Artificial Intelligence in Health Professions Regulation: An Exploratory Qualitative Study of Nursing Regulators in Three Jurisdictions

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Abstract

Context: Artificial intelligence (AI) refers to a broad group of technologies that are increasingly commonplace in everyday life; however, they have had only limited application in regulatory practice. **Aims:** The present study explored nursing regulators' perceptions of the role and value of AI in regulation and potential barriers and facilitators to the uptake and implementation of AI. **Methods:** Three facilitated focus group sessions with XX representatives of regulators from Australia, the United Kingdom, and the United States were conducted. Content analysis of verbatim transcripts was completed. **Results:** Key themes that emerged included (a) interest in how AI could enhance sustainability and improve cost-effectiveness of certain regulatory processes and (b) concerns regarding how the term "artificial intelligence" itself could be problematic. Specific barriers to the uptake of AI in regulation included concerns regarding codification of system bias, negative public perception, and lack of clarity around accountability for decision-making. Facilitators to implementation included enhancing the consistency of processes and improving the decision-making and utility in supporting trend analyses and audit functions. **Conclusions:** Additional work in exploring how best to incorporate evolving AI technologies in regulatory practice—and what they should be named—is required, but these findings suggest that promising outcomes may lie ahead.

/Keywords/*Keywords:* Artificial intelligence, regulatory practice, nursing regulation, health professions regulation, regulatory bodies

Background:

Artificial intelligence (AI) has been evolving rapidly in recent years, leading some to openly muse that the present is now the future (Anderson & Rainie, 2018). It has infiltrated the daily activities and routines of most people. For example, social media, online shopping, and lane-change–assist features on many automobiles make extensive use of AI in ways that are hidden from the view of the public but are now generally taken for granted by most people and admired as technological revolution by many (Poola, 2017). AI represents a constellation of different technologies and systems with the capability of "performing tasks that would otherwise require human intelligence, and have the capacity to learn or adapt to new experiences or stimuli" (Ertel, 2017, p. XX page 3). Unlike other forms of automation or technology, AI is distinguished by its ability to actually (or potentially) replace (not simply support) human oversight and judgment and to expand its processing and decision-making capacity through the ongoing integration of new data from diverse sources (Anderson & Rainie, 2018).

Designers of AI systems have long grappled with a central tension based on how best to integrate human beings into processes that could be theoretically undertaken through the use of AI (Auernhammer, 2020). Two dominant modes have evolved: "Humans in the Loop" (HIL) and "Humans out of the Loop" (HOL) (Pawluczyk, 2020). HIL describes systems in which AI is programmed according to algorithms and in which "learning" is directed, validated, and tested by humans who maintain direct control at all or most times. HIL systems are often thought of as "decision support" systems: using computational power and memory to provide guidance and evidence but requiring humans to make and implement final decisions. An example of HIL systems in healthcare includes flagging drug-drug interactions in electronic medical records. In such cases, the system alerts the user (physician, nurse, or pharmacist) to a potential or

theoretical drug-drug interaction but requires the user to make a decision to override the alert or manage the alert in a different way (eg, identify an alternative drug). In contrast, HOL systems function with minimal or no human intervention. An example of HOL systems in healthcare is computer-adaptive testing used by some regulatory and licensing examination bodies to determine a healthcare professional's readiness to practice. These systems follow pre-programmed algorithms to determine the number of test items a healthcare professional can successfully answer in order to be judged competent and ready to enter professional practice without direct human intervention of decision-making for each individual candidate.

In healthcare, AI has a track record of successful use, ranging from drug discovery and genomics/precision medicine to the design of mobile applications ("apps") used by consumers to monitor their health along with clinical decision support for diagnosis and treatment (Bohr & Memarzadeh, 2020). Many frontline clinicians use AI or AI-driven systems without even knowing it (Davenport & Kalakota, 2019). In most cases, AI in healthcare is built around HIL, which reinforces the supremacy of humans in analysis and decision-making (Secinaro et al., 2021). Importantly, this is not because of any specific deficiencies in AI itself, nor due to the lack of capacity of AI to make decisions in healthcare settings. Instead, it is a deliberate choice made to reinforce human control despite the reality that AI in many healthcare contexts is at least equal to, if not superior to, human-led decision-making in many clinical contexts (Secinaro et al., 2021). Most frequently, this reality is framed in the context of an assistive role played by HIL-AI and an oft-repeated claim that humans possess wisdom, judgement, compassion, and care that ultimately result in "better" decisions (Davenport & Kalakota, 2019).

