Common Melanocytic Nevi in 7-Year-Old Schoolchildren Residing at Different Latitudes in Sweden

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Abstract

Background: Current epidemiologic research shows consistently that increased number of acquired common melanocytic nevi (CMN) is an important risk factor for cutaneous malignant melanoma. The purpose of this study was to investigate the number of CMN in relation to tanning habits and complexion among 7-year-old children residing at different latitudes in Sweden.

Methods: Two municipalities were chosen at latitude 65°N to 68°N in the north of Sweden and two at latitude 57°N in the south. Children born in 1994 and registered in the municipalities were to be included (N=1,676). A questionnaire was sent to their parents asking about the child’s tanning habits. A body examination of CMN of size ≥2 mm was done by the same trained nurse in 1,380 (82.3%) of the children.

Results: CMN was significantly less prevalent among children living in the north with a prevalence of 5.6 [95% confidence interval (95% CI), 4.8-6.5] inland and 6.2 (95% CI, 5.3-7.2) coastal compared with the south with a prevalence of 9.5 (95% CI, 8.2-11.0) inland and 10.4 (95% CI, 8.9-12.0) coastal. In addition, blond hair, blue/gray/green eyes, holidays at seaside resorts abroad, more frequent sunburns, and parents fancying tanning were significant predictors of higher prevalence of CMN.

Conclusions: These findings support previous evidence that the development of CMN is related to the level of sun exposure in childhood expressed as latitude of residence, holidays at seaside resort abroad, and number of sunburns. To reduce the incidence of cutaneous malignant melanoma, a change in attitude and behavior must start with young children and their parents. (Cancer Epidemiol Biomarkers Prev 2007;16(1):122–7)

Introduction

Current epidemiologic research shows consistently that increased number of common melanocytic nevi (CMN) is an important risk factor for cutaneous malignant melanoma (CMN; refs. 1, 2). Studies of the epidemiology of nevi therefore have the potential to shed light on the etiology of CMM. The CMM incidence shows a geographic variation in Sweden, and the incidence in the north is about half of that in the south (3).

The principal environmental risk factor for the development of CMN and CMM has been found to be exposure to sunlight (2, 4-9). Studies in Australia (4), Canada (5), and Europe (10) have shown that the number of nevi increases with decreasing skin pigment content and nevi are more common in individuals with many freckles. An association has been seen with latitude (11-13), and the prevalence of nevi among adults in Sweden showed a statistically lower prevalence in northern Sweden (14).

The aim of this study was to investigate the prevalence of CMN in relation to tanning habits and complexion among 7-year-old children residing at different latitudes in Sweden.

Materials and Methods

The study comprised two parts: a physical examination, including nevi count, and a questionnaire about tanning habits. The project was done in collaboration with the school health services. The study was approved by the ethical committee at the Karolinska University Hospital.

Two municipalities were chosen at latitude 65°N to 68°N in the north of Sweden (Kiruna and Piteå) and two at latitude 57°N in the south (Ljungby and Falkenberg). The coastal municipalities (Piteå and Falkenberg) have on average more sun hours than those inland (Kiruna and Ljungby). Descriptive statistics about the municipalities are shown in Table 1. Factors taken in consideration when selecting the municipalities were that the number of children of 7 years of age, income level, and unemployment rate should be as similar as possible. There should neither be a university.

Information about children born during 1994 and residing in any of the four municipalities in August 2001 was achieved from the national census file. An invitation letter to the parents with information about the study, a written consent form for participation in the physical examination, and the questionnaire were sent in September 2001.

Questions were asked about skin reaction to sun, number of holidays spent at seaside resorts abroad, sailing and skiing, how often the child had been naked in the sun, number of sunburns, how often the child was protected, to what degree parents were fancying outdoor tanning, whether close relatives had been diagnosed with skin cancer, whether the child had been treated by a doctor for asthma, allergy, and eczema, and highest level of education of each parent.

