Preferences for AI use in radiation therapy: What matters most? A DCE

AUTHORS

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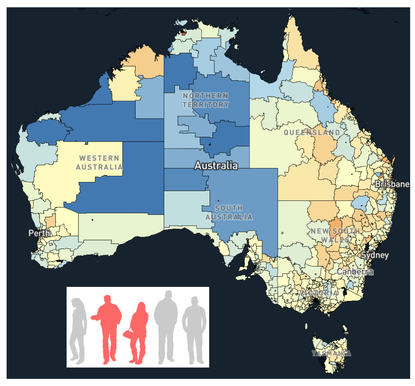
BACKGROUND



- 2 in 5 Australians will be diagnosed with cancer before the age of 85
- Radiation therapy is a primary modality in oncology and used in treatment of about 50% of cancer patients
- The increasing demand for radiation therapy also drives the need for improved efficiency
- AI systems can meet this need, if they are acceptable to stakeholders

The integration of artificial intelligence (AI) in radiation therapy offers significant potential to enhance cancer care by improving diagnostic accuracy, streamlining workflows, and reducing treatment delays. However, the adoption of AI in clinical settings depends heavily on its acceptability, shaped by perceptions of accuracy, cost, efficiency, and ethical considerations

OBJECTIVE: To investigate the preferences of **AUSTRALIAN GENERAL PUBLIC** for the specific features of AI-systems used in radiation therapy planning

METHODS

- An online DCE of Australian general public (N=533)
- Designed Experiment with 256 choice tasks; 16 versions each with 16 choice tasks
- An initial D-optimal design constructed using “idefix” used to select the choice options to allow estimation of main effects for each attribute using multinomial logit (MNL)
- Choices were modelled using mixed logit regression
- The survey also included questions about attitudes to AI

ATTRIBUTES AND LEVELS

Accuracy	Automation	Cost	Time	Use of data
AI sometimes misses cancer	Assistive	No additional cost ($0)	10 days longer	AI may use your medical images only, and only with your consent
AI never misses cancer but sometimes calls normal tissue cancer		Additional $35	No change (30 days)	AI uses your medical images only, without needing your consent
Same as clinician	Autonomous	Additional $50	10 days shorter	AI system may use your medical images and health record data only with your consent
AI system is less likely to miss cancer and less likely to call healthy tissue for cancer		Additional $100	15 days shorter	AI uses your medical images and your health record data without needing your consent

EXAMPLE CHOICE TASK

Imagine that you were recently diagnosed with cancer, and you will be treated with radiation therapy treatment. You have a choice between two treatment centres. AI-systems are used for diagnosis and treatment at both treatment centres, but the systems are different. Which treatment centre would you prefer?

Please click on the treatment centre you prefer. Please hover your mouse or pointer over the highlighted words if you want to see more information about those terms.

Task 1 of 16

For testing purpose :
Version - 15
Task - 1

	Treatment centre A	Treatment centre B
Accuracy Compared with clinicians	The AI system is less likely to miss cancer and less likely to call healthy tissue for cancer	The AI system sometimes misses cancer
Diagnosis and treatment oversight	**Assistive**	**Fully autonomous**
AI impact on out-of-pocket costs	Additional $35	Additional $50
AI impact on time to cancer treatment Compared to the usual 30 days waiting time at treatment centre not using AI it will be	15 days shorter	10 days longer
AI-driven use of your data to update its learning/model	The AI may use you medical images only, and only with your consent	The AI uses your medical images only, without needing your consent
Which treatment centre do you prefer?	○	○

Compared with the treatment centre you have chosen, would you prefer a treatment centre that does not use AI?

Please select one response.

Yes

No

RESULTS

- Respondents preferred AI systems with enhanced accuracy and reduced treatment delays.
- Systems less likely to misclassify tissues were highly valued, while fully autonomous AI systems were less favoured compared to assistive systems requiring clinician oversight.
- Data privacy concerns varied, with some participants prioritising consent-based data usage.
- Willingness-to-pay estimates showed the respondents were willing to pay for features such as enhanced oversight, reduced time burden, and AI-driven data use

RESPONDENTS (N=533)

