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UKHSA Conference

ARTIFICIAL INTELLIGENCE (AI) IN SCIENCE AND HEALTHCARE

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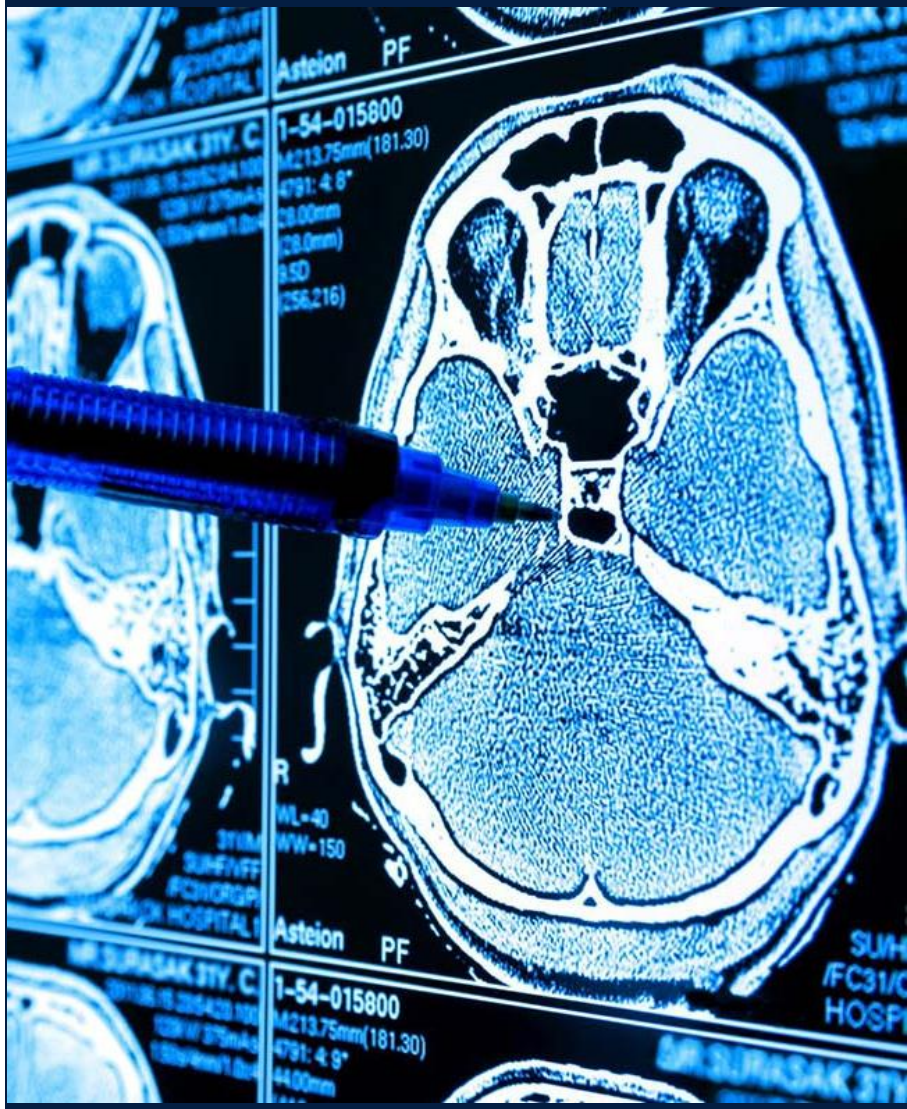
November 2023

Agenda

AI in Science and Healthcare

1. **Trends**
   - > Advances in technology are having huge impacts on the healthcare sector
2. **Examples**
   - > Care Fertility
   - > Cohorting
3. **Proof of Concept Demo: UKHSA Research Assistant**



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BJSS @ UKHSA

We run the Cloud Platform for UKHSA

- We joined Test & Trace in August 2020
- We built the Halo platform and accompanying services, e.g. Atlassian, M365, Virtual Desktops
- We are the UK's largest privately owned consultancy, with almost 3000 people working across engineering, business change, design and innovation.

aws PARTNER

- Govt. Services Competency
- DevOps Services Competency
- Security Services Competency
- Data & Analytics Services Competency
- Migration Services Competency
- Healthcare Services Competency
- Cloud Operations Competency

