Poster ID - P0717

Development of a Predictive Photoaging Risk Model to Improve Photoprotection Adherence in Young Adults

Jonathan SERAFINI[1], Catherine BAISSAC[2], Camille BOUDET[3], Gautier DOAT[3], Giovanni PELLACANI[4]

1. DATA ORA, Bordeaux, France
2. Patient Affairs Department, Pierre Fabre Dermo-Cosmetics & Personal Care, Toulouse, France
3. Medical Department, Laboratoires Dermatologiques Eau Thermale Avène, Pierre Fabre Dermo-Cosmetics & Personal Care, Lavaur, France
4. Dermatology Department, La Sapienza University, Roma, Italy

Introduction & Objectives

Melanoma is one of the most frequent cancers in young adults and accounts for a substantial proportion of cancers occurring before the age of 30. Despite well-established prevention campaigns promoting photoprotection, adherence to recommendations remains insufficient.

At the same time, concerns related to appearance and skin ageing often have a greater impact than long-term cancer risk in young people, who are also responsive to experiential and personalised tools.

Objective: to develop a digital, engaging tool that estimates individual photoaging risk with AI support, with the aim of improving engagement in photoprotective behaviours.

Materials & Methods

A predictive photoaging model was developed using a data-driven approach based on an in-depth review of the scientific literature. Six factors known to influence photoaging were integrated — phototype, sun exposure, use of sun protection, age, sex and geographical latitude. Each was assigned a coefficient derived from published studies reporting quantitative associations with photoaging markers (wrinkle severity, DNA damage, erythemal response). The model has a multiplicative structure; its outputs were compared with observational and experimental data from the literature to verify consistency with established clinical knowledge.

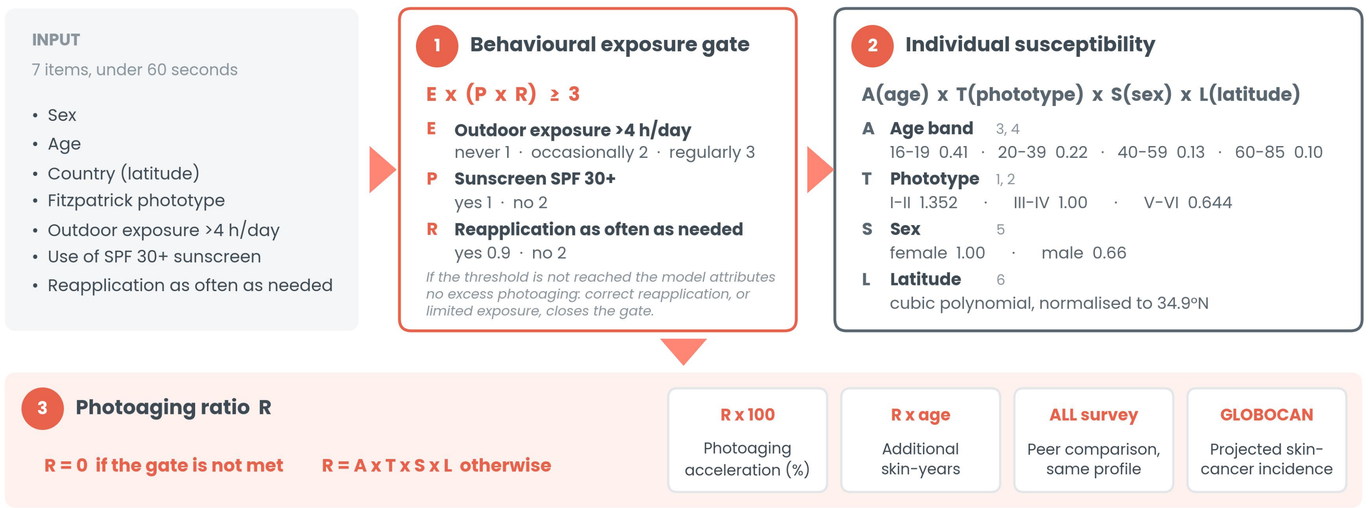


Figure 1. Model architecture. Superscripts refer to the numbered references. Peer comparison and skin-cancer projections are contextual layers, not model outputs.

Results

The model reproduces the three gradients established in the photoaging literature — **age, phototype and ambient UV** — and isolates a single behavioural determinant: reapplication.

Across 20 countries, 49.0% of respondents report sun exposure at peak UV hours while only 13.1% reapply sunscreen as often as needed (51.8% and 14.8% among respondents under 40). The gap is widest where ambient UV is highest — Kenya 66% vs 6%, South Korea 65% vs 7%.

