	20.5 (26.3)	20.0 (25.9)	20.1 (25.0)	21.7 (28.0)
<b>AMED diet score, mean (SD)</b>	3.9 (1.9)	3.9 (1.9)	3.8 (1.8)	4.0 (1.9)	4.3 (1.9)
<b>Current smoking, %</b>	13.5	12.9	12.6	12.4	9.5
<b>Asthma, %</b>	6.2	6.3	6.0	6.3	7.2
<b>Cancer, %</b>	0.5	0.5	0.6	0.6	0.7
<b>Rheumatoid arthritis, %</b>	0.8	0.8	0.8	0.7	0.7
<b>Inflammatory Bowel Disease, %</b>	1.0	0.9	1.0	0.9	0.9
<b>Chronic obstructive pulmonary disease, %</b>	0.6	0.6	0.7	0.8	0.7
<b>Corticosteroid use, %</b>	1.4	1.3	1.4	1.3	1.3
<b>History of diabetes mellitus, %</b>	0.8	0.9	0.8	1.0	0.8
<b>Depression, %</b>	7.8	7.7	7.9	9.3	9.4
<b>Skin reaction to the sun, painful/blistering sunburn, %</b>	24.3	24.7	22.6	24.3	26.1
<b>Number of lifetime severe sunburns, %</b>					
None	33.2	34.7	36.5	31.0	28.1
1 - 4	56.4	56.1	54.7	58.1	58.5
5 - 9	7.6	6.8	6.6	7.8	9.2
≥10	2.5	2.1	2.0	2.7	3.9
<b>Natural hair color, dark brown or black, %</b>	41.3	41.0	40.8	38.7	36.5

Based on 94,108 participants who completed the questionnaire in 1991.

Abbreviations: UVR, ultraviolet radiation; METs, metabolic equivalent task hours; AMED, alternate Mediterranean diet score (range 0 to 9, with higher score indicating a healthier diet); Q, quintile.

**Supplemental Table 4. Ambient ultraviolet radiation exposure, skin reaction, and lifetime number of severe sunburns, and incidence of herpes zoster in three prospective cohorts**

	HPFS		NHS		NHS II	
	Age adjusted HR (95% CI)	Multivariable adjusted HR (95% CI)	Age adjusted HR (95% CI)	Multivariable adjusted HR (95% CI)	Age adjusted HR (95% CI)	Multivariable adjusted HR (95% CI)
<b>Updated UVR</b>						
<b>Quintile 1</b>	Reference	Reference	Reference	Reference	Reference	Reference
<b>Quintile 2</b>	1.09 (0.97, 1.23)	1.09 (0.97, 1.23)	0.99 (0.93, 1.05)	0.99 (0.93, 1.05)	1.05 (0.99, 1.12)	1.05 (0.99, 1.12)
<b>Quintile 3</b>	1.09 (0.97, 1.22)	1.09 (0.97, 1.22)	1.01 (0.95, 1.07)	1.01 (0.95, 1.07)	1.03 (0.97, 1.10)	1.03 (0.95, 1.09)
<b>Quintile 4</b>	1.13 (1.01, 1.27)	1.13 (1.01, 1.27)	0.99 (0.94, 1.05)	0.99 (0.93, 1.05)	1.05 (0.98, 1.11)	1.04 (0.98, 1.11)
<b>Quintile 5</b>	1.15 (1.02, 1.29)	1.14 (1.02, 1.29)	1.01 (0.95, 1.07)	0.99 (0.93, 1.05)	0.97 (0.91, 1.04)	0.96 (0.90, 1.03)
<b>Skin reaction</b>						
<b>None</b>	Reference	Reference	Reference	Reference	Reference	Reference
<b>Some redness</b>	-	-	1.01 (0.96, 1.07)	1.01 (0.95, 1.06)	1.00 (0.94, 1.06)	1.01 (0.95, 1.07)
<b>Burn</b>	1.06 (0.97, 1.17)	1.06 (0.96, 1.16)	0.99 (0.93, 1.06)	0.99 (0.93, 1.05)	1.03 (0.96, 1.10)	1.03 (0.96, 1.10)
<b>Painful burn</b>	-	-	1.00 (0.93, 1.09)	0.98 (0.91, 1.06)	1.09 (1.02, 1.17)	1.07 (1.00, 1.15)
<b>Burn with blisters</b>	1.22 (1.10, 1.35)	1.20 (1.08, 1.33)	1.03 (0.94, 1.14)	1.01 (0.92, 1.12)	1.15 (1.06, 1.26)	1.12 (1.02, 1.22)
<b>Lifetime number of severe sunburns</b>						
<b>None</b>	Reference	Reference	Reference	Reference	Reference	Reference
<b>1-4</b>	0.97 (0.85, 1.10)	0.96 (0.84, 1.10)	1.14 (1.06, 1.23)	1.11 (1.03, 1.20)	1.08 (1.03, 1.13)	1.07 (1.02, 1.12)
<b>5-9</b>	0.97 (0.85, 1.11)	0.97 (0.85, 1.11)	1.16 (1.07, 1.25)	1.12 (1.04, 1.21)	1.18 (1.10, 1.28)	1.15 (1.06, 1.24)
<b>≥10</b>	1.09 (0.86, 1.22)	1.08 (0.96, 1.20)	1.18 (1.10, 1.27)	1.14 (1.05, 1.22)	1.17 (1.03, 1.32)	1.13 (1.00, 1.28)

