Standardised Data and Patient safety:

From 1979 to 2019 to 2039?

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Standardised Data and Patient safety

- I joined the GS1 Advisory board in 2015 – my advice was to engage clinicians and see an evidence base
- My third time here – huge advances already. See the ‘TechTalks’ tomorrow
- Previously I have spoken about how the NHS should be thinking like a high risk industry
- Today I want to talk about standardised data
Where were we with data in 1979?
"The past is a foreign country: they do things differently there."
Where are we with data in 2019?
Data – we are surrounded by it and the UK NHS is awash with it

- Cancer registries
- Immunisation records
- Emails
- 100,000 genome project
- 3D MRI = 150 Mb
- Electronic health records

“In God we trust; all others bring data.”

– W. Edwards Deming
Will ‘Big Data’ answer all our health questions?

• By 2020, the average UK hospital will generate 1000 terabytes/year
• 50 petabytes of healthcare data stored currently
• 90% of the world’s data generated in the last 2 years
• Exponential increase since internet 1989 and subsequent email, text, apps and other cyber data
What will Big Data be used for?

• Support research
• Support self care
• Support providers

**BUT** to do this we need to transform unstructured data into useful information
World’s 5 biggest companies all use Big Data

• Amazon
• Apple
• Microsoft
• Facebook
Machines faster than humans at diagnosing brain injuries

Tom Whipple Science Editor

Computers have outperformed doctors in diagnosing neurological illnesses and retinal disease—a finding that scientists said could speed up treatments.

In two separate studies, artificial intelligence programs were trained to spot the signs of illness in CT scans. They did it as well as humans and were 100 times faster.

Scientists said this meant dangerous conditions could be spotted far more quickly. Eric Oermann, from John School of Medicine at Mount Sinai, said: “With a total processing and interpretation time of 12 seconds, such a triage system can alert physicians to a critical finding that may otherwise remain hidden.”

The expression of these findings suggests that rapid and accurate diagnosis may lead to better outcomes.

In a separate study of a British team at the University of Oxford, a high-tech algorithm classified scans of the human brain faster and more accurately than doctors.

The research, published in the journal *Science*, showed that computers could diagnose brain injuries five times faster and with greater accuracy than human doctors.

The findings were based on a database of 250,000 scans from patients in the UK and the US. The team used a deep learning algorithm to predict the presence of brain injuries, such as strokes, which are a common cause of disability and death.

The algorithm was able to accurately identify the presence of brain injuries in 95% of cases, compared to 85% for human doctors. The researchers said the algorithm was able to identify brain injuries in only 10% of cases, compared to 5% for human doctors.

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Telemedicine Enabled Primary Eyecare

Universal Eye Care - through telemedicine-enabled Vision Care

Annually over 600K outpatient visits from rural communities

Universal eye health in 3 years in the 5 million population covered

Sectors leading in AI adoption today

Leading sectors

Future AI adoption trajectory

The increasing availability of data and decreasing costs of data storage, processing and analysis create a unique opportunity to advance data science & AI in health...
Where will we be with data in 2039?
There will be huge change – as there has been since 1979

Population
- Age
- Births
- Social isolation
- Loss of the nuclear family
- Obesity

Technology
- Genomics
- Nanotechnology
- Artificial intelligence
- Robotics
- Online medicine
- Data

Disease patterns
- Long-term conditions
- Complexity
- Multi-morbidity
- Emerging disease
- Climate change
Computerised prescribing with computerised decision support can decrease serious medication errors by 55% - 64%

EPIC at UCLH

Interoperability and standardised data
Expert Clinical Advice – MHRA Medical Devices

Report of the independent review on MHRA access to clinical advice and engagement with the clinical community in relation to medical devices.

Professor Terence Stephenson
% of children with diabetes admitted with ketoacidosis over last 5 yrs – 7 fold variation across England
Inequalities in glycaemic control in CYP with T1D – mean HbA1c by deprivation quintile across major ethnic groups

Cross-sectional analysis of 2012-13 NPDA data
Eric Topol, who this week published a report for the Department of Health on adapting NHS staff to the rise of digital technology, argues that automation of diagnosis will mean that routine care will no longer need a doctor at all as nurses or even receptionists equipped with computers can do just as well.
“We are heading for a global workforce crisis in healthcare. It’s estimated that the world will need an extra 18m health workers by 2030 as the population grows and ages. In the short term the UK is in danger of making a bad situation worse.”

Standardised data can make workflow more efficient (ie drudgery):

- Appointments
- MDT
- Triage eg of scans
- Standard measurements
- Semi-automated reporting
- QA
- Informatics

Better use of standardized data can mitigate the workforce deficit but human doctors and nurses will not be redundant any time soon!
Thank you