Saving Skin: A Model of Optimal Sunscreen Reapplication Time, Integrated into a Pre-Existing Mobile Application

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Many people do not know when to reapply sunscreen, if at all, greatly contributing to the increase in melanoma incidence worldwide. While many health organizations recommend reapplication every two hours, this number is blanketed and impersonal as it does not account for individual variation in skin type and history, or activity level. My project fills this gap by determining the personalized optimal sunscreen reapplication time and integrating this into the mobile app, Saving Skin, that I created last year, giving this project global implications. I realized that the reason sweat decreases sunscreen's effectiveness is because it washes off sunscreen. Thus, my redesign modeled someone sweating during exercise and tested to see after how many minutes of physical activity each sunscreen washed off. I tested the three best-performing sunscreens from last year's project and told the user to reapply after all the sunscreen had washed off. I found that, if using Banana Boat Sport Faces SPF 30 or 40% Zinc Oxide, reapply after 10 minutes into exercise, if Coppertone Sport Broad Spectrum SPF 30, after 25 minutes into exercise, so physical activity greatly alters the commonly recommended reapplication time. In order to take into account factors other than activity level, I used the risk analysis conducted last year in that the app recommended a specific sunscreen to the user after determining their cumulative risk for melanoma development. Then, the user indicates which sunscreen they were recommended to use and the app starts a timer of when they should reapply.

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