High-Tech Screenings May Miss Skin Cancer in People with Darker Skin

Images used to train artificial intelligence to diagnose skin cancer rarely include non-white people.

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Artificial intelligence (AI), which leverages computer technology and big data to mimic human problem-solving, is frequently used to help diagnose various diseases, including skin cancer.

But AI programs may not be particularly accurate for people of color. A study published in The Lancet Digital Health found that the available data used to train AI to diagnose skin cancer do not include sufficient images of darker-skinned individuals to make accurate diagnoses among black and brown populations, reports a press release from the National Cancer Research Institute.

For the study, researchers reviewed available data on skin lesions throughout the world—a compilation of 21 data sets comprising over 100,000 images. Of 14 data sets that noted country of origin, 11 showed only images from Europe, North America and Oceania. Most of the images were published in 2018 or later.

Hardly any of the 21 data sets included the ethnicity or complexion of those photographed. In addition, among the images that noted complexion (2,436 photos), just 10 depicted brown skin, and only one showed a person with dark brown or black skin. Details about ethnicity were indicated for 1,585 images, and none showed individuals of African, Afro-Caribbean or South Asian descent.

Skin cancer diagnoses from a photo require a shot of the lesion and an image taken with a dermatoscope—a special handheld magnifier. From the 21 data sets, just two contained pictures produced using both of these techniques. The data sets also lacked other key information about the method used to select the photos, including proof of ethical approval or patient consent.

“This has implications for the programs developed from these images, due to uncertainty around how they may perform in different groups of people, especially in those who aren’t well represented in data sets, such as those with darker skin,” said David Wen, MD, an academic clinical fellow in dermatology at the University of Oxford and the study’s lead researcher.

“This can potentially lead to the exclusion or even harm of these groups from AI technologies.

Although skin cancer is rarer in people with darker skins, there is evidence that those who develop it may have worse disease or be more likely to die of the disease," Wen explained. "One factor contributing to this could be the result of skin cancer being diagnosed too late."

The two most common types of skin cancer are basal and cutaneous squamous cell carcinomas, followed by melanoma. Basal cell carcinoma appeared in 6,861 photos, melanoma in 6,802 images and cutaneous squamous cell carcinoma in 873 pictures.

"AI programs hold a lot of potential for diagnosing skin cancer because it can look at pictures and quickly and cost-effectively evaluate any worrying spots on the skin," Wen said. "However, it's important to know about the images and patients used to develop programs, as these influence which groups of people the programs will be most effective for in real-life settings. Research has shown that programs trained on images taken from people with lighter skin types only might not be as accurate for people with darker skin and vice versa."

To learn more about skin cancer in people with darker complexions, read "Brown Skin Too: If You Have Skin, You Can Get Skin Cancer."

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