The physical examinations took place in schools between October 2001 and March 2002 and were done by the same registered nurse throughout the study. She was trained by a dermatologist to differentiate CMN from other pigmented skin lesions. The nurse and the dermatologist both examined the same 100 children, and there was a strong agreement between their nevi counts [κ coefficient = 0.86; 95% confidence interval (95% CI), 0.71-0.93].

The body examination excluded scalp, genitalia, buttocks, and abdomen below the umbilicus. Nevi were defined as raised
or flat brown lesions ≥2 mm on the skin. The decision to not count smaller nevi was due to the problem to differentiate small nevi from freckles. The size of each nevus was measured with an overlay of Plexiglas and classified into two groups, ≥2 and <6 mm and ≥6 mm, according to an IARC protocol (15). The body surface area was divided into 16 body sites (10, 14), and totally, 84.5% of the body surface area was investigated. The nurse also assessed hair color, eye color, height, and weight.

In the statistical analysis, Poisson regression models with a generalized estimating equations approach were used (16). In the univariate analyses of number of nevi, adjustment for body surface area was done. All covariates with a P value of ≤0.10 in the univariate analyses were considered for inclusion in the multivariate model. A stepwise procedure with forward selection and backward elimination was used. The final multivariate model included covariates or interactions with P values of ≤0.05.

Results

In total, 1,676 children resided in the municipalities in year 2001. For 1,469 (87.6%) of those, the questionnaire was filled out and 193 (11.5%) did not want to participate and 12 (0.7%) could not be traced. In the physical examination, 1,380 (82.3%) participated. Children with brown or black skin were excluded from the analyses. The analysis set comprised 1,360 children who participated in the physical examination and whose parents answered the questionnaire.

The results of the univariate analyses are presented in Table 2 and final multivariate model in Table 3. Number of nevi was significantly less prevalent among children residing in the north, 5.6 (95% CI, 4.8-6.5) in Kiruna and 6.2 (95% CI, 5.3-7.2) in Piteå, in contrast to 9.5 (95% CI, 8.2-11.0) in Ljungby and 10.4 (95% CI, 8.9-12.0) in Falkenberg (Table 3). The prevalence is of the same magnitude in the municipalities at the same latitude with a somewhat higher mean for the coastal region. Thus, latitude seems to have the major effect on number of nevi, whereas number of sun hours at the same latitude is of less importance.

Prevalence of nevi increased with lighter hair color. However, red hair color was associated with lower prevalence. The prevalence of nevi was lower among children with brown eye color compared with children with blue/grey/green. The number of nevi was lower for children who never had spent any holiday at a seaside resort abroad before 2 years of age and increased with number of sunburns between 2 and 4 years of age. The more the parents liked outdoor tanning, the higher was the prevalence of nevi in their child. Sunscreen use seems to increase the prevalence of nevi (Table 2). Children who never were protected with sunscreen had the lowest prevalence, 7.5 (95% CI, 5.7-9.8) in comparison with 10.7 (95% CI, 10.1-11.2) in those who often were protected. Skin types I, II, and IV had lower prevalence of nevi compared with skin type III.

Discussion

The findings in this study support previous evidence that the development of CMM is related to the level of sun exposure in childhood. Differences between studies are therefore not always possible.

The fact that this is a population-based study implies that all individuals were identified and offered to participate in the study. The nonparticipating rate was of the same magnitude in all municipalities.

Fifteen percent of the children had not always lived in the actual municipality. When classifying earlier residing areas according to UV exposure, only 4% had lived in an area with a lower UV radiation intensity. The results did not change when excluding these children from the analysis set.

The results support the Australian data where the prevalence of nevi in 6- to 15-year-old children increased with diminishing latitude (11). Among children at age 6 years, the arithmetic means were 23.6 at latitude 51.1°N, 18.9 at latitude 53.7°N, 14.4 at latitude 56.9°N, and 9.9 at latitude 58.0°N. In a Swedish study of nevi in 8- to 9-year-old children at latitude 56°N, median number of nevi was found to be 8 (10).