AI continues to evolve at a rapid rate, and as it becomes more prevalent in the day-to-day life of ordinary people, resistance to HOL-AI is likely to dissipate (Longoni et al., 2019). This

trend may or may not apply to healthcare settings. Much of the resistance to HOL-AI is built on a foundation of speculative science fiction (e.g., Stanley Kubrik's classic movie *2001: A Space Odyssey*) of dystopian futures associated with robot-led civilizations that enslave humanity (Longoni et al., 2019). The reality is far more mundane (Habli et. al., 2020): while HOL-AI may not be perfect, it is generally far safer, more effective, more efficient, and ultimately may even be less expensive in a diverse array of situations ranging from automated driving of cars and trucks to management of personal finances through "robo-advisors" (Habli et al., 2020).

Health professions regulators have been somewhat slower than other agencies to embrace and incorporate AI in daily practice (Davenport & Kalakota, 2019). In April 2023, the U.S. Federal Trade Commission, the U.S. Department of Justice, and other national organizations released a joint statement on AI highlighting commitments to uphold core principles of fairness, equality, and justice as they anticipate AI will become more common in everyday life (Federal Trade Commission, 2023). Currently, there are few reported applications of HOL-AI or even HIL-AI in health professions regulation despite opportunities that may exist to improve the efficiency, effectiveness, impartiality, transparency, and fairness of decision-making (Reddy et al., 2020). One such opportunity relates to the ways in which regulators assess and make decisions regarding complaints against registrants (Pawluczyk, 2020). Currently, in most regulatory bodies in most professions, the process of reviewing and adjudicating complaints and determining whether escalation to a full investigation and potentially a disciplinary hearing is a resource-intense and almost entirely human-centered process. Where technology is used, it is most frequently for the storage and recall of data, including precedents/findings from similar cases and organization of case files. The use of any form of AI to support decision-making in regulation has not been widely embraced by regulators to date, and there is no published research

examining the regulatory barriers or facilitators associated with the inclusion of AI in daily practice and decision-making. Other sectors dealing with highly sensitive information and high-stakes decision-making—including banking/financial services and healthcare delivery itself—are increasingly relying on AI in daily work.

/H1/Objectives

The objective of this research was to explore nursing regulators' perceptions of the potential role and value of AI technologies in regulatory practice and to identify barriers and enablers to greater use in day-to-day decision-making. As described by Kitzinger (1995), since there is little extant literature on this topic, an exploratory approach using qualitative, discussion-focused methods was selected as an appropriate first step in building an evidence base for the future (Kitzinger, 1995).

/H1/Methods

The research reported in this article was part of a broader study, which was the first of its kind in health regulation and was funded by the U.S. National Council of State Boards of Nursing. Its quantitative findings were reported in the *Journal of Nursing Regulation* in 2021 (Jago et al., 2021). It was delivered by a multidisciplinary team of researchers comprising regulatory experts, lawyers, health academics, and computer scientists. Despite significant differences in the health systems of Australia, the United States, and the United Kingdom, the practice and culture of nursing and nursing regulation are broadly similar, which supported comparisons across these jurisdictions. Australia has state/territory and national regulation, the United Kingdom has national regulation, and the United States uses a state regulatory model.

/H2/Focus Groups

Research involving the regulatory community is complex given the multiple demands on regulators (Squires & Dorsen, 2018). A focus-group design was selected for preliminary exploration of the topic to provide the greatest opportunities for participation by regulators (Wilkinson, 1998). The focus-group method also allowed for a more interactive approach to discussion that supported participants' abilities to build upon one another's comments and reflect upon each other's perspectives in ways that enriched the data collection process, facilitated production of thick descriptions, and supported member checking (a qualitative research validation process in which researchers confirm their understanding of participants' comments following the initial interview/focus group session) (Plummer-D'Amato, 2008). Invitations were sent to regulatory staff at the three nursing regulatory bodies with a description of the objectives of the discussion. Focus group sessions lasting 60 to 90 minutes were planned. Because this research was undertaken during the COVID-19 pandemic (2020 and 2021), all focus group meetings were held using videoconferencing technology to ensure that safe social distancing practices were in place. Each of the three focus group discussions were facilitated by the two of three trained and experienced hosts, and all discussions were recorded and transcribed verbatim for data analysis. All participants provided full informed consent. This research project was approved through the Royal Holloway, University of London (U.K.) Research Ethics Board.

