

The background of the slide is a composite image. The top portion shows a close-up of a silver stethoscope resting on a medical chart with various colored tabs. The bottom portion shows a blurred view of the same medical chart and stethoscope, creating a sense of depth and focus on the healthcare setting.

Driving Analytics to the Point of Care

Mark D. Sugrue, MSN, RN-BC, FHIMSS,
CPHIMS

April 12, 2017

New England Nursing Informatics Consortium

Driving Analytics to the Point of Care

A Joint Program Offering



NENIC
New England Nursing Informatics Consortium
Nurses Transforming Healthcare Through Informatics

The NENIC logo consists of the acronym "NENIC" in large, bold, blue, sans-serif capital letters. A blue, three-dimensional arrow curves around the letters from the top right, pointing towards the center. Below the acronym, the full name "New England Nursing Informatics Consortium" is written in a smaller, blue, sans-serif font. At the bottom, the tagline "Nurses Transforming Healthcare Through Informatics" is written in a blue, italicized, sans-serif font.



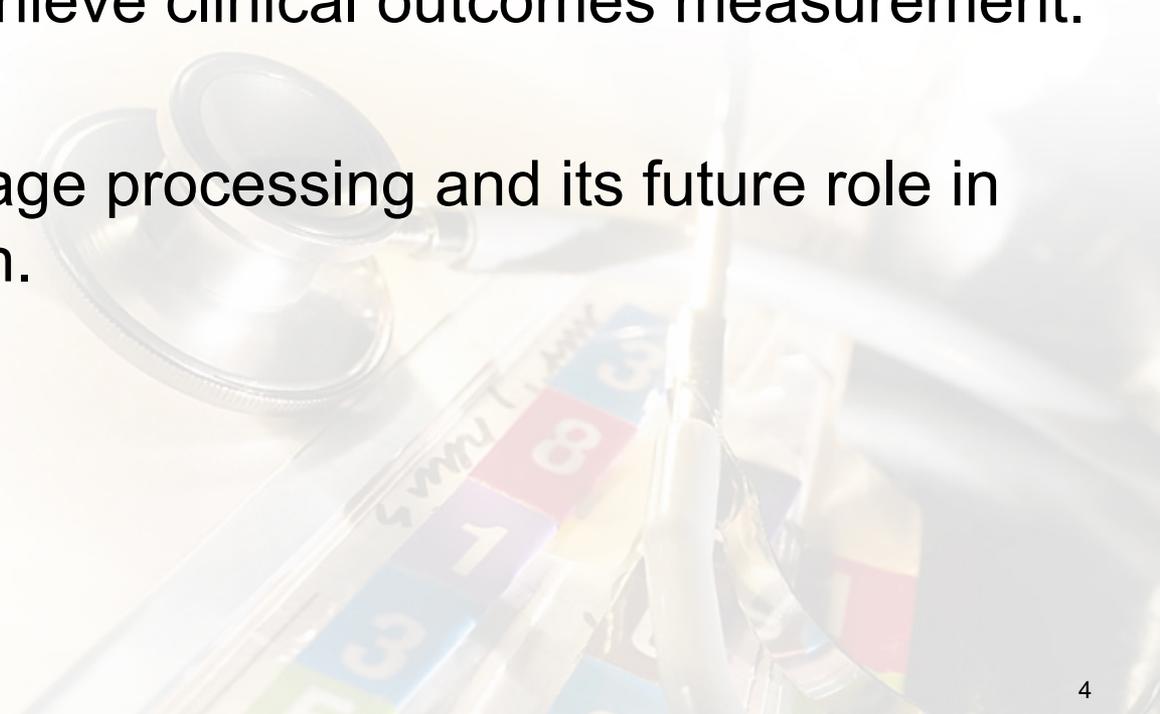
Conflict of Interest Disclosure

Mark D. Sugrue, MSN, RN-BC, FHIMSS, CPHIMS has no real or apparent conflicts of interest to report.





