Artificial Intelligence in Health Care

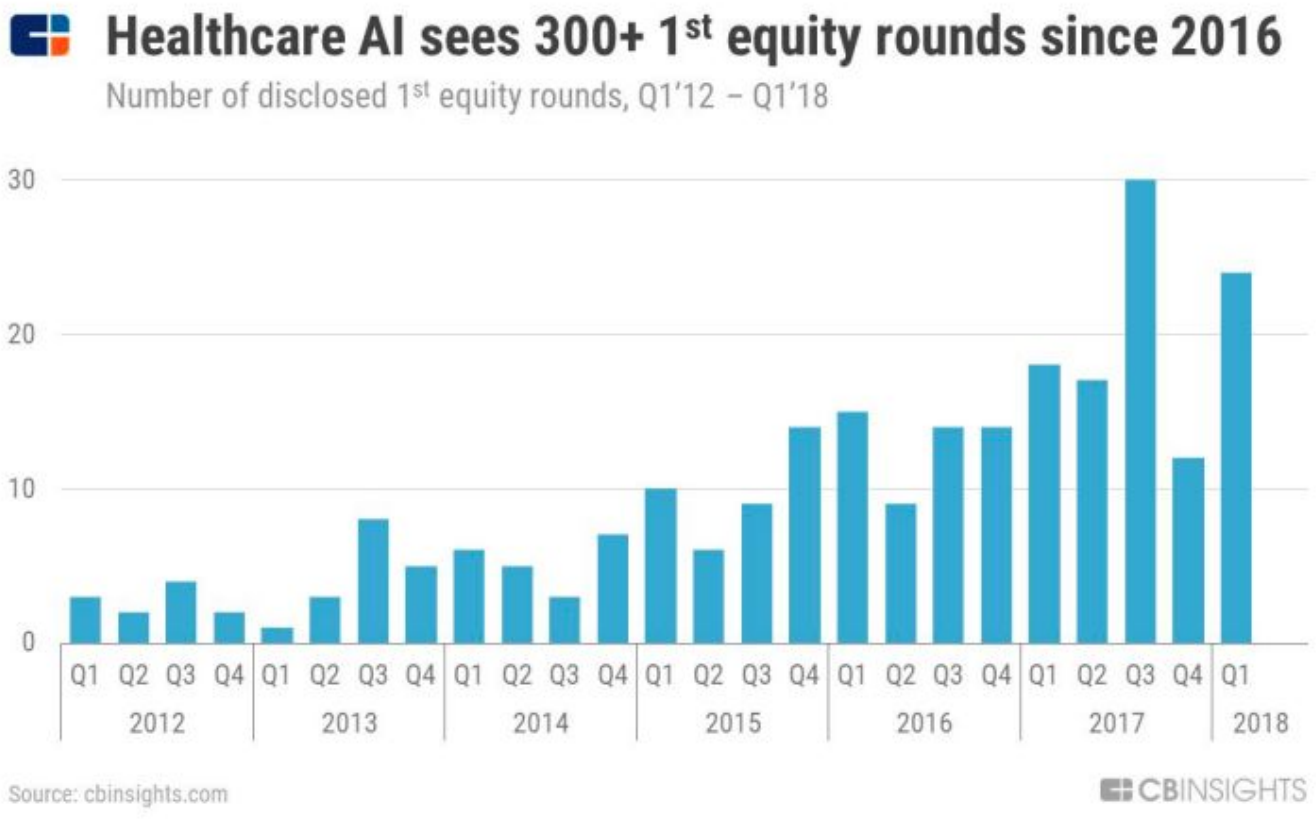
Agenda:-

1. The AI Explosion
2. What is AI
3. AI Uses
4. The Challenges impeding progress

The AI Explosion

How AI Has exploded in health care

Investment in AI health startups



Hospitals are ramping up ..

