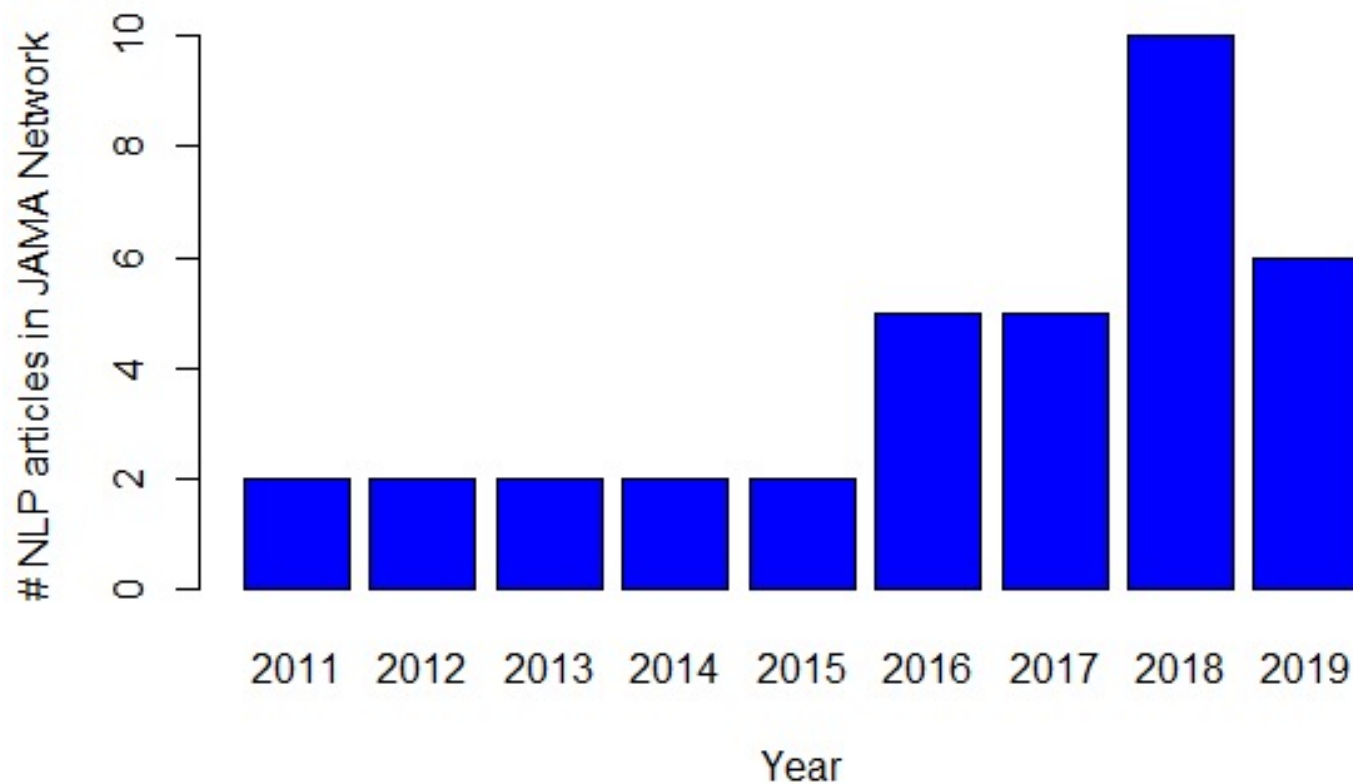


Biomedical Natural Language Processing

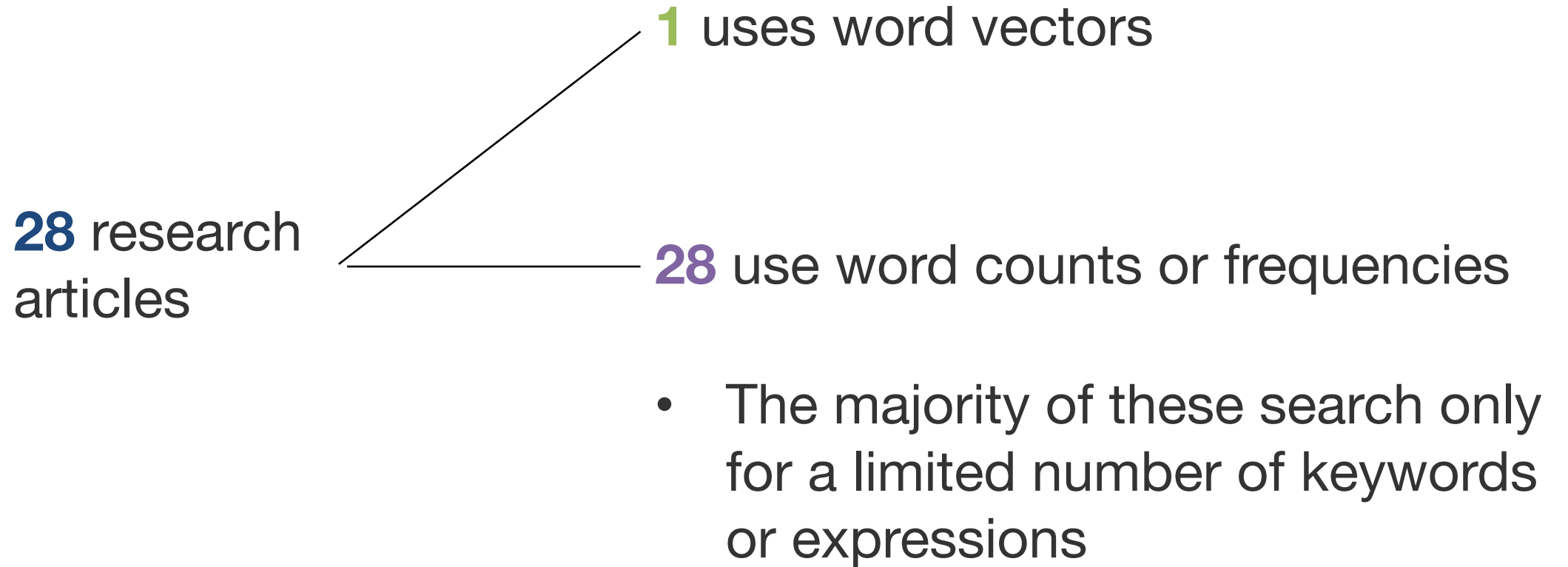
