ECHAlliance
The Global Health Connector

the digital health society
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# 10 Use Cases For AI In Healthcare Today

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# The AI club

The Digital Health Society and the European Institute for Innovation Through Health Data formed the AI Club in September 2022 in order to explore the challenges and opportunities of leveraging the benefit of AI in health and care inspired by attendees at the DHS and I~HD Round Tables and the Calls to Action.

The group is formed of experts from academics, policy makers, industry, life sciences, health systems and policy backgrounds. This paper is intended to inform those working in health and care as to the current global progress to date and the areas where work and collaboration are needed.

The club has been formed to examine the baseline of AI in healthcare and the thematic areas that require further progress via expert consensus. The group have examined the current landscape, especially in light of the pace of development of generative AI and have annotated this in terms of four high priority areas:

Theme 1 - Use Cases and Evaluation for Healthcare AI

Theme 2 - AI Explainability for Citizens

Theme 3 - AI Competencies and Education in Healthcare

Theme 4 - Safety and Bias in Healthcare

With thanks to the Theme Leads – Professor Dipak Kalra, Dr Kathrin Creswell, Dr Mehdi Khaled, Sara Boltman

# AI Club Recommendations

R1. Creation of a global framework for standardised but flexible evidence-based impact and process evaluation for AI in health that also allows global comparison and continuous monitoring of AI performance in real world deployment.

R2. Creation of a global evidence-based evaluation framework for risk and opportunity for use cases that allows for local sensitivities such as demographics and healthcare priorities and personalisation and including ethics.

R3. Creation of a global standard to define and implement explainability that meets the needs of all stakeholders including the citizen, professionals and leaders.

R4. Development of evidence-based competency frameworks for the skills required by the health and care workforce and national alignment to education interventions needed to achieve them.

R5. Development of an exemplar global health literacy skills framework for the citizen to empower them to engage with use of AI in their health system and other related services.

R6. Creation of a global data transparency framework ensuring AI training data is initially fit for purpose, continues to be fit for purpose, can be benchmarked globally and mitigates bias.

# 1. Finding Connections between Information

Unlikely insights can be used as real beak thoughts. For instance, did you know a reduction in step length picked up by devices can be an indicator of Crohs's flair up. Finding these patters at a pathway level allows new ways of early intervention. Patterns in patients' health records could indicate the likely success of surgery or other treatments.