Three focus groups discussions were conducted with regulators from Australia in November 2020 (10 participants), the United Kingdom in March 2021 (11 participants), and the Texas Board of Nursing (United States) in May 2021 (7 participants). Participants worked in a variety of regulatory roles, including senior administrators/organizational leaders, data support personnel, complaints investigators, legal counsels, and practice advisors.

A semi-structured focus group protocol was used to elicit commentary and discussion from participants (see Appendix 1). Purposive recruiting of participants was undertaken with individuals who were employees of these regulatory bodies and primarily engaged in client-facing activities with either nurse-registrants or members of the public. No incentive or honoraria was provided for participation in this study. Focus groups were structured based on regulatory body (i.e., all participants in each focus group session were employees of the same regulatory body) and most focus group participants knew and worked closely with one another prior to participation in this research; thus, it was not possible to guarantee or safeguard anonymity.

/H2/Data Analysis

After each focus group session, verbatim transcripts were produced and analyzed using thematic analysis and a constant-comparative method described by Kitzinger (1995). Inductive coding was used to identify common topics and to produce coding categories that were subsequently refined into themes that are presented in the Findings section. Data storage, manipulation, and analysis were supported through use of nVIVO 12.0. Member validation was not undertaken due to logistical constraints.

These themes were defined in terms of frequency and intensity. In this analysis, frequency describes how often a topic or theme was discussed by multiple participants (including those who simply agreed with a statement made by another participant but did not elaborate further), whereas intensity describes the strength of opinion, the emphasis placed on it, and the way in which the importance of the theme was described by individuals and others in agreement. Although this form of inductive coding is imperfect, it can provide a useful filter for highlighting

issues of greater or lesser importance to focus group participants and across all three different focus groups (Woo et al., 2017).

Findings

Across all three focus groups, the following themes were observed:

- The majority of participants had general familiarity with the principles of AI and had some preconceptions of its potential value in regulatory practice as well as potential consequences of use. This topic was not new to most participants, though few had had any formal opportunity to previously share their perspectives and concerns in a systematic and formal way.
- The majority of participants framed their perspectives and concerns regarding AI in a regulatory context around the central issue of sustainability of current practices. Increasing demands on regulators for more rapid/responsive services, expanding workloads, heightened expectations for demonstration of accountability, transparency in decision-making, and impartiality in processes were all identified as reasons why current regulatory practices were likely unsustainable in the years ahead.
- The majority of participants identified the term "artificial intelligence" as potentially problematic and potentially interfering with an impartial assessment of its role in regulatory practice. The term itself was framed in somewhat problematic, Orwellian terms associated with surveillance, lack of nuance, and a highly impersonal and context-free tool that was being applied to a highly personal and highly context-dependent setting. Terms such as "decision support" were more highly favored, emphasizing the role of AI with HIL.

Each focus group discussion moved beyond these preliminary comments, and across the three focus groups, a series of barriers and benefits associated with the implementation of AI/decision support in regulatory practice emerged. The themes described in the following paragraphs were consistent across all three focus groups and were expressed with similar frequency and intensity by participants regardless of geographical location.

/H2/Key Advantages/Benefits

Key advantages, or benefits, for fuller integration of AI/decision support into regulatory processes included more efficient use of existing resources, enhanced consistency of processes, effectiveness of processes and decision-making, efficiency of regulatory practice, and trend analyses and audits.