MMCi Block 4

Matthew Engelhard

A Survey of NLP in JAMA...



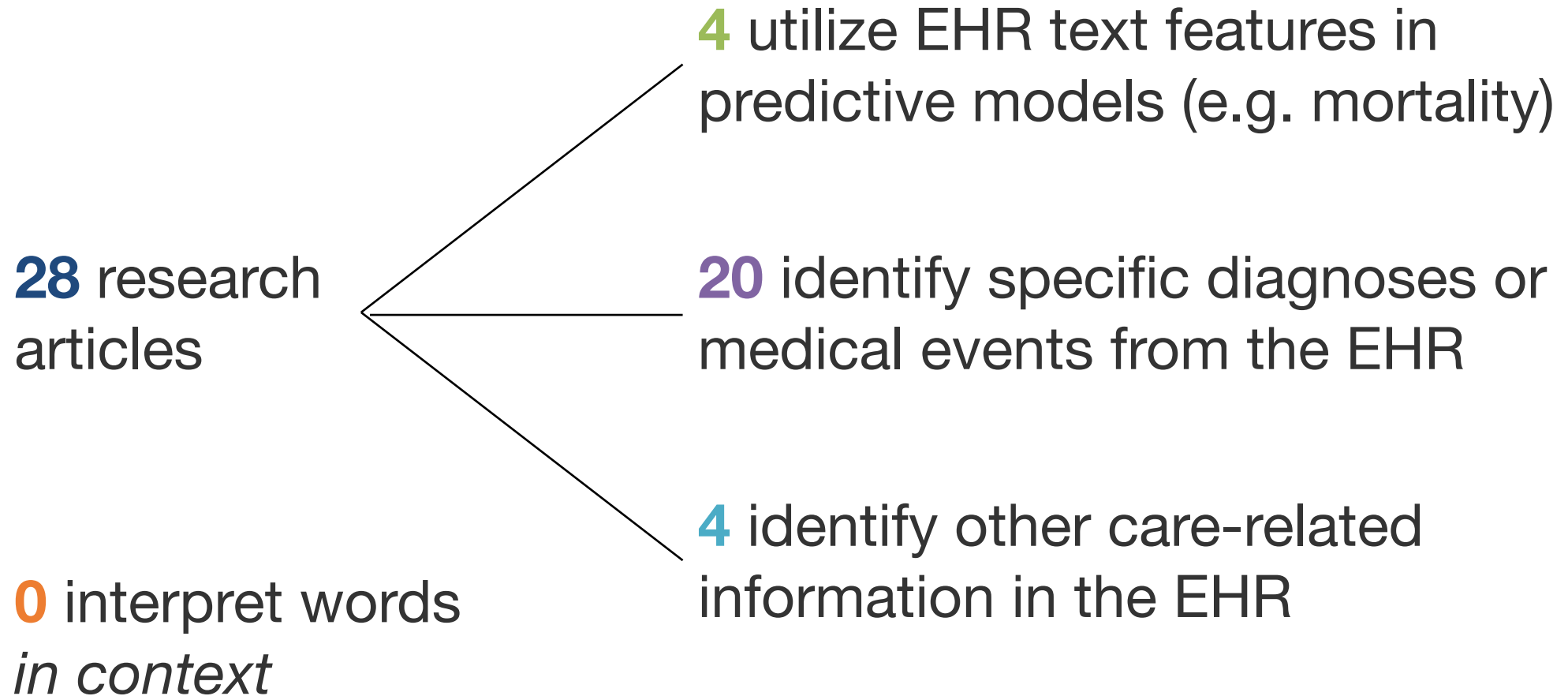
A Survey of NLP in JAMA...



