Annals of Agricultural and Environmental Medicine 2025, Vol 32, No 3, 323–323
www.aaem.pl

Possible contribution of artificial intelligence to ophthalmologic services in rural areas

Kazuhiko Kotani[1,A,C,E-F], **Takao Suzuki**[2,3,A-B,D,F], **Aminu Kende Abubakar**[2,3,C-D,F]

[1] *Division of Community and Family Medicine, Jichi Medical University, Japan*
[2] *Graduate School of Public Health, St. Luke's International University, Japan*
[3] *Hitotsubashi Institute for Advanced Study, Hitotsubashi University, Japan*

A – Research concept and design, B – Collection and/or assembly of data, C – Data analysis and interpretation, D – Writing the article, E – Critical revision of the article, F – Final approval of the article

To the Editor,

We wish to thank Czesak et al. [1] for providing a valuable summary of how artificial intelligence (AI) is helping improve ophthalmological activities in rural areas. The shortage of ophthalmologic services in rural areas has been a concern in many countries [2], and as we are global rural investigators, we believe that our additional perspectives could add further highlights to the findings of Czesak et al. [1] on the contribution of AI to ophthalmologic services in rural areas.

The first perspective of AI is its flexibility in adjusting the detection performance. While screening and diagnosis are both important settings for diseases, they may have different significance in rural areas with culturally tailored mass screening and less involvement of specialists [3,4]. AI has the flexibility to adjust its detection performance by modifying the decision-making thresholds. For screening, sensitivity should be prioritized to reduce false negatives, while for diagnoses, specificity should be enhanced to reduce false positives. Basically, in order to avoid missing diseases with higher sensitivity and reasonable specificity, mass screening in rural areas seems to be important, and the sensitivity and specificity might be balanced in the respective areas. Future work with AI may be able to develop optimal area-specific screening and diagnostic strategies for ophthalmologic services in rural areas.

The second perspective is the compatibility of AI with telemedicine and specialists as an integrative package. When information driven by AI is provided, patients, nurses, general physicians, and eye specialists can communicate via telemedicine. In addition, real-time practice is possible. In general, one may think that, as residents tend to be vulnerable to equipment use, trained experts are required in rural areas; however, smartphone-based systems with healthcare devices are being realized [2]. Currently, optical coherence tomography, as reviewed by Czesak et al. [1], enables non-experts to conduct examinations independently in an automated machine [5]. Further development of resident-friendly integrated AI and surrounding services for rural residents is expected.

Therefore, now would be the time to consider the merits of AI in ophthalmologic services in rural areas, with careful ethical consideration. This may assist mitigate rural-urban disparities and promote the sustainability of rural healthcare. We look forward to future research on this topic.

REFERENCES

1. Czesak K, Gałuszka Z, Adamska O, Kamiński M, Pierzak A, Kamińska A. Is Artificial Intelligence an accurate tool for improving access to ophthalmological services in rural areas? A narrative review. Ann Agric Environ Med. 2025;32(2):320–322. doi:10.26444/aaem/195109
2. Kotani K. Expectation of tele-ophthalmology in remote areas including islands. Eye. 2024;38(9):1781–1781. doi:10.1038/s41433-024-02997-3
3. Anderson AE, Henry KA, Samadder NJ, Merrill RM, Kinney AY. Rural vs urban residence affects risk-appropriate colorectal cancer screening. Clin Gastroenterol Hepatol. 2013;11(5):526–33. doi:10.1016/j.cgh.2012.11.025
4. Zhang M, Sit JWH, Choi KC, Chow KM, Chan CWH. Effects of a theory driven and culturally tailored educational program on promoting cervical cancer screening in rural populations. Sci Rep. 2025;15(1):18540. doi:10.1038/s41598-025-02600-z
5. Kaplan RI, Chen M, Gupta M, Rosen RB. Impact of automated OCT in a high-volume eye urgent care setting. BMJ Open Ophthalmol. 2019;4(1):e000187. doi:10.1136/bmjophth-2018-000187

✉ Address for correspondence: Kazuhiko Kotani, Division of Community and Family Medicine, Jichi Medical University, 3311-1 Yakushiji, 329-0498, Shimotsuke-City, Japan
E-mail: kazukotani@jichi.ac.jp