An advantage of this study is that the country has a rather homogeneous population. Another is that the same nurse examined all children and that the agreement with a dermatologist as regards diagnostics was high. There is therefore no reason to suspect any systematic differences in nevus count between the municipalities.

We found that prevalence of CMM was associated with previously identified risk factors for CMM [e.g., light eye color and light hair color (4, 10-12, 17)]. Red hair color seems to have a protective effect, which has been reported previously (7, 10, 11, 18-20).

We found that holidays at seaside resorts before 2 years of age were associated with higher nevi count, similar to the findings from Germany (17, 21), which supports the view that early sun exposure in childhood is of special importance.

The more the parents liked outdoor tanning, the higher was the number of nevi in their children. It can therefore be argued that the parents' habits have an effect on sun exposure of their

Table 1. Characteristics of participating municipalities

| Municipality       | Kiruna (inland) | Piteå (costal) | Ljungby (inland) | Falkenberg (costal) |
|--------------------|-----------------|----------------|-----------------|---------------------|
| Latitude (°N)      | 67.8            | 65.3           | 56.9            | 57.0                |
| Sunshine duration (average number of hours per year, 1961-1990) | 1,485 | 1,775 | 1,440 | 1,750 |
| Summer sunshine duration (average number of hours per year in June, July, and August, 1961-1990) | 670 | 835 | 610 | 730 |
| Average minimum and maximum temperatures (°C) in July 1961-1990 | 7.4/16.6 | 11.6/20.2 | 10.5/20.9 | 13.5/20.0 |
| Yearly sum of CIE-UV (Whm-2)* | 65.7 | 84.5 | 104.0 | 110.6 |
| LS means with 95% CI | 5.6 (4.8-6.5) | 6.2 (5.3-7.2) | 9.5 (8.2-11.0) | 10.4 (8.9-12.0) |

*The radiation is weighted according to International Commission on Illuminations.
Table 2. Results of the univariate Poisson regression analyses (number of CMN adjusted for body surface area)