Real world use case – Defining thresholds for intervention for frail patients

# 2. Creating Insights from Big Data

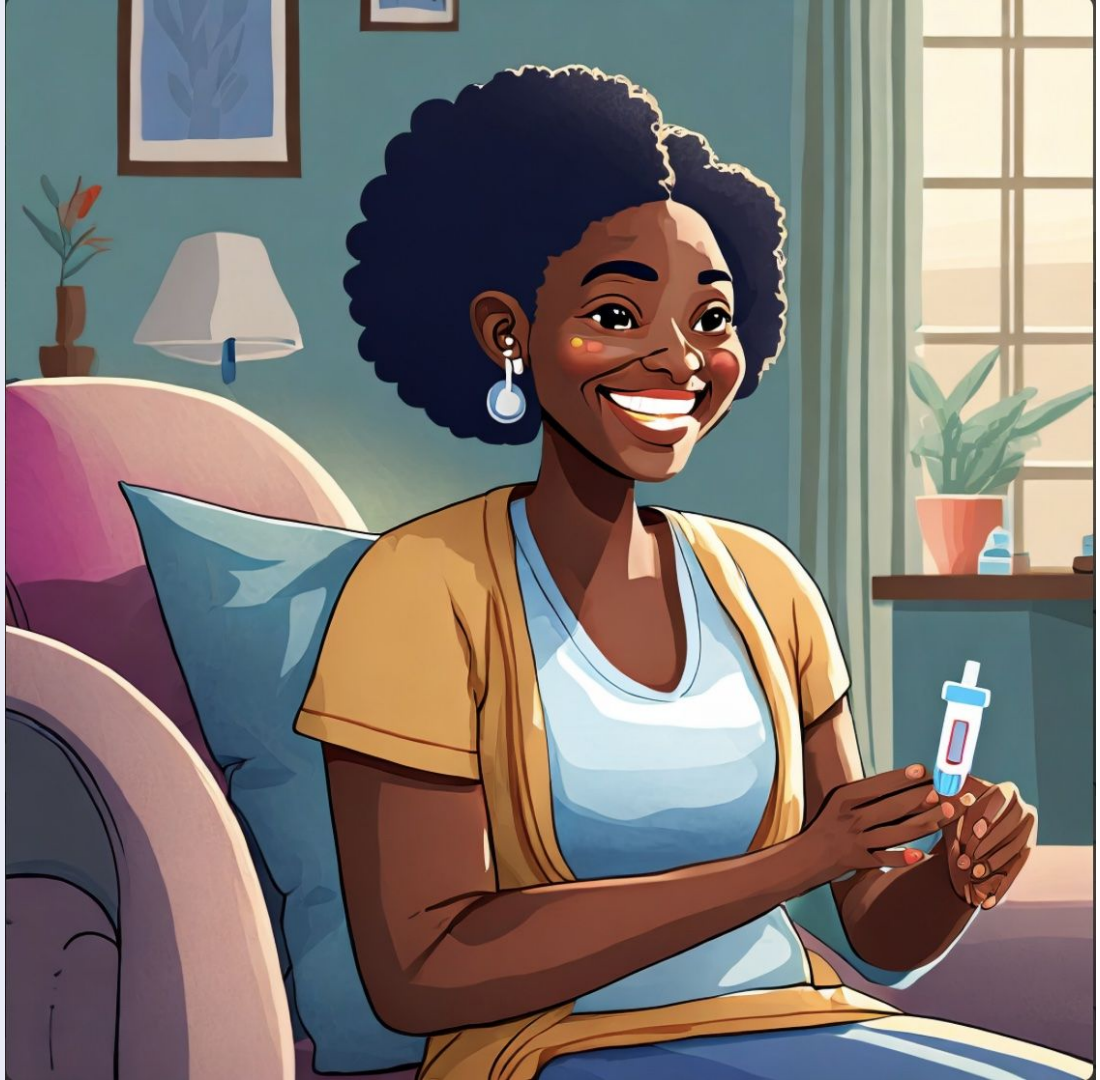
Health and care is an information rich but insight poor. With the arrival of generative AI we have the ability of using technology to drive insights from our data. This may asking AI to find correlations between diseases,  finding clusters of disease in geographies or informing us of the best placement for new services. Asking generative AI to assess the cause and effect within population data sets allows health systems to decide where to invest.

Real world use case – Analysis of GUM usage and optimal placement / opening hours

# 3. Creating Personalized Content

Engaging with our citizens, speaking their language and placing the experience in context is important to enable self-care and management. AI – especially generative AI is excellent at personalising facts and presenting information in the best way for the patient. It can provide advice in a simple but useful way for children and can provide device or voice driven interactions.

Real world use case – Generative AI driven, multi-language recipes in cultural context for pre diabetics



