Appendix – Description of studies

Reference (no.)	Type of AI application as the focus	Stakeholder respondents	Survey method	Attitudes/perceptions expressed by majority (>50%)	Expectations	Dependencies
Scheetz et al (3)	Defined by authors as AI algorithms for image analysis.	632 trainees/fellows of ophthalmology (305; response rate 20%), radiology-radiation oncology (230;l response rate 5%), dermatology (97; response rate 13%) colleges of Australia and New Zealand.	On-line questionnaire of 18 multiple choice questions and additional open-ended questions.	AI would improve their field. AI would impact on future workforce needs. Concerns about outsourcing application development to large AI companies, clinician liability for AI errors and decreased reliance on specialists ('do-it-yourself' medicine).	Requirement of AI to perform better than specialists for disease screening and diagnosis. Improved patient access to screening, provide greater diagnostic confidence and reduce specialist time spent on mundane tasks. Exposure to liability for error would be disincentive to use AI.	AI applications must be accurate, integrated with routine clinical workflows, shown to improve clinical decision-making, and not usurp specialists. Clinicians must be protected from liability for error.
Coppola et al (4)	Not defined by authors Respondents (66%) defined AI as 'an aid to daily working practice'.	1032 radiologists from Italian Society of Medical and Interventional Radiology. Response rate 9%.	On-line questionnaire of 10 single choice and 3 multiple choice questions.	AI would optimise and expedite image interpretation and detection and characterisation of lesions on images reduce diagnostic error. AI would optimise work flows	Fewer diagnostic errors Faster turnaround time Loss of professional status and career development. Need for regulatory policies.	AI applications must be accurate, integrated with routine clinical workflows, shown to improve clinical decision-making, and not usurp specialists.

				AI may reduce professional reputation of radiologists, decrease learning opportunities and lower salaries and recruitment.		Professional status and career development of radiologists must be protected.
Waymel et al (5)	Defined by authors as 'AI-based solutions'.	70 radiology residents and 200 senior radiologists registered with department of health in Nord and Pas-des-Calais. Response rate 44%.	On-line questionnaire of 42 questions with Likert scales.	AI would automatically detect and measure lesions on images and improve image post-processing. AI would positively impact future practice. Radiologists should remain liable for AI error. Interest expressed in AI research partnerships. Concerns around AI shifting practice from diagnostic to interventional radiology. Mammography, CT scanning, plain X-rays and MRI most likely to be affected by AI. Training in AI currently insufficient	Fewer diagnostic errors. Faster turnaround time. More time spent with patients. Adverse impact on some professional roles.	AI applications must be accurate, integrated with routine clinical workflows, shown to improve clinical decision-making. Role of the diagnostic radiologist needs to be preserved.
Collado-Mesa et al (6)	Not defined by authors.	69 registered radiologist trainees in a single US	On-line questionnaire of 13 questions, 12 multiple choice and	Potentially unfavourable impact on career prospects. Willingness to help create	Major impact on the role and daily work of radiologists.	Role of the diagnostic radiologist must be protected.

		radiology training program. Response rate 66%	one Likert scale score.	or train AI application to do some of the tasks of a radiologist.		
Sit et al (7)	Not defined by authors.	484 medical students from 19 of 34 UK medical schools. Response rate not stated.	On-line survey of 11 questions with 5-point Likert scales.	Teaching in AI would be beneficial for career development. Some specialties would be replaced by AI over next 30 years, with radiology being most likely.	Major impact on the role and daily work of radiologists.	Professional roles must be protected by providing adequate training in AI.
Pinto dos Santos et al (8)	Authors defined AI in generic terms but in a sub-section of the questionnaire referred to specific radiology applications	263 undergraduate medical students in three German universities. Response rate not stated.	On-line questionnaire with four sections and total of 18 questions with Likert agreement scale scores.	AI could potentially detect pathologies on images and improve radiology. AI would not be able to establish a definite diagnosis. AI would not replace human radiologists.	Fewer diagnostic errors. Adverse impacts on professional role if training in AI is inadequate.	AI applications must be accurate. Professional roles must be protected by providing adequate training in AI.
Gong et al (9)	Not defined by authors although questionnaire included questions about students' understanding of the principles of deep learning.	322 medical students from all 17 medical schools in Canada, with target population being students wanting to pursue radiology. Estimated	On-line questionnaire of 17 items including multiple choice questions, true/false questions, Likert scale items, slider scale question and narrative question.	AI will augment radiologist capability and make radiologists more efficient. AI would not replace radiologists. AI will reduce number of required radiologists Radiologists should embrace AI and work with IT industry for its application. Students understanding of	Faster turnaround time. Adverse impact on professional role if not adequately trained in AI.	Professional roles must be protected by providing adequate training in AI.