| Municipality          | n   | Oddsratio (95% CI) | P       | Least square mean with 95% CI |
|-----------------------|-----|--------------------|---------|-----------------------------|
| Kiruna                | 256 | 1.0                |         | 6.8 (6.3-7.4)               |
| Piteå                 | 423 | 1.10 (0.99-1.22)    | 0.0764  | 7.5 (7.0-8.1)               |
| Ljungby               | 285 | 1.72 (1.55-1.92)    | <0.0001 | 11.8 (11.0-12.7)            |
| Falkenberg            | 396 | 1.87 (1.69-2.08)    | <0.0001 | 12.8 (12.0-13.7)            |
| Skin type             |     |                    |         |                             |
| IV                    | 200 | 1.0                |         | 8.6 (7.7-9.5)               |
| III                   | 940 | 1.22 (1.09-1.37)    | 0.0007  | 10.4 (10.0-10.9)            |
| I and II              | 184 | 1.04 (0.90-1.21)    | 0.5781  | 8.9 (8.0-9.9)               |
| Not reported          |     | 36                 |         |                             |
| Eye color             |     |                    |         |                             |
| Brown                 | 325 | 1.0                |         | 7.7 (7.0-8.4)               |
| Blue/gray/green       | 1,035| 1.36 (1.23-1.51)   | <0.0001 | 10.5 (10.0-11.0)            |
| Hair color            |     |                    |         |                             |
| Dark                  | 82  | 1.0                |         | 6.9 (5.7-8.3)               |
| Ash blond             | 343 | 1.35 (1.10-1.67)    | 0.0040  | 9.1 (8.4-9.9)               |
| Blond                 | 904 | 1.53 (1.26-1.86)    | <0.0001 | 10.5 (10.0-11.0)            |
| Red                   | 31  | 0.86 (0.59-1.26)    | 0.4447  | 5.9 (4.4-8.0)               |
| Sex                   |     |                    |         |                             |
| Girls                 | 688 | 1.0                |         | 9.5 (9.0-10.1)              |
| Boys                  | 672 | 1.07 (0.99-1.16)    | 0.0949  | 10.2 (9.6-10.7)             |
| Holidays at seaside resorts abroad before 2 yr of age |    |                    |         |                             |
| Never                 | 974 | 1.0                |         | 9.4 (9.0-9.9)               |
| Ever                  | 181 | 1.21 (1.07-1.37)    | 0.0022  | 11.4 (10.2-12.8)            |
| Not reported          | 205 |                    |         |                             |
| Holidays at seaside resorts abroad between 2 and 4 yr of age |    |                    |         |                             |
| Never                 | 876 | 1.0                |         | 9.4 (9.0-9.9)               |
| Ever                  | 285 | 1.19 (1.08-1.31)    | 0.0005  | 11.2 (10.3-12.2)            |
| Not reported          | 199 |                    |         |                             |
| Holidays at seaside resorts abroad after 4 yr of age |    |                    |         |                             |
| Never                 | 756 | 1.0                |         | 9.2 (8.7-9.7)               |
| Ever                  | 499 | 1.21 (1.11-1.31)    | <0.0001 | 11.1 (10.4-11.8)            |
| Not reported          | 105 |                    |         |                             |
| Sailing during holidays/weekends |    |                    |         |                             |
| Never                 | 1,108| 1.0              |         | 10.0 (9.6-10.5)             |
| Seldom                | 48  | 0.78 (0.66-0.93)    | 0.0054  | 7.8 (6.6-9.3)               |
| Sometimes             | 23  | 0.88 (0.70-1.12)    | 0.3063  | 8.9 (7.1-11.2)              |
| Often                 | 16  | 0.77 (0.54-1.08)    | 0.1346  | 7.7 (5.5-10.8)              |
| Not reported          | 165 |                    |         |                             |
