

PCOR Methods for Data Infrastructure: Transformations, Linking & Generalizability

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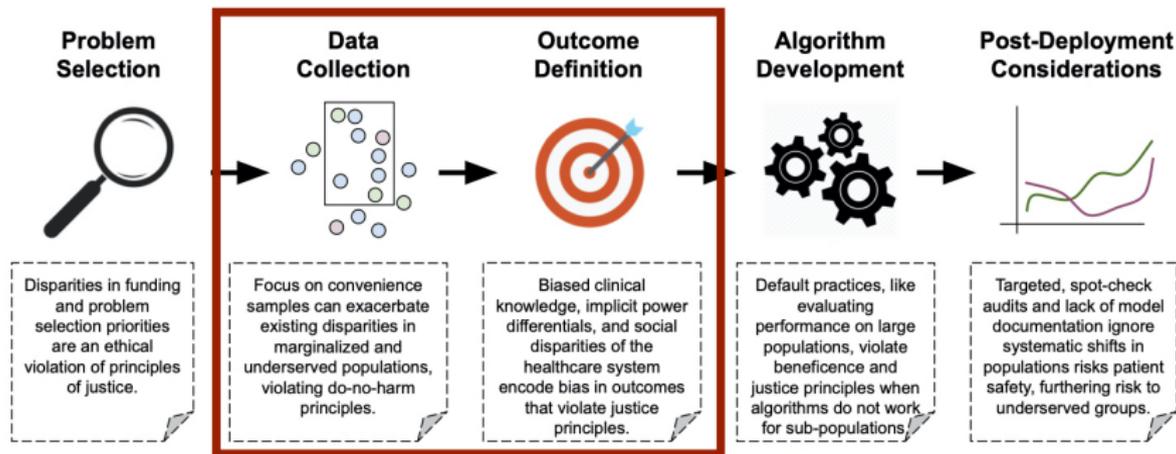


May 24, 2021

DATA TRANSFORMATIONS

Ethical Machine Learning in Healthcare

Irene Y. Chen, Emma Pierson, Sherri Rose,
Shalmali Joshi, Kadija Ferryman,
and Marzyeh Ghassemi



Methodological Development for Fairness



Data transformations

Intervening on the Data

Feedback loop between health care system data and risk adjusted plan payments



Correct misallocations via risk adjustment

Modify data into payment algorithm



Applications

Underpayment for chronic illness groups



Health care disparities by geographic income level

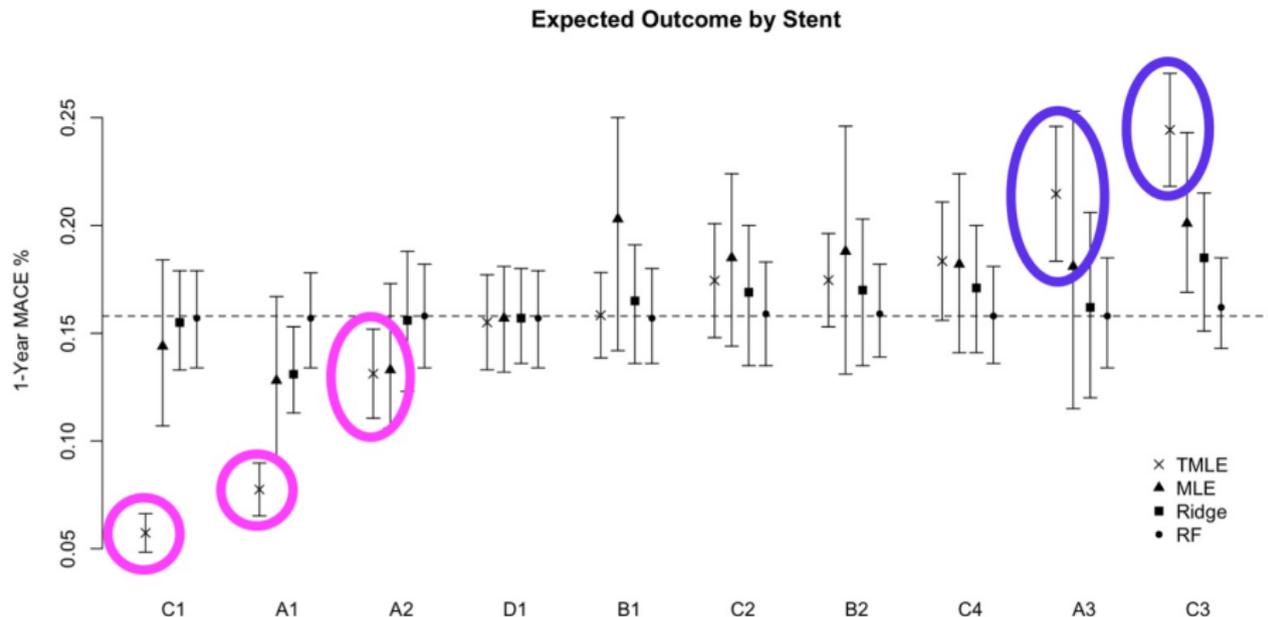


Data transformations to improve the performance of health plan payment methods

Bergquist, Layton, McGuire, Rose (2019)