Global Healthcare AWS Partner of the Year

GLOBAL WINNER 2022

Microsoft Solutions Partner

Security
Digital & App Innovation
Data & AI
Infrastructure

Advanced Specialisations

Kubernetes
Analytics
Windows & SQL Migration

Competencies

Gold Application Development
Gold Application Integration
Gold Data Analytics
Gold Data Platform
Gold Cloud Platform
Gold Cloud Productivity
Gold Datacenter
Gold DevOps
Gold Security

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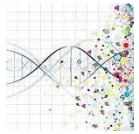
AI in Healthcare

Current use-cases

Medical imaging applications: Integration of computer vision improves accuracy of diagnoses.

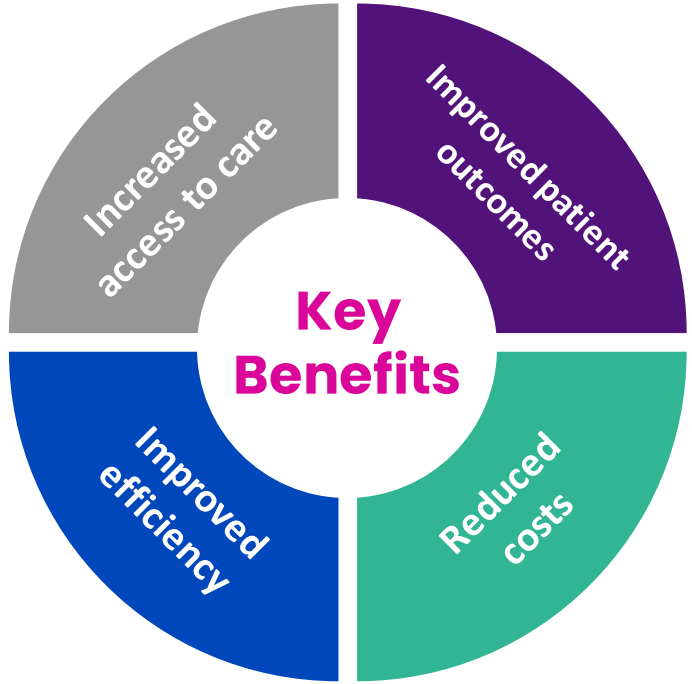
Drug discovery and development: identify new drug targets, prediction of drug efficacy and toxicity, and optimization of clinical trials.

Robotics: greater precision and accuracy in surgery and rehabilitation.



Personalized medicine: treatment plans for patients based on their individual genetic and medical data

Healthcare virtual assistants: answer questions and help connect patients with healthcare providers.



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AI in Healthcare

Challenges

Need for clinicians to drive AI solutions

Data

- Quality is key
- Health and Digital inequality correlation
- Data privacy and security
- Our Future Health

Algorithmic bias

Regulation

- MHRA – AI systems as medical devices
- NICE - Regulations and advice for developers and adopters

New Developments

Predicting birth due dates

Home healthcare provider

Genomics England

- Pioneering sequencing as part of standard clinical care
- Newborn Genomes Programme

PhD topics:

- Detection of laryngeal cancer from voice
- Identifying patients who will benefit from chemotherapy following surgery for gastric cancer
- Thematic classification of free text in patient reported outcome measures