		response rate of all students 2.8%. Estimated response rate of students favouring radiology 34%.		basic principles of deep learning was poor		
Sarwar et al (10)	Not defined by authors.	487 pathologists in 59 countries (mostly Canada, US and UK) listed on faculty websites ascertained by Google search. Response rate not stated.	On-line questionnaire of 43 questions.	AI as a diagnostic tool would facilitate improvements in workflow efficiency and quality assurance. Diagnostic decision-making will remain a predominantly human or shared task. AI should allow more time to research unanswered questions. Half of respondents felt liability for error lay with pathologist.	Fewer diagnostic errors. Faster turnaround times. Liability for error is undecided.	AI applications must be integrated with routine clinical workflows. Clinicians must be given adequate training in AI. Clinicians must be protected from liability for error.
Polesie et al (11)	Not defined by authors.	1271 dermatologists listed as members of the International Dermoscopy Society from 92 countries. Response rate not stated.	On-line questionnaire of 29 questions.	AI will improve dermatological diagnosis. AI will not replace dermatologists. AI will revolutionise dermatology and make medicine in general more exciting. Insufficient training in AI.	Fewer diagnostic errors. Greater professional satisfaction.	AI applications must be accurate. Clinicians must be given training in AI.

Ardon et al (12)	Not defined by authors.	1721 non-clinical personnel in pathology laboratories in Utah. Response rate 42%.	On-line questionnaire of 6 knowledge/attitude questions, 4 demographic questions.	AI may result in job loss and decreased human interaction. AI may augment diagnostic functions.	Adverse impact on job security.	Role of the laboratory technician has to be protected.
Blease et al (13)	Authors used generic descriptors of 'machines' and 'future technology'.	720 UK general practitioners as listed on a clinician marketing service. Response rate 49%.	On-line questionnaire relating to 6 primary care tasks and a open-ended narrative question.	AI cannot emulate human empathy and communication that underpins evidence-based, patient-centred care. AI requires clinical judgement in determining value-based care. AI best suited for reducing administrative burden and improving clinician productivity.	Inability to assist history taking, physical examination and other tasks requiring a 'human touch'. Inability to reason within complex clinical contexts.	Human interaction and shared decision-making need to be preserved. AI applications must be able to be integrated with administration systems.
Doraiswamy et al (14)	Authors used generic descriptors of 'machines' and 'technology'.	791 psychiatrists from 22 countries listed on a global online platform used for networking and research. Response rate not stated.	On-line survey of 10 questions.	AI would never be able to provide empathic care as well or better than psychiatrists. AI would be unable to perform mental status assessments, evaluate suicidality or formulate personalised treatment plans. AI best suited for in documentation tasks (eg updating medical records)	Inability to assist interviewing and other tasks requiring a 'human touch'. Inability to reason within complex clinical contexts.	Human interaction and shared decision-making need to be preserved. AI applications must be able to be integrated with administration and decision support systems.

				and synthesising information to reach a diagnosis. Uncertainty about potential benefits of AI outweighing potential risks.		
Oh et al (15)	Not defined by authors.	669 Korean doctors (and some medical students) graduated from, or affiliated with, a university, mainly physicians and surgeons. Response rate 22%	On-line questionnaire of 11 closed-ended questions with Likert agreement scales or open-ended format.	AI able to quickly obtain large amounts of clinically relevant, high-quality data in real time. Using this data, AI may assist diagnosis and forming a treatment plan. AI is not superior in performance to, and would not replace, doctors, especially in regards to uncommon scenarios associated with limited data.	Inability to assist interviewing and other tasks requiring a 'human touch'. Inability to assist with uncommon or complicated scenarios. Mixed views as to the carrier of liability for AI errors.	AI applications must ensure human interaction and shared decision-making are preserved. AI applications must be able to be integrated with decision support systems. Question of who carries liability for error needs to be resolved.
Fan et al (16)	Defined by authors as 'AI-based medical diagnostic systems'	191 Chinese doctors affiliated with single hospital or listed on professional platform. Response rate not stated.	On-line and paper questionnaire of 43 items related to 10 constructs.	Disinclined to use AI tool unable to be understood in how it improves care, or was considered to be untrustworthy.	Requirement of AI to perform as good as or better than doctors for making diagnoses.	AI applications must be accurate.
Castagno et	Not defined by	98 clinicians (38	On-line	Major privacy concerns.	Privacy had to be	AI developers must

