Regulatory decision making for nurses; is the regulatory environment ready for AI?

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Ackn Charlie O'Hara

AI =
*technology that
imitates aspects of
human
decision making abilities,
using algorithms to calculate,
predict, interpret data*

Machine learning =
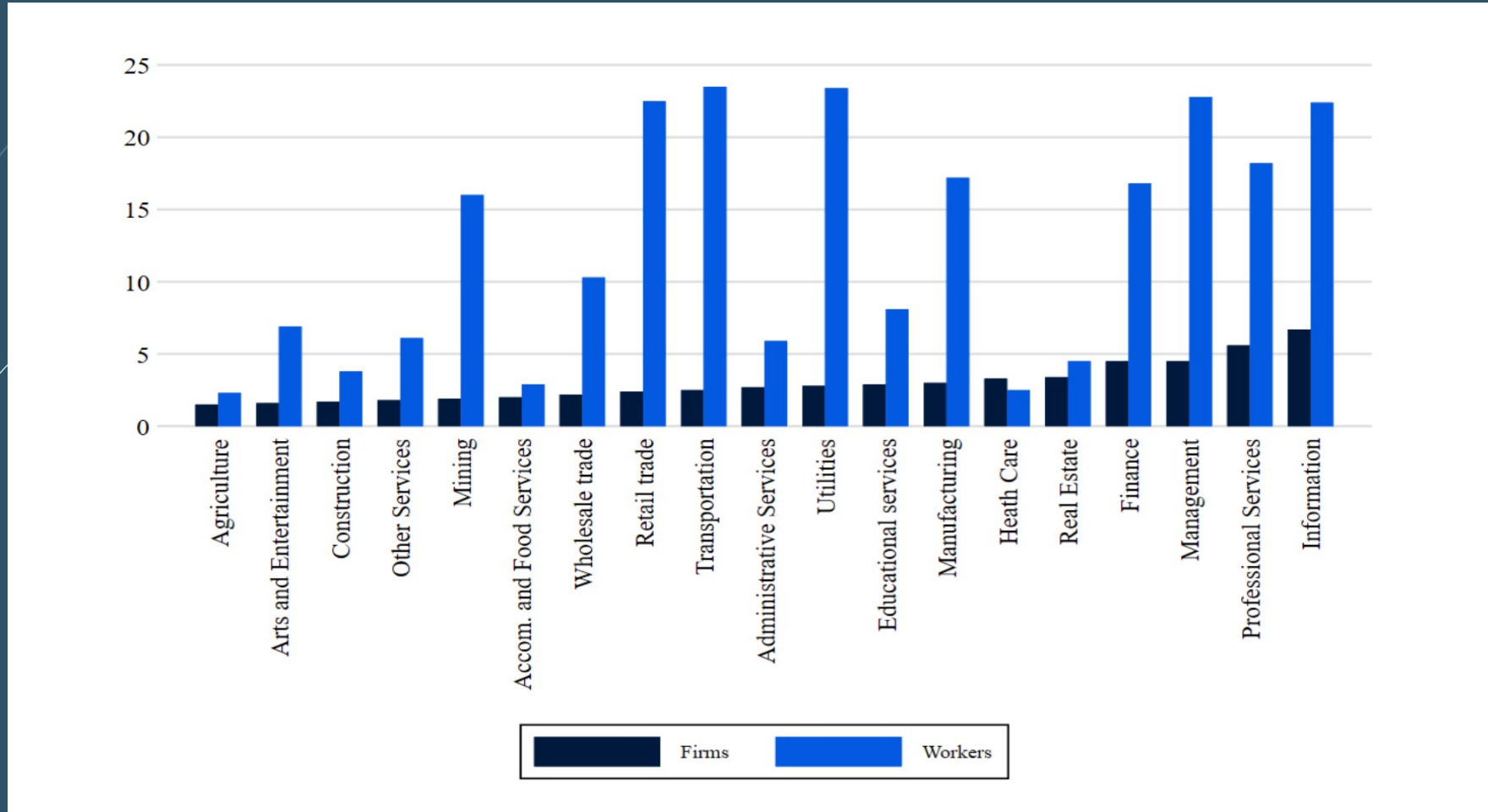**models that learn from data**

2 types
supervised
self supervised

The impact of AI

Is the regulatory environment ready for AI?

- ▶ Nurse Discipline

- ▶ There are a small number of high risk nurses

- ▶ 70+% of cases require no regulatory action

- ▶ Better use of data may help to focus on higher order risks and improve regulation

Research Question

Can we develop new tools to aid regulatory decision making in disciplinary work?