NLP in Medicine So Far:

MOSTLY BAG OF WORDS!

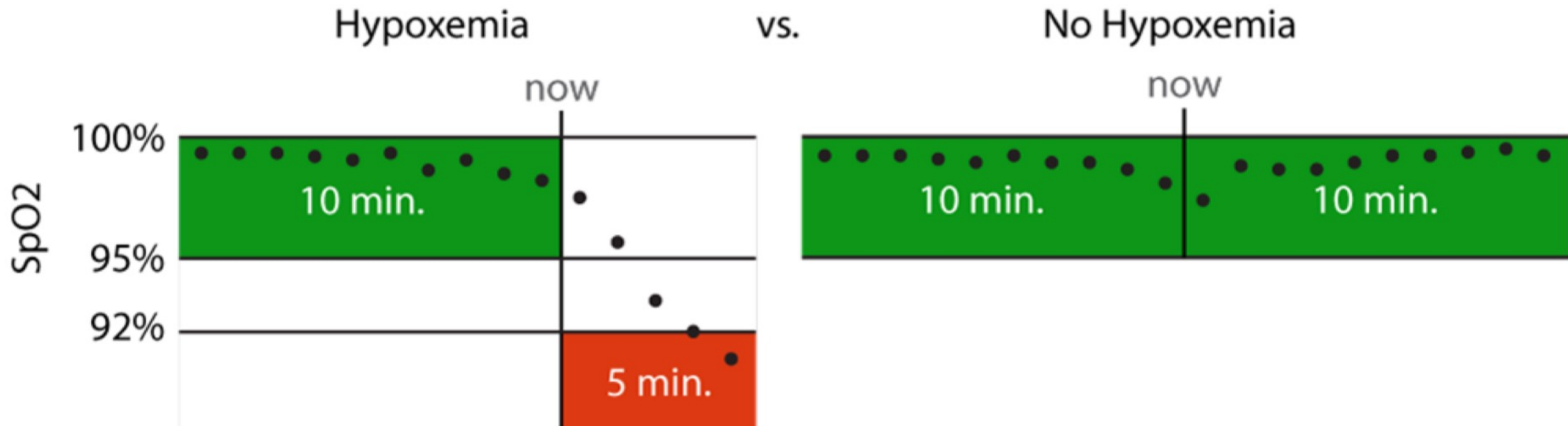
A Survey of NLP in JAMA...



