

# Better over-the-phone health care using artificial intelligence

November 7 2022

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## MACHINE LEARNING

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Credit: Boo-Tique/Shutterstock

In health care, triage involves categorizing patients by urgency levels so that the most urgent patients are prioritized to receive care. When patients are assigned a less urgent category than they really need, it is considered undertriage—and can have fatal consequences. Now,

researchers from Japan have developed a computer-based method for predicting undertriage in a phone-based triage system. Their findings were published this month in *Annals of Medicine* and may improve over-the-phone triage outcomes worldwide.

Triage protocols are continuously being updated to improve their performance and decrease the proportion of undertriage. One promising way to do this involves machine-learning models, which are computer-based programs that use a training set of data to find patterns, and can then make predictions in new data based on the patterns that they have learned to recognize. Machine-learning models for hospital-based triage have recently been developed and are better than traditional methods at predicting appropriate urgency levels.

Triage can also be given via phone services, where [patients](#) are advised about how urgently they should seek in-person health care. Machine-learning models have not yet been developed for phone-based triage, and researchers from the University of Tsukuba decided to address this issue.

"We used data from a [private company](#) that provides after-hours [medical care](#) using a phone-based triage system," explains lead author of the study, Associate Professor Ryota Inokuchi. "We developed five different machine-learning models and found that two were especially good at predicting undertriage in the data."

Notably, the two best-performing [machine-learning models](#) had some important features in common.

"Both models identified the same risk factors for undertriage: a higher age, being male, the presence of other diseases like hypertension or diabetes, and certain categories of complaints such as common cold symptoms," says Professor Nanako Tamiya, senior author of the study.

"These risk factors can be used to update phone-triage protocols to improve patient outcomes Furthermore, our machine-learning approach can be used globally to assess and improve phone-triage protocols."

Because over-the-phone triage can take a long time and is relatively difficult to do well, any factors that can speed up the process and/or improve its accuracy will be welcomed by the medical community. Prioritizing the [risk factors](#) identified in the present study will help to lower the rates of undertriage and may speed up the phone-[triage](#) process. Given that phone-based [health care](#) is increasingly common, especially post-COVID-19, improved protocols could save many lives and improve patient outcomes.

**More information:** Ryota Inokuchi et al, Machine learning models predicting undertriage in telephone triage, *Annals of Medicine* (2022). [DOI: 10.1080/07853890.2022.2136402](https://doi.org/10.1080/07853890.2022.2136402)

Provided by University of Tsukuba

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