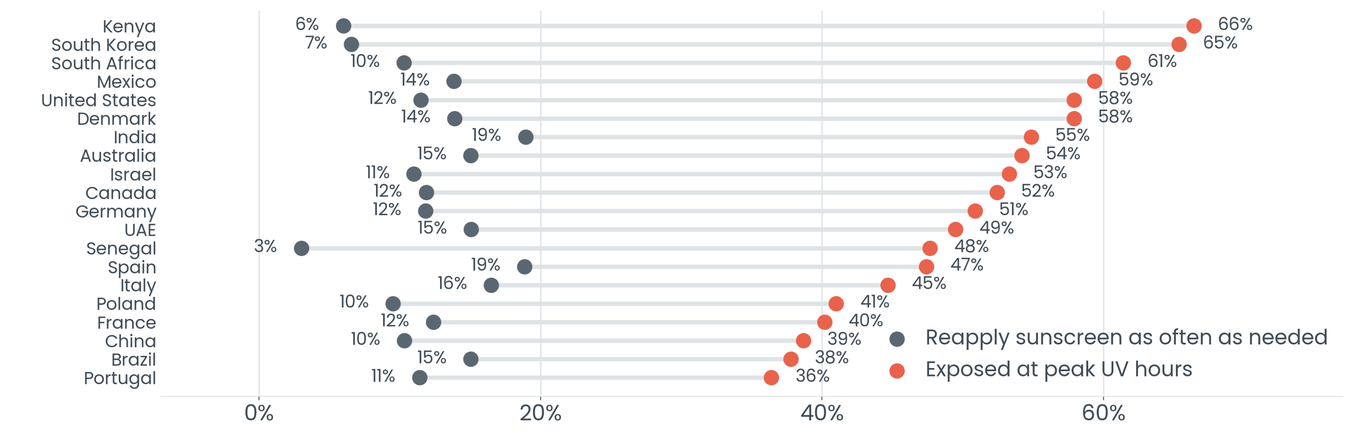


Figure 2. Sun exposure at peak UV hours vs. reapplication of sunscreen as often as needed, by country. ALL international survey, 50,552 respondents, 20 countries.

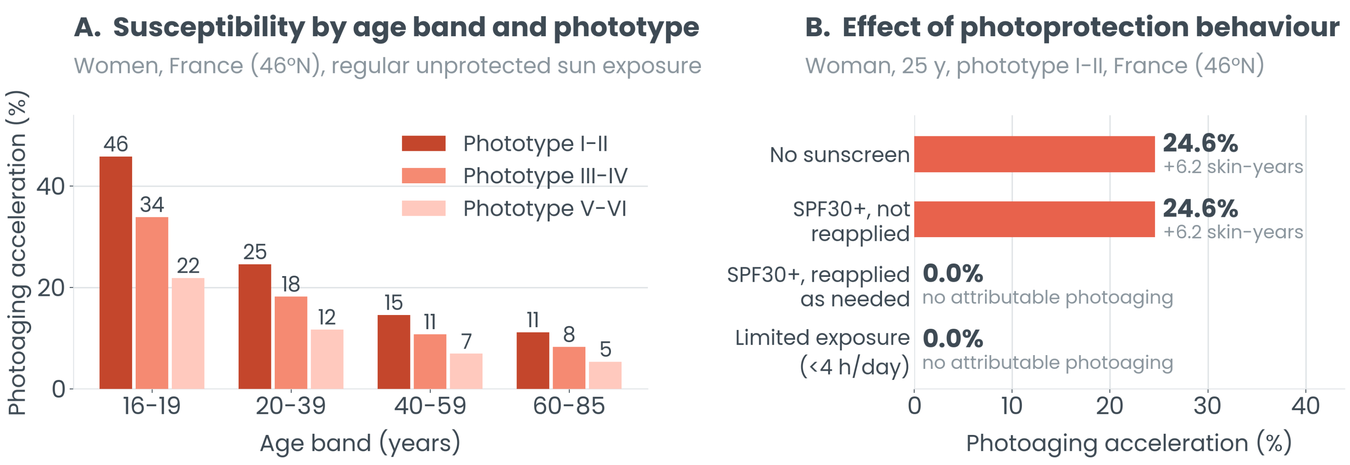


Figure 3. Model outputs. Photoaging acceleration is the modelled excess ageing attributable to sun exposure, relative to an unexposed reference of the same profile; skin-years = ratio × chronological age. Regular exposure = >4 h/day outdoors.