| Skiing during holidays/weekends |    |                    |         |                             |
| Never                 | 588 | 1.0                |         | 10.8 (10.2-11.4)            |
| Seldom                | 206 | 0.98 (0.87-1.11)    | 0.7776  | 10.6 (9.5-11.8)             |
| Sometimes             | 395 | 0.82 (0.74-0.90)    | <0.0001 | 8.8 (8.2-9.5)               |
| Often                 | 153 | 0.77 (0.67-0.88)    | 0.0002  | 8.3 (7.3-9.4)               |
| Not reported          | 18  |                    |         |                             |
| Naked in the sun before 2 yr of age |    |                    |         |                             |
| Never                 | 222 | 1.0                |         | 8.3 (7.4-9.2)               |
| Seldom                | 484 | 1.18 (1.04-1.34)    | 0.0081  | 9.8 (9.2-10.5)              |
| Sometimes             | 480 | 1.27 (1.12-1.44)    | 0.0002  | 10.5 (9.9-11.2)             |
| Often                 | 132 | 1.30 (1.10-1.54)    | 0.0018  | 10.8 (9.5-12.2)             |
| Not reported          | 42  |                    |         |                             |
| Naked in the sun between 2 and 4 yr of age |    |                    |         |                             |
| Never                 | 56  | 1.0                |         | 9.5 (7.5-12.0)              |
| Seldom                | 337 | 0.93 (0.73-1.20)    | 0.5943  | 8.8 (8.1-9.6)               |
| Sometimes             | 689 | 1.05 (0.83-1.34)    | 0.6717  | 10.0 (9.4-10.5)             |
| Often                 | 253 | 1.14 (0.89-1.48)    | 0.2973  | 10.8 (9.9-11.9)             |
| Not reported          | 25  |                    |         |                             |
| Naked in the sun after 4 yr of age |    |                    |         |                             |
| Never                 | 91  | 1.0                |         | 9.6 (8.2-11.2)              |
| Seldom                | 239 | 0.95 (0.78-1.14)    | 0.5791  | 9.1 (8.2-10.0)              |
| Sometimes             | 611 | 0.98 (0.82-1.16)    | 0.7950  | 9.4 (8.8-9.9)               |
| Often                 | 386 | 1.14 (0.96-1.37)    | 0.1331  | 11.0 (10.2-11.8)            |
| Not reported          | 33  |                    |         |                             |
| Number of sunburns before 2 yr of age |    |                    |         |                             |
| None                  | 1,156| 1.0               |         | 9.6 (9.2-10.0)              |
| 1-2 times             | 145 | 1.23 (1.08-1.40)    | 0.0017  | 11.8 (10.4-13.3)            |
| 3-5 times             | 9   | 1.17 (0.65-2.09)    | 0.6011  | 11.2 (6.3-20.0)             |
| >5 times              | 0   | No observation     |         |                             |
| Not reported          | 33  |                    |         |                             |
| Number of sunburns between 2 and 4 yr of age |    |                    |         |                             |
| None                  | 741 | 1.0                |         | 9.2 (8.7-9.7)               |
| 1-2 times             | 537 | 1.14 (1.06-1.24)    | 0.0012  | 10.5 (9.9-11.2)             |
| 3-5 times             | 34  | 1.61 (1.30-1.99)    | <0.0001 | 14.7 (12.0-18.1)            |
| >5 times              | 2   | 0.78 (0.40-1.52)    | 0.4662  | 7.2 (3.7-13.9)              |
| Not reported          | 46  |                    |         |                             |
| Number of sunburns after 4 yr of age |    |                    |         |                             |
| None                  | 441 | 1.0                |         | 8.8 (8.2-9.4)               |
Table 2. Results of the univariate Poisson regression analyses (number of CMN adjusted for body surface area) (Cont’d)

