

## Supplementary Online Content

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## eMethods

### SUPPLEMENTARY METHODS

#### DATA SOURCES AND LITERATURE SEARCH

Searches of electronic databases were performed using the following search text.

Pubmed: *"indoor tanning" or "sunbed\*" or "tanning bed\*" or "tanning booth\*" or "tanning salon\*" or "solarium\*" or "solaria" or "sunlamp\*" or "artificial tanning" or "UV tanning" or "non-solar ultraviolet radiation" or "non-solar UV radiation" or "nonsolar ultraviolet radiation" or "nonsolar UV radiation."*

Scopus: *TITLE-ABS-KEY("indoor tanning" OR "sunbed\*" OR "tanning bed\*" OR "tanning booth\*" OR "tanning salon\*" OR "solarium\*" OR "solaria" OR "sunlamp\*" OR "artificial tanning" OR "UV tanning" OR "non-solar ultraviolet radiation" OR "non-solar UV radiation" OR "nonsolar ultraviolet radiation" OR "nonsolar UV radiation").*

Web of Science: *TS=("indoor tanning" OR "sunbed\*" OR "tanning bed\*" OR "tanning booth\*" OR "tanning salon\*" OR "solarium\*" OR "solaria" or "sunlamp\*" OR "artificial tanning" OR "UV tanning" OR "non-solar ultraviolet radiation" OR "non-solar UV radiation" OR "nonsolar ultraviolet radiation" OR "nonsolar UV radiation").*

Additionally, we reviewed the articles identified in our database search and relevant review articles to locate published articles missed by the database searches and to locate publicly available data not yet published in the scientific literature. Publicly available data were located by noting named surveys used in the published literature. We searched online for nine named surveys (American Cancer Society Sun Survey, Growing Up Today Survey, National Longitudinal Study of Adolescent Health, National Health Interview Survey Cancer Control Supplement, Youth Risk Behavior Survey, Health Information National Trends Survey, Sunbed-Use: Needs for Action Study, New South Wales Population Health Survey, and New South Wales School Students Health Behaviors Survey) to identify recent iterations of these surveys whose data on indoor tanning prevalence were available publicly but not published in the scientific literature.

#### STUDY SELECTION

In one case, two studies using the same original data were both included. Choi et al<sup>1</sup> and the United States (US) National Cancer Institute (NCI)<sup>2</sup> independently reported on the US Health Information National Trends Survey in 2005. The data available from the NCI<sup>2</sup> reported overall population prevalence, while Choi et al<sup>1</sup> reported gender specific prevalence. These two reports were included in separate meta-analyses (Choi et al<sup>1</sup> when we summarized prevalence according to gender and the NCI<sup>2</sup> when we summarized prevalence overall) and so were both kept in our review.

#### DATA EXTRACTION

Because complete data was not consistently available for all studies, and in order to include as many studies as possible, we made several content-specific decisions that applied to individual studies. These decisions were felt to be the most reasonable course of action after detailed review of manuscripts and discussion by two authors (EL and MRW). The following decisions were made during data abstraction:

- Nielsen et al<sup>3</sup> stated that "the overall use of sunbeds" was "approximately 50%." We used 50% as the ever exposure prevalence estimate.

- For one publicly available record<sup>4</sup>, the number of participants was not available. We obtained this through electronic correspondence with the US National Cancer Institute.
- Koster et al<sup>5</sup> presented prevalences for four distinct data points in an adolescent population but only the total number of adolescent participants was available. We divided that total number of participants by four in order to estimate the number of participants for each data point.
- Savona et al<sup>6</sup> presented a figure showing the prevalence of indoor tanning as a bar graph without any numbers reported. Two reviewers independently visually estimated the prevalence. In one data point out of four, the estimates differed by 2% and the mean was used as the final estimate.
- Zhang et al<sup>7</sup> asked participants if they had ever been exposed to indoor tanning during certain periods of their lives (high school through college and age 25 through 35). We used the higher of the two prevalences reported (that for age 25 through 35) in ever prevalence analyses.
- Veierod et al<sup>8</sup> asked participants aged 30 to 50 about ever exposure to indoor tanning between the ages of 10 and 39, which we used in ever prevalence analyses.
- Unverricht et al<sup>9</sup> asked participants about whether they were exposed to indoor tanning during different seasons in the past year. We used the winter season's estimate, which was the highest prevalence estimate, as the best estimate of exposure in the past year.
- For studies with prevalence results and participant numbers available for females and males separately or for a range of age groups separately<sup>10-18</sup>, we calculated the prevalence for the overall population ourselves using the gender or age group specific prevalences and numbers of participants in each group. In one study<sup>19</sup>, the prevalences for males and females were calculated using the number of participants in each group and the percentages of females and males in participants reporting exposure.

## DATA SYNTHESIS AND STATISTICAL METHODS

### *Primary analyses*

When separating studies into categories for analysis (adults, university students, and children), we prioritized separating study populations into adult and child categories over retaining any age-adjustment or weighting used. Age-adjusted data was available and used for 10 out of 84 records.