Aim

- Calculate risk level from complaints data
- Link cases to regulatory standards
- Link cases to previous similar cases
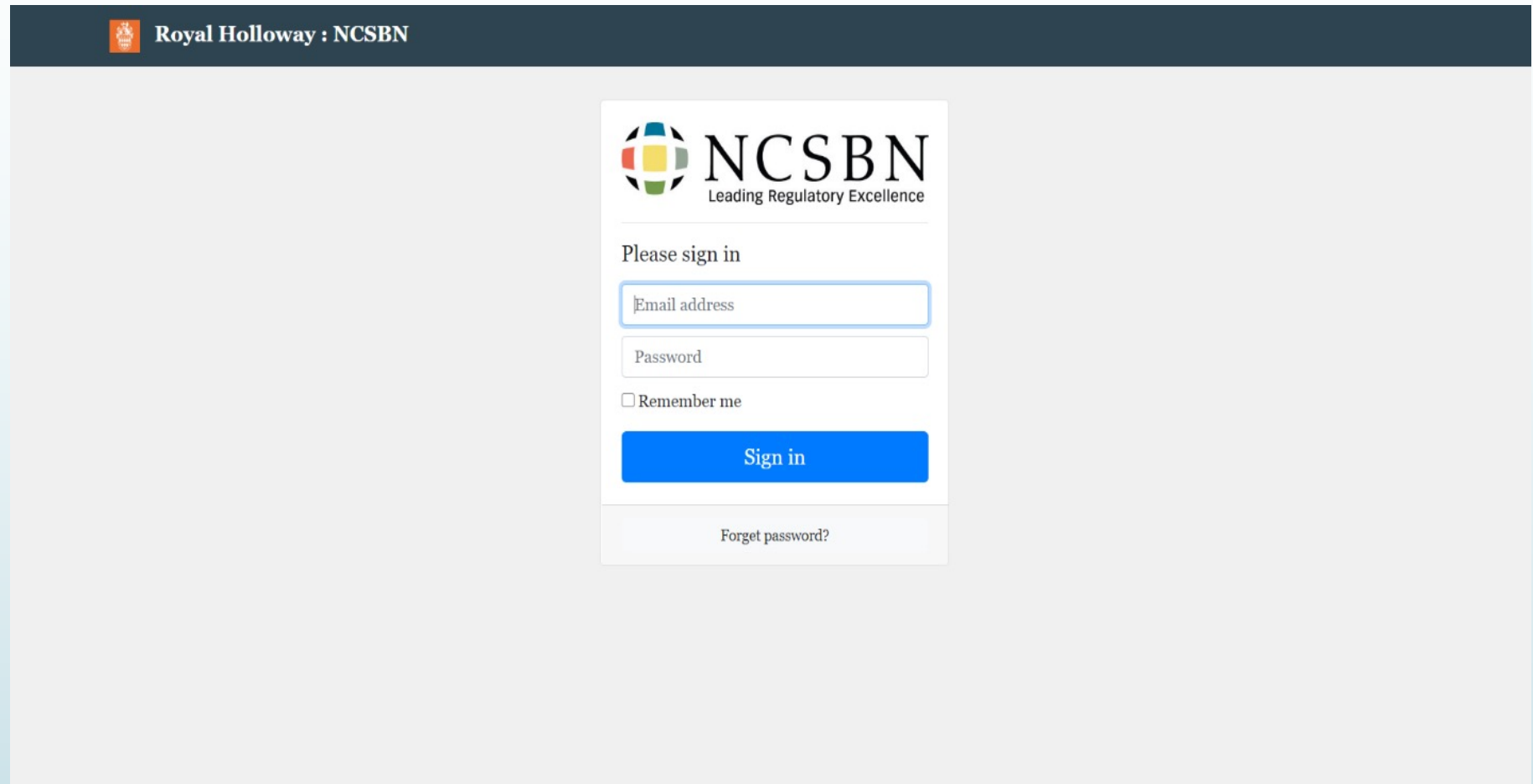- Reduce the workload for regulators

Design principles

fairness, accountability sustainability transparency

(Leslie, 2019)

Methodology

Quantitative and Qualitative summary

- ➤ 5,700 (anonymized) disciplinary cases (US,UK,Australia)
- ➤ Reliability testing of prototype
- ➤ Gender debiasing techniques
- ➤ Qualitative testing with regulatory staff