|                          | n     | Odds ratio (95% CI) | P       | Least square mean with 95% CI |
|--------------------------|-------|---------------------|---------|-----------------------------|
| 1-2 times                | 735   | 1.15 (1.06-1.26)    | 0.0013  | 10.1 (9.6-10.7)             |
| 3-5 times                | 143   | 1.32 (1.14-1.52)    | 0.0001  | 11.6 (10.2-13.1)            |
| >5 times                 | 17    | 0.94 (0.68-1.30)    | 0.7104  | 8.2 (6.0-11.4)              |
| Not reported             | 24    |                     |         |                             |
| Protect the child: sunscreen |      |                     |         |                             |
| Often                    | 748   | 1.0                 |         | 10.7 (10.1-11.2)            |
| Sometimes                | 422   | 0.85 (0.78-0.93)    | 0.0004  | 9.1 (8.5-9.8)               |
| Seldom                   | 124   | 0.81 (0.70-0.94)    | 0.0063  | 8.6 (7.5-9.9)               |
| Never                    | 52    | 0.70 (0.53-0.92)    | 0.0122  | 7.5 (5.7-9.8)               |
| Not reported             | 14    |                     |         |                             |
| Protect the child: clothes |       |                     |         |                             |
| Often                    | 706   | 1.0                 |         | 9.5 (9.0-10.1)              |
| Sometimes                | 549   | 1.08 (0.99-1.17)    | 0.0816  | 10.2 (9.6-10.9)             |
| Seldom                   | 72    | 1.09 (0.92-1.29)    | 0.3089  | 10.4 (8.9-12.1)             |
| Never                    | 22    | 1.05 (0.73-1.52)    | 0.7738  | 10.0 (7.0-14.4)             |
| Not reported             | 11    |                     |         |                             |
| Protect the child: shadow |       |                     |         |                             |
| Often                    | 100   | 1.0                 |         | 9.9 (8.6-11.4)              |
| Sometimes                | 434   | 1.03 (0.88-1.21)    | 0.7149  | 10.2 (9.5-10.9)             |
| Seldom                   | 443   | 1.04 (0.89-1.22)    | 0.6073  | 10.3 (9.6-11.1)             |
| Never                    | 304   | 0.87 (0.74-1.02)    | 0.0937  | 8.6 (7.9-9.3)               |
| Not reported             | 79    |                     |         |                             |
| Protect the child: staying indoors |   |                     |         |                             |
| Often                    | 73    | 1.0                 |         | 10.4 (8.6-12.6)             |
| Sometimes                | 293   | 1.00 (0.81-1.23)    | 0.9707  | 10.4 (9.5-11.3)             |
| Seldom                   | 360   | 0.97 (0.79-1.20)    | 0.0254  | 10.1 (9.4-10.9)             |
| Never                    | 563   | 0.89 (0.72-1.09)    | 0.2526  | 9.2 (8.7-9.8)               |
| Not reported             | 71    |                     |         |                             |
| Parents fancying outdoor tanning |   |                     |         |                             |
| Not at all               | 28    | 1.0                 |         | 7.6 (5.8-9.9)               |
| Rather not              | 93    | 1.14 (0.84-1.54)    | 0.3961  | 8.7 (7.4-10.1)              |
| Neither like or dislike it | 316 | 1.15 (0.87-1.51)    | 0.3234  | 8.7 (8.1-9.5)               |
| Fairly much | 581 | 1.36 (1.04-1.78) | 0.0254 | 10.4 (9.8-11.0) |
| Very much | 331 | 1.38 (1.05-1.82) | 0.0211 | 10.5 (9.7-11.4) |
| Not reported             | 71    |                     |         |                             |
| Parents with skin cancer |       |                     |         |                             |
| No                       | 1,287 | 1.0                 |         | 9.8 (9.4-10.2)              |
| Yes                      | 13    | 1.00 (0.58-1.72)    | 0.9917  | 9.8 (5.7-16.8)              |
| Not reported             | 60    |                     |         |                             |
| Grandparents with skin cancer |     |                     |         |                             |
| No                       | 1,250 | 1.0                 |         | 9.7 (9.3-10.1)              |
| Yes                      | 67    | 1.32 (1.08-1.61)    | 0.0064  | 12.8 (10.6-15.6)            |
| Not reported             | 43    |                     |         |                             |
| Siblings with skin cancer |       |                     |         |                             |
| No                       | 1,286 | 1.0                 |         | 9.8 (9.4-10.2)              |
| Yes                      | 3     | 0.53 (0.37-0.77)    | 0.0007  | 5.2 (3.6-7.5)               |
| Not reported             | 71    |                     |         |                             |
| Other close relative with skin cancer |   |                     |         |                             |
| No                       | 1,239 | 1.0                 |         | 9.7 (9.3-10.1)              |
| Yes                      | 59    | 1.08 (0.87-1.34)    | 0.4666  | 10.5 (8.5-13.0)             |
| Not reported             | 62    |                     |         |                             |
| Treated by a doctor for asthma |   |                     |         |                             |
| No                       | 1,122 | 1.0                 |         | 10.0 (9.6-10.4)             |
| Yes                      | 144   | 0.92 (0.81-1.05)    | 0.2314  | 9.2 (8.2-10.4)              |
| Not reported             | 94    |                     |         |                             |
| Treated by a doctor for allergy |     |                     |         |                             |
| No                       | 1,055 | 1.0                 |         | 10.0 (9.5-10.4)             |
| Yes                      | 233   | 0.95 (0.86-1.04)    | 0.2938  | 9.4 (8.7-10.3)              |
| Not reported             | 72    |                     |         |                             |
| Treated by a doctor for eczema |     |                     |         |                             |
| No                       | 995   | 1.0                 |         | 9.9 (9.4-10.3)              |
| Yes                      | 307   | 0.95 (0.86-1.05)    | 0.3440  | 9.4 (8.6-10.3)              |
| Not reported             | 58    |                     |         |                             |
| Mother’s education       |       |                     |         |                             |
| University with exam     | 313   | 1.0                 |         | 9.3 (8.5-10.1)              |
| University without exam  | 115   | 1.04 (0.89-1.21)    | 0.6446  | 9.6 (8.4-11.0)              |
| Upper secondary school   | 739   | 1.09 (0.98-1.20)    | 0.0975  | 10.1 (9.6-10.7)             |
| Vocational training school | 70   | 1.19 (0.97-1.46)    | 0.1097  | 11.0 (9.2-13.3)             |
| Compulsory school        | 96    | 1.00 (0.84-1.18)    | 0.9648  | 9.3 (8.0-10.7)              |
| Not reported             | 27    |                     |         |                             |
| Father’s education       |       |                     |         |                             |
| University with exam     | 209   | 1.0                 |         | 9.5 (8.5-10.6)              |
| University without exam  | 62    | 0.86 (0.71-1.05)    | 0.1383  | 8.2 (7.0-9.7)               |
| Upper secondary school   | 756   | 1.06 (0.94-1.20)    | 0.3491  | 10.0 (9.5-10.6)             |
| Vocational training school | 145 | 1.15 (0.97-1.36) | 0.1133 | 10.8 (9.5-12.3) |
| Compulsory school        | 146   | 1.02 (0.87-1.20)    | 0.7848  | 9.6 (8.6-10.8)              |
| Not reported             | 42    |                     |         |                             |
Table 3. Result of final model of the multivariate Poisson regression analysis (number of CMN adjusted for body surface area)

