

Health Applications Society Online Seminar Series



*Professor of
Personalized Medicine*

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University

**May 26, 2023
(Friday)**

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An end-to-end approach to improving population health outcomes in diabetic retinopathy through personalized screening strategies

Abstract: Diabetic retinopathy (DR) is a complication from diabetes that affects the eyes. According to the National Eye Institute, early detection, timely treatment, and appropriate follow-up can reduce the risk of severe vision loss from DR by 95%. Yet, DR remains the leading cause of blindness among Americans aged 20-74. In the US, an estimated 899,000 diabetic adults have vision-threatening DR (VTDR) despite it being preventable with timely treatment. VTDR is difficult to catch due to its slow progression and dependence on patients' care seeking behavior. Here I present an overview of a project which takes an end-to-end approach to this problem. Working with a care coordination company, we (1) use medical record and healthcare claims data to predict VTDR risk (2) identify barriers, motivators, and the effects of interventions at the patient and population level, and (3) apply agent-based simulation to guide care coordination intervention choices. I will go into detail on the prediction task, in which we leverage 20+ years of electronic health records to construct and extend ensemble classifiers to identify patients that will develop DR and VTDR within the next year with high recall. In practice this classifier can personalize care coordination to improve utilization and timing without any additional patient actions.

Bio: Maria E. Mayorga is a Professor of Personalized Medicine and Director of Graduate Recruitment and Success in the Edward P. Fitts Department of Industrial and Systems Engineering at North Carolina State University. She is currently serving as the Interim Director of the Operations Research Program. In 2019 she received the C.A. Anderson Award for contributions to teaching and was selected as a University Faculty Scholar for her academic leadership and research achievements. In 2021 she was selected as a Provost Faculty Fellow at NC State and was named an INFORMS MIF Fellow. In 2022 she was named as a Fellow of the Institute of Industrial and Systems Engineers (IISE). Her research interests include predictive models in health care, health care operations management, emergency response, and humanitarian logistics. She has authored over 90 publications and currently serves on the editorial board several IISE and INFORMS journals.