We calculated the standard error for each study assuming probability to be a Bernoulli random variable,  $p$ , with variance= $p(1-p)$  in all but three records. In three instances of extremely low prevalences (0% and 3%,<sup>20</sup> 0.3%,<sup>21</sup> all in males) and in one instance of very low prevalence with a small number of participants (7.9% in 38 males)<sup>22</sup> this calculation yielded negative lower confidence intervals. Because negative prevalences are impossible, we used an exact confidence interval calculation as the input into the analyses for these four prevalence data points.

### *Sensitivity analyses*

In the first sensitivity analysis, six studies were included that did not report exposure measures that specifically fit our 'ever exposure' nor 'past year exposure' definitions. A study that reported "use"<sup>23</sup> was included in an ever exposure sensitivity analysis. Studies that reported "regular" use,<sup>24</sup> use at least once per year,<sup>25,26</sup> use in the past six months,<sup>27,28</sup> and use at least once per month,<sup>9</sup> were included in the past year exposure sensitivity analyses.

In the second sensitivity analysis, records of specific occupational groups not representative of the general population were included: pilots and flight attendants,<sup>13</sup> indoor office workers,<sup>29</sup> outdoor workers,<sup>9</sup> and healthcare workers.<sup>7,17,30</sup>

In the third sensitivity analysis, seven studies<sup>5,12,25,31-34</sup> that reported combined results of teenagers (> 15 years old or > 16 years old) and adults that could not be split into child and adult

subgroups were excluded from the adult category. One study<sup>35</sup> reported results from a population of university students and high school students and was excluded from the university students category.

In the fourth sensitivity analysis, we excluded studies of potentially lower methodologic quality. These studies had unclear sampling methods, used convenience sampling, or had a sample size less than 500. Two studies<sup>36,37</sup> had unclear sampling and six studies<sup>6,32,33,38-40</sup> were specifically reported as convenience samples. We also considered analyses of parents or caregivers whose children were enrolled in a study or children whose parents were enrolled in a study,<sup>36,41-44</sup> participants recruited in healthcare settings,<sup>12,22,31,45</sup> pilot studies,<sup>46,47</sup> and school based studies that did not sample more than two schools<sup>21,47-50</sup> as convenience samples. Two studies not excluded for the sampling reasons above were excluded for sample size less than 500.<sup>5,10</sup> This sensitivity analysis was not performed in the university student category because the records in this category almost all contained fewer than 500 participants.