/H3/More Efficient Use of Existing Resources

Across most domains of regulatory practice—ranging from entry-to-practice decisions to fitness-to-practice to whether complaints should be investigated further and escalated in a disciplinary process—most participants highlighted the ways in which greater use of technology could support more efficient allocation of resources and help staff better manage increasing workloads. When used in this way, AI would be most helpful in allowing for rapid access to and identification and screening of similar cases/situations to guide human decision makers. Current regulatory practices were described as being slow and cumbersome because decision-making relies heavily on precedent and similar cases being treated in similar ways. Finding "similar cases" was described as a laborious process that could benefit from the efficiency of AI or other technologies. One participant commented:

> *There's the potential for it be faster, I guess, at identifying particular cohorts of practitioners who may…you know, may be deemed at higher risk. So in terms of effectiveness, there's the opportunity for us then to concentrate our efforts where the machine had identified that there was a particular risk and do that much sooner.*

/H3/Enhance Consistency of Processes

Most focus group participants agreed that consistency in regulatory practice is essential because it fosters trust in regulation for both registrants and the public. While consistency in decision-making can be challenging, consistency in processes was described as being amenable to support through AI/decision support. Use of AI to guide data gathering, support data analysis, and signpost procedural irregularities was highlighted as an important and needed advantage.

/H3/Effectiveness of Processes and Decision-Making.

Aligned with the capacity of AI to enhance the consistency of regulatory processes, most focus group participants agreed that the effectiveness of these processes could be enhanced through targeted use of AI to support specific steps or elements, such as ensuring that all required data for analysis was captured and coded in an appropriate manner. Improving the effectiveness of regulatory processes was highlighted by participants as an important step in improving the quality of final decision-making by enabling transparency and impartiality. Participants described how procedural issues or errors undermine faith in regulation and faith in regulatory decisions. There was general consensus that AI and decision support tools could tighten regulatory processes and thus improve decision-making. For example, one participant noted, "In

terms of processing and identifying the absolute high risk and the very low risk, that's relatively easy to identify, and I think AI could support us to improve that further."

/H3/Efficiency of Regulatory Practice

There was strong support for the notion that AI/decision support could enhance the efficiency of regulatory practice by enhancing rapid access to information, a process that was currently described as problematic by some participants. Similar to decision support and AI tools used in clinical practice, algorithm-driven systems could provide regulators with more time- and cost-efficient options for processing complaints, processing entry-to-practice applicants, and adjudicating fitness-to-practice issues. As one participant put it, "There's a potential for improved consistency to manage…we have 35 staff…and we manage a ballpark 10,000 [complaints] a year."

/H3/Trend Analysis and Audit.

Participants in this study identified one of the most important positive and promising features of AI in regulatory practice: the ability to monitor, in real time, trends that are influencing professional practice. Most participants described current regulatory systems that were built to somewhat passively respond to environmental cues rather than to constantly monitor and proactively manage them. The potential of AI to signpost "small but growing problems" before they became "large, unmanageable problems" through constant environmental monitoring, use of threshold-based indicators, or other kinds of algorithmic devices was described as a potential positive role.

/H2/Disadvantages/Barriers of AI

Key disadvantages, or barriers, to incorporation of AI in decision-making in regulation included the codification of existing system bias and negative perceptions of objectivity, accountability, and trust in regulatory practice.

/H3/Codification of Existing System Bias.

Many participants highlighted the potential risk of machine learning inherent in algorithm development in AI worsening or making semi-permanent existing issues of over-representation of certain groups in data, thus compounding the risk of systemic bias and discrimination. Concerns regarding a checklist-based—rather than situation-sensitive—approach echo previous work by Gawande (2011) despite evidence to suggest that when applied appropriately, checklists actually improve outcomes. For example, within the nursing profession across all three jurisdictions, there is an overrepresentation of male and Black nurses in complaints based on their proportion in the profession (Evangelista & Sims-Giddens, 2008). Machine-learning algorithms built upon previous data may perpetuate a system of inequity that is at the core of this issue—an issue that hasn't yet been sufficiently analyzed and understood. Building AI algorithms on today's datasets may be problematic if the datasets themselves are not "clean" and free of inequity or system bias issues (Lertvittayakumjorn et al., 2021). Participants in this investigation highlighted their ongoing work to "clean" such data and reduce or remove system bias, but they pointedly noted that this is an ongoing work in progress, thus raising the question of which datasets could or should be used to begin with that would not further codify existing bias and exacerbate it by putting the weight of AI behind it? As one participant put it,

> *There were certain characteristics of practitioners such as, you know, their age, their gender, their [place] of practice that might predispose them to being more likely to have a complaint about them…. They were concerned that we were biased against them on these sorts of characteristics…rather than…forming our view about them based on the particulars of the [situation]. So I think to whatever extent that there is an algorithm in the background that is using information about practitioners' past and relating it to the present matter…the algorithm might not be fully based on a fair and independent consideration of the facts in the matter.*

