

Practical challenges for AI/ML development, spread, and scale

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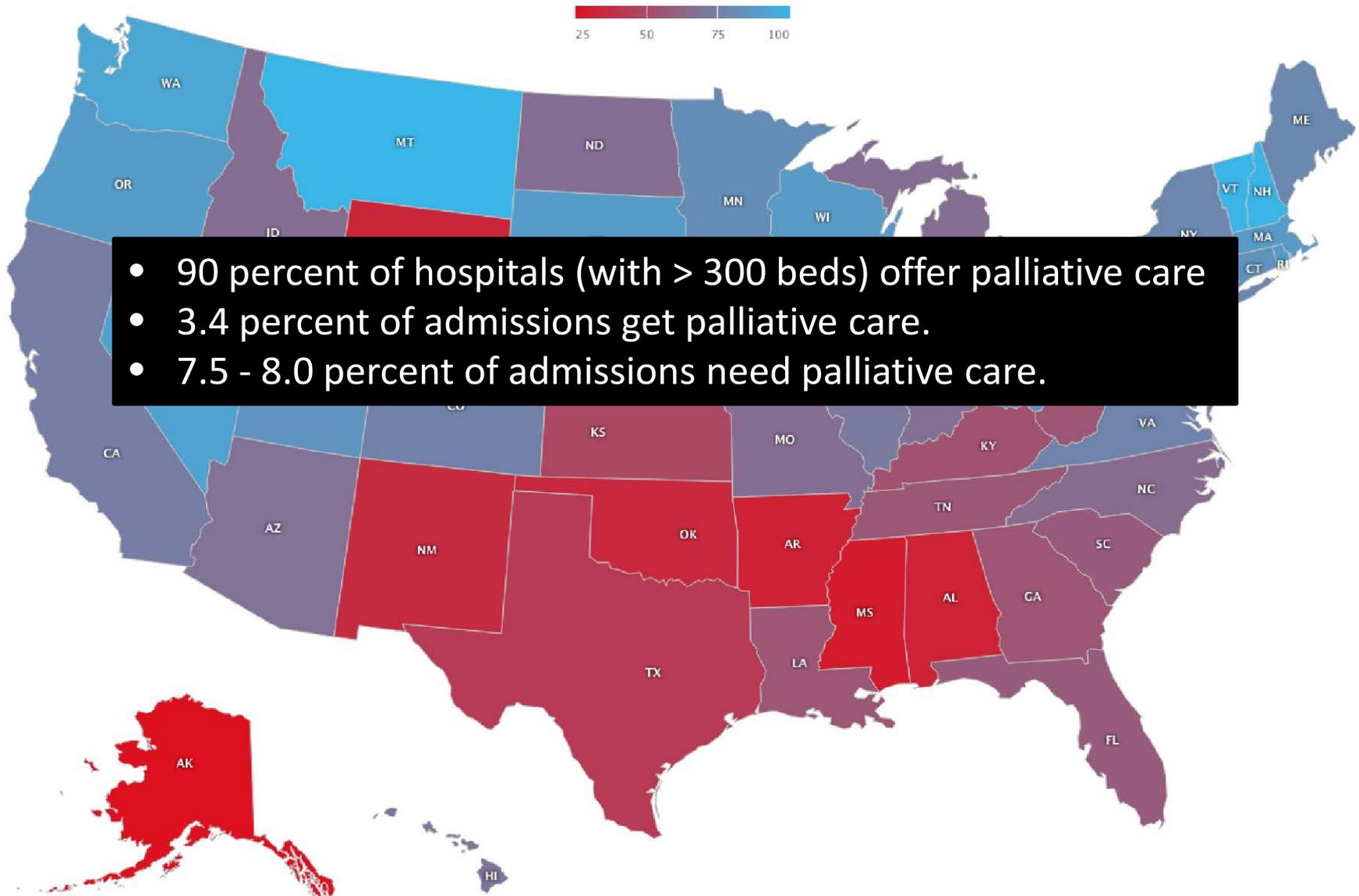
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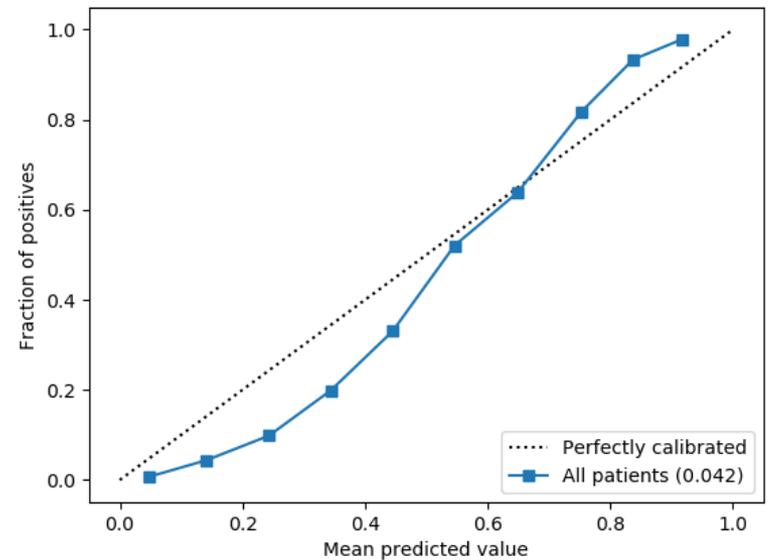
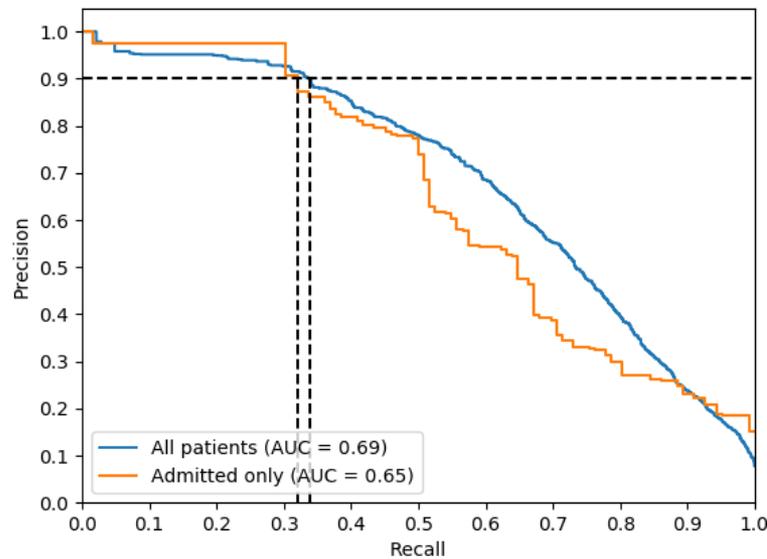
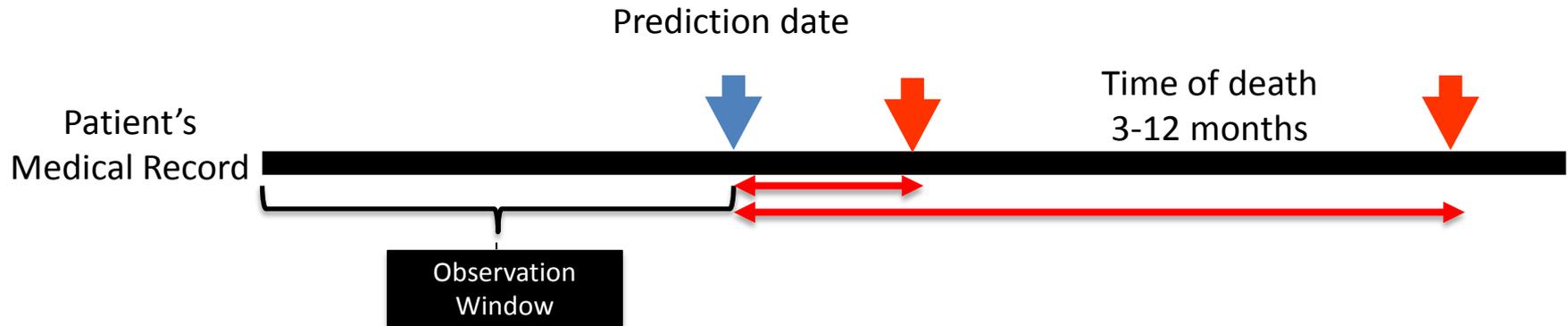
STANFORD