eTable 1: Study characteristics

| Reference   | Year published | Year(s) of data collection <sup>a</sup> | Participants in study (N) | % female | Population description  | Ever prevalence |         |         | Past-year prevalence |         |         |
|---|----------------|---|---------------------------|----------|---|-----------------|---------|---------|----------------------|---------|---------|
|   |                |   |                           |          |   | Males           | Females | Overall | Males                | Females | Overall |
| <b>USA</b>  |                |   |                           |          |   |                 |         |         |                      |         |         |
| Bagdasarov <sup>51</sup>                          | 2008           | 2005                                    | 745                       | --       | Undergraduates <25 years old and not dark skinned   |                 |         | 95.0%   |                      |         |         |
| Baker <sup>52</sup>                               | 2010           | 2008-2009                               | 227                       | 100%     | Undergraduates 18-30 years old  |                 | 69.2%   |         |                      |         |         |
| Bandi <sup>42</sup>                               | 2010           | 1998                                    | 1187                      | --       | Parents of adolescents in the American Cancer Society Sun Survey I <sup>b</sup>   |                 |         |         |                      |         | 8.6%    |
|   |                | 2004                                    | 1931                      | 76%      | Parents of adolescents in the American Cancer Society Sun Survey II <sup>b</sup>  |                 |         |         | 5.3%                 | 14.8%   | 12.8%   |
| Banerjee <sup>53</sup>                            | 2012           | Pre-2012                                | 551                       | --       | Undergraduates <25 years old  |                 |         | 39.6%   |                      |         |         |
| Banks <sup>45</sup>                               | 1992           | 1989                                    | 96                        | 42%      | 16-19 year old patients at a general pediatric clinic <sup>b</sup>  | 16.1%           | 32.5%   | 22.9%   |                      |         |         |
| Basch <sup>54</sup>                               | 2012           | 2009                                    | 139                       | 58%      | Undergraduates 18-25 years old  |                 |         | 60.4%   |                      |         |         |
| Bolek-Berquist <sup>38</sup>                      | 2009           | 2004                                    | 184                       | 53%      | 18-40 year olds <sup>b</sup>  |                 |         |         |                      |         | 34.8%   |
| Brooks <sup>39</sup>                              | 2006           | 2004                                    | 448                       | 58%      | 18-30 year olds <sup>b</sup>  |                 |         |         |                      |         | 33.0%   |
| CDC <sup>c</sup> & NCI <sup>d</sup> <sup>55</sup> | 2012           | 2010                                    | 25233                     | --       | ≥18 year olds in the National Health Interview Survey   |                 |         |         | 2.2%                 | 8.9%    | 5.6%    |
| Choi <sup>1</sup>                                 | 2010           | 2005                                    | 2869                      | --       | White 18-64 year olds in the Health Information National Trends Survey  |                 |         |         | 6.3%                 | 18.1%   |         |
|   |                |   |                           |          | Parents of 9-16 year olds at a general pediatric clinic   |                 |         |         |                      | 49.5%   |         |
| Cohen <sup>56</sup>                               | 2013           | 2010                                    | 301                       | 93%      | 9-16 year olds at a general pediatric clinic  |                 |         | 4.3%    |                      |         |         |
|   |                |   | 301                       | 53%      | 11-18 year olds in the American Cancer Society Sun Survey I   |                 |         |         |                      |         | 10.1%   |
| Cokkinides <sup>57</sup>                          | 2009           | 1998                                    | 1196                      | --       | 11-18 year olds in the American Cancer Society Sun Survey II  |                 |         |         |                      |         | 11.1%   |
| Danoff-Burg <sup>58</sup>                         | 2006           | 2003                                    | 164                       | 50%      | Undergraduates 18-23 years old  |                 |         |         | 15.9%                | 56.8%   | 35.0%   |
| Demko <sup>59</sup>                               | 2003           | 1996                                    | 6903                      | 51%      | White 13-19 year olds in the National Longitudinal Study of Adolescent Health Wave II                                   | 11.2%           | 36.8%   | 24.1%   |                      |         |         |
