The Future of Field Epidemiological Research: Harnessing the Power of AI

With the emergence of artificial intelligence (AI) technology, many researchers are beginning to explore its potential applications in epidemiological research. AI has already been used in healthcare and medical research for tasks such as image recognition, natural language processing, drug discovery, and disease diagnosis. AI may also be utilized to assist field epidemiologists with their studies by helping them review literature, select research questions or hypotheses, and rewrite the discussion and conclusions sections of their papers.

AI technology can be used to speed up tedious literature reviews by providing search algorithms which quickly scan through large amounts of text for relevant information [1]. This helps field epidemiologists save time so that they can focus on more important aspects of their research, such as designing experiments that will produce reliable results. For instance, AI-based transformers, that is machine learning models available in the Chat-Generative Pre-training Transformer (ChatGPT), demonstrated potential usefulness in supporting the conduct of an epidemiological study [2].

AI algorithms can also be used to identify subtle relationships and trends in the data that may not have been visible before, potentially leading to new insights [3]. By using AI in this way, epidemiologists can increase their chances of finding relevant information and discovering new phenomena.

However, AI algorithms are only as reliable and accurate as the data they are trained on, meaning that biases embedded in the data can lead to biased results if left unchecked. Additionally, AI models may not always be able to accurately interpret complex phenomena or datasets. Therefore, it is essential to verify the accuracy of any AI-generated results before using them for any purpose.

AI may also be used to rewrite original drafts of the discussion and conclusions sections of scientific papers for publication in peer-reviewed medical journals. AI algorithms can subsequently scan through

relevant literature and contrast the most important points, allowing epidemiologists to write these sections more thoroughly and accurately.

While AI technology can assist with conducting research, researchers should take care to ensure that their work reflects a deep understanding of the research topic. This means that authors should use AI to augment their own research skills, not to replace them. AI can be an invaluable tool for conducting field epidemiological research and writing manuscripts for publication; however, the responsibility still lies with researchers to ensure that their work is of the highest quality [4].

Field epidemiologic investigations often presents with puzzling clinical findings that can gain from the use large datasets from outbreak investigations and reports, such as the Program for Monitoring Emerging Diseases (ProMED) sponsored by the International Society for Infectious Diseases [5], and the Global Public Health Intelligence Network [6], among other continuously updated databases. The information of such type of databases enables the Global Infectious Disease Epidemiology Online Network (GIDEON) [7], the ability to estimate the probability of a given diagnosis based on the physical findings and data on place of occurrence. Well-conducted field epidemiologic outbreak investigations are ultimately a unique source on primary data on the occurrence and distribution of health-related events in specific populations, places, and times to inform the algorithms in software and models.

The American Journal of Field Epidemiology aims to provide an outlet for the dissemination of such information, and the opportunity to contrast in a succinct manner their findings with those previous outbreaks, which can be synthesized with the application of this emerging technology. AI has the potential to assist field epidemiologists with their inquiries while they are still deployed on the field, highlighting the gaps in knowledge on the epidemiology of the condition being investigated to make their inquiries more focused and to assist in writing the findings with the perspective of a thorough review of the literature. AI can also be of assistance in writing their results in other languages. Such

endeavor requires the trainers of field epidemiologists to upgrade their skills in the use of software such as the chatbot ChatGPT and MATLAB neural networks for deep learning.

When utilizing AI in scientific research and writing, it is crucial to be mindful of the ethical implications related to plagiarism. Authors must not only ensure that they give appropriate credit to all sources used, but this also extends to sources generated by AI algorithms. Additionally, it is of utmost importance that authors diligently cite any AI-generated information that is incorporated into their papers. By doing so, readers are provided with the means to evaluate the accuracy and validity of the claims put forth. This conscientious approach to acknowledging AI contributions not only upholds academic integrity but also fosters a transparent and accountable research environment.

In conclusion, AI is a powerful tool for epidemiologists that can help to uncover insights and drive scientific progress. However, it is important for researchers to be aware of the ethical considerations associated with its use. With these safeguards in place, AI can be an invaluable asset to epidemiological research. The Journal has prepared policies, guidelines, and instructions now available on the use of AI for manuscript submissions.

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