# 4. Finding opportunities to Improve quality

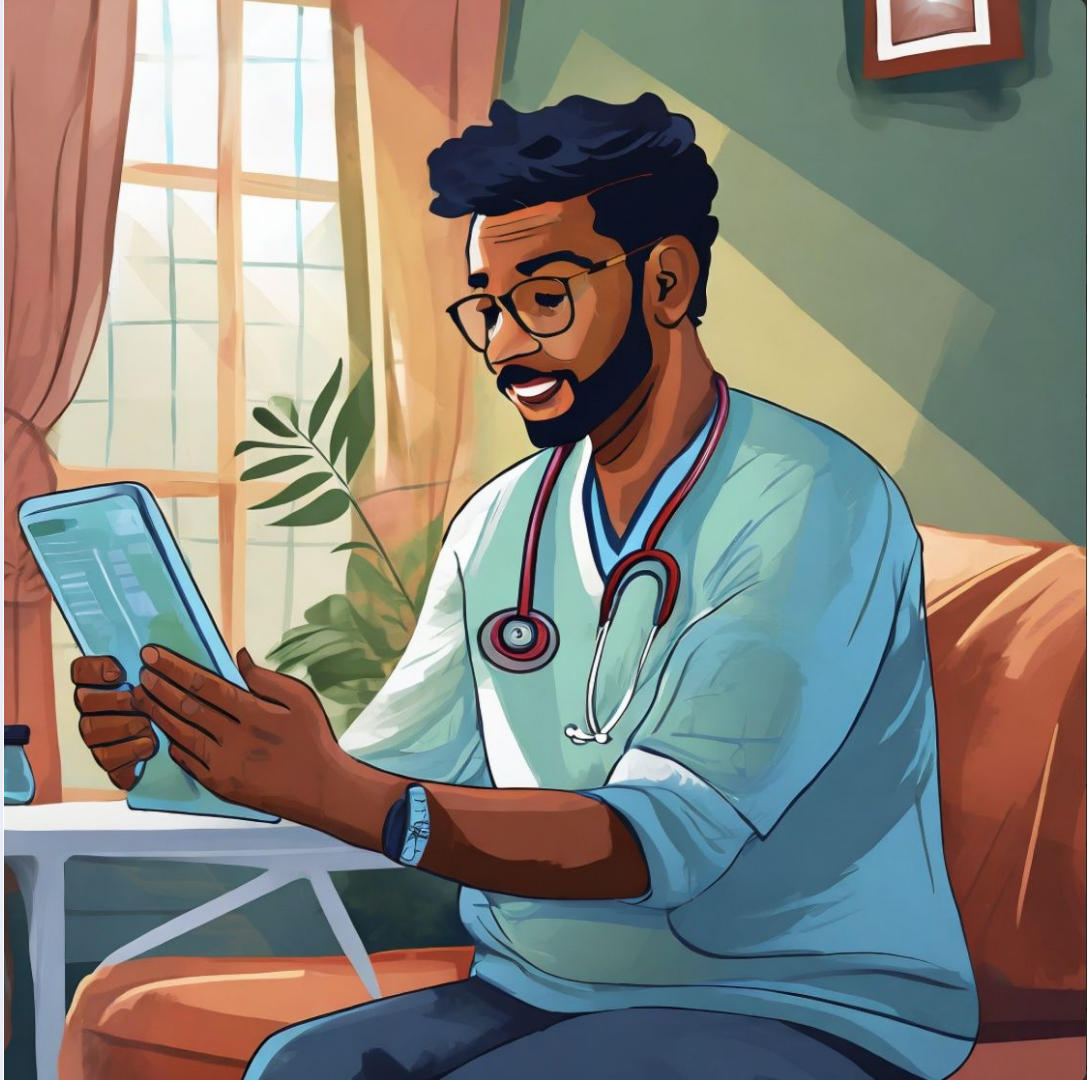
The true quality of care delivered by a health system comprises of many factors. These include the demographics of the population, social determinants of health and existing diseases burdens. These factors make the benchmarking of health and care outcomes difficult across differing geographies.
AI can increasingly be used to find areas where health systems have opportunities to improve and finding comparator benchmarks for granular areas.

Real world use case - Identifying outlier cardiac outcomes in real world context

# 5. Creating human interfaces to bodies of knowledge

Many knowledge bases both for clinical use and citizen use are hard to navigate and interpret. They are often only provided in one language and search tools are often poor. Using large language models trained correctly on this data enable a multi-language access.  They also make navigation far easier with a question-and-answer style interface.

Real world example – Multi Language Chat GPT like interface to health entitlements at a city level



# 6. Finding cohorts in big data

Many diseases like rare diseases often have early signatures in people's health records. This may include issues in childhood, symptoms with no known cause and repeat diagnostics without conclusive result. This data often forms an early signature for a disease before it is suspected. Within longitudinal health records these patterns and the cohorts displaying these patterns can be found far earlier with AI.

Real world use case – Rare disease cohort identification from paediatric diagnostic records.

