

## Appendix L: Additional Research by Klein Buendel

### Additional information for SSA, Section A.1:

Klein Buendel's research group has collected data to evaluate sun protection interventions with adults in community settings. Among the most relevant are studies working with an outdoor recreation industry. In these projects, many adults made poor sun safety decisions. Few adults complied with sunscreen advice. While, 50% wore sunscreen with SPF 15+, 27% did not pre-apply it and 80% did not reapply. Only 15% were in total compliance (50% did not use sunscreen). Compliance was lowest during inclement weather (5.7%,  $p < .0001$ ), by males (5.1%,  $p < .0001$ ) and among adults who felt skin cancer was less personally important (5.2%,  $p < .0001$ ), had less sun sensitive skin (6.7%,  $p < .0001$ ) and were 18-25 years old (5.7%,  $p < .0001$ ).<sup>58</sup> In another analysis, adults failed to accurately assess UV levels.<sup>59</sup> Clear skies ( $b = -0.944$ ,  $p < .001$ ), elevation ( $b = 0.202$ ,  $p < .001$ ), deviation from winter solstice ( $b = 0.194$ ,  $p < .001$ ), and proximity to noon ( $b = 0.146$ ,  $p < .001$ ) strongly predicted UV levels, with latitude ( $b = -0.106$ ,  $p = .002$ ) and temperature ( $b = 0.054$ ,  $p < .001$ ) having weak associations. But, adults mainly used cloud cover when deciding to wear sunscreen, lip balm, and reapply sunscreen, with some consideration of latitude. They did not attend to seasonality, proximity to noon, or elevation. They took more precautions in warm weather, but temperature was an unreliable UV indicator. A series of messages placed in the outdoor recreation environment improved sun protection by adults visiting these environments (composite sun protection behavior: mean=4.07 [0-2 types of GSS messages implemented], 4.68 [3-4 types], 4.36 [5-6 types],  $p < .001$ ; use of sunscreen and lip balm: mean=0.83 [intervention, no message recall], 1.01 [intervention, message recalled], 0.89 [control, no message recall], 0.89 [control, message recalled],  $p = 0.002$ ).<sup>60</sup>

The research group at Klein Buendel has tested a number of technology-based interventions for improving cancer prevention. Most recently, Klein Buendel has evaluated a mobile phone application for supporting smoking cessation.<sup>61</sup> A sample of 100 U.S. adult smokers aged 18 to 30 were recruited, pretested and randomized to either an experimental group receiving Real e Quit Mobile (REQ-Mobile) or a group receiving text messages on cessation. Both mobile interventions produced smoking abstinence at 12-weeks, with abstinence higher among those who used either program compared to non-users (30-day point prevalence abstinence: used=46%, not used=21%,  $p = 0.04$ ) and when the programs were used more frequently ( $b = 0.01$ ,  $p < 0.01$ ). Smoking abstinence was somewhat higher among text message users than REQ-Mobile users (point-prevalence abstinence: 80% text message, 52% REQ-Mobile among completers,  $p < .05$ ; 55% text message, 55% REQ-Mobile intent-to-treat,  $p < .05$ ). In this trial, Dr. Buller developed successful protocols for recruiting smokers, provided them with a mobile application on a smart phone with the Windows Mobile operating system, tracked usage of the mobile application, provided technical support to users, and posttested at 6 and 12 weeks post randomization.

Additionally, Klein Buendel's research group has considerable experience assessing sun protection by adults. In two trials with the North American ski industry, employee ( $n = 4,342$ ), and guests ( $n = 11,799$ ) were interviewed at over 100 ski areas on sun safety, including measures of sunburn prevalence, frequency of sun protection behavior (reliability  $\alpha = 0.66$ ), perceived

need, norms for sun safety, demographic characteristics, skin type, skin cancer history, sunburn prevalence, and outcome and self-efficacy expectations.<sup>60,62-64</sup> Klein Buendel also assessed sun protection in samples of workplace managers, school district administrators and principals, parents, and residents of Denver.<sup>65,66</sup> Dr. Buller worked on an NCI-sponsored project that pretested sun protection measures for adults and adolescents.<sup>67,68</sup>

Additional information for SSA, Section A.6:

A recent trial on validity of sun protection measures identified three months as an optimal recall period. While these trial results are not yet published, Dr. Hillhouse shared his findings with Klein Buendel. With NCI funding, Dr. Hillhouse tested the validity of sunburn and sun protection measures, comparing 3-month recalls to weekly diaries during the summer (n=250 adults). 3-month sunburn recall was validated: 190 and 191 adults reported at least 1 sunburn on weekly diaries and end-of-summer assessment ( $p<.001$  for association); 88% reporting a sunburn on both diaries and end-of-summer report (although 40% reported one on diaries but not end of summer); and 3-month sunburn recall had a 0.60 specificity and 0.88 sensitivity.

References can be found at the end of the Supporting Statement A.