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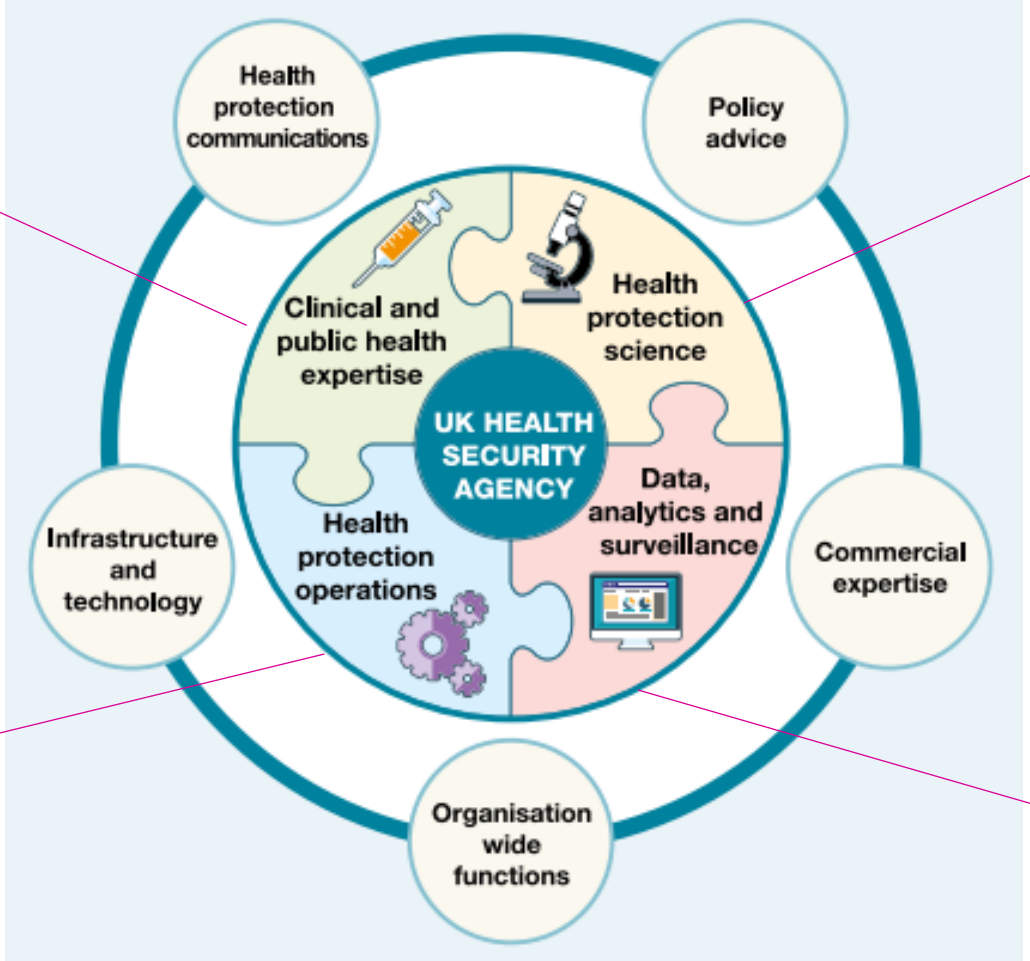
UKHSA Applications

Use in population analysis identifying at risk individuals, communities and cohorts

Predictive capabilities to assist with intervention

Ability to succinctly query large bodies of policy, process and operational documentation

Sophisticated automated responses to queries from public and clinicians



Improving disease control through identification of genetic predispositions, drug responses

Enhanced drug development and gene-related treatments

Data analysis, mining, trending

Data quality assessments

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Examples

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Care Fertility

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Cohorting as a Service (CaaS)

Cohorting as a Service securely identifies groups of people with shared characteristics from national health data. These groups (cohorts) enable tailored direct care to be delivered to improve health and social care outcomes.

Cohort identification

- range of data sources including demographic data (PDS), GP data (GPES), hospital data (HES), and others.
- QCovid® predictive modelling developed at Oxford University.

Challenges

- Legal and governance hurdles associated with using patient data.
- Currently run on scope for direct care purposes only.

Successfully created cohorts:

- Increased Covid risk (QCovid) 2020
- Covid At Risk 2021
- Influenza vaccinations 2022
- Covid vaccinations 2022

Planned cohorts:

- National pandemic flu service preparedness
- Galleri Cancer blood test Trial
- DToS – Diabetic Eye and Breast Screening

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Proof of Concept Demo:

