

THE GRADUATE COLLEGE OF THE
UNIVERSITY OF OKLAHOMA HEALTH SCIENCES CENTER

ANNOUNCES THE FINAL EXAMINATION OF

Juell Homco

FOR THE DEFENSE OF THE DOCTOR OF PHILOSOPHY DEGREE
GRADUATE COLLEGE

Department of Biostatistics and Epidemiology



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Impact of Misclassification Error on Estimated Cardiovascular Care Performance

COMMITTEE IN CHARGE:

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ABSTRACT: Healthcare systems are currently undergoing an important transition from a fee-for-service payment structure, where each service offered to a patient results in provider revenue, to a value-based model, where payment is based on whether high quality care is being delivered to patients. Value-based payment models often require providers to document the care delivered in electronic health records (EHRs) and encourage the implementation of quality improvement activities into their day-to-day routine. Moreover, advances in health information technology are allowing patient information from multiple sources, such as EHRs and claims data, to be shared across healthcare systems for patient care through mechanisms such as Health Information Exchange (HIE). While these systems that record and exchange patient data are increasingly being implemented across the US, how well they measure the quality of care has rarely been evaluated. This project aimed to describe and quantify the impact that misclassification and selection biases can have on estimating cardiovascular care performance scores. To achieve these aims, a systematic review of the literature on the validity of performance measurement in US primary care was first conducted. Next, Bayesian latent class models were used to estimate and compare the bias introduced by the use of chart abstraction (CA) and EHR data (two imperfect data sources) to determine performance scores for Aspirin Use, Blood Pressure Control, and Smoking Cessation Counseling and Intervention. Misclassification-adjusted performance scores were similar to unadjusted estimates, although CA estimates tended to be slightly higher, especially for Blood Pressure Control and Smoking Cessation Counseling and Intervention. Lastly, the potential impacts of selection and misclassification biases on estimating cardiovascular performance scores using EHR and HIE data were quantified using patient-level data collected through a large Oklahoma dissemination and implementation research study. There were considerable differences in the number of patients deemed eligible for each measure and disagreement in classifying patients as having performance met (or not) between the two data sources, which both importantly changed performance score estimates. Ensuring valid performance measurement is critical for expansion of value-based payment models in the US; results of this dissertation will help better target performance measurement improvement and future research.