| Dennis <sup>15</sup>                              | 2009           | Pre-2009                                | 162                       | 73%      | University students   | 58.3%           | 99.3%   | 88.2%   | 52%                  | 94%     | 83%     |
| Fogel <sup>60</sup>                               | 2012           | 2011                                    | 576                       | 52%      | College students <35 years old  |                 |         |         |                      |         | 7.3%    |
| Geller <sup>44</sup>                              | 2002           | 1999                                    | 10079                     | 59%      | 12-18 year olds in the Growing Up Today Study (children of the participants of the Nurses Health Study II) <sup>b</sup> |                 |         |         | 2.4%                 | 14.4%   | 9.5%    |
| Gillen <sup>e</sup> <sup>26</sup>                 | 2012           | Pre-2012                                | 277                       | 53%      | College students 18-25 years old  |                 |         |         | 11%                  | 22%     | 17%     |
| Guy <sup>61</sup>                                 | 2011           | 2009                                    | 14590                     | 50%      | High school students in the Youth Risk Behavior Survey  |                 |         |         | 6.7%                 | 25.4%   | 15.6%   |
| Heckman <sup>11</sup>                             | 2008           | 2005                                    | 29394                     | 52%      | Adults in the National Health Interview Survey  |                 |         |         | 10.7%                | 16.1%   | 13.4%   |
| Hillhouse <sup>16</sup>                           | 1999           | Pre-1999                                | 254                       | 66%      | Fair-skinned university students  | 46.5%           | 80.0%   | 68.7%   | 21.3%                | 48.5%   | 39.3%   |
| Hillhouse <sup>62</sup>                           | 2005           | Pre-2005                                | 126                       | 100%     | University students   |                 | 55.6%   |         |                      |         |         |
| Hillhouse <sup>63</sup>                           | 2012           | 2008-2009                               | 296                       | --       | College students  |                 |         | 53.7%   |                      |         |         |
| Hoerster <sup>41</sup>                            | 2007           | 2005                                    | 5274                      | 78%      | Parents of adolescents in the CITY100 (Controlling Indoor Tanning in Youth) study <sup>b</sup>                          |                 |         | 23.9%   |                      |         |         |
|   |                | 2005                                    | 5274                      | 53%      | 14-17 year olds in the CITY100 (Controlling Indoor Tanning in Youth) study <sup>b</sup>                                 |                 |         |         | 3.5%                 | 18.1%   | 11.2%   |
| Knight <sup>64</sup>                              | 2002           | 1999                                    | 489                       | 70%      | Undergraduate and graduate students   |                 |         | 61.0%   |                      |         | 47.0%   |
| Lazovich <sup>65</sup>                            | 2004           | 2000                                    | 1273                      | 62%      | 14-17 year olds   | 12.0%           | 41.5%   | 30.3%   |                      |         |         |
| Lazovich <sup>66</sup>                            | 2005           | 2002                                    | 802                       | 55%      | ≥18 year olds   | 30.2%           | 44.9%   | 38.0%   |                      |         |         |
| Lazovich <sup>46</sup>                            | 2008           | Pre-2008                                | 24                        | 83%      | Unknown <sup>b</sup>  |                 |         | 74.0%   |                      |         |         |
| Lucci <sup>e</sup> <sup>27</sup>                  | 2001           | 1999-2000                               | 210                       | 44%      | Junior high and high school students 12-18 years old  |                 |         |         |                      |         | 18.0%   |
| Ma <sup>47</sup>                                  | 2007           | Pre-2007                                | 369                       | --       | High school students <sup>b</sup>   |                 |         |         |                      |         | 12.2%   |
| Mawn <sup>32</sup>                                | 1993           | Pre-1993                                | 477                       | 63%      | Whites >15 years old <sup>b†</sup>  |                 |         | 34.0%   |                      |         |         |
| Mermelstein <sup>67</sup>                         | 1992           | Pre-1992                                | 1703                      | 53%      | High school students  | 7.4%            | 18.5%   | 13.3%   |                      |         |         |