Objectives

- Discuss cognitive computing and artificial intelligence as methods for enabling decision making at the point of care.
 - Explore the importance of capturing health and care data in a structured way to achieve clinical outcomes measurement.
 - Discuss natural language processing and its future role in nursing documentation.
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- Introduction/Definitions
- Historical Perspective
- Data & Analytics Today
- Applied Analytics
- Closing Thoughts



Artificial Intelligence

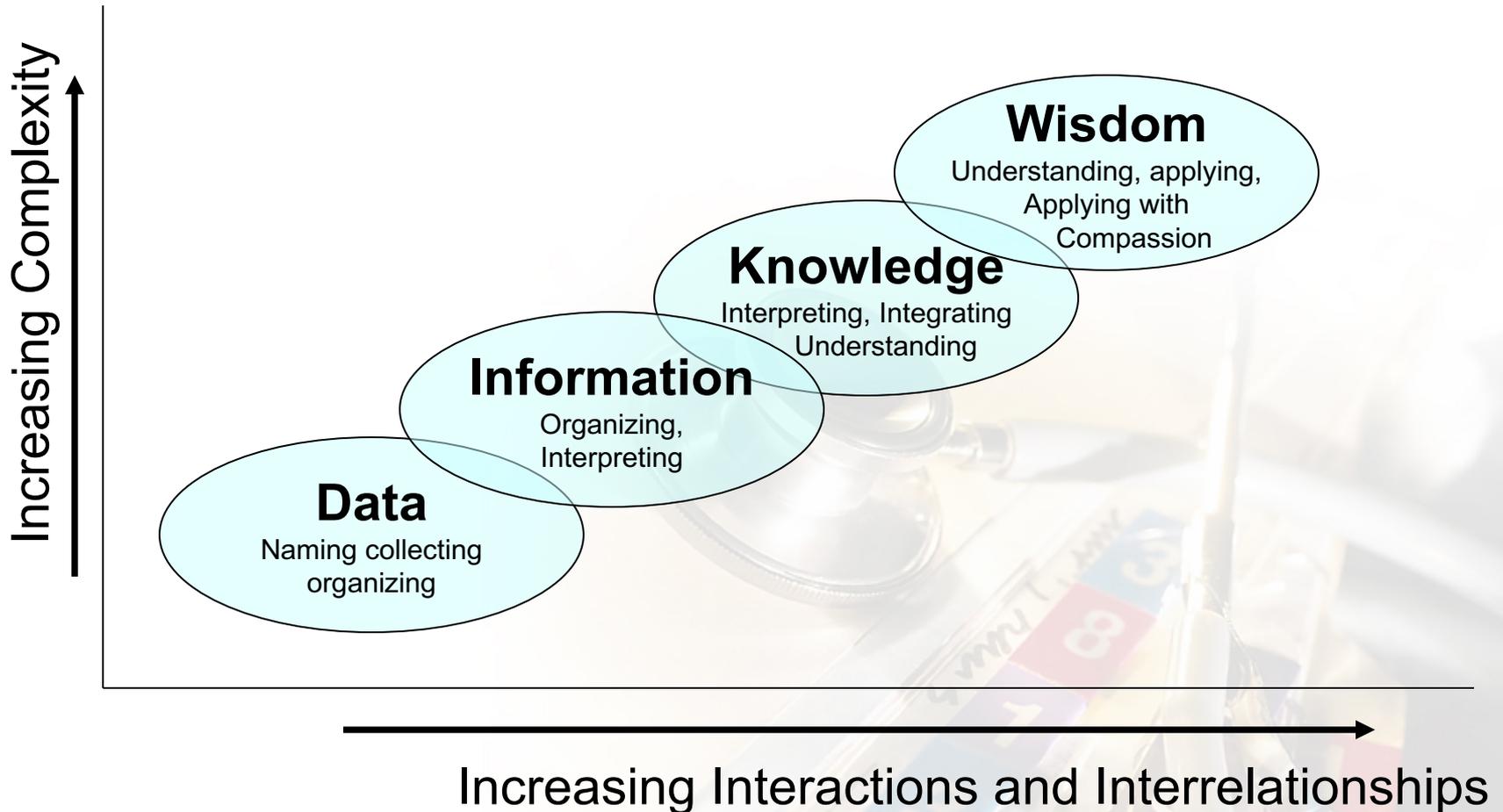
The theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.