# 7. Finding themes in Big Data

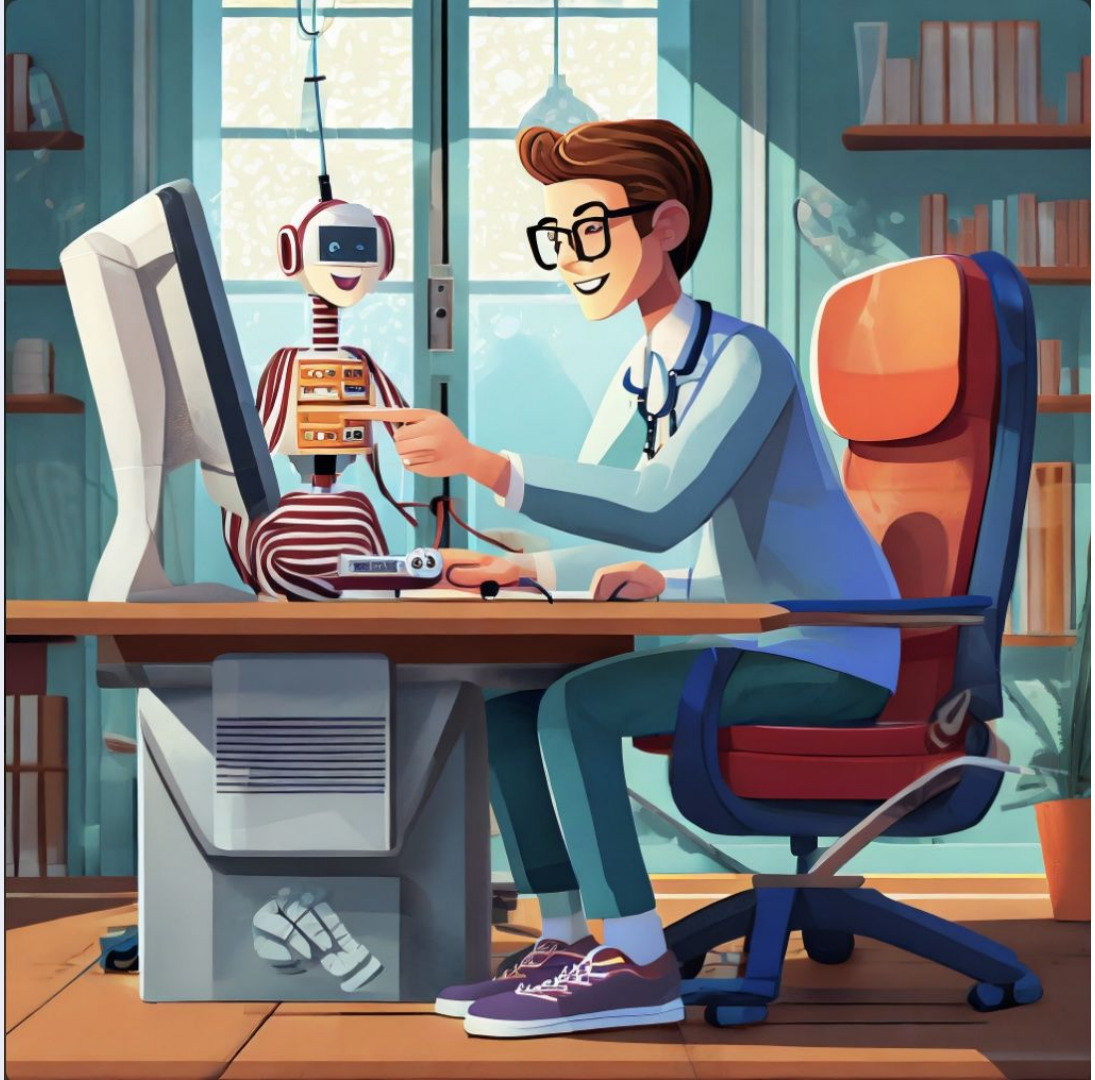
The use of AI in healthcare is not just for clinical care. AI can be used to help how an organisation is governed. It can look for themes in big data to support risk management, look for clinical outcome trends to support clinical quality and summarise data for corporate use. Generative AI can be asked to write summaries in “house style” or aligned with previous reporting templates.

Real world use – Creating standardised board papers from a previous months activity

# 8. Creating Personalized Avatars

Health and care is increasingly including patient facing services and experiences. Having a personalised experience with an avatar who speaks your language or is created using your real clinical team's likeness to increase engagement.
There are now multiple companies working in this space allowing clinicians to send avatar messages or health systems to create engagement experiences.