| Reference                          | Year published | Year(s) of data collection <sup>a</sup> | Participants in study (N) | % female | Population   | Ever prevalence |         |         | Past-year prevalence |         |         |
|------------------------------------|----------------|---|---------------------------|----------|--|-----------------|---------|---------|----------------------|---------|---------|
|                                    |                |   |                           |          |  | Males           | Females | Overall | Males                | Females | Overall |
| MMWR <sup>g 68</sup>               | 2012           | 2010-2011                               | 15425                     | 48%      | Adolescents in the Youth Risk Behavior Survey  |                 |         |         | 6.2%                 | 20.9%   | 13.3%   |
| Moore <sup>22</sup>                | 2003           | 2002                                    | 106                       | 64%      | >18 year old patients at a primary care clinic <sup>b</sup>                                    | 7.9%            | 25.0%   | 19.0%   |                      |         |         |
| Mosher <sup>69</sup>               | 2010           | Pre-2010                                | 421                       | 68%      | College students   |                 |         | 56.3%   | 24.1%                | 59.5%   | 47.7%   |
| NCI <sup>d 2</sup>                 | n/a            | 2005                                    | 5523                      | --       | ≥18 year olds in the Health Information National Trends  |                 |         |         |                      |         | 8.4%    |
|                                    |                | 2007                                    | 7424                      | --       | ≥18 year olds in the Health Information National Trends  |                 |         |         |                      |         | 8.8%    |
| NCI <sup>d 4</sup>                 | n/a            | 2005                                    | 3064                      | 49%      | 14-17 year olds in the National Health Interview Survey-Cancer Control Supplement              |                 |         |         | 2.0%                 | 15.5%   | 8.7%    |
|                                    |                | 2008                                    | 2204                      | 49%      | 14-17 year olds in the National Health Interview Survey-Cancer Control Supplement              |                 |         |         | 1.1%                 | 10.2%   | 5.5%    |
|                                    |                | 2010                                    | 2751                      | 49%      | 14-17 year olds in the National Health Interview Survey-Cancer Control Supplement              |                 |         |         | 1.2%                 | 7.9%    | 4.4%    |
| Neenan <sup>70</sup>               | 2012           | 2010                                    | 487                       | 60%      | Community college students >18 years old   | 17.7%           | 50.4%   | 37.2%   |                      |         |         |
| Oliphant <sup>48</sup>             | 1994           | 1991                                    | 1008                      | 52%      | 13-19 year olds <sup>b</sup>   | 15%             | 51%     | 34%     |                      |         |         |
| Poorsattar <sup>71</sup>           | 2007           | 2005-2006                               | 375                       | 65%      | University students <30 years old  | 17%             | 42%     | 33%     |                      |         |         |
| Reynolds <sup>49</sup>             | 1996           | Pre-1996                                | 465                       | 49%      | European-American 6th graders <sup>b</sup>   |                 |         | 3.3%    |                      |         |         |
| Robinson <sup>e 24</sup>           | 1997           | 1986                                    | 1012                      | 50%      | >18 year olds  |                 |         |         |                      |         | 2%      |
|                                    |                | 1996                                    | 1000                      | 53%      | >18 year olds  |                 |         |         |                      |         | 6%      |
| Robinson <sup>72</sup>             | 1997           | Pre-1997                                | 658                       | 48%      | 11-19 year olds  |                 |         |         | 1.2%                 | 16.4%   | 8.5%    |
| Sahn <sup>40</sup>                 | 2012           | 2007                                    | 415                       | 100%     | >18 year olds <sup>b</sup>   |                 |         |         |                      | 51.3%   |         |
| Savona <sup>6</sup>                | 2005           | 1999-2001                               | 483                       | 47%      | 13-19 year olds <sup>b</sup>   | 14%             | 27%     |         |                      |         |         |
| Stapleton <sup>73</sup>            | 2008           | Pre-2008                                | 174                       | 72%      | Undergraduates   |                 |         |         |                      |         | 42.9%   |
| Stryker <sup>43</sup>              | 2004           | 2000-2001                               | 1284                      | 100%     | Caregivers of adolescents in the Minnesota and Massachusetts Indoor Tanning Study <sup>b</sup> |                 |         |         |                      | 15.4%   |         |
| Woodruff <sup>36</sup>             | 2006           | Pre-2006                                | 94                        | --       | Parents of adolescents <sup>b</sup>  |                 |         | 22.34   |                      |         |         |
|                                    |                | Pre-2006                                | 94                        | --       | 14-17 year olds <sup>b</sup>   |                 |         | 11.7%   |                      |         |         |
| Zhang <sup>h 7</sup>               | 2012           | 2005                                    | 73494                     | 100%     | Nurses in the Nurses Health Study  |                 | 19.8%   |         |                      |         |         |
| <b>Canada</b>                      |                |   |                           |          |  |                 |         |         |                      |         |         |
| Genuis <sup>31</sup>               | 2009           | 2001-2007                               | 1411                      | 74%      | Adult and pediatric patients seen in 3 general medical clinics <sup>b</sup>                    |                 |         |         |                      |         | 9.4%    |
| Gordon <sup>19</sup>               | 2009           | 2006                                    | 1202                      | 54%      | Grade 10 students  | 7.6%            | 19.4%   | 14%     |                      |         |         |
| Rhainds <sup>74</sup>              | 1999           | 1996                                    | 1003                      | 58%      | Whites 18-60 years old   |                 |         |         | 8.6%                 | 12.8%   | 11.1%   |
| <b>Northern and Western Europe</b> |                |   |                           |          |  |                 |         |         |                      |         |         |
| <b>UK</b>                          |                |   |                           |          |  |                 |         |         |                      |         |         |
| Amir <sup>h 30</sup>               | 2000           | 1996                                    | 470                       | 89%      | Adult healthcare employees   | 29.0%           | 48.0%   | 44.0%   |                      |         |         |
| Hamlet <sup>e 28</sup>             | 2004           | 2003                                    | 1405                      | --       | 8-11 year olds   |                 |         |         |                      |         | 6.8%    |
| Jackson <sup>12</sup>              | 1999           | 1995                                    | 3105                      | --       | >16 year old patients at 16 general medical practices <sup>b f</sup>                           |                 |         | 17.0%   |                      |         |         |
| Mackay <sup>37</sup>               | 2007           | Pre-2007                                | 496                       | 50%      | 14-16 year olds <sup>b</sup>   | 25%             | 60%     | 43%     |                      |         |         |
| Thomson <sup>75</sup>              | 2010           | 2008-2009                               | 3101                      | 49%      | 11-17 year olds in the National Prevalence Study in England                                    | 3.5%            | 8.6%    | 6.0%    |                      |         |         |
|                                    |                | 2008-2009                               | 6209                      | 50%      | 11-17 year olds in the Six Cities Study  | 7.3%            | 14.4%   | 10.8%   |                      |         |         |
| <b>Ireland</b>                     |                |   |                           |          |  |                 |         |         |                      |         |         |
| Pertl <sup>33</sup>                | 2010           | 2007-2008                               | 590                       | 60%      | 16-26 year olds <sup>b f</sup>   |                 |         | 11.0%   |                      |         |         |
| <b>Iceland</b>                     |                |   |                           |          |  |                 |         |         |                      |         |         |
| Rafnsson <sup>h 13</sup>           | 2003           | Pre-2003                                | 1095                      | 78%      | Pilots and cabin attendants  | 52.3%           | 90.5%   | 82.2%   |                      |         |         |
|                                    |                | Pre-2003                                | 1918                      | 76%      | Sample of general population age and sex matched to the pilots and cabin attendants            | 64.1%           | 87.8%   | 82.2%   |                      |         |         |

