Ethical Algorithmic Decision-Making in Health Care
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Introduction
Clinical Decision Support Systems (CDSSs) are algorithmic systems that organize data for decision-making by initially comparing databases of medical records and scientific information, and then simulating the response of the patient to different patient-specific treatment methods[1, 2]. CDSSs were created to make medical diagnoses quicker and choose more reliable treatment than an individual clinician would, thus benefitting both the patient and the provider[3]. The ethics of these algorithmic decision-making systems are threatened by algorithmic bias[4].

Methods
The ethics of CDSSs are examined through testing the accuracy of the systems themselves in assessing a patient’s diagnosis and treatment success. These results are found in scholarly journals that also discuss algorithmic bias and how to combat it to make more ethical systems. It is important to note that other ethical concerns are associated with AI decision-making in health care such as loss of humanity when relying more on technology instead of human providers.

Results
It is unethical to have bias in algorithmic systems because it propagates inequitable treatment and does not benefit all patients. Therefore, this bias must be removed from CDSSs for algorithmic decision-making in health care to be ethical.

Algorithmic bias can be eliminated through:
• Participant-centered development of AI algorithms[4]
• Sharing data responsibly and making data standards inclusive[4]
• Code sharing, “including sharing of AI algorithms that can synthesize underrepresented data to address bias”[4]

Example: Some dermatological algorithmic systems are strictly trained with images of skin lesions on White patients or datasets of under 10% Black patients[4]. When tested with images of Black patient skin lesions, these CDSSs “have approximately half the diagnostic accuracy compared with what their creators originally claimed”[4]. To ensure that Black patients are more likely to be accurately diagnosed through these algorithms and in turn, receive optimal and ethical care, skin lesions of Black patients—an underrepresented group—need to be included in CDSS training[4].

Conclusions
The elimination of algorithmic bias will allow CDSSs to:
• Reduce medical errors in health care[1]
• Improve quality of care and accessibility for all patients[1]
• Reduce risk of liability for providers[1]

When algorithmic bias is eliminated from CDSSs, they are more accurate in assessing databases and offering appropriate, effective and fair treatment options. Thus, algorithmic decision-making systems can be ethical and benefit all patients’ health in an equitable and just manner.

References