Multivariable adjusted HRs adjusted for age, cancer, rheumatoid arthritis, systemic lupus erythematosus, inflammatory bowel disease, chronic kidney disease, diabetes mellitus, asthma, chronic obstructive pulmonary diseases, depression, use of corticosteroids, smoking, BMI, waist circumference, physical activity, alternate Mediterranean diet score, sleep, analgesics (ibuprofen, acetaminophen, and aspirin), and elevated cholesterol. Additionally, parity, oral contraceptives, and hormone therapy were adjusted in the multivariable model among women in NHS and NHS II.

Abbreviations: UVR, ultraviolet radiation; HPFS, Health Professionals Follow-up Study; NHS, Nurses' Health Study; NHS II, Nurses' Health Study II; HR, hazard ratio; CI, confidence interval.

**Supplemental Table 5. Ambient ultraviolet radiation exposure, skin reaction, and lifetime number of severe sunburns, and incidence of herpes zoster in three prospective cohorts where participants with skin cancers were censored**

	HPFS	NHS	NHS II
	Multivariable adjusted HR (95% CI)	Multivariable adjusted HR (95% CI)	Multivariable adjusted HR (95% CI)
<b>Updated UVR</b>			
<b>Quintile 1</b>	Reference	Reference	Reference
<b>Quintile 2</b>	1.16 (1.01, 1.34)	0.99 (0.93, 1.06)	1.05 (0.99, 1.12)
<b>Quintile 3</b>	1.11 (0.96, 1.28)	1.03 (0.97, 1.10)	1.02 (0.95, 1.09)
<b>Quintile 4</b>	1.26 (1.09, 1.45)	1.00 (0.94, 1.07)	1.04 (0.97, 1.11)
<b>Quintile 5</b>	1.31 (1.13, 1.51)	1.03 (0.96, 1.10)	0.95 (0.89, 1.02)
<b><i>p</i> for trend</b>	<.001	.28	.03
<b>Skin reaction</b>			
<b>None</b>	Reference	Reference	Reference
<b>Some redness</b>	-	1.01 (0.95, 1.07)	1.01 (0.95, 1.08)
<b>Burn</b>	1.04 (0.93, 1.15)	0.96 (0.90, 1.04)	1.04 (0.97, 1.11)
<b>Painful burn</b>	-	0.96 (0.88, 1.06)	1.09 (1.01, 1.17)
<b>Burn with blisters</b>	1.17 (1.03, 1.32)	1.03 (0.91, 1.16)	1.12 (1.02, 1.23)
<b><i>p</i> for trend</b>	.02	.49	<.001
<b>Lifetime number of severe sunburns</b>			
<b>None</b>	Reference	Reference	Reference
<b>1-4</b>	0.84 (0.70, 1.00)	1.18 (1.09, 1.28)	1.06 (1.02, 1.11)
<b>5-9</b>	0.95 (0.78, 1.15)	1.16 (1.07, 1.27)	1.14 (1.05, 1.24)
<b>≥10</b>	0.97 (0.81, 1.17)	1.18 (1.09, 1.28)	1.15 (1.01, 1.31)
<b><i>p</i> for trend</b>	.06	.02	<.001

Adjusted for age, cancer, rheumatoid arthritis, systemic lupus erythematosus, inflammatory bowel disease, chronic kidney disease, diabetes mellitus, asthma, chronic obstructive pulmonary diseases, depression, use of corticosteroids, smoking status, BMI, waist circumference, physical activity, alternate Mediterranean diet score, sleep, analgesics (ibuprofen, acetaminophen, and aspirin), and elevated cholesterol. Additionally, parity, oral contraceptives, and hormone therapy were adjusted in the multivariable model among women in NHS and NHS II.

Abbreviations: HPFS, Health Professionals Follow-up Study; NHS, Nurses' Health Study; NHS II, Nurses' Health Study II; RR, risk ratio; CI, confidence interval.