| Reference                   | Year published | Year(s) of data collection <sup>a</sup> | Participants in study (N) | % female         | Population   | Ever prevalence |         |         | Past-year prevalence |         |         |
|-----------------------------|----------------|---|---------------------------|------------------|--|-----------------|---------|---------|----------------------|---------|---------|
|                             |                |   |                           |                  |  | Males           | Females | Overall | Males                | Females | Overall |
| Denmark                     |                |   |                           |                  |  |                 |         |         |                      |         |         |
| Bentzen <sup>76</sup>       | 2012           | 2011                                    | 5509                      | 50%              | 14-18 year olds  |                 |         |         | 28%                  | 70%     | 38%     |
| Køster <sup>5</sup>         | 2011           | March 2007                              | 3356                      | 57%              | 15-59 year olds <sup>†</sup>   |                 |         | 62.5%   | 21.8%                | 35.9%   | 29.9%   |
|                             |                | August 2007                             | 3497                      | 59%              | 15-59 year olds <sup>†</sup>   |                 |         | 59.7%   | 17.2%                | 35.3%   | 27.8%   |
|                             |                | 2008                                    | 3915                      | 52%              | 15-59 year olds <sup>†</sup>   |                 |         | 57.6%   | 17.5%                | 35.4%   | 26.7%   |
|                             |                | 2009                                    | 3746                      | 50%              | 15-59 year olds <sup>†</sup>   |                 |         | 59.1%   | 16.7%                | 30.1%   | 23.3%   |
|                             |                | March 2007                              | 342.25                    | --               | 15-19 year olds  |                 |         |         |                      |         | 50.3%   |
|                             |                | August 2007                             | 342.25                    | --               | 15-19 year olds  |                 |         |         |                      |         | 47.4%   |
|                             |                | 2008                                    | 342.25                    | --               | 15-19 year olds  |                 |         |         |                      |         | 44.2%   |
| 2009                        | 342.25         | --                                      | 15-19 year olds           |                  |  |                 |         |         | 32.9%                |         |         |
| Kraru <sup>77</sup>         | 2011           | 2008                                    | 1871                      | 54%              | 8-18 year olds   |                 |         | 20.8%   |                      |         | 16.5%   |
| Savona <sup>6</sup>         | 2005           | 1999-2001                               | 668                       | 53%              | 13-19 year olds <sup>b</sup>   | 52%             | 72%     |         |                      |         |         |
| Norway and Sweden           |                |   |                           |                  |  |                 |         |         |                      |         |         |
| Boldeman <sup>78</sup>      | 2001           | 1999                                    | 2684                      | 54%              | 20-50 year olds  | 51.3%           | 74.9%   | 64.0%   |                      |         |         |
| Boldeman <sup>79</sup>      | 2003           | 1993                                    | 1190                      | --               | 14-19 year olds  | 43.0%           | 70.1%   | 56.1%   |                      |         |         |
|                             |                | 1999                                    | 2891                      | --               | 14-19 year olds  | 19.3%           | 44.8%   | 32.9%   |                      |         |         |
| Brandberg <sup>80</sup>     | 1998           | 1996                                    | 2615                      | --               | Adolescents  |                 |         | 9.9%    |                      |         |         |
| Bränström <sup>81</sup>     | 2004           | 2001                                    | 1752                      | 56%              | 18-37 year olds  |                 |         | 35.0%   |                      |         |         |
| Nielsen <sup>3</sup>        | 2012           | 1990-1992                               | 40,000                    | 100%             | 25-64 year olds in the Melanoma Inquiry of Southern Sweden                         |                 | 50%     |         |                      |         |         |
| Veierød <sup>8</sup>        | 2010           | 1991-1992                               | 79042                     | 100%             | 30-50 year olds in the Norwegian-Swedish Women's Lifestyle and Health Cohort study |                 | 52.0%   |         |                      |         |         |
| Wichstrøm <sup>18</sup>     | 1994           | 1992                                    | 15169                     | 55%              | High school students   |                 |         |         | 34.9%                | 74.9%   | 57.1%   |
| Belgium                     |                |   |                           |                  |  |                 |         |         |                      |         |         |
| De Vries <sup>82</sup>      | 2006           | Pre-2006                                | 602                       | 59%              | 14-18 year olds  |                 |         | 36.5%   |                      |         |         |
| Germany                     |                |   |                           |                  |  |                 |         |         |                      |         |         |
| Börner <sup>10</sup>        | 2009           | 2007                                    | 1419                      | 52% <sup>i</sup> | 18-90 year olds  |                 |         | 28.8%   |                      |         |         |
|                             |                | 2007                                    | 81                        | 52% <sup>i</sup> | 14-17 year olds  |                 |         | 18.5%   |                      |         |         |
| Schneider <sup>83</sup>     | 2009           | 2008                                    | 500                       | 49%              | 18-45 year olds in the SUN-Study (Sunbed-Use: Needs for Action-Study)              | 34.8%           | 59.0%   | 46.7%   | 16.0%                | 26.6%   | 21.0%   |
| Schneider <sup>14</sup>     | 2012           | 2011-2012                               | 4333                      | 49% <sup>i</sup> | 18-45 year olds in the SUN-Study (Sunbed-Use: Needs for Action-Study)              |                 |         | 42.9%   |                      |         | 15.7%   |
|                             |                | 2011-2012                               | 518                       | 49% <sup>i</sup> | 14-17 year olds in the SUN-Study (Sunbed-Use: Needs for Action-Study)              |                 |         | 8.7%    |                      |         | 5.2%    |
| Unverricht <sup>e h 9</sup> | 2007           | Pre-2007                                | 149                       | --               | 20-65 year olds with outdoor occupations   |                 |         |         |                      |         | 12.8%   |
| Austria                     |                |   |                           |                  |  |                 |         |         |                      |         |         |
| Schauberger <sup>e</sup>    | 1992           | 1990                                    | 1500                      | --               | >16 year olds <sup>†</sup>   |                 |         |         |                      |         | 9.8%    |
| France                      |                |   |                           |                  |  |                 |         |         |                      |         |         |
| Ezzedine <sup>84</sup>      | 2008           | 2001                                    | 7200                      | 59%              | 35-60 year olds  | 6%              | 21%     | 15%     |                      |         |         |
| Isvy <sup>h 17</sup>        | 2012           | 2010                                    | 570                       | 70%              | 5th or 6th year medical students and first-year medical residents                  | 9.2%            | 15.4%   | 13.5%   |                      |         |         |
| Tella <sup>b 21</sup>       | 2012           | 2011                                    | 704                       | 48%              | <18 year olds  | 0.3%            | 2.7%    | 1.4%    |                      |         |         |