SCHOOL OF MEDICINE

Palliative care in the USA



A predictive model for mortality



We have a model, what next?

- Can we explain the predictions?
- What would the intervention be?
- Who dispenses the intervention?
- How does it affect the doctor-patient relationship?

- What are the mechanics of dispensing the intervention?
 - What is the capacity to intervene?
- What is the threshold for action?
 - How many false positives can there be in the top k predictions?
- What performance measure do we use?
 - Physician agreement | useful consult | or accuracy (F1 etc.)
- What are the outcomes we track?
 - Consult rates | time between AD setup and death | Rate of AD set up
| Increase in no. of in home deaths | ?
- Where would we deploy the model?

When you see a model, ask:

- What is the kind of use case at hand?
- Who will decide on the action to take?
- What assumptions are being made?

	Operational	Medical
Diagnostic		
Prognostic		X
Therapeutic		

Reg, the existence of an **alternative** action

Reg, the need for **interpretability**

Reg, the **incentives & ability** to take an action

A cheat sheet for taking prediction models into practice

1. Find a condition with a low prevalence (e.g. 1-3:100), where the NNT is too high for an existing intervention.
2. Learn a model to predict that condition/outcome in members of that population.
3. Set prediction threshold such that the post-test probability of having the condition has a 10-15x “lift”.
4. Ask what would you do differently with the prediction in hand?
5. Ask if an explanation of the prediction is really needed?
 - Separate prediction from action
6. Ask about your capacity for action
 - Focus on precision @ K
7. Think of the model as a ranking metric or as a screening test
 - Don't get hung up on AUROC, AUPRC, the exact probabilities
8. Define, measure, and monitor the outcome you focus on changing
9. Be aware of and measure the impact on the humans
10. Iterate