LINKING & CAUSALITY

ML+Causal Inference: CER for Cardiac Stents

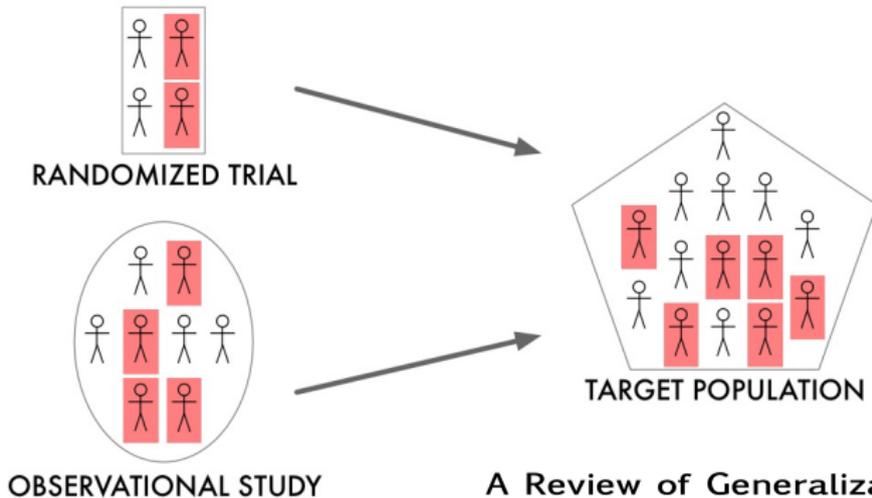


Biometrics JOURNAL OF THE INTERNATIONAL BIOMETRIC SOCIETY

Double robust estimation for multiple unordered treatments and clustered observations: Evaluating drug-eluting coronary artery stents

Sherri Rose  Sharon-Lise Normand

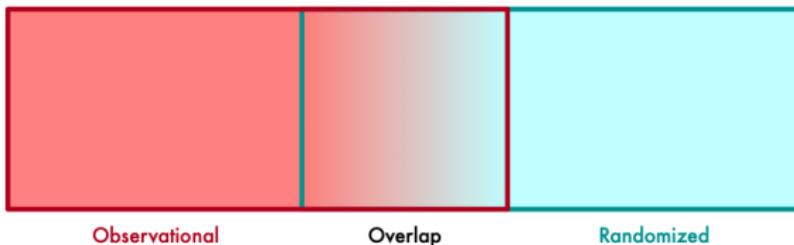
GENERALIZABILITY



A Review of Generalizability and Transportability

Irina Degtiar and Sherri Rose
Harvard T.H. Chan School of Public Health and Stanford University

arXiv
2102.11904



New Estimators

- ▶ Conditional cross-design synthesis outcome regression
- ▶ 2-stage conditional cross-design synthesis outcome regression
- ▶ 2-stage whole data outcome regression
- ▶ Conditional cross-design synthesis inverse probability weighting
- ▶ Double robust conditional cross-design synthesis

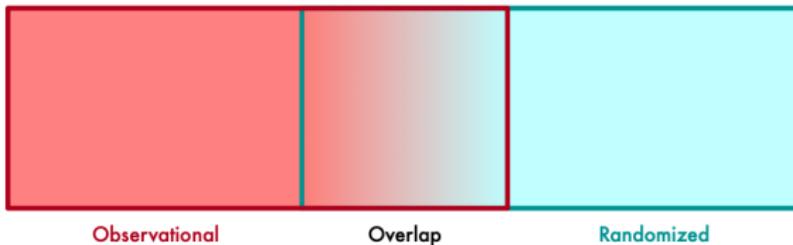
Comparison estimators: (1) Extrapolate from randomized data fit and (2) Use separate randomized and observational data fits

Conditional Cross-Design Synthesis Estimators for
Generalizability in Medicaid



Irina Degtiar¹, Timothy Layton¹, Jacob Wallace², Sherri Rose³

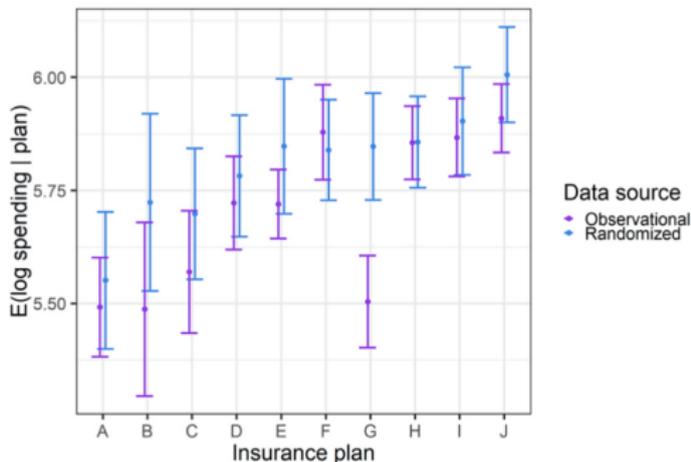
¹Harvard University, ²Yale University, ³Stanford University



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- ▶ 2-stage whole data outcome regression
- ▶ Conditional cross-design synthesis outcome regression
- ▶ Double robust conditional cross-design synthesis outcome regression

Comparison estimators: (1) Extrapolation
(2) Use separate randomized and observational data



Conditional Cross-Design Synthesis Estimators for Generalizability in Medicaid



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IN CLOSING

Does Your Algorithm Have a Social Impact Statement?

Responsibility

Explainability

Accuracy

Auditability

Fairness

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