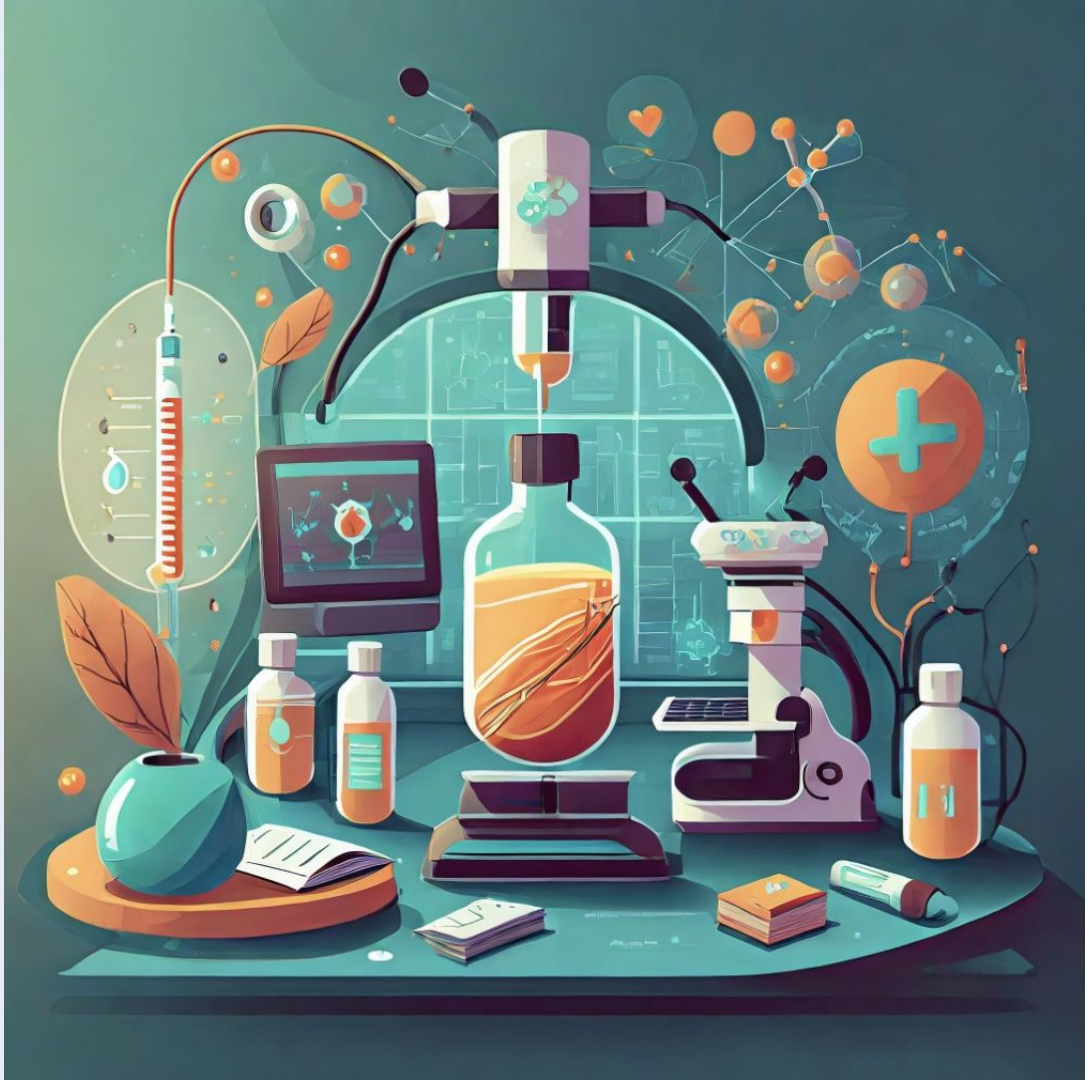
Real world use case – Avatar clinician providing after appointment guidance and summarising advice.



# 9. Creating Synthetic Data

Synthetic data is data that behaves like a real cohort of people statistically but does not include any real personal data. It can be used to research, to test concepts, to train AI, to test hypothesis and to ensure privacy (e.g. academic research). Generative AI can be used to help generate synthetic data for healthcare – improving insights while ensuring privacy.

Real world use case – Creating synthetic data for “soft” validation of cohorts for life science research.



# 10. Creating Code for automation

Generative AI is increasingly been used to write code and generate automations.
In health care AI is being used now in productivity tools and communication tools. It is also being used to assist with Robotic Process Automation (RPA).

Real World Use Case – use of generative AI in office productivity tools to make information easier to find and act upon.

“We are now in the cognitive age – we must work out how to leverage AI for human benefit and how to govern it well.”

# Thanks!

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