Can data save healthcare

Dr Mark Davies
Chief Medical Officer (EMEA)
IBM
Quadruple aim

- Improved health and wellbeing
- Transformed quality of care delivery
- Sustainable finances
- Improving the experience of providing care

Sikka et al (2015)BMJ Quality and Safety - [http://qualitysafety.bmj.com/content/early/2015/06/02/bmjqs-2015-004160.full](http://qualitysafety.bmj.com/content/early/2015/06/02/bmjqs-2015-004160.full)
What makes us healthy?

As little as 10% of a population’s health and wellbeing is linked to access to health care.

We need to look at the bigger picture:

- Good work
- Our surroundings
- Money & resources
- Housing
- The food we eat
- Education & skills
- Transport
- Family, friends & communities

But the picture isn’t the same for everyone.

The healthy life expectancy gap between the most and least deprived areas in the UK is: 19 years
Growing data volume and complexity demands a new approach.

- 44 zettabytes
- Sensors & Devices
- Medical Images
- Images/Multimedia
- Natural Language
- Enterprise Data

We are Here

IDC, Digital Universe Study, 2014
How to Translate “Big Data” to “Actionable Insights”...
Definition of Population Health

...is an approach aimed at **improving the health of an entire population**

It is about improving the physical and mental health outcomes and wellbeing of people, whilst reducing health inequalities within and across a defined population.

It includes action to reduce the occurrence of ill-health, including addressing wider determinants of health, and requires working with communities and partner agencies.
Focusing on people

- Understanding needs
- Understanding value
- Working with communities
Coordinating individual care

- Integrating care pathways
- Understanding risk
- Identifying gaps and overlaps
- Citizens as experts
Dynamic management of the whole system

- System redesign
- Financial reform & incentives
- Workforce redesign
- Governance and accountability
Foundation for Delivering Change in this New Era...
Generating insights from information

Knowledge sources
- Scientific papers
- Guidelines
- Books

Data sources
- Longitudinal records
- Patient-reported data
- Claims, Rx, labs

Watson Health analytics

- 200M+ lives
- 100M+ patient records
- 30B+ images managed
- 1.2M medical abstracts
- 3B+ reference points
- 4M+ drug patents
- 40M+ research documents
The Evolution of Watson in Oncology

Reaching More Patients
Cumulative Oncology Offerings

Today: 45K+
2016: 9K
2015: 1.8K

Additional Cancers Trained
Watson for Clinical Trial Matching (CTM) and Watson for Oncology (WfO)

Increased Deployment in Hospitals and Health Organizations
Cumulative Oncology Offerings

Today: 155
2016: 8
2015: 1

Breast
Lung
Colon
Rectal
Gastric
Cervical
Ovarian
Prostate
Bladder
Liver
Esophageal
Thyroid
Endometrial

WFO/CTM
WFO Only

Today: 45K+
2016: 9K
2015: 1.8K

Today: 155
2016: 8
2015: 1
Clinical Evidence: Operational Efficiency with Clinical Trial Matching

During a 16-week trial period, data from 2,620 visits by lung and breast care patients were processed in the Clinical Trial Matching (CTM) system.

Watson for Clinical Trial Matching successfully demonstrated the ability to expedite patient screening for clinical trial eligibility, reducing processing time from 1 hour and 50 minutes to 24 minutes.

Increased efficiency
(Compared to manual work by a clinical trial coordinator at Highlands Oncology Group)

- 78% Reduced pre-screening wait time
- 94% Omitted 94% of non-matching patients automatically

<table>
<thead>
<tr>
<th></th>
<th>Generally well/good wellbeing</th>
<th>Long term condition(s)/social needs</th>
<th>Complexity of LTC(s)/social need and/or with disability</th>
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<tbody>
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<td>Children and young people</td>
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<td>Working age adults</td>
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<td>Older people</td>
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<td>Condition</td>
<td>Percentage of Recommended Care Received</td>
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<td>Senile cataract</td>
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<td>Prenatal care</td>
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<td>Low back pain</td>
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<td>Osteoarthritis</td>
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<td>Urinary tract infection</td>
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<td>Community acquired pneumonia</td>
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<td>Alcohol dependence</td>
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Courtesy of Bill Runciman, APSF – Extracted data from AHRQ 2006 report, USA
Why segment?

Uniformity

Equality
Humans + AI=“Augmented Intelligence”

People excel at:
- Common sense
- Dilemmas
- Morals
- Compassion
- Imagination
- Dreaming
- Abstraction
- Generalization

Artificial Intelligence systems excel at:
- Natural Language
- Pattern Identification
- Locating Knowledge
- Machine Learning
- Reduce Bias
- Endless Capacity
Let’s Partner to INVENT the Future ... 

@markpricedavies

@IBMWatsonHealth

www.ibm.com/watson/health/

“The best way to predict the future is to invent it.”
- Alan Kay