/H3/Objectivity

Participants noted that impartiality in processes and decision-making are essential attributes of quality regulatory practice but that impartiality is different than objectivity. Similar to the difference between "equity" and "equality," slavish application of machine learning algorithms used in AI to all cases risks removing a nuanced understanding of circumstances and contexts from complex cases, all in the name of "objectivity," which in practice can lead to regulatory unfairness. Participants—particularly those involved in fitness-to-practice and complaints/disciplinary processes—highlighted the pivotal role of interpretation of facts and situations in guiding decision-making. Incorporating these elements into regulatory practice was not seen as "subjective" or biased but instead as a reflection of the realities associated with the complexities of day-to-day professional practice. Removing or downplaying these elements—in the name of objectivity—may actually produce worse outcomes, perpetuate unfairness, and call into question the quality of regulatory processes and decision-making despite providing the veneer of "fairness." Regulatory bodies rely heavily on the lived experiences of peer

practitioners to help them understand complex problems and cases, and this was deemed an important value that may be difficult to reconcile with AI HOL.

> *I would avoid the word "objectivity." I think that both the risk assessment and regulatory decision-making are always inherently subjective, but I think that what we're trying to strive for in terms of fairness is to have a systematic framework and criteria we work through to assess the risk in each and every case. It helps us with consistency and, you know, it helps us with the explainability and it helps in our fairness and our thoroughness.*

/H3/Accountability

As has been seen in other sectors where AI has recently proliferated, participants in this study expressed concerns regarding accountability for decision-making when it is entirely or substantially reliant upon AI algorithms. Several participants highlighted the example of autonomous (self-driving) vehicles and liability claims and concerns for system failures. Where AI, especially AI with HOL, is relied upon for decision-making, responsibility and accountability for faulty decision-making or even unanticipated consequences may become blurred; such ambiguity is challenging to manage within a regulatory context. Without a clear legal framework for understanding responsibility and accountability where AI HOL or AI HIL is used, one that is built upon a foundation of administrative law, it is difficult to see how further incorporation of AI of any sort can be operationalized.

> *I guess one of the barriers…is the potential for there to be a legal challenge to the decision-making brought about by the fact that the algorithm that supports the decision is…. They're not necessarily able to be explained in the same way that the reasoning of a human brain might be able to be explained.*

/H3/Trust in Regulatory Practice

Many focus group participants described the unique and nuanced nature of the relationship between regulatory bodies, their registrants, the public, and (depending on the jurisdiction) the government that oversees their work. The complex negotiation of different stakeholder needs and expectations, in a potentially antagonistic and legally fraught context, is only possible because of trust that is conferred to regulators—trust that is consistently earned through careful, deliberate, impartial, and transparent processes. Participants questioned how incorporation of AI in any form may disrupt this carefully balanced and negotiated series of stakeholder relationships, particularly if, as expected, there will be issues, errors, overreach, or other problems as AI systems "learn" and build their algorithms during initial start-up. The high-stakes nature of regulatory practice means there is minimal (if any) tolerance for error or oversight, and reputational integrity of regulatory bodies is of paramount importance. Adoption of new, unproven, and untested technologies can be threatening; while other industries may have demonstrated how innovation and risk-tolerance can be embedded into organizational culture, it is essential that regulators have opportunities to be fully engaged in this process to ensure the bedrock of trust that is necessary for regulatory effectiveness is not compromised during a time of evolution and change in regulatory practices. As noted by one participant,

I think decision support would be seen the most favorably of these terms. Nobody trusts AI, I don't know if you've read the future of the professions or the future of law but…you know it was forecast a long time ago that we would be relying on AI that there's been a basic distrust of that in our industry."

Another participant summarized their concern as "The public might look at it as Big Brother, Big Sister."