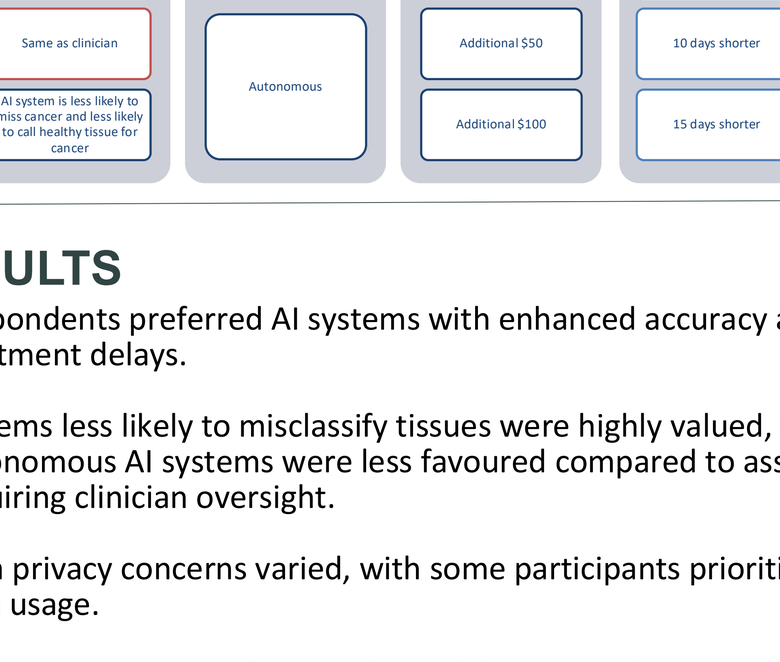
49% / 51%

Employed 69%

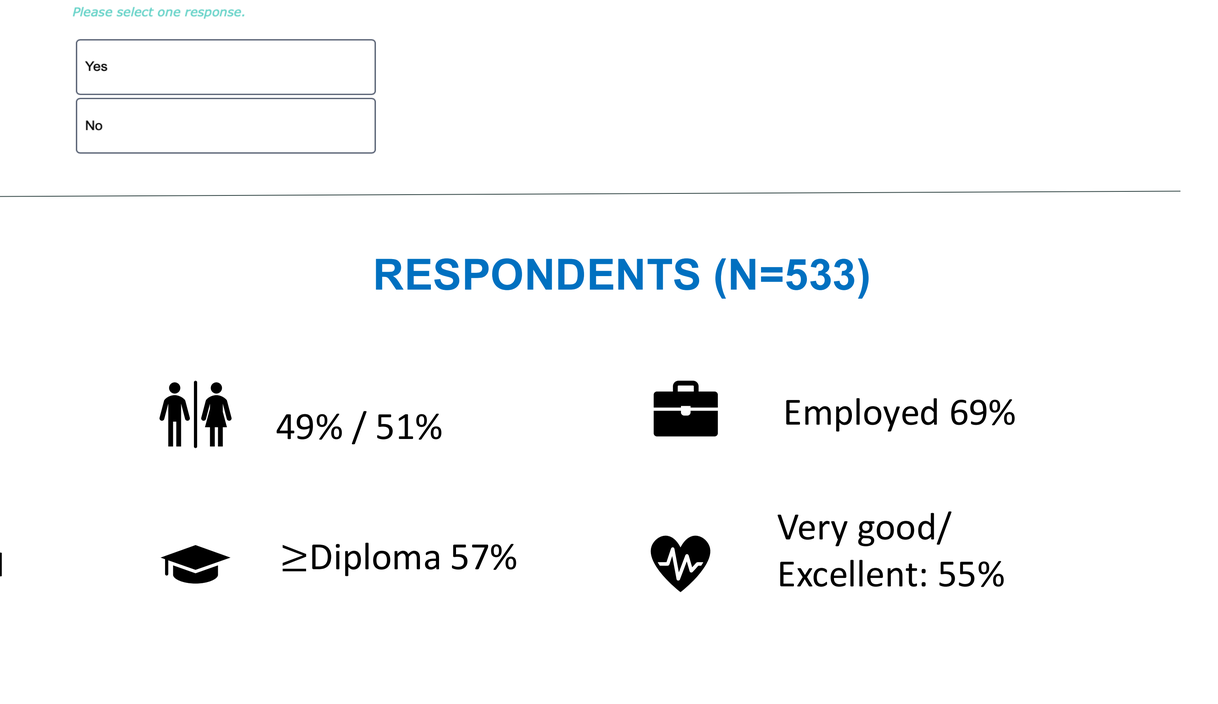
≥Diploma 57%

Very good/ Excellent: 55%

MIXED LOGIT MODEL RESULTS (N=533)



OPINIONS AND ATTITUDES TO AI



TRANSLATION & IMPACT

This study provides important information about Australian general public preferences for AI in treatment planning and can be used to inform future research on economic evaluations and implementation of AI-driven technologies in radiation therapy.

DCE with Australian healthcare professionals

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