Implications of AI in health care

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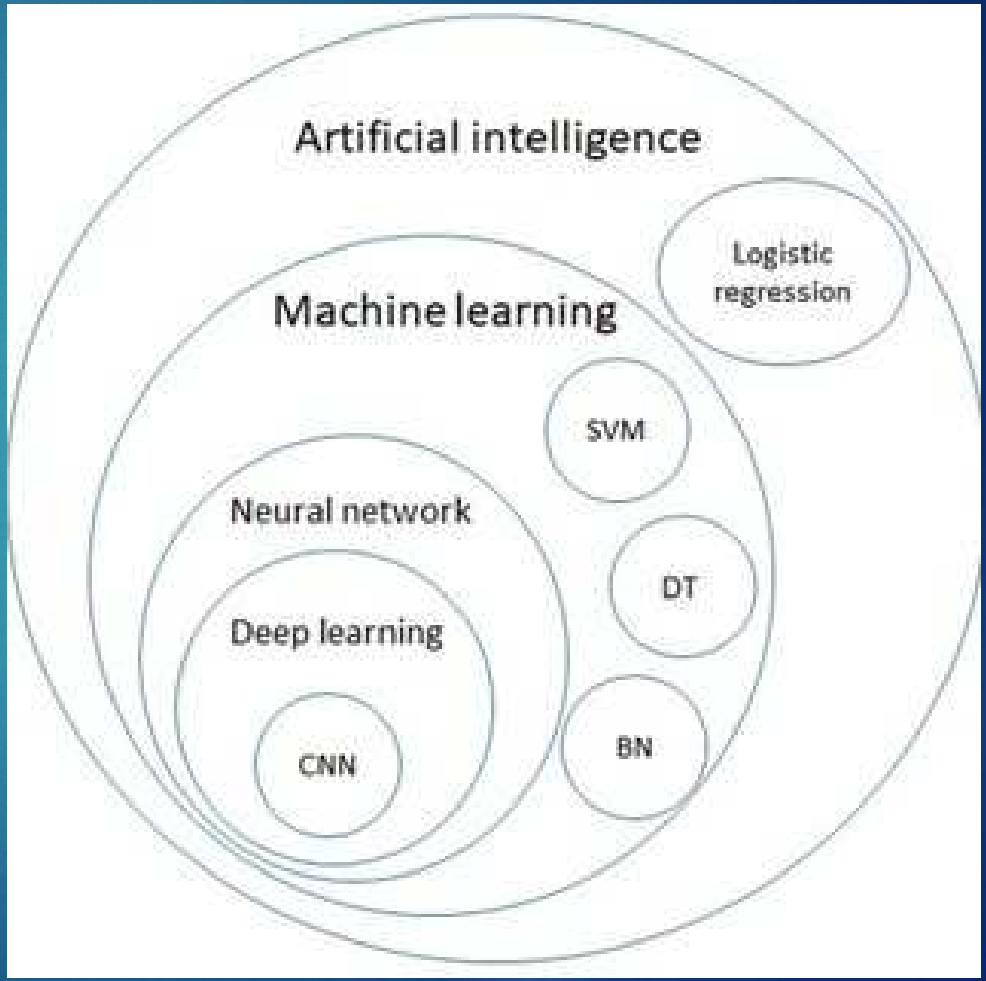
AI definition

- Deep Learning
- Machine Learning
- Artificial Intelligence
- Predictive AI/Generative AI



Main issues with AI in health

- **Political** – Is is politically acceptable?
- **Economic** – Is it commercially viable- short, medium or long term?
- **Social** - Cultural beliefs, health and safety, bias, equity, patient and clinician acceptance
- **Technological** – Is it technically feasible now?
- **Legal** – Medico-legal regulations are way behind innovation
- **Environmental**- Effect on environment

Why AI ?

- AI predictions could reduce pressure on A&E by triaging patients via online consultations more consistently
- It can be useful in radiology to rule in or out abnormalities, to help radiologists concentrate on potentially abnormal scans
- It can be useful in predicting progression of disease
- It can help advise on real world outcomes in multi-morbidity where there is lack of clinical trial data
- It can personalize surgical and cancer treatment
- It can help optimize patient flow in hospitals and primary care
- Can help extremely customized treatment for individual patients

Limitations of AI in health care?