UKHSA Research Assistant

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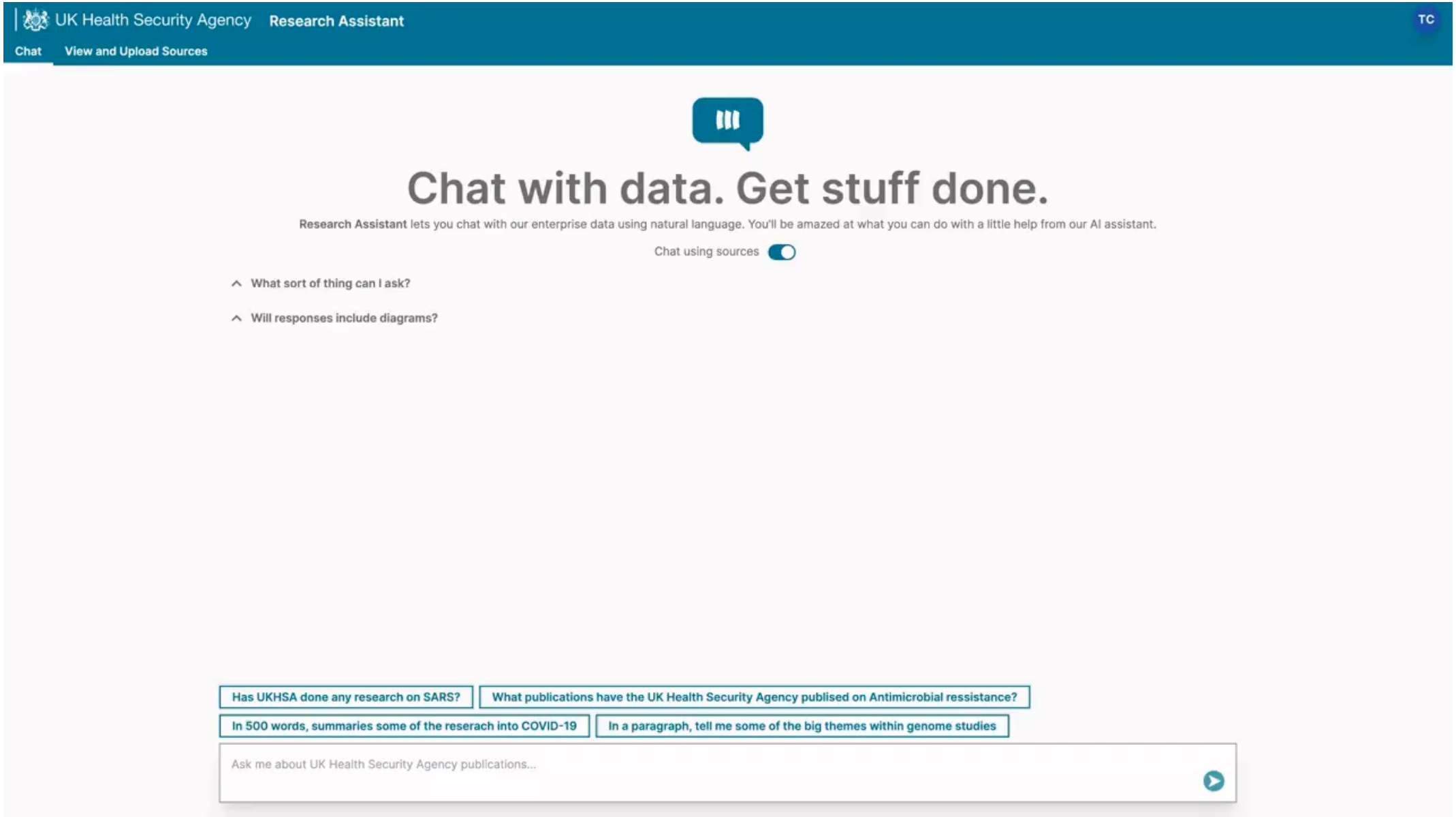