| Reference                   | Year published | Year(s) of data collection <sup>a</sup> | Participants in study (N) | % female | Population  | Ever prevalence |         |         | Past-year prevalence |         |         |
|-----------------------------|----------------|---|---------------------------|----------|---|-----------------|---------|---------|----------------------|---------|---------|
|                             |                |   |                           |          |   | Males           | Females | Overall | Males                | Females | Overall |
| <b>Spain</b>                |                |   |                           |          |   |                 |         |         |                      |         |         |
| Galán <sup>85</sup>         | 2011           | 2007                                    | 2007                      | 51%      | 18-64 year olds in El Sistema de Vigilancia de Factores de Riesgo asociados a Enfermedades No Transmisibles |                 |         |         | 1.9%                 | 6.6%    | 4.3%    |
| <b>Italy</b>                |                |   |                           |          |   |                 |         |         |                      |         |         |
| Fabbrocini <sup>50</sup>    | 2012           | 2011                                    | 191                       | 61%      | 16-19 year olds <sup>b</sup>  |                 |         | 40.0%   |                      |         |         |
| Monfrecola <sup>35</sup>    | 2000           |   | 764                       | 58%      | High school and university students 16-21 years old <sup>f</sup>  |                 |         | 12.3%   |                      |         |         |
| <b>Slovakia</b>             |                |   |                           |          |   |                 |         |         |                      |         |         |
| Jakusova <sup>e 23</sup>    | 2012           | 2003                                    | 311                       | --       | College students  |                 |         | 39%     |                      |         |         |
|                             |                | 2005                                    | 367                       | --       | College students  |                 |         | 30%     |                      |         |         |
|                             |                | 2008                                    | 163                       | --       | College students  |                 |         | 13%     |                      |         |         |
| <b>Australia</b>            |                |   |                           |          |   |                 |         |         |                      |         |         |
| CER, NSW <sup>j 34</sup>    | n/a            | 2005                                    | 11241                     |          | ≥16 year olds in the New South Wales Population Health Survey   |                 |         |         | 2.0%                 | 2.6%    | 2.3%    |
| CER, NSW <sup>j 86,87</sup> | n/a            | 2005                                    | 2618                      | 53%      | 12-17 year olds in the New South Wales School Students Health Behaviors Survey                              |                 |         |         | 11.5%                | 13.3%   | 12.4%   |
|                             |                | 2008                                    | 7448                      | 56%      | 12-17 year olds in the New South Wales School Students Health Behaviors Survey                              |                 |         |         | 7.0%                 | 7.5%    | 7.2%    |
| Francis <sup>20</sup>       | 2010           | 2003/2004                               | 5073                      | 50%      | 18-69 year olds   | 6.5%            | 15.4%   | 10.9%   | 1.3%                 | 3.0%    | 2.2%    |
|                             |                | 2006/2007                               | 5085                      | 50%      | 18-69 year olds   | 5.5%            | 15.7%   | 10.6%   | 0.9%                 | 2.1%    | 1.5%    |
|                             |                | 2003/2004                               | 699                       | 49%      | 12-17 year olds   | 2.8%            | 3.8%    | 3.4%    | 0.3%                 | 2.3%    | 1.2%    |
|                             |                | 2006/2007                               | 652                       | 49%      | 12-17 year olds   | 1.5%            | 3.4%    | 2.5%    | 0.0%                 | 1.3%    | 0.6%    |
| Gordon <sup>h 29</sup>      | 2012           | 2009                                    | 2867                      | 60%      | Indoor office workers   |                 |         |         |                      |         | 2.5%    |
| Lawler <sup>88</sup>        | 2006           | 2004                                    | 9298                      | 50%      | 20-75 year olds   |                 |         | 10.7%   | 0.5%                 | 1.3%    | 1.3%    |
| <b>Unknown</b>              |                |   |                           |          |   |                 |         |         |                      |         |         |
| Yoo <sup>89</sup>           | 2009           | Pre-2009                                | 155                       | 0%       | 11-18 year olds   | 9.4%            |         |         |                      |         |         |