| Municipality       | n     | Odds ratio (95% CI) | P     | Least squares mean with 95% CI |
|---------------------|-------|---------------------|-------|-------------------------------|
| Kiruna              | 256   | 1.0                 |       |                               |
| Piteå               | 423   | 1.11 (0.99-1.23)    | 0.067 | 6.2 (5.3-7.2)                 |
| Ljungby             | 285   | 1.72 (1.52-1.92)    | <0.0001 | 9.5 (8.2-11.0)                |
| Falkenberg          | 396   | 1.87 (1.67-2.08)    | <0.0001 | 10.4 (8.9-12.0)               |
| Hair color          |       |                     |       |                               |
| Dark                | 82    | 1.0                 |       |                               |
| Ash blond           | 343   | 1.14 (0.92-1.42)    | 0.2337 | 8.7 (7.7-9.9)                 |
| Blond               | 904   | 1.26 (1.02-1.57)    | 0.0335 | 9.7 (8.7-10.7)                |
| Red                 | 31    | 0.68 (0.45-1.05)    | 0.0827 | 5.2 (3.6-7.6)                 |
| Eye color           |       |                     |       |                               |
| Brown               | 325   | 1.0                 |       |                               |
| Blue/grey/green     | 1,035 | 1.27 (1.14-1.42)    | <0.0001 | 8.6 (7.5-9.8)                 |
| Holidays at seaside resorts ahead of 2 yr of age | None   | 974 | 1.0 | 7.1 (6.2-8.0) |
|                     | Ever  | 181 | 1.16 (1.03-1.30)    | 0.0127 | 8.2 (7.0-9.6)                 |
| Number of sunburns between 2 and 4 yr of age | None   | 741 | 1.0 | 6.8 (6.0-7.8) |
|                     | 1-2 times | 537 | 1.06 (0.98-1.15)    | 0.1613 | 7.2 (6.3-8.2)                 |
|                     | >2 times | 36 | 1.32 (1.08-1.61)    | 0.0075 | 9.0 (7.2-11.2)               |
| Parents fancying outdoor tanning | Not at all | 28 | 1.0 | 6.5 (5.1-8.3) |
|                     | Rather not | 93 | 1.08 (0.82-1.40)    | 0.5721 | 7.0 (5.8-8.5)                 |
|                     | Neither like or dislike it | 316 | 1.21 (0.96-1.52)    | 0.1071 | 7.8 (6.8-9.0)                 |
|                     | Fairly much | 581 | 1.34 (1.07-1.67)    | 0.0107 | 8.6 (7.6-10.0)               |
|                     | Very much | 331 | 1.28 (1.01-1.61)    | 0.0378 | 8.3 (7.2-9.5)                 |

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