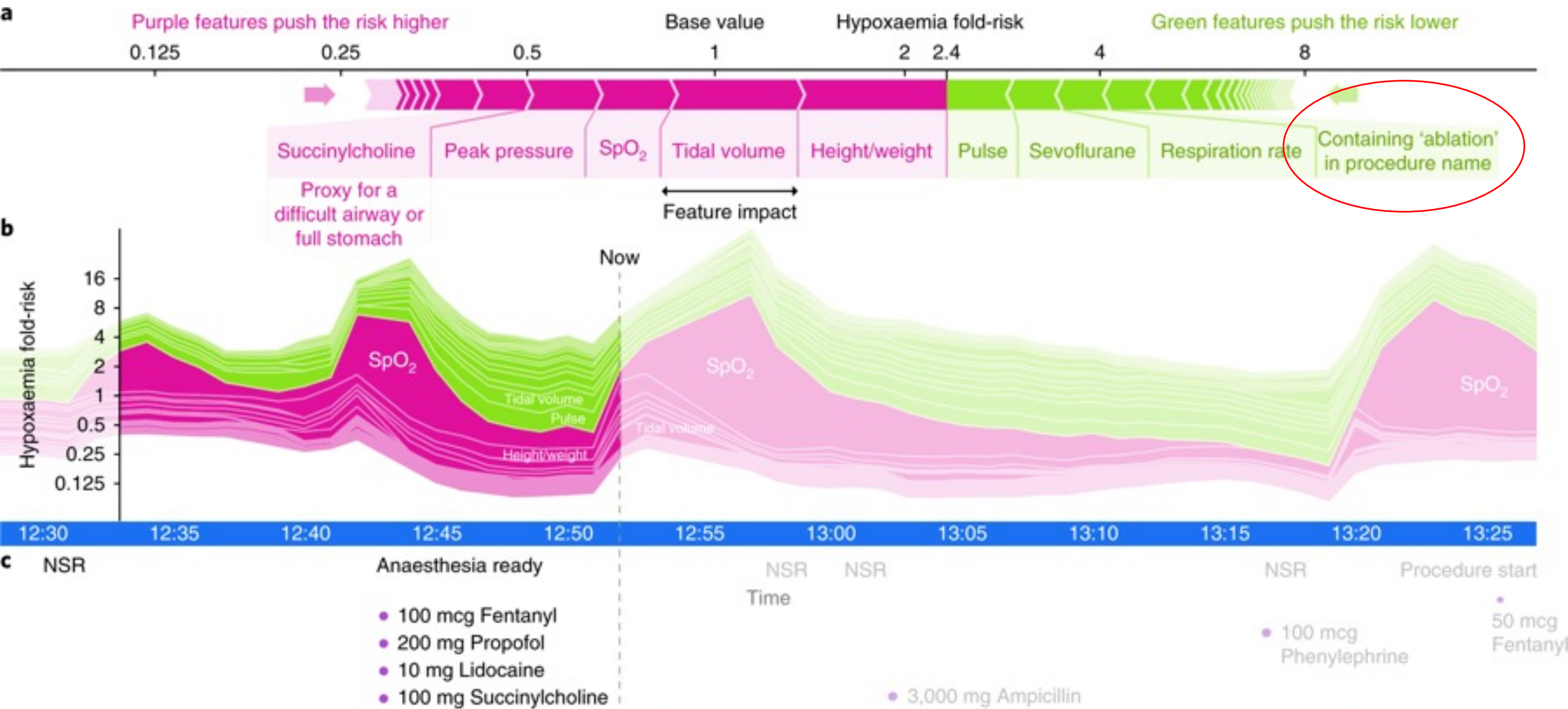
Hypoxemia Prediction during Surgery

Real-time Prediction Task:

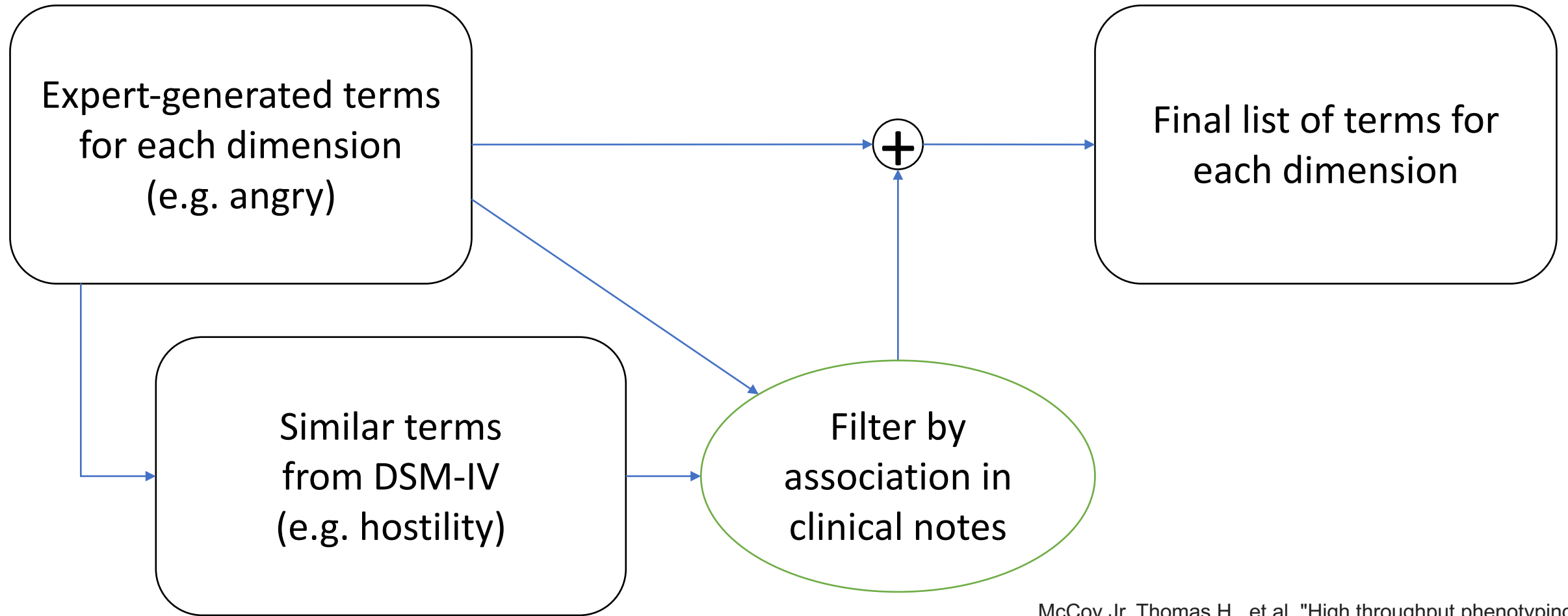
- hypoxemia (yes/no) in the next 5 minutes
- based on data from the Anesthesia Information Management System
- static features + real-time features collected up to that time point