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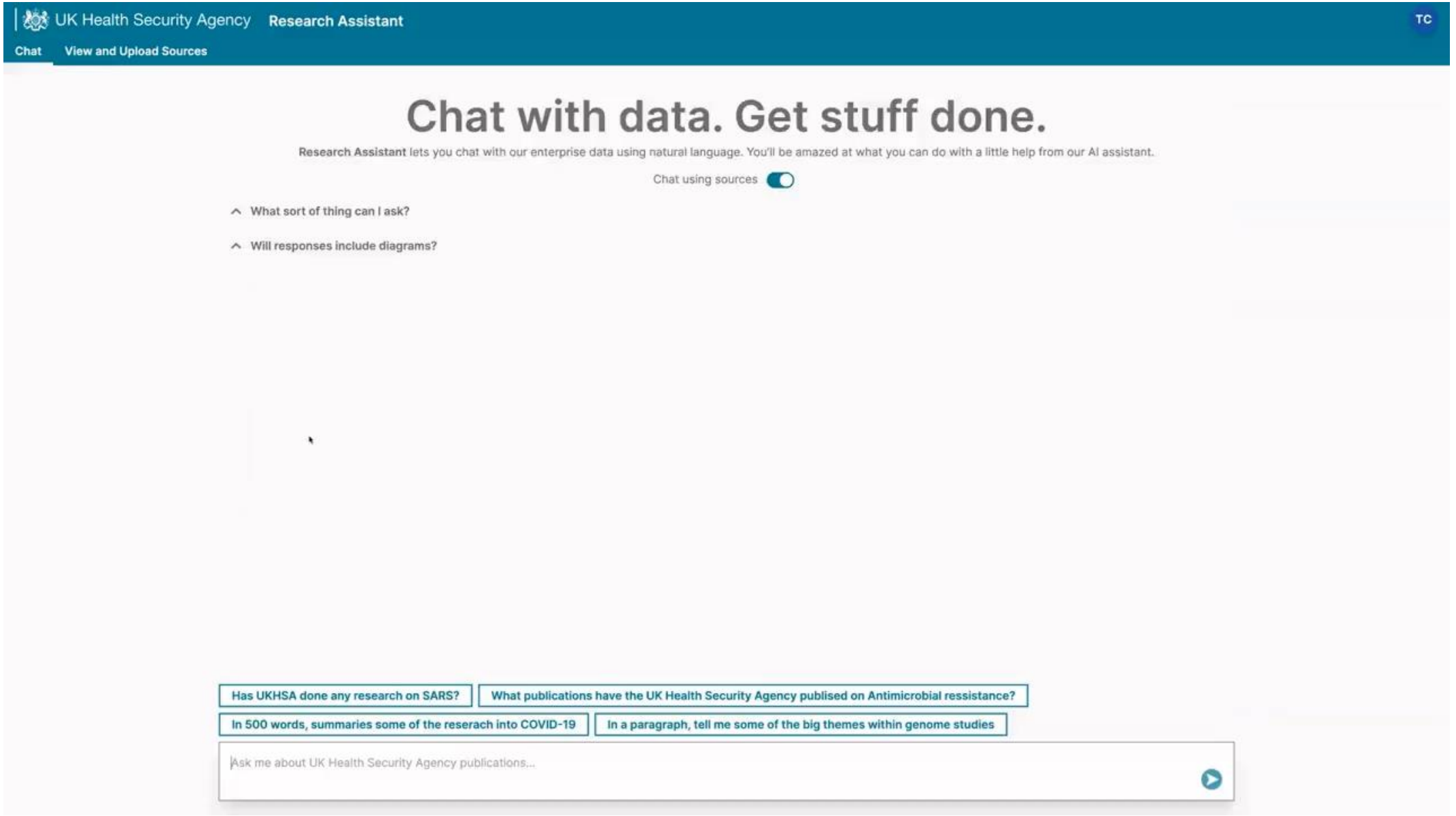

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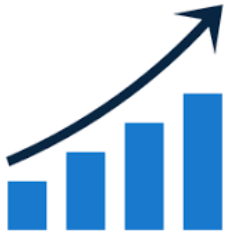
Takeaways

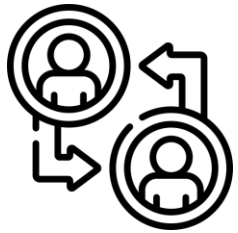
1. Use in healthcare is growing.

   AI is moving into the mainstream.



2. Be ready:
   - > Start to think about potential application.
   - > Consider opportunities and risks.
   - > Monitor developments across healthcare.

3. Engage with the UKHSA AI Taskforce.



"The UK is already a world leader in this revolutionary technology and the new AI Strategy will help us seize its full potential - from creating new jobs and improving productivity to tackling climate change and delivering better public services."

Digital Secretary Oliver Dowden

March 21

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