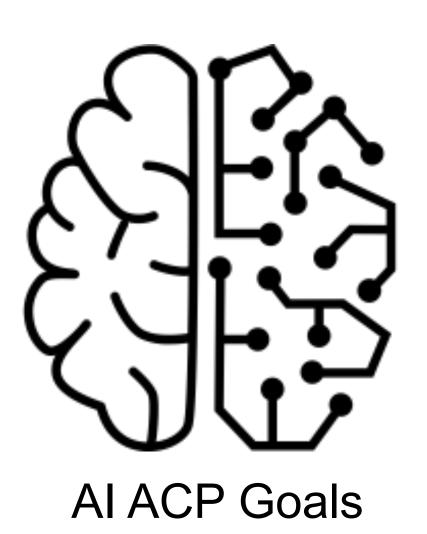
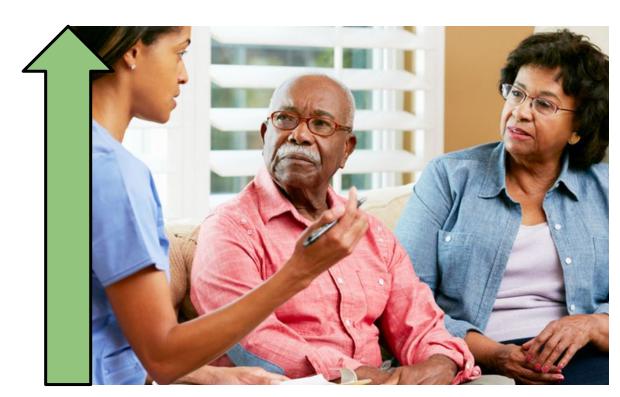
Jonathan Lu¹, Amelia Sattler^{2*}, Samantha Wang^{3*}, Ali Raza Khaki^{4*}, ..., Kavitha Ramchandran⁴, Michael F. Gensheimer⁵, ..., Winifred Teuteberg^{6**}, Nigam H. Shah^{7,8,9**} * indicates equal contribution, ** indicates joint senior authorship 1 Center for Biomedical Informatics Research, Stanford University School of Medicine; 3 Division of Hospital Medicine; 3 Division of Primary Care and Population Health, Stanford University School of Medicine; 4 Division of Oncology, Stanford University School of Medicine; 5 Department of Radiation Oncology, Stanford University School of Medicine; 7 Technology / Digital Solutions, Stanford Healthcare / Stanford University School of Medicine; 8 Clinical Excellence Research Center, Stanford University School of Medicine

INTRO

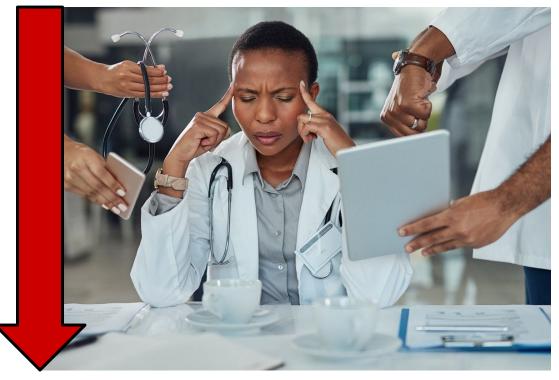
End-of-life care not goal-concordant



- Few Advance Care Planning (ACP) conversations¹
- Bottlenecked by physician assessments of who would benefit most²
- Stanford's Serious Illness Care Program explored 2 AI models to identify high-risk patients for ACP conversations²



Increase precision ACP conversations



Decrease missed ACP opportunities Decrease physician burden to trigger

RESEARCH QUESTION

VALIDITY: How well do the Epic and Stanford end-of-life models predict patients likely to die within 1 year among inpatient oncology patients, in comparison with clinician judgment (gold standard)?

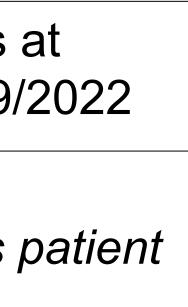
EQUITY: Performance for patient subgroups (race/ethnicity, sex, intersection of race/ethnicity & sex)

METHODS

Population	Hospitalized oncology patients Stanford from 8/15/2021 - 3/19/
Gold Standard	Clinician answer to <i>"Would you be surprised if this</i> passed away in 1 year"? ⁸
# Positive / Total	Not Surprised: 105 / 150 pat
Analysis	Epic and Stanford AI models versus clinical judgment

Stanford MEDICINE Can Advance Care Planning AI models support better End-of-life Care planning?