/H1/Discussion

Focus group participants highlighted the probable inevitability of greater adoption of both AI HIL and AI HOL in regulatory practice over time, and in general they understood and accepted the positive long-term potential of this evolution and change. Most focus group participants were not simply vaguely aware of AI and its risks and benefits—they had already contemplated and thought deeply about its impact on day-to-day activities of regulators and the consequences on stakeholder relationships. Overall, most participants expressed openness to greater incorporation of some elements of AI, such as decision support systems that incorporate machine-learning algorithms, but there was consistent and vocal support for HIL models that ensure that final decision-making authority and responsibility rest with named individuals. Top-of-mind issues for participants included nomenclature: the term "artificial intelligence" when applied to a regulatory context was problematic, whereas "decision support" and other terms that emphasize HIL and individual control over final decisions more fully capture the current desired objective for regulators.

/H2/Strengths and Limitations

This study represents an important first step in better understanding an evolving issue of considerable complexity. A strength of this work is its multi-jurisdictional orientation: regulators from three different countries participated in focus groups for this study. While each jurisdiction has its own unique issues, culture, and context, there are substantial similarities in regulatory and professional practice across all three jurisdictions that can help expand our understanding of the issues discussed. Another strength of this work was its emphasis on the participants themselves: focus groups were carefully facilitated to provide participants with opportunities to share their true experiences and insights and build upon one another's thoughts (Wilkinson, 1998). Transcript quotations were used to analyze data, ensuring appropriate respect for what participants actually said, not simply what the research team thought they said. Finally, while these focus group discussions were exploratory in nature, they were among the first to attempt to understand how AI may impact regulatory practice and may therefore be useful as a springboard for other research.

Of course, there are also limitations. The focus group methodology utilized in this study has inherent limitations that have been described in the literature (Wilkinson, 1998). Social and peer pressures at work during a focus group discussion may inhibit some forms of conversations and amplify or distort others, giving researchers an unrepresentative view of individual participant's true beliefs and opinions. Additionally, focus groups do not permit in-depth exploration of issues due to time constraints. Nonetheless, focus groups can be useful at providing an initial exploration of a complex topic and support signposting of further research that may be valuable in the area (Tausch & Menold, 2016). Another potential limitation of this work involves the hypothetical nature of the discussions themselves: while AI is rapidly

evolving, few participants had any authentic firsthand knowledge or experience upon which to base their comments. Instead, participants were mainly dealing with conjecture and future-looking "what-if" possibilities. This lack of grounding in an actual, lived reality around AI may diminish some of the impact of the findings.

Despite these limitations, there may be some valuable information for nurse regulators and regulators across different professions and different jurisdictions to consider, specifically that advances in AI are continuing apace and that AI/decision support will in all likelihood become part of regulatory practice in the not-too-distant future. Already, regulatory bodies in all professions routinely use algorithms to support—and sometimes guide—their decision-making processes, and such algorithms form the foundation of AI and decision support systems. While professions, cultures, and jurisdictions may differ, there are broad similarities across professional regulatory bodies worldwide with respect to adherence to processes, the need for transparency and fairness in decision-making, and the desire to enhance operational efficiencies of day-to-day functions. These discussions with nursing regulators can provide some preliminary insights into potential issues and support further profession- and jurisdiction-specific research in the future.

Conclusions

The present article has highlighted important considerations regarding adoption and implementation of technological options for regulatory practice. The focus group discussions with nursing regulators highlighted a variety of potential significant benefits to greater adoption of AI in regulation, including (a) more efficient use of existing resources; (b) potential increases in consistency of decision-making; (c) enhanced efficiency and effectiveness of regulatory processes; (d) increased capacity for real-time trend analysis, reporting, and auditing; and (e)

opportunity for cross-jurisdictional and interprofessional collaboration. Nursing regulators also highlighted some important barriers to adoption of AI, including (a) concerns regarding diminishment of trust in regulatory practice, (b) codification of existing system bias, (c) issues of accountability and transparency, and (d) inability to exercise discretion based on case-specific circumstances, leading to bureaucratic rigidity. Participants noted that there may be certain functions/activities in regulation that are better suited to initial implementation of AI (for example, preliminary screening of complaints or comparison of historical cases with current cases for the purposes of penalty adjudication). The unique nature of regulatory work and the complex web of stakeholder relationships introduce important challenges for AI and decision support despite recognition of the potential value it could bring to regulatory practice.

