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## A Survey of Sun Protection Policy and Education in Secondary Schools

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### Abstract

**Background**—The Centers for Disease Control and Prevention (CDC) issued recommendations for school programs to reduce skin cancer.

**Objective**—Personnel at U.S. secondary schools were surveyed to describe sun protection policy and education prior to these recommendations.

**Methods**—School principals or other personnel at 484 secondary schools in 27 cities responded to a telephone survey in January and February 2002 (response rate = 31%).

**Results**—A sun protection policy was reported at 10% of the schools but sun protection education occurred at nearly all schools (96%). Policies were more prevalent in regions with high ultraviolet radiation ( $p < .0001$ ) but education was not. Many personnel were willing to adopt a policy (41%) and interested in obtaining a sun safety curriculum (96%).

**Limitations**—Self-report measures, non-response, and new schools not in the sampling frame.

**Conclusion**—Sun protection was a low policy priority for U.S. schools. Sun safety education was prevalent but written materials were used infrequently. A substantial proportion of school personnel were receptive to the CDC's advice.

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In 2002, the U.S. Centers for Disease Control and Prevention issued recommendations to the nation's schools to implement programs to prevent skin cancer through policy, supportive environments and health services, regular education, family involvement, professional

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**Statement on Potential Conflict of Interest:** The authors of this manuscript produced the *Sunny Days, Healthy Ways* sun safety curriculum for grades 6–8. Dr. Buller is employed by, and Ms. Buller is an owner of, Klein Buendel, Inc., which intends to market this curriculum to schools. Dr. Reynolds currently works with Klein Buendel, Inc. on another sun safety project through a subcontract from Klein Buendel to the University of Southern California.

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development of staff, and on-going evaluation of the programs.<sup>1</sup> Prior these recommendations, we surveyed principals, teachers and other relevant school personnel at public secondary schools enrolling children in grades 7–12 in 27 cities in the United States that provided a picture of the sun protection policy and education landscape to which these recommendations applied.

The survey was modeled after one conducted with elementary school principals in 1998.<sup>2</sup> In that survey, principals at only 3% of schools reported that there was a sun protection policy for children and less than one-quarter of elementary schools provided sun protection education in the past three years. A similar dearth of policies was observed in elementary schools in Hawaii, although nearly half of them taught children sun safety.<sup>3</sup> The principals expressed strong support for sun protection policies but also needed resources to create and implement them (e.g., information for staff and parents about sun safety; a model policy).

## Methods

### Participants

A sample of 1,591 public secondary schools in 27 metropolitan areas in the United States in 2002 was selected at random from a list of schools obtained from the National Center for Education Statistics (NCES). To be eligible, schools had to contain at least one grade in the range from grade seven to 12. The cities were the same as those selected for the survey of elementary schools in 1998 to allow comparison. They were chosen from the 58 U.S. cities regularly reporting the UV Index in 1997 in nine regions defined by UVR intensity.

Schools were selected proportional to the number of schools in each city. The proportion of completed interviews in each metropolitan area was similar to the original proportionate sampling procedure (deviations ranged from  $-0.06$  to  $+0.03$ ).

One respondent was interviewed per school. School principals were initially contacted but they could designate another staff person to answer the survey. Respondents held the jobs of principals, assistant principals, health, physical education, science, and family studies teachers, school nurses, and social workers

### Interviewing Procedures

The principal of each school was sent an introductory letter explaining the purpose of the survey and professional interviewers from an in-house survey research unit subsequently contacted them to conduct the survey. Interviewers completed the survey by telephone with school personnel at 484 eligible schools (31%) (50 without a valid telephone number). Personnel at 271 schools refused to be interviewed (142 respondent refusals, 53 gatekeeper refusals, 76 said they needed school district approval to participate) (17%), at two schools failed to completed the survey, and at 834 schools could not be reached (270 answering machines were encountered, 184 gatekeepers took a message, 293 respondent not available) (52%).

Bias caused by non-response was investigated in several ways. Later responding school personnel (based on date of interview), who might be more similar to nonresponding personnel, were in larger schools ( $r=0.12$ ,  $p=.008$ ) with lower proportions of white, non-Hispanic students ( $r=-0.14$ ,  $p=.002$ ) in regions with higher UVR ( $r=0.10$ ,  $p=.034$ ) than earlier responding personnel but did not report any greater perceived importance of sun protection education ( $p>.05$ ) or presence of a sun protection policy ( $p>.05$ ). Those who responded after more attempts were made to reach them also were from larger schools ( $r=0.17$ ,  $p=.0001$ ) but were more likely to report the presence of a sun protection policy ( $r=0.10$ ,  $p=.034$ ) than those reached with fewer attempts.