- So far, AI mainly used in the back of the house, for scheduling prediction of mortality and readmission risk.
- **Clinical use is increasing**. Hospitals use AI to flag warning signs of sepsis and examine therapeutic options for patients with disease.

Weighting costs and benefits

- **Financial costs:** is it worth 200-1000 per patient for treatment recommendations? Does the benefit of AI justify the expense?
- **Privacy and ethical costs:** Companies trying to apply AI to medicine need to mine vast amounts of patient data. Who ensures the data being used to improve health, instead of pursing profit?
- **Reputational costs:** Hospitals can get a marketing boost by using tech tools on cutting edge, but that strategy carries risks if a product is not adequately validated

Areas of real promise

- **Imaging, imaging, imaging:** The use of AI showing huge promise in this area, imaging and diagnostics account for 25 percent of startups science 2014
- **A recent example:** Google DeepMind researchers developed a system for diagnosing eye disease and quickly triaging patients. IDX got FDA approval last year for the first diagnostic that can be used without the oversight of a specialist.
- **The benefit:** the ability to quickly identify emergent events and speed up the delivery of treatment in time-critical circumstances

It’s not going to cure cancer

- This is where we need to pump the breaks. Cancer is enormously complicated and it takes huge volumes of data to train an AI system to understand it and treat it.
- In the near term, AI might play a role in quality assurance and help surface research to help clinicians consider therapeutic options.

What is Artificial Intelligence ?

AI is not a monolith

- AI comes in many forms and level of complexity,

  And performs very different tasks in healthcare.
- Two main tasks is **classification and prediction**
  - **Classification** is typically used in diagnosis and classify the disease in the image as COVID-19 classification, and Cancer classification
  - **Prediction** is used to forecast a future events and match treatment to a specific patient.

Glossary of Common terms

- **Machine Learning** An AI system's capability to learn from data and improve its performance without being explicitly programmed. It's the ability to get better with experience.
- **Deep Learning** A subset of ML, this refers to the capability to learn from unstructured huge data.
- **Natural Language Processing** The capability of the computer to process and understand human language.

AI uses in healthcare

Hospitals

- Many medical centers uses Amazon's AI to **schedule its operating room**.
- Many hospitals are using AI to detect the onset of sepsis, a big killer in the U.S. Early detection is particularly important to saving lives.
- Hospitals are using algorithms to target interventions to particular patients.

The drug pipeline

- AI holds huge potential for improving **the R&D process**, and many companies are already investing heavily.
- Pharma companies and research institutions can use AI to examine the mechanisms of disease and map out potential therapeutic targets.
- It can help identify patient subgroups that may benefit from certain therapies and support pricing commensurate with the level of benefit.

Improving clinical trials

- AI systems can improve the efficiency of clinical trials by helping with recruiting and speeding up the processing and cleaning of data.
- They can also incorporate real-world evidence to screen participants for adverse reactions using existing data in specifc disease categories

The Challenges impeding progress

Data sharing remains limited

- Data sharing between institutions is increasing, but it’s still not enough to enable AI systems to generate new ingights about complex patients.
- A greater diversity of data is needed. Patient data of different races, geographics, and socioeconomic statuses is necessary to calibrate the use of AI to specific populations and eliminate bias.

Algorithms are flawed

- Algorithms, like the humans who design them, are not perfect.
- They need further refinement to generate positive results for patients.
- The data must properly obtained and used in a way that protects privacy and minimizes and potential for bias

Resources

- https://healthtechmagazine.net/article/2020/02/future-artificial-intelligence-healthcare
- https://www.healtheuropa.eu/how-is-ai-and-machine-learning-benefiting-the-healthcare-industry/98260/
- https://www.slideshare.net/KajolDahal1/artificial-intelligence-in-health
- https://en.wikipedia.org/wiki/Artificial_intelligence_in_healthcare#:~:text=Artificial%20intelligence%20in%20healthcare%20is,complicated%20medical%20and%20healthcare%20data.

Thank You :)