A majority of features are keyword counts

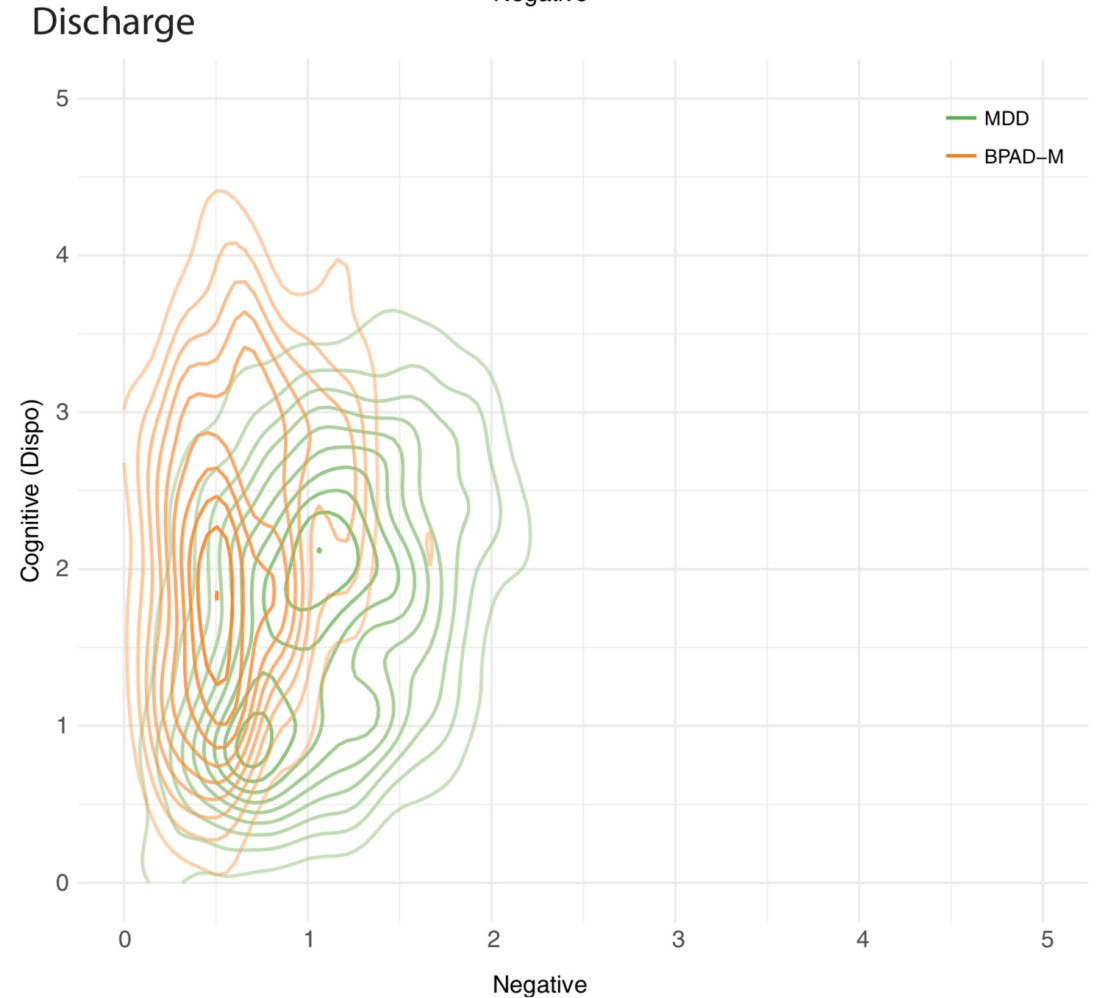
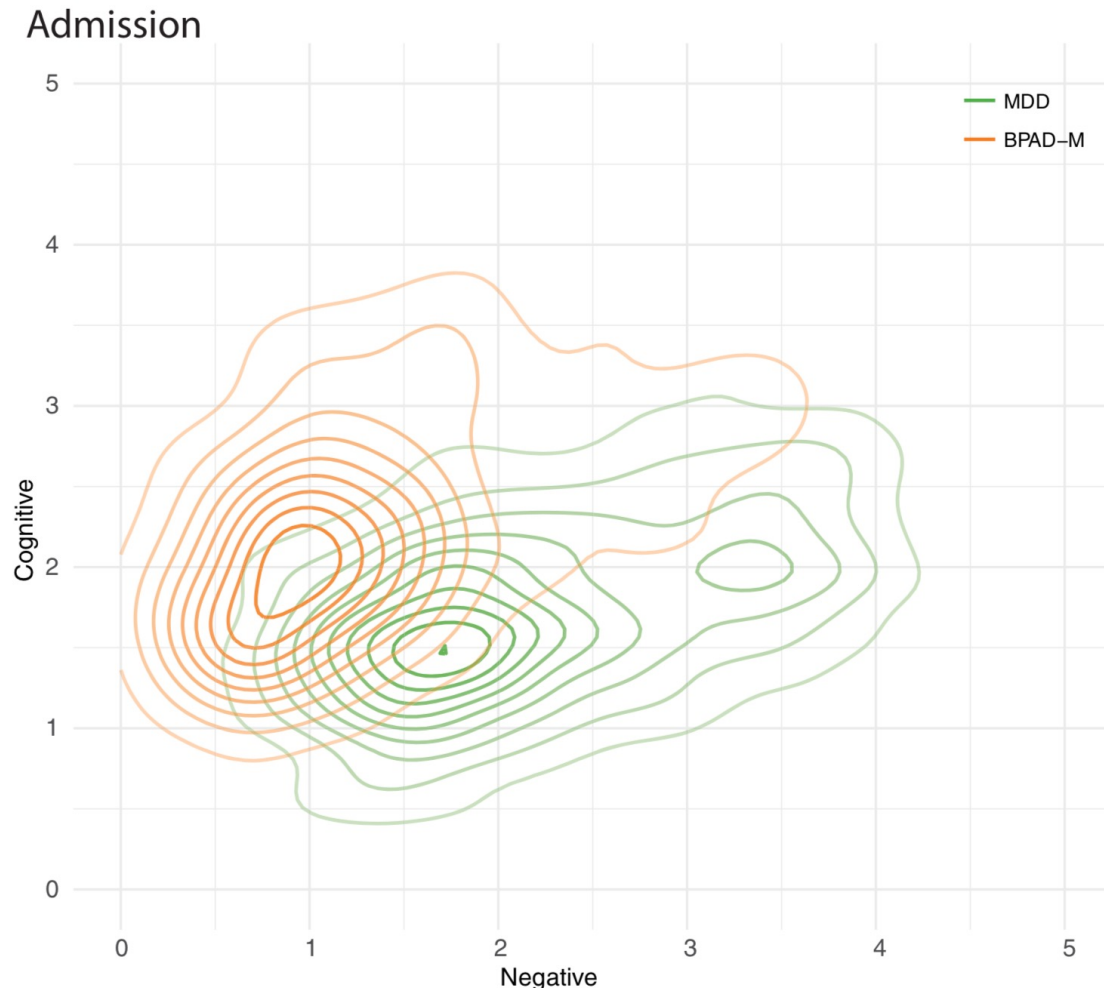


Scoring Dimensional Psychopathology



McCoy Jr, Thomas H., et al. "High throughput phenotyping for dimensional psychopathology in electronic health records." *Biological psychiatry* 83.12 (2018): 997-1004.