Further work is required to understand how to best leverage current and future technologies to better serve the needs of regulators and their diverse stakeholders without sacrificing crucial elements of regulatory work that demand nuanced and impartial decision-making. Based on these exploratory discussions, several potential next steps could be considered, including (a) more jurisdiction-specific research aimed at understanding public, practitioner, and regulator perspectives on barriers and facilitators to adoption of AI in regulatory practice; (b) rigorous and formal evaluation of the implementation of existing decision support and AI technologies in regulatory practice; (c) pilot testing of customized AI systems for regulatory contexts, addressing some of the concerns reported by participants in this work as currently being barriers to implementation (for example, enhanced screening/triaging of complaints through use of decision support); (d) initiation of discussions focused on the legal implications of and regulatory frameworks for greater incorporation of AI in regulatory practice to ensure transparency, impartiality, and consistency; and (e) further discussions within regulatory bodies

to identify particular practices or areas of work (e.g., complaints adjudication, readiness-to-practice assessments of internationally educated health professionals) that may be more amendable to decision support.

As noted by participants in these focus group discussions, the expansion of AI into regulatory practice is not only inevitable, it is also desirable due to its potential to enhance operational efficiencies and reduce human biases in decision-making. To maximize potential for successful integration of AI into regulation, the concerns expressed by these focus group participants provide a useful first step in aligning technological potential with real-world needs.

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Appendix 1

Protocol for Focus Group Facilitation

Focus Group Work: NCSBN Project

Can AI [artificial intelligence] improve the quality and efficiency of decision-making in nurse regulation?

Objective Set Out in the NCSBN Proposal

To gain an understanding of the socio-cultural and organizational contexts that may shape the reception and use of this tool if it were to be used in practice. This would necessitate obtaining views on the potential ethical implications of using the tool in practice and whether the degree to which the tool is embraced or rejected is likely to vary by local cultural context.

[A.v.d.G. or Z.A., with R.J. and M.W. introducing,] would facilitate the workshops with [A.v.d.G.] observing and [the group would] undertake a thematic analysis following Kitzinger (1995). ~~*Braun and Clark (2006) and Kitzinger (1995).*~~ *Consultation through a virtual forum with a group of experts from each jurisdiction may be part of the development process to ensure workshops are fit for the purpose of each jurisdiction.*

Aim

This workshop aims to explore regulatory staff perceptions of the use and value of decision support tools in disciplinary work.

Who Will Be Involved?

- Staff involved in the disciplinary process, senior managers responsible for implementation

- RHUL Research Team ([R.J.] to start and [A.v.d.G. or Z.A.] to facilitate Australian Health Practitioner Regulation Agency discussion; [M.W.] to start and [A.v.d.G. or Z.A.] to facilitate the Nursing and Midwifery Council discussion; and [R.J.] to start and [A.v.d.G. or Z.A.] to facilitate the Texas Board of Nursing discussion)

Start [R.J./M.W.]

Introduce everyone—Does someone from the Australian Health Practitioner Regulation Agency state the land acknowledgment? *(Note: Land acknowledgements are formal statements acknowledging Indigenous/Aboriginal/First Nations stewardship of lands and the impact of colonization and colonial practices resulting in historical inequities).*

Housekeeping—Timing (30-40 minutes or so on each topic), forms, recording, data

Proposed Topics

1. ***Potential Barriers [A.v.d.G. or Z.A.] — 20 minutes plus***

What barriers might there be to using decision support tools in the fitness-to-practice [FTP] process? (Be prepared for wider positioning within education/registration, etc., but focus is on FTP.) Possible prompts:

- What concerns might there be from the perspectives of case managers?
- Might you be concerned about risk, harm, or reputational damage to those involved? What, who, and how?
- Might you be concerned about issues such as bias; transparency, fallibility, limitations of AI—what are these?
- What would you need to know to be confident that an AI tool could fulfil its functions?

- What activities might an AI tool, in the context of regulation, be unable to do? Please elaborate.

2. Potential Benefits [A.Z./A.v.d.G.] — 20 minutes plus

What benefits might there be of using decision support tools in the FTP process? (Be prepared for wider positioning within education/registration, etc., but focus is on FTP.) Unpick what benefits there might be and their logic:

- efficiency (quicker decisions)
- effectiveness (better decisions, less prone to challenge)
- objectivity
- consistency
- performance monitoring
- freeing up resources for "humane regulation"
    - Will it free up time?
    - Will it allow resources to be more effectively directed?
- finale: Reflection? Gaps? Any areas that could be developed?