## Questionnaire

The questionnaire contained 60-items that assessed (a) school and student characteristics (number of teachers, size and ethnic composition of students, grade levels); (b) sun protection education in the past 3 years; (c) respondents' attitudes toward sun protection education; (d) school plans to include sun protection education in the future; (e) tools and resources desired by the respondents to conduct sun protection education; (f) presence and content of sun protection policy; (g) school policies that prohibit personal sun protection (e.g., sunscreen, sunglasses); (h) respondents' willingness to develop a sun protection policy; (i) resources desired by the respondent to create a policy; (j) presence and extent of outdoor shade; and (k) time scheduled for outdoor activities by children.

## Statistical Analysis

Frequency of responses was calculated. Chi-square statistics were used to compare differences in policies by regions of low and high UVR intensity, with an alpha level set at  $p < .05$ . A weighted analysis was calculated based on sampling fractions within cities to balance the sample with respect to metropolitan area population.

## Results

### Profile of Schools

On average, each school enrolled over 1,000 students, which was higher than the national average (795 students) in 2000–2001.<sup>4</sup> Respondents over-represented senior high schools (15% of schools contained grades 7–8 or 7–9 and 63% grades 9–12 or 10–12 in 2000–01 nationwide).<sup>4</sup> The respondents' schools had a majority of non-Hispanic white students, with sizable minorities of African American and Hispanic students. About 1 in 3 schools were located in regions with high UVR intensity (UV Index range=7–9). See Table 1.

### Sun Protection Policy

Sun protection policies were uncommon in secondary schools (Table 1), and when present, addressed scheduling outdoor activities to avoid having children outside during daily peak UVR ( $n=13$ ), requiring children to wear shirts with sleeves ( $n=22$ ), hats with a brim ( $n=12$ ), or sunglasses ( $n=6$ ), or requiring children to wear sunscreen during outdoor times ( $n=5$ ). Policies were more prevalent in high UVR intensity regions (22.7%) than low UVR intensity regions (5.0%;  $\chi^2=34.41$ ,  $p < .0001$ ).

Some schools had policies that discouraged sun protection. Hats and sunglasses were prohibited at some schools and very few provided sunscreen (Table 1). At one-third of schools, students were outdoors at midday when UVR was most intense; the percentage of schools with children outdoors at midday did not differ by regional UVR intensity ( $\chi^2=0.307$ ,  $p=.580$ ).

**Policy Development**—Two-fifths of personnel at schools without sun protection policies were willing to create them (Table 1), regardless of regional UVR intensity ( $\chi^2=1.34$ ,  $p=0.247$ ). They were most supportive of requiring students to wear shirts with sleeves, sunscreen, hats, and sunglasses, but few would re-schedule outdoor activities (Table 1). School personnel desired several resources to help them with policy development, most commonly materials to educate teachers, staff, and parents about the importance of sun safety, a sample policy, and step-by-step instructions on creating a policy (Table 1).

**Shade Provision**—Shade was provided at over half of the schools, mostly by trees and in a very limited area (Table 1). Most personnel were willing to increase the amount of shade, if

funds were available. Shade (high=81.7%, low=49.6%; chi-square=42.78,  $p<.0001$ ) and willingness to increase shade (high=72.8%, low=58.8%; chi-square=8.43,  $p=.004$ ) were more common in high rather than low UVR intensity regions.

### Sun Protection Education

Almost all respondents endorsed the importance of teaching students sun safety and reported that some form of sun protection education occurred in their school (most in the current year and mainly in health, science, and physical education classes) (Table 1). Neither response differed by regional UVR level ( $p>.05$ ). However, a written curriculum on sun protection was used at only one-quarter of schools.

There was strong interest in adding instructional materials on sun protection either through written or computer-based instructional materials. Many personnel also desired materials for parents and were interested the daily UV index from the National Weather Service (Table 1). In their opinion, sun protection education would be most well-received by students in health class (Table 1). Personnel at schools in higher UVR regions (84.5%) expressing more interest in written instructional materials than in lower UVR regions (76.2%; chi-square=4.08,  $p=.043$ ) (this difference did not exist when the data was weighted by the sampling fractions within each city; chi-square=1.96,  $p=.161$ ). Nearly all schools had money available to purchase additional instructional materials but only a few personnel at the school level had the authority to decide to purchase new curricular materials.