Trends in psychopathology during stay



McCoy Jr, Thomas H., et al. "High throughput phenotyping for dimensional psychopathology in electronic health records." *Biological psychiatry* 83.12 (2018): 997-1004.

Figure 1. Domain comparison contour plots showing change between admission (top) and discharge (bottom). BPAD-M, bipolar disorder–mania; MDD, major depressive disorder.

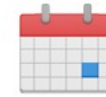
Suggested Email Responses



Messaging



Health



Appts & Visits



Questionnaires

Message Center

[ASK A QUESTION](#)

Inbox Sent Messages



Sort by:

Received Date



Filters:

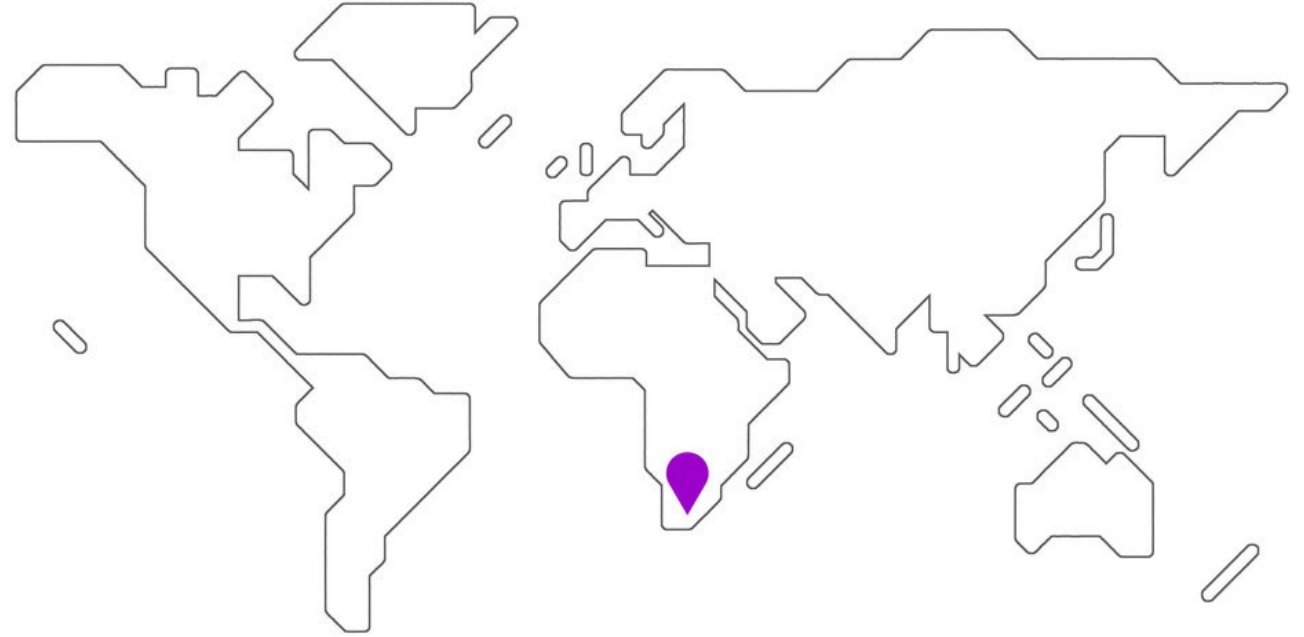
All Messages



Global Maternal Health

Maternal Health HelpDesk:

**2 million women connected to
NDoH staff via SMS**



<https://www.praekelt.org>

Binary Classification: Urgent Message? (Yes/No)

Conclusions

- NLP is approaching human performance on benchmark tasks like question answering
- Text data are central to clinical medicine, so the potential for NLP impact is high
- We can use word counts to turn text samples into vectors that we already know how to work with
- The techniques we have discussed already go beyond the majority of “NLP” found in the medical literature