- **Explainability and Interpretability:** Medicolegally, AI models needs to be explainable and results interpretable
- **Differences in machines:** Algorithms trained with data from one type of imaging machine may not perform in the same way when assessing instances from other types
- **Reporting accuracy:** The nature of your training data's composition means that the ostensible accuracy of your model might not be as accurate as purported.
- **Biased data:** Data used to train, or test may not be representative of the actual patient
- **Distributional shift:** Model may be unable to accurately apply what it has learned from training data to a novel set of data if there is a significant difference
- **Adversarial interventions:** Tricked to produce a certain result
- **Democratization:** It is not always possible to take a preconstructed algorithm, apply it in a new situation, and expect perfect performance

Potential challenges to implementing AI solutions:

- **Overenthusiasm:** Enthusiasm should be approached with caution when you aim to implement AI in health care. Overemphasized and glorified claims, such as computers replacing all physicians, can create unrealistic predictions and a false sense of what AI will be able to do.
- **Fear:** The inverse of overenthusiasm, one should not let fearfulness unnecessarily block AI implementation. Overly restrictive guardrails may impede the potential benefits of AI in health care.
- **Managing change:** Change management for AI in health care is a complex task. Implementing AI in health care should be managed carefully and involve all relevant stakeholders. Fearfulness and overenthusiasm can be addressed with careful change management

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DOCTOR WON'T SEE YOU SOON Computers will replace doctors in just ten years, says Health Secretary Jeremy Hunt

Jeremy Hunt predicts patients will be diagnosed by machines by the time the NHS is 80 in 2028

Shaun Wooller
Published: 2:45, 13 Sep 2017

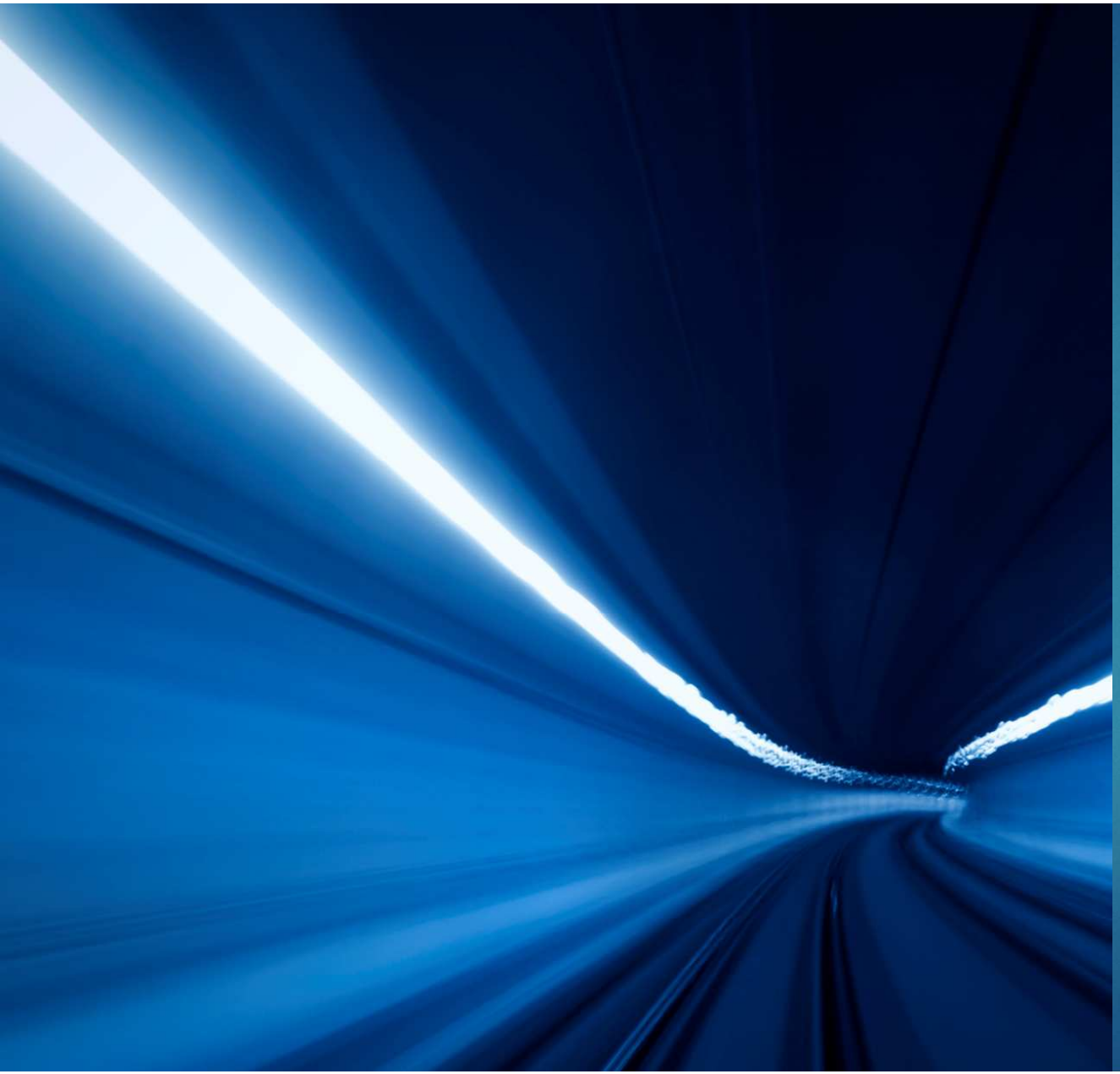
Babylon did not live up to expectations. One former employee, Hugh Harvey, a doctor, said that the company's "AI algorithm" was little more than a standard medical if/then "decision tree" set out in an Excel spreadsheet.