al (17)	the authors – reference in one question to 'deep learning' and 'machine learning'; another to 'speech recognition' or 'transcription applications'.	doctors, 23 nurses, 30 allied health) employed at the Royal Free Hospital, London. Response rate: 1.3%.	questionnaire of 7 closed-ended questions.	AI could be useful in their field of work. No fear of job loss.	safe guarded.	adhere to legal and community expectations regarding data privacy and security.
Abdullah et al (18)	Not defined by authors.	250 clinicians (121 nurses, 70 doctors, 59 technicians) employed at 4 hospitals in Riyadh, Saudi Arabia. Calculated response rate <0.1%	On-line questionnaire of 14 items with Likert agreement scale.	AI could reduce errors. AI could improve work efficiencies and accelerate work processes. AI can deliver high quality relevant data in real time. AI could replace clinicians over time. AI is still unable to provide reasoned opinions in every case or in unfamiliar situations. AI cannot sympathise and consider emotional well-being. AI is often developed by specialists with little clinical experience.	Fewer diagnostic errors. Faster turnaround time. Adverse impact on some professional roles. Inability to assist with uncommon or complicated scenarios. Inability to assist tasks requiring a 'human touch'.	AI applications have to be accurate. AI applications must be able to be integrated with administration and decision support systems. AI applications must be developed with involvement of domain experts.
Esmaeilzadeh et al (19)	Authors defined a detailed scenario about an AI-supported device	307 US adults recruited through Amazon's	On-line survey whereby, after reading the scenario,	AI has inherent risk of technical malfunction. AI may result in loss of human social interaction.	Minimal vulnerability to malfunction. No loss in human	AI applications must be accurate. AI applications, as much as possible,

	able to analyse clinical data and make recommendations about diagnosis and management.	Mechanical Turk (MTurk) survey tool. 427 analysable surveys returned which satisfied sample size required (400) based on power calculations.	respondents were asked questions about their perceptions of risks, benefits, and intention towards future use.	Ai may not be trustworthy in its diagnostic or management predictions, more so as the level of AI autonomy increases. AI acceptance is less likely in the absence of regulatory standards or clear demarcation of who is accountable for error.	interaction. AI performance as good or better than clinicians for making decisions. Formulation of regulatory and accountability standards.	must be immune from technical failure. AI applications must ensure human interaction and shared decision-making are preserved. AI applications must have associated regulatory and accountability standards.
Pega Inc (20)	Not defined by authors.	6000 adults recruited globally through Pegasystems customer engagement software.	On-line survey of AI uses (9 questions) which included a question on healthcare applications.	AI has risk of error and doctors should avoid using it.	AI performance as good or better than clinicians for making decisions.	AI applications must be accurate.
Lennartz et al (21)	Not defined by authors.	229 patients undergoing elective radiological; procedures at a single German hospital radiology	Paper-based questionnaire of 7 items with Likert agreement scales and binary responses, and given to patients in waiting room.	AI can assist clinicians in making diagnostic and treatment decisions by integrating the most recent scientific evidence into clinical decisions. AI is less trustworthy in making decisions related	Better informed clinical decisions for less severe diseases. Clinician decisions more dependable when managing severe disease.	AI applications must be accurate and accompanied by clinician oversight.

		service. Response rate 48%. Met sample size calculation of 200.		to more severe disease. When AI disagrees with clinician opinion, the latter is preferred.		
Palmisciano et al (22)	Authors defined 5 case scenarios of how an AI system could assist a neurosurgeon in diagnosing brain lesions or planning or assisting surgery.	107 patients who had undergone brain surgery at a London neurosurgery hospital.	Questionnaire of 4 questions with Likert scale agreement scales for each case scenarios, administered in person using tablet computer.	AI can assist the surgeon in brain image interpretation, operative planning and real-time alert to operative complications, but with surgeon maintaining control at all times.	Better informed decisions.	AI applications must be accurate and accompanied by clinician oversight.
Tran et al (23)	Authors defined 4 case vignettes related to use of AI-enabled biometric monitoring devices and chatboxes.	1183 patients with at least one chronic medical condition recruited from the Community of Patients for Research (ComPaRe) e-cohort in France. Response rate 51%.	On-line survey which first asked two general questions on BMD/AI technologies, and then readiness to switch from current care to BMD/AI in response to four vignettes.	AI can assist clinicians in making diagnoses. In most instances risks of AI (loss of human interaction, risk of hacking, risk of data misuse) outweighed benefits (improved access to care, better follow-up, reduced treatment burden.	Better informed diagnostic decisions.	AI applications must be accurate. AI applications must be accurate. AI applications must be immune from technical failure. AI applications must ensure human interaction is preserved.
Sisk et al (24)	Authors opted to use 'computer programs' and	804 parents of children recruited	On-line questionnaire of 14 questions.	Openness to AI technologies if assurances around quality,	Better informed decisions. Secured privacy.	AI applications must be accurate. AI applications

