Article:
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Online supplementary material

Online Table 1. Australian melanoma incidence and mortality without melanoma per 100,000 by age group and sex for 2007-2009

Men		
Age	Melanoma incidence rate (h1*)[1]	Mortality rate without melanoma (h2)[1, 2]
0 to 4	0	117.17
5 to 9	0	10.57
10 to 14	1	11.91
15 to 19	3	49.08
20 to 24	6.9	70.56
25 to 29	11.85	83.16
30 to 34	20.25	98.61
35 to 39	29.48	121.53
40 to 44	37.87	159.55
45 to 49	52.03	233.14
50 to 54	79.01	350.8
55 to 59	106.8	520.83
60 to 64	140.09	824.74
65 to 69	180.62	1364.82
70 to 74	222.15	2256.97
75 to 79	269.59	4056.83
80 to 84	331.62	7169.49
Women		
Age	Melanoma incidence rate (h1*)[1]	Mortality rate without melanoma (h2)[1, 2]
0 to 4	0	93.42
5 to 9	0.1	8.85
10 to 14	0.4	9.4
15 to 19	3.18	23.27
20 to 24	10.7	26.42
25 to 29	16.1	32.63
30 to 34	24.79	42.51
35 to 39	34.43	61.5
40 to 44	42.4	90.25
45 to 49	53.2	143.89
50 to 54	60.29	215.91
55 to 59	74.41	318.69
60 to 64	85.42	502.9
65 to 69	93.39	799.2
70 to 74	109.02	1366.44
75 to 79	123.96	2476.91
80 to 84	135.82	4793.44

Online Table 2. Distribution of predictor variables in the development and independent validation studies

	Australian Melanoma Family Study[a]				Leeds Melanoma Case-Control Study[b]			
Predictor variable	Cases		Control		Cases		Control	
	n	%	n	%	n	%	n	%
Age								
15-19	10	2.17	1	0.40	7	0.7	0	0.0
20-24	40	8.68	16	6.35	21	2.2	4	0.8
25-29	92	19.96	40	15.87	35	3.6	4	0.8
30-34	138	29.93	90	35.71	68	7.1	17	3.3
35-39	181	39.26	105	41.67	80	8.3	39	7.6
40-44					97	10.1	45	8.8
45-49					104	10.8	43	8.4
50-54					115	12.0	68	13.3
55-59					117	12.2	70	13.6
60-64					109	11.4	61	11.9
65-69					113	11.8	66	12.9
70-74					87	9.1	73	14.2
75-79					6	0.6	22	4.3
Missing	0	0	0	0	1	0.1	1	0.2
Sex								
Female	288	62.47	146	57.94	575	59.90	302	58.87
Male	173	37.53	106	42.06	384	40.00	211	41.13
Missing	0	0	0	0	1	0.10	0	0
Total number of body nevi greater than or equal to 2mm [c,d]								
Less than 28	16	3.47	60	23.81	322	33.54	359	69.98
28- 61	45	9.76	64	25.40	288	30.00	105	20.47
62-143	100	21.69	65	25.79	242	25.21	37	7.21
More than 144	300	65.08	63	25.00	88	9.17	3	0.58
Missing	0	0	0	0	20	2.08	9	1.75
Solar Lentigines [c]								
Less than 20	21	4.56	36	14.29	254	26.46	178	34.70
20	83	18.00	79	31.35	250	26.04	134	26.12
40	94	20.39	53	21.03	200	20.83	93	18.13
60	83	18.00	34	13.49	156	16.25	60	11.70
80	133	28.85	39	15.48	36	3.75	26	5.07
100	47	10.20	11	4.37	3	0.31	5	0.97
Missing	0	0	0	0	61	6.35	17	3.31