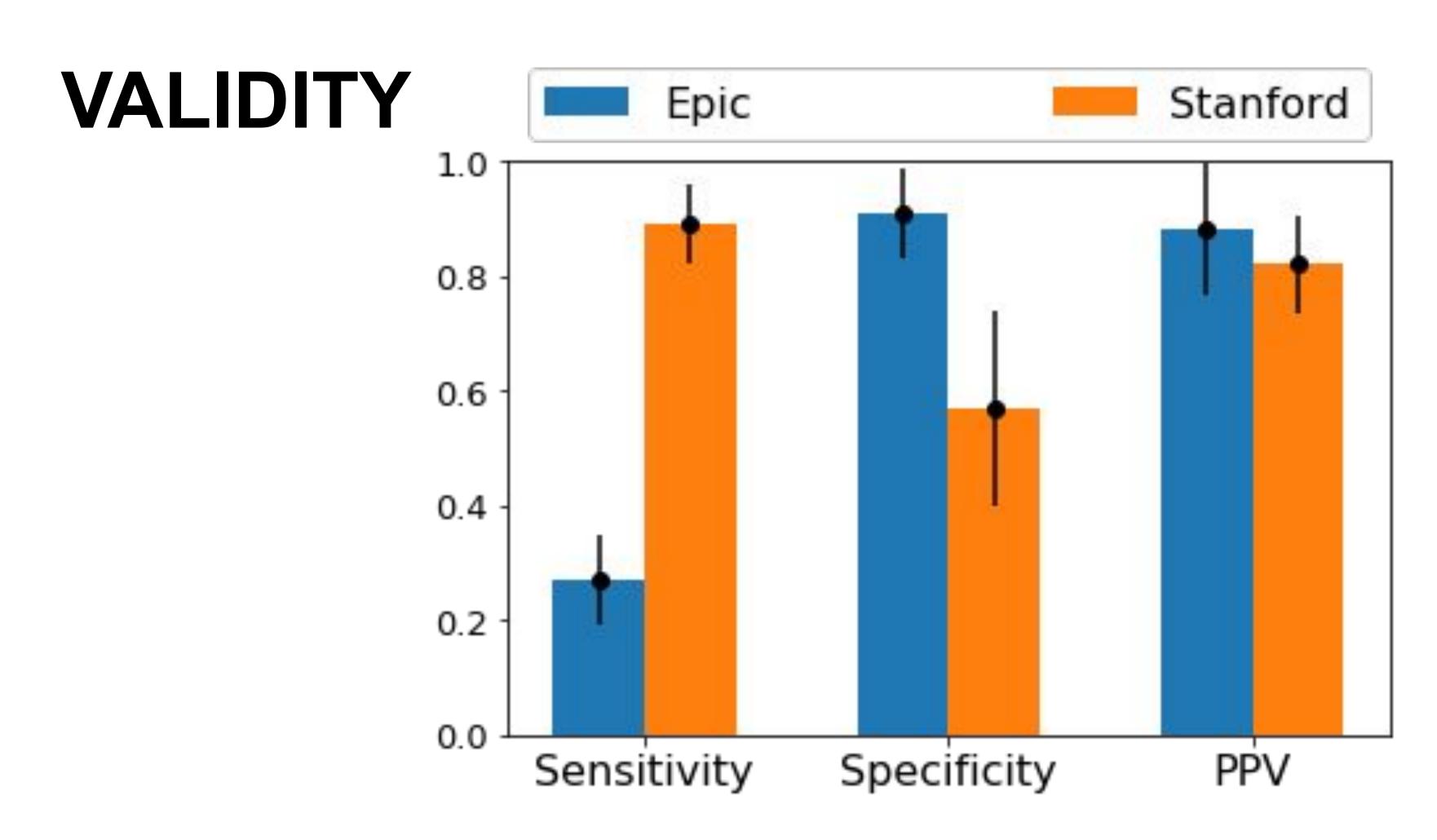




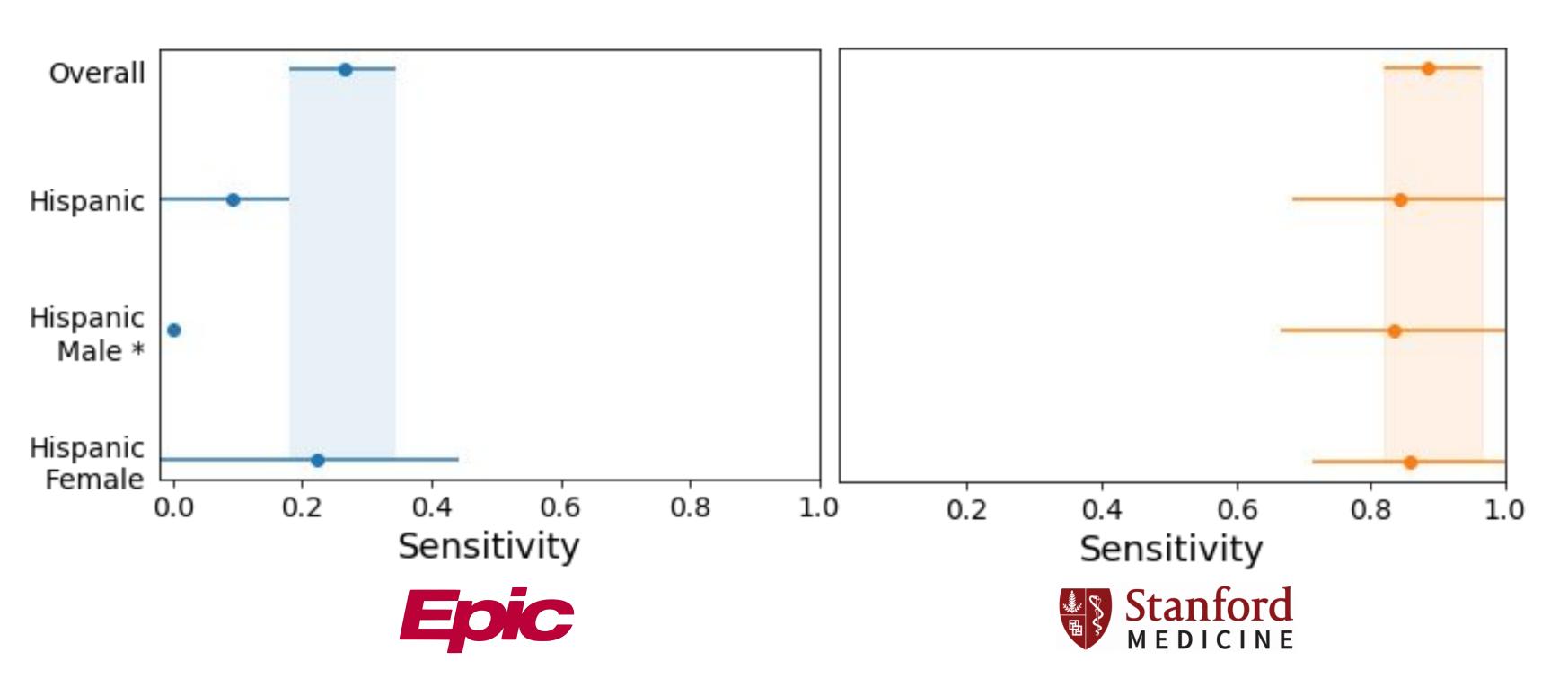
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Al Model	Logistic Regression ³	Gradient-Boosted Tree ⁴
# Features	46	13,189
Features	Demographics (Age, Sex, Insurance Status), Labs, Comorbidities, Medications	Demographics (Age, Sex), Lab/Procedure Orders (done in last year)
Output	One-year mortality risk	One-year mortality risk
Threshold Flag	>45%	>25%
Date of Predictions	6/14/2021 (live predictions unavailable)	8/15/2021 - 3/19/2022



EQUITY (Hispanic group, example)





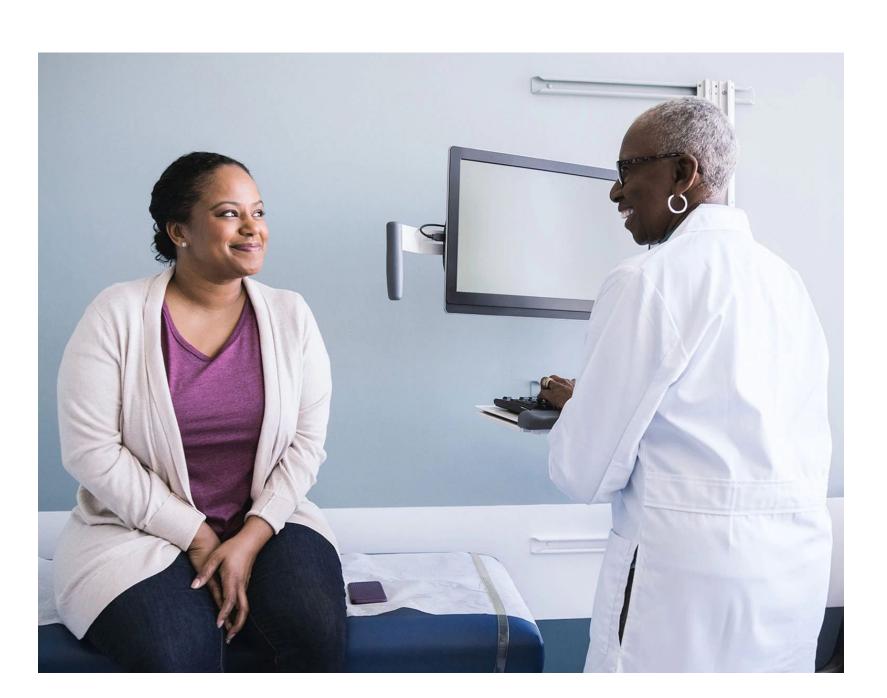


DISCUSSION

- Sensitivity: Stanford model outperformed Epic
- Specificity: Epic outperformed Stanford
- PPV: Both models > 80%, given high-risk population prevalence
- For patients flagged by the models, >80% chance a clinician would agree the patient would pass away in 1 yr
- Equity: Epic model underestimates mortality for Hispanic Male patients, potentially decreasing access to quality end-of-life care

LIMITATIONS

- joining data
- Race/ethnicity data in the EMR is often wrong⁵ • Large data losses (~50 patients dropped) when
- Model predictions occurred up to 9 months before clinician assessments







Before using Al models, clinicians should ask for validity and equity data about model performance.

References & picture credits: scan or see <u>tinyurl.com/acp22eolref</u>

