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Data and Algorithms: Ethics and Policy - Memo 5

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in the future doctors and all other medical professionals will be completely replaced by algorithms...

It is true that medical algorithms are evolving and able to help medical professionals reach quicker conclusions for some particular diagnoses. However, the claim that all medical professionals will be completely replaced by algorithms in the future is audacious. While we have many medical algorithms that help make efficient the work of a medical professional, it is more likely that as medical algorithms evolve, so too do the professional's approach on how algorithms are being utilized. Let us consider the nuances of some of the ethical and legal considerations of how algorithms are currently being used in medicine and how they should be used in medicine going forward.

First, we must distinguish between the two major purposes in medical diagnostics, that is, prediction and explanation. In some instances, medical professionals must find a cause and may rely on algorithms and large data sets to find patterns. Some of these patterns however cannot be discovered by an algorithm that was not programmed or trained on the relevant dataset, hence it is up to the medical professional to design their own heuristic or use the evidence and their knowledge of medicine to base their medical conclusions on. It could also be the case that the medical professional is simply trying to diagnose an individual in an effort to design a treatment plan. While the algorithm might be good at pretty accurately supporting the discovery of a particular diagnosis, the medical professional in today's world must either endorse or reject the findings of the output data.

The reason it is not likely that medical professionals will be replaced by machines, is because there will always be some discrepancies that arise from a particular algorithm. This will cause medical professionals to always check the output of an algorithm. This concept is called automation bias, and it implies a certain level of skepticism by humans when considering the findings of an algorithm.

When it was discovered that an algorithm that is used to help determine if someone has skin cancer was trained on a data set of mostly white people, it became clear to dermatologists around the world that black and brown skin people could be underdiagnosed. While the medical industry becomes more efficient, more accurate and taking on more cases, medical professionals will continue to rely on their education rather than simply the outputs. As medical professionals consider changes to access in care, the privacy of patients with respect to their medical data, and the overall consistency (or uniformity) of medical results, so too will they become more aware of the hidden biases of raw data analysis.