Entries listed by region, country, alphabetically by reference, date of publication, and date of data collection.

n/a indicates not applicable (i.e. study not published and has no publication date)

-- indicates data not available

<sup>a</sup> 'Pre' indicates that no specific date of data collection was available

<sup>b</sup> Unclear or convenience sampling. Excluded in the sensitivity analysis that excluded studies of potentially lower methodologic quality.

<sup>c</sup> United States Centers for Disease Control (CDC)

<sup>d</sup> United States National Cancer Institute (NCI)

<sup>e</sup> Studies that reported exposure measures that did not specifically fit our 'ever exposure' nor 'past year exposure' definitions and were not included in primary analyses but only in sensitivity analyses.

<sup>f</sup> Studies that reported combined results of children (> 15 years or > 16 years) and adults or children and university students that could not be split into subgroups. These were included in the adult category or the university student category for primary analysis and were removed in a sensitivity analysis.

<sup>g</sup> Morbidity and Mortality Weekly Report Surveillance Summary (MMWR)

<sup>h</sup> Studies that assessed specific occupational groups and were not included in primary analyses but only in sensitivity analyses.

<sup>i</sup> Percent female of the entire study, not specific to the population subset listed on this row

<sup>j</sup> Center for Epidemiology and Research, New South Wales Department of Health (CER, NSW)



eTable 2: Results of sensitivity analyses

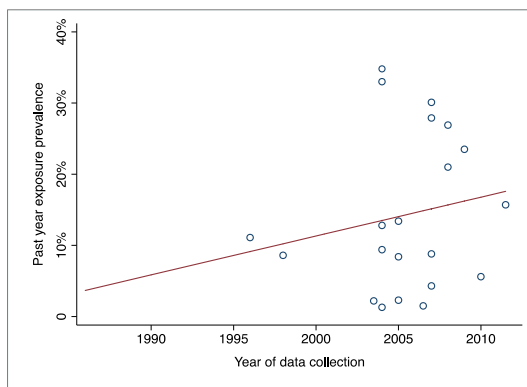
| <b>Ever exposure</b>      |   | <b>Summary prevalence<br/>(95% CI)</b> | <b>No. of<br/>records</b> |
|---------------------------|---|--|---------------------------|
| Adults                    | Primary analysis  | 35.7% (27.5%-44.0%)                    | 22                        |
|                           | <i>Sensitivity - inclusion of occupational group records</i>                          | 38.9% (30.1%-47.8%)                    | 26                        |
|                           | <i>Sensitivity - exclusion of records that included participants &lt;18 years old</i> | 32.0% (24.8%-39.2%)                    | 15                        |
|                           | <i>Sensitivity - exclusion of records of lower methodologic quality<sup>a</sup></i>   | 38.7% (27.4%-49.9%)                    | 14                        |
| University students       | Primary analysis  | 55.0% (33.0%-77.1%)                    | 11                        |
|                           | <i>Sensitivity - inclusion of non-standard measures<sup>b</sup></i>                   | 49.1% (29.9%-68.3%)                    | 14                        |
|                           | <i>Sensitivity - exclusion of records that included high school students</i>          | 59.3% (41.6%-77.0%)                    | 10                        |
| Adolescents               | Primary analysis  | 19.3% (14.7%-24.0%)                    | 23                        |
|                           | <i>Sensitivity - exclusion of records of lower methodologic quality<sup>a</sup></i>   | 19.2% (13.5%-24.8%)                    | 14                        |
| <b>Past year exposure</b> |   |  |                           |
| Adults                    | Primary analysis  | 14.0% (11.5%-16.5%)                    | 21                        |
|                           | <i>Sensitivity - inclusion of non-standard measures<sup>b</sup></i>                   | 12.9% (10.7%-15.2%)                    | 25                        |
|                           | <i>Sensitivity - inclusion of occupational group records</i>                          | 13.4% (11.0%-15.8%)                    | 23                        |
|                           | <i>Sensitivity - exclusion of records that included participants &lt;18 years old</i> | 11.3% (8.8%-13.8%)                     | 15                        |
|                           | <i>Sensitivity - exclusion of records of lower methodologic quality<sup>a</sup></i>   | 12.7% (9.8%-15.5%)                     | 16                        |
| University students       | Primary analysis  | 43.1% (21.7%-64.5%)                    | 7                         |
|                           | <i>Sensitivity - inclusion of non-standard measures<sup>b</sup></i>                   | 39.8% (21.5%-58.2%)                    | 8                         |
| Adolescents               | Primary analysis  | 18.3% (12.6%-24.0%)                    | 23                        |
|                           | <i>Sensitivity - inclusion of non-standard measures<sup>b</sup></i>                   | 17.8% (12.4%-23.2%)                    | 25                        |
|                           | <i>Sensitivity - exclusion of records of lower methodologic quality<sup>a</sup></i>   | 13.3% (6.4%-20.3%)                     | 17                        |

<sup>a</sup> Records with lower methodologic quality were those with unclear sampling, convenience sampling, or sample sizes less than 500.

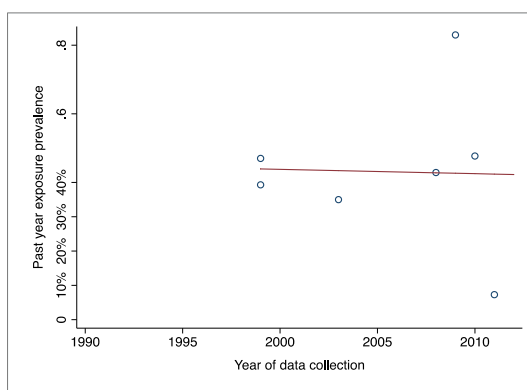
<sup>b</sup> Non-standard measures were those that did not specifically fit our 'ever exposure' nor 'past year exposure' categories.

eFigure. Results of meta-regressions of past-year exposure prevalence and year of data collection

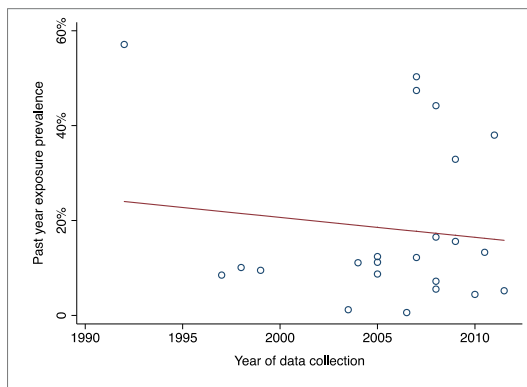
a. Adults



b. University students



c. Adolescents



Each circle represents a data point. Red lines represent the result of a meta-regression. All p-values >0.05.

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