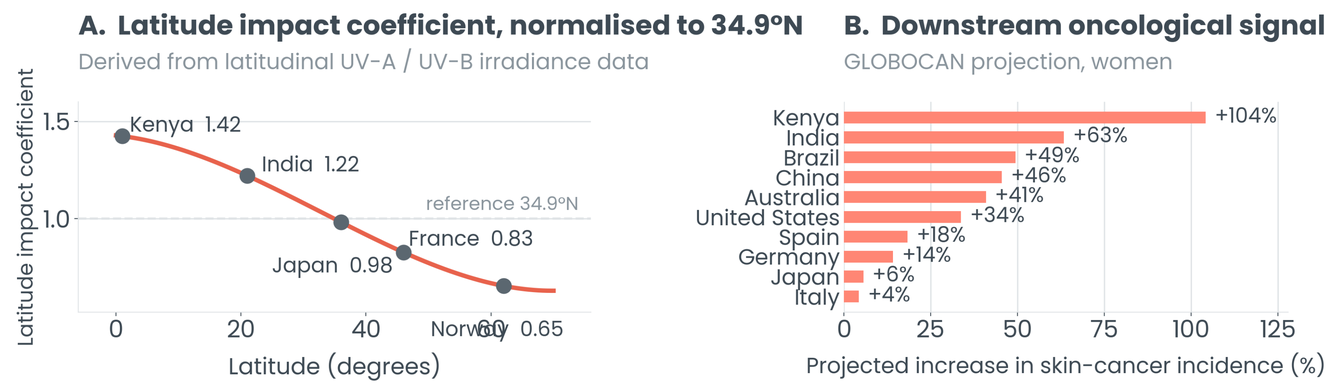


Figure 4. Geographical gradient. The latitude impact coefficient spans a 2.2-fold range between the equator and 62°N, and covaries with projected skin-cancer incidence.

Key figures

49%

of respondents are exposed to the sun at peak UV hours

13%

reapply sunscreen as often as needed — the single behaviour that closes the model's exposure gate

+6.2

skin-years modelled for a woman of 25, phototype I–II, in France, with regular unprotected exposure

Conclusions

- This work demonstrates the feasibility of translating heterogeneous dermatological data into a simple, interpretable and engaging tool: seven questions, an individualised photoaging estimate in a few clicks.
- By leveraging appearance-related concerns rather than long-term cancer risk, the approach targets the motivational lever that matters most in young populations.
- The model makes the behavioural message explicit: what separates attributable risk from no attributable risk is not owning sunscreen but reapplying it — a behaviour reported by only 13% of respondents.
- Coefficients are literature-derived rather than fitted to a prospective cohort, and the exposure term is a threshold rather than a continuous dose; outputs are motivational estimates, not clinical measurements.
- Future directions include large-scale prospective studies with standardised protocols, to refine model parameters and strengthen clinical validation.

References & disclosures

1. Del Bino S, et al. Relationship between skin response to ultraviolet exposure and skin colour type. Pigment Cell Res 2006.
2. Osto M, Hamzavi IH, Lim HW, Kohli I. Individual typology angle and Fitzpatrick skin phototypes are not equivalent in photodermatology. Photochem Photobiol 2022.
3. Flament F, et al. Effect of the sun on visible clinical signs of aging in Caucasian skin. Clin Cosmet Investig Dermatol 2013.
4. Flament F, et al. Clinical impacts of sun exposures on the faces and hands of Japanese women of different ages. Int J Cosmet Sci 2019.
5. Chien AL, et al. Perioral wrinkles are associated with female gender, aging and smoking. J Am Acad Dermatol 2016.
6. Grigalavicius M, Moan J, Dahlback A, et al. Daily, seasonal and latitudinal variations in solar ultraviolet A and B radiation. Int J Dermatol 2016.
7. Randhawa M, et al. Daily use of a facial broad-spectrum sunscreen over one year significantly improves clinical evaluation of photoaging. Dermatol Surg 2016.
8. Krutmann J, et al. Daily photoprotection to prevent photoaging. Photodermatol Photoimmunol Photomed 2021.
9. Chung JH, et al. Cutaneous photodamage in Koreans: influence of sex, sun exposure, smoking and skin colour. Arch Dermatol 2001.

Data sources. ALL international survey, 20 countries, n = 50,552. GLOBOCAN skin-cancer incidence projections.

Disclosures. [to be completed]

Presented at the 35th EADV Congress, 30 September – 3 October 2026, Vienna, Austria