Assessment #3

Research Assessment #2

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Subject: Artificial Intelligence

MLA citation:

Smak Gregoor, Anna M., et al. “An Artificial Intelligence Based App for Skin Cancer Detection Evaluated in a Population Based Setting.” *npj Digital Medicine*, vol. 6, no. 90, 20 May 2023, https://doi.org/10.1038/s41746-023-00831-w.

Assessment:

This research paper explored the use of an AI-based mHealth app for detecting skin cancer and its impact on healthcare consumption in a real-world population. One of the key findings was that the app led to a 32% increase in claims for (pre)malignant skin lesions among users compared to non-users, suggesting that the app may improve early detection. However, this was balanced by a three- to fourfold increase in claims for benign skin conditions, raising concerns about overdiagnosis and increased healthcare costs. I have identified some potential issues with my initial approach to developing the skin cancer early detection app, including overdiagnosis, especially for benign conditions that don’t pose an immediate threat. If people are increasingly subjected to unnecessary procedures and anxiety due to false positives, is the app helping, or is it creating new problems? I have thought of possible solutions, such as increasing the confidence rating of the AI and not giving a diagnosis if the confidence rating for a particular image is too low. Also, I will make sure that the user knows that this app is not a replacement for

medical advice but just a helpful companion that can help you keep track of unusual skin spots on your body and, if necessary, advise you to get a checkup from a doctor while giving the doctor a report that will help them in diagnosing the problem. The report might include some images that the user has taken and consented to be stored and the response from the AI. I also think about how this compares to traditional methods of cancer screening. Unlike routine screenings performed by trained clinicians, this AI-based app places diagnostic power in the hands of users who might not have the medical background to understand risk. This democratization of healthcare through technology might be a double-edged sword. On one hand, people have more access to early detection tools, which could be lifesaving. On the other hand, without the context and understanding that comes from years of medical training, people might panic, and the stress on the healthcare system might increase. This paper also made me reconsider the economic aspects of healthcare. The cost-effectiveness data was surprising—€2567 for each additional malignant lesion detected seems high when considering the burden of increased benign diagnoses. This might indicate that the future of AI in healthcare might hinge less on its ability to detect diseases and more on its cost-efficiency and the reduction of false positives. The app would need to strike a balance where it maximizes life-saving potential without overburdening the healthcare system financially. I plan to research this more by analyzing how other countries address these issues, especially in places where skin cancer is prevalent. This will help me answer whether the AI app should be used more selectively in high-risk populations instead of being offered to the general public. This study helped me see the app's effects on a large national population even though the study doesn't provide long-term data on patient outcomes, which would have helped determine whether these early detections improve

survival rates or quality of life. This highlights a limitation in my understanding of how AI can be evaluated. I want to know more about the long-term impact of early detection on patient health—does catching more benign lesions lead to better outcomes overall, or is it just inflating healthcare use without real benefit? Moving forward, I think my research should focus on long-term studies of AI-based diagnostics to get a clearer picture of their true value. While I find the use of AI in mHealth apps promising, this paper has raised important questions about overdiagnosis, economic viability, and long-term patient outcomes. It's clear that AI holds immense potential, but its implementation needs to be carefully calibrated to avoid unintended consequences. I plan to research these questions more and develop optimal solutions to help the app have some real, tangible impact.

Annotations:

https://drive.google.com/file/d/1fPen65y-JvXgyHHjANOkKa5vYin1-17f/view?usp=sharing