An overview of the prototype decision support tool

Task 1: calculating risk using anonymized data

Tool highlights key elements used in the prediction of risk category

Predicted risk level, probability & confidence
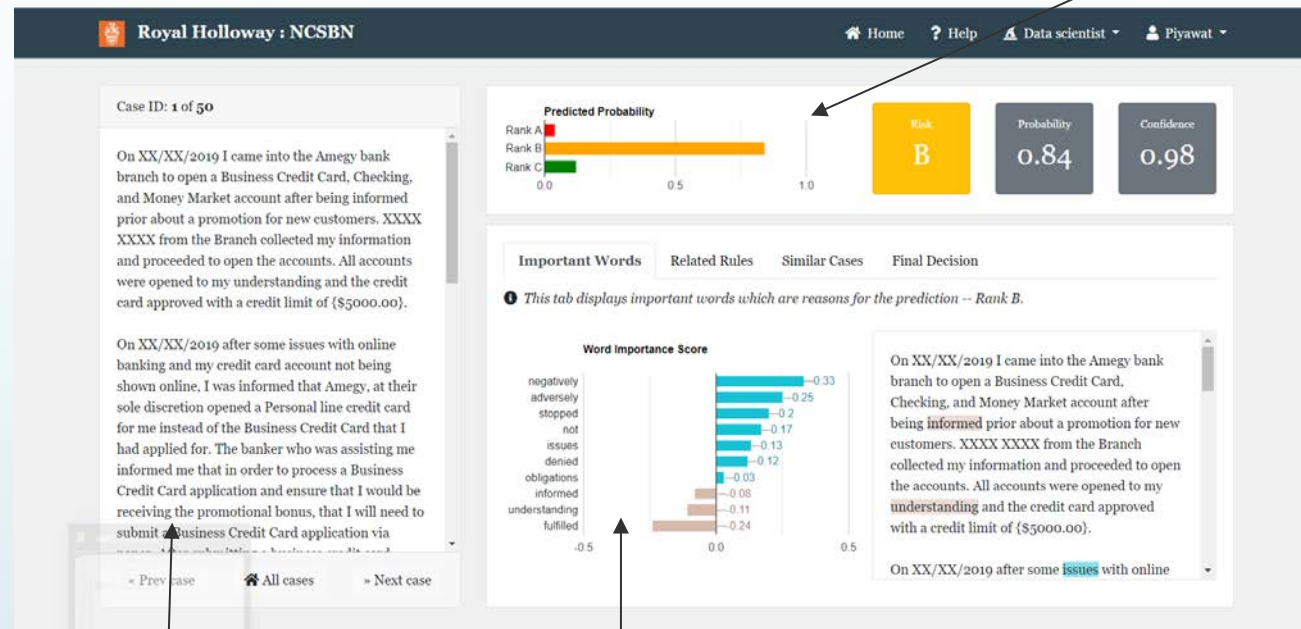
The complaint text used by the algorithm

Scores key words detected in the text

Task 2 & 3: compare current case with rules and previous similar cases

Relates to Texas Board of Nursing rules

Compares case to previous similar cases

Record of case manager decision

Reliability results: Phase 1 testing

1241 cases

Model	Accuracy
Majority Baseline	0.617 ± 0.032
C1: Gradient Boost.	0.671 ± 0.025
C2: AdaBoost	0.646 ± 0.028
C3: CNNMultiTask	0.668 ± 0.029
C4: BERT-base	0.680 ± 0.038
C5: Meta info	0.662 ± 0.029
Ensemble model	$\mathbf{0.708 \pm 0.036}$

Team perspectives and ethical concerns

- Team perspectives varied significantly –
- Computer Scientists
- Lawyer
- Clinical and regulatory
- Social Scientists

- Michael Sandel (2018)
  - Privacy and surveillance
  - Bias and discrimination
  - The role of human judgment

Qualitative Research Methodology

- Three online focus groups with nurse regulators - 28 participants
  - Australia (n=10);
  - United Kingdom (n=11);
  - Texas, USA (n=7)
- The online focus groups were facilitated by 3 members of the research team
- The six phases of **Braun and Clark's** thematic analysis was used :

1. Familiarisation with the data
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the report

Themes raised in our research

Themes	Sub-themes
1. Negotiating trust and trustworthiness	1a Prioritising honesty and transparency 1b A balanced appraisal of human/machine capability 1c Impacting language
2. Affirming fairness and non-discrimination	2a Minimising bias 2b Avoiding fabrication 2c Accountability
3. Managing burdens and benefits	3a Shades of grey 3b Fears of falling through cracks 3c Black box 3d Effectiveness and burden reduction

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The future?

Ensure a deliberative process

Balancing enthusiasm and caution and recognizing the bias of the contributor

- 'idealogues' and 'romantics'
- 'pragmatists' and 'objectionist'

Preparing the workforce (both regulators and professionals)

Policy preparation for public- effective legislation and regulation

'Politics of accommodation'

Conclusions

- ✓ Using AI tools in nurse regulation is feasible & has the potential to bring benefits
- ✓ This work needs replication with a larger US dataset involving multiple states
- ✓ Engagement with regulatory staff, nurses and patients essential to successful integration

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Thank you

Q & A

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