In 2017, the Care Quality Commission raised concerns.

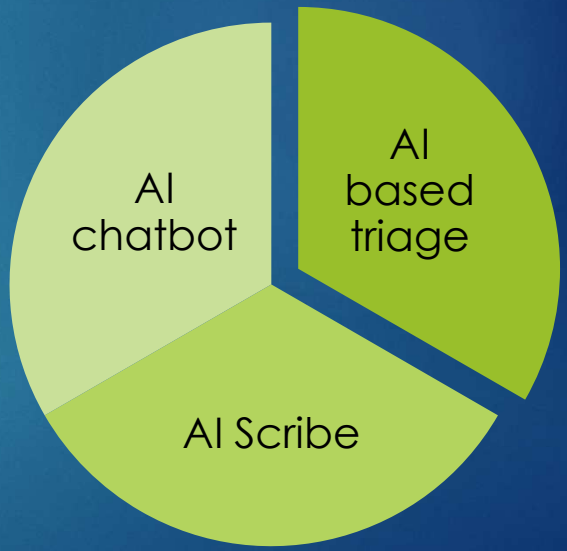
In 2018, The Lancet concluded that there was no evidence that Babylon's chatbot worked better than a doctor, and there was "a possibility that it might perform significantly worse".

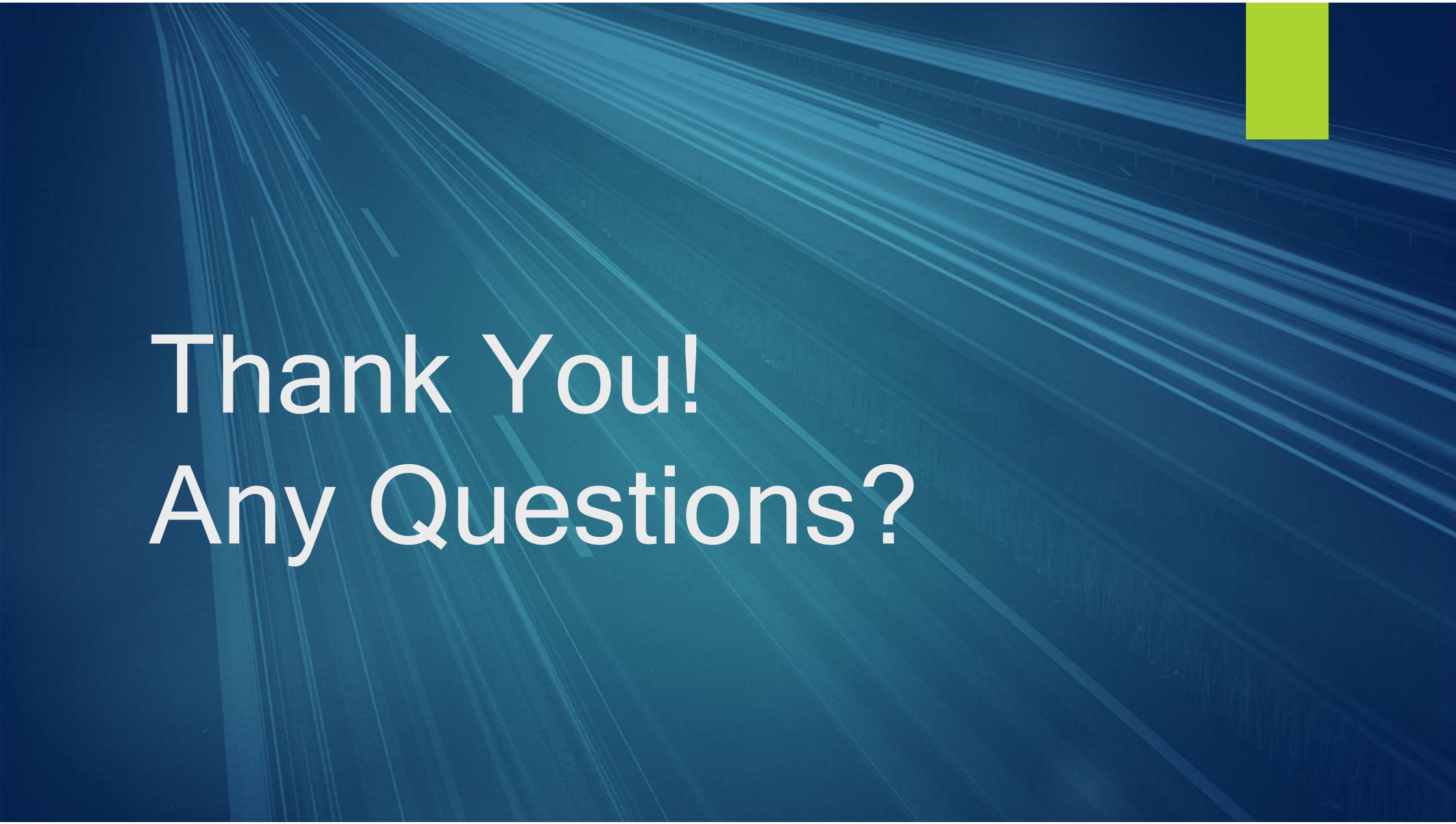
Assistive versus Autonomous AI in health care

	Assistive AI algorithms		Autonomous AI algorithms		
	Level 1	Level 2	Level 3	Level 4	Level 5
	 Data presentation	 Clinical decision-support	 Conditional automation	 High automation	 Full automation
Event monitoring	AI	AI	AI	AI	AI
Response execution	Clinician	Clinician and AI	AI	AI	AI
Fallback	Not applicable	Clinician	AI, with a backup clinician available at AI request	AI	AI
Domain, system, and population specificity	Low	Low	Low	Low	High
Liability	Clinician	Clinician	Case dependent	AI developer	AI developer
Example	AI analyses mammogram and highlights high-risk regions	AI analyses mammogram and provides risk score that is interpreted by clinician	AI analyses mammogram and makes recommendation for biopsy, with a clinician always available as backup	AI analyses mammogram and makes biopsy recommendation, without a clinician available as backup	Same as level 4, but intended for use in all populations and systems



AI technologies used in our surgery




Thank You!
Any Questions?