	Australian Melanoma Family Study[a]				Leeds Melanoma Case-Control Study[b]			
Predictor variable	Cases		Control		Cases		Control	
	n	%	n	%	n	%	n	%
Hair colour at age 18 years								
Black/dark brown	124	26.90	104	41.27	169	17.60	149	29.04
Light brown	178	38.61	103	40.87	454	47.29	258	50.29
Blonde	103	22.34	31	12.30	182	18.96	68	13.26
Red	50	10.85	11	4.37	121	12.60	29	5.65
Missing	6	1.30	3	1.19	34	3.54	9	1.75
Personal history of non-melanoma skin cancer								
No	423	91.76	248	98.41	899	93.65	503	98.05
Yes	35	7.59	2	0.79	51	5.31	10	1.95
Missing	3	0.65	2	0.79	10	1.04	0	0.00
Total participants included in the analyses	461	100	252	100	865	90.10	492	95.91

[a] In the Australian Melanoma Family Study,[3] those participants aged over 40 years or who did not undergo a study skin examination were excluded from the analyses.
[b] In the Leeds Melanoma Case-Control Study[4] freckle density, categorized as <20%, 20%, 40%, 60%, 80%, 100%, was used as a proxy for solar lentigines (Spearman correlation coefficient =0.28, 95% CI 0.21-0.35, p<0.0001).
[c] Assessed from clinical examinations in dermatology clinics.
[d] Based on quartile cut-points in the Australian Melanoma Family Study controls.

Online Method 1. Procedure for reweighting the age and sex distribution of the Leeds Melanoma Case-Control Study controls to the general population

In the Leeds Melanoma Case-Control Study,[4] where the age and sex distribution of the study controls were matched (within 5 years) to the study cases, the distributions of risk factors among controls are more similar to cases than to the general population. To correct for potential biases in area under the curve (AUC) estimates, we reweighted the age and sex distribution of the study controls to the general population (eTable3) using methods proposed by Pepe and colleagues.[5]

We created 23 age and sex specific strata and subsequently reweighted each stratum based on the proportion of the general population to the study controls. For example, the AUC weight of 6.64 for stratum 1 was estimated by dividing the proportion of Leeds population, 9.10%, with the proportion of study controls, 1.37%.

Online Table 3. Area under the curve (AUC) weights in the Leeds Melanoma Case-Control

Strata	Age group (years)	Sex	Yorkshire population 2000-2005 (n)	Yorkshire population 2000-2005 (%)	Leeds Melanoma Case-Control Study controls (n)	Leeds Melanoma Case-Control Study controls (%)	AUC weight
1	20-24	Female	988833	9.1	4	1.37	6.64
2	25-29	Female	912911	8.4	1	0.34	24.71
3	30-34	Female	1093420	10.06	15	5.14	1.96
4	35-39	Female	1157162	10.65	22	7.53	1.41
5	40-44	Female	1092773	10.06	33	11.3	0.89
6	45-49	Female	977603	9	31	10.62	0.85
7	50-54	Female	981023	9.03	43	14.73	0.61
8	55-59	Female	935492	8.61	44	15.07	0.57
9	60-64	Female	770520	7.09	33	11.3	0.63
10	65-69	Female	718552	6.61	24	8.22	0.8
11	70-74	Female	655924	6.04	32	10.96	0.55
12	75-79	Female	579585	5.34	10	3.42	1.56
13[a]	20-29	Male	1884685	18.15	1	0.49	37.04
14	30-34	Male	1058589	10.2	2	0.98	10.41
15	35-39	Male	1131577	10.9	16	7.84	1.39
16	40-44	Male	1078801	10.39	11	5.39	1.93
17	45-49	Male	972114	9.36	11	5.39	1.74
18	50-54	Male	973834	9.38	24	11.76	0.8
19	55-59	Male	923894	8.9	24	11.76	0.76
20	60-64	Male	740763	7.13	28	13.73	0.52
21	65-69	Male	654917	6.31	40	19.61	0.32
22	70-74	Male	541474	5.21	37	18.14	0.29
23	75-79	Male	422556	4.07	10	4.9	0.83

[a] The 20-24 and 25-29 age groups for males were combined to form stratum 13 due as there were zero Leeds Melanoma Case-Control study controls in the 20-24 age group.

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