	'devices' rather than AI/ML as terminology, as applied to four functions: diagnosis, risk prediction, treatment selection, medical guidance.	through Amazon's Mechanical Turk (MTurk) survey tool.		convenience and cost. Concerns about inaccuracy, loss of privacy, interference with human interaction and shared decision-making, inconvenience, expense, and social discrimination.	No loss in human interaction. No access barriers. No prohibitive costs. No disadvantage to minorities.	must ensure human interaction is preserved. AI developers must adhere to legal and community expectations regarding data privacy and security. AI applications must not disadvantage minorities.
Nelson et al (25)	Authors defined direct to patient and clinician decision support tools for skin cancer screening.	48 patients attending a US hospital melanoma clinic.	Face to face semi-structured interviews with transcribed texts subject to thematic analysis.	AI can provide clinicians with a second opinion, and improve diagnostic accuracy. Skin biopsies are warranted when AI disagrees with clinicians.	Better informed decisions.	AI applications must be accurate and accompanied by clinician oversight.
McCradden et al (26)	Authors defined 3 vignettes: data driven approaches to research; use of ML in clinics; commercialisation of data,	18 patients with meningioma attending neurosurgical clinic at Toronto hospital; 7 caregivers; 5 healthcare providers.	Face to face interviews with transcribed texts subject to thematic analysis.	Non-consented use of health data endorsed provided there was disclosure and transparency about its use. Decisions around allocation of resources should not be delegated to computers. Commercialisation of data	Disclosure and transparency about use of data. No use of AI applications for resource allocation decisions. No monetisation of AI applications.	AI developers must adhere to legal and community expectations regarding data privacy and security. AI applications must have associated

				is not supported.		regulatory and accountability standards. AI applications must ensure equity if they are to be used for allocating resources. AI applications must not be commercialised.
Accenture (27)	Authors defined AI as natural language processing, intelligent agents, computer vision, machine learning, expert systems, data analysis software, data-based diagnostic tools, chatbots, voice recognition.	180 health service executives from six countries in Europe and Asia-Pacific.	On-line survey of 41 questions with various response options.	Improved cybersecurity. Greater operational efficiency. Enhanced analytics capacity.	Adequate staff training. Explicit regulator legislation. Mature digital infrastructures.	Clinicians must be given adequate training in AI. AI applications must have associated regulatory and accountability standards.
Jungmann et al (28)	Authors referred to 'AI solutions in radiology.'	123 participants attending national German meeting for AI, e-Health and IT infrastructure. Response rate	On-line survey comprising 28 items with Likert agreement scale responses.	Improved efficiency of care, especially in regards to image lesion measurement and support in reporting. Alert functions to enable triage of examinations. Clinicians make final	Appropriate validation of AI applications. Comprehensibility of AI outputs.	AI applications must be accurate and accompanied by clinician oversight. Clinicians must be given adequate training in AI.

		44%.		decisions and bear sole responsibility when using AI. AI outputs had to be plausible and understandable to users and be validated in clinical studies involving domain experts. AI will change working environment. AI must be included in medical education.		
Lai et al (29)	Authors referred to 'AI in imaging'.	40 participants with AI interest identified by their presentations at several public symposia	Face to face or telephone semi-structured interviews with 13 questions, with transcribed texts subject to thematic analysis.	Reliable AI required access to large quantities of patient data. Access to data had to be coupled with confidentiality safeguards and greater transparency in how data were gathered and processed. Many AI tools lack proof of efficacy in clinical settings. Clinicians will not assume liability for error from a tool they could not understand. Industry desire to avoid liability as a hindrance to tool development. Need to formulate	Appropriate validation of AI applications. Comprehensibility of AI outputs. Disclosure and transparency about use of data.	AI applications must be accurate. AI developers must adhere to legal and community expectations regarding data privacy and security. AI applications must have associated regulatory and accountability standards. Question of who carries liability for error needs to be resolved.

				regulatory standards. More funding for AI research and more rapid translation of findings into practice.		