## Discussion

### Sun Protection Policy

In 2002, only a minority of secondary schools in the United States had sun protection policies, although this was slightly higher than the proportion of elementary schools nationwide with such a policy in 1997 or in Hawaii in 2002.<sup>2,3</sup> Sun protection policies still appear to be a relatively low priority for school personnel. Greater public awareness of the dangers of over exposure to the sun, forums to educate school principals, other administrators, and teachers on the CDC's guidelines for school programs to prevent skin cancer, and provision of resources to help them create and implement policies may improve this situation. However, there is little evidence on successful strategies for convincing school districts to adopt such policies.<sup>5,6</sup>

Many secondary school personnel appear receptive to the idea of develop a sun protection policy so organized efforts to promote sun protection policy may be successful. Efforts should focus on promoting the use of sunscreen and changing the dress code to require hats, protective clothing and sunglasses. Schedule changes may be more difficult because it may not be possible to accommodate the large number of classes and organizations that conduct outdoor activities on school grounds without scheduling during the midday hours.

Any policy change program needs to provide school personnel with tools and resources to develop comprehensive policies, not simply tell them to do so. It also must address existing policies that work against sun safety such as prohibiting hats and sunglasses in order to avoid other health problems such as head lice transmission or due to concerns over the display of gang insignias or colors. State and local governments and school districts may need to modify statutory requirement concerning over-the-counter medicines designed to control liability for undesirable side effects in order to increase the use of sunscreen. Where government regulations do not prohibit these items, health officials must make sure that school personnel do not inadvertently enact policies that restrict them.

Changes to school schedules and in the structural and environmental features (e.g., trees, shade covering) of schools may be a longer-term goal in secondary schools, as it is in primary schools.

Structure and environmental modifications also face financial challenges; however, one strategy may be to encourage schools to include shading in the design of new school buildings and renovation and upgrades of existing schools and school grounds. Undoubtedly, school officials will need information on the shading properties of various materials and trees, and on effective and affordable shade structure designs.

### Sun Protection Education

Some information about sun protection was being taught to children in nearly all schools; however, the situation may not be as positive as these data imply. This instruction may not be very comprehensive or effective if it did not involve the use of written curricula. It may be taught in science classes where only technical aspects of UVR are considered such as an environmental feature or as part of biology where the skin within human anatomy. Such approaches may not address the breadth of content needed to motivate children to take precautions such as emphasizing the health consequences, effectively teaching prevention strategies using behavioral modeling and goal-setting, and addressing common barriers to sun protection encountered by adolescents (e.g., peer pressure to tan).<sup>7, 8, 9</sup>

Some school personnel appear receptive to the idea of adopting formal instructional materials on sun safety. Unfortunately, evidence-based sun safety instructional materials for secondary schools is in limited supply,<sup>5, 10</sup> although we reported that the Sunny Days, Healthy Ways curriculum produced positive outcomes in grades 6–8.<sup>7, 11</sup> Still, school personnel will probably need to be convinced to spend the small resources available to schools on sun protection curriculum. As of 2002, most schools still had funds to purchase supplementary instructional materials but many also faced restrictions on adoption decision from the bureaucracy in their school districts. These limitations may explain why despite the professed interest among elementary school principals, few purchased the Sunny Days, Healthy Ways curriculum when we promoted it to them in a recent trial.<sup>12</sup> Additional efforts undoubtedly will be needed to disseminate evidence-based sun safety education to secondary schools, too.

### Limitations to the Survey

Response validity is a concern with the self-report measures. Not only are they subject to social desirability biases but in this survey some of the responding personnel may not have been familiar with the policies, conditions, and issues assessed. Efforts to validate them are needed, such as using objective assessments of written policies and amount of shade. The low response rate also is a concern. Secondary school personnel were less willing to complete the survey than elementary school principals. It appears that response came more from personnel with greater time to do the survey, who felt that sun protection was more relevant, and who worked in senior high schools. Those with more time pressures and less interest may be less likely to adopt sun protection policies and education. The findings also may apply mainly to secondary schools rather than those with grades 7 and 8. Finally, the NCES list was missing new schools, even though it was the most comprehensive list available. Fortunately, we found that there were no differences between new and existing elementary schools in the NCES list in our survey of elementary schools.<sup>2</sup>

### Summary

The CDC has concluded that sun protection policy and education at schools is an important piece of community-wide sun protection efforts.<sup>1</sup> But they are only one of several potentially effective venues in any community for promoting sun safety for children. Moreover, schools face constant cross-pressures on their policies and curriculum that may make skin cancer prevention a low priority. As children progress through secondary school the amount of time outdoors appears to decline, with less formal outdoor recess and the reduced presence of physical education classes. Thus, school personnel may believe that there is less need for sun

protection policies in secondary than primary schools. However, children take more responsibility for their own health behavior and tanning norms emerge during secondary school, so sun protection policies and education at school is one community channel to help instill lifelong sun safety habits in children.

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Table 1

## Responses from School Personnel

	<u>Response</u>
<u>School Characteristics (n=484):</u>	
Number of students (mean)	1,222 sd=903
Grades: 7–8 or 7–9	4%
9–12 or 10–12	90
Other combination of secondary grades	4
Refused to report	2
Student Ethnicity: Non-Hispanic White	58%
Hispanic White	17
African-American	17
Other	8
UV Intensity Regions: High (Southeast, Southern California, Southwest Cities)	35%
Low (Northeast, Midwest, and North West Cities)	65
<u>School Policies Related to Sun Protection (n=484):</u>	
Have a policy with rules or recommendations for students, teachers, staff or parents designed to improve sun protection	10%
Have a policy at that prohibits students from wearing hats	30%
Have a policy that prohibits students from wearing sunglasses	16%
Is sunscreen provided for students while students while outdoors	7%
<u>Development of School Policies on Sun Protection:</u>	
Would be willing to develop a policy on sun protection for your school (n=484)	42%
Requirements (n=229): Shirts with sleeves	47%
Hats with a brim	37%
Sunglasses	34%
Sunscreen with SPF 15 or greater	46%
Avoid having children be outside during daily periods of peak ultraviolet radiation	23%
Things that might be helpful for developing a school sun protection policy (n=229): <sup>a</sup>	
Printed materials explaining sun safety for your teachers and staff	88%
Printed step-by-step instructions on creating a sun protection policy	72%
Tool to evaluate your school's current sun protection policy and environment	53%
Example of a school sun protection policy	82%
Printed message for parents explaining why sun protection is important at school	82%
A consultant who drafted a sun protection policy or a qualified person, who presented a seminar to your staff	45%
A qualified person to present a seminar for parents	41%
<u>School Schedules and Environment:</u>	
Most outdoor activities occur between 10 am and 2 pm (n=484)	37%
Does your school have any structures that provide shade and/or shelter (n=484)	59%
Type (n=285): Outdoor shelters	11%
Awnings	17%
Planted trees	31%
Other	41%
Percentage of the outdoor space shaded and/or sheltered (n=285): 0%–20%	60%
21%–40%	27
41%–60%	9
61%–80%	3
81%–100%	1
Willing to make structural changes to increase the amount of shade, if funds were available (n=484)	63%
<u>Sun Safety Education:</u>	
Important to teach children about sun protection (n=484) <sup>b</sup>	96%
Education on sun protection currently provided at your school (n=484)	93%
Venue (n=451): Health education class	39%
Physical education/gym	16
Science class	21
Environment class	4
Some other class	6
Guest speaker	7
Other	7
Sun protection education program took place this school year (n=451)	74%
A written sun protection curriculum was used (n=451)	26%
<u>Adding Sun Safety Instructional Materials (n=484):</u>	
Interested in obtaining: A sun protection curriculum designed specifically for secondary school grades	79%
A CD-ROM, website or other educational technology that teaches sun protection	87%
Materials that you could distribute to parents explaining the importance of sun protection and instructions on proper precautions	78%
The daily Ultra-Violet or U.V. Index	68%
Venue sun protection education would be most well-received by students:	
Health education class	47%
Physical education class	17%
Science class	17%
Other	19%
School has money available to purchase additional instructional materials to supplement existing curriculum	82%
Who is required to approve a new curriculum purchased from a publishing company:	
Curriculum committee or administrator at the district level	39%

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	<b>Response</b>
School principal	21
Individual teacher	21
Some other person or group	19

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<sup>a</sup>Percentage reporting 4 or 5 on a 1 (not helpful at all) to 5 (very helpful) scale.

<sup>b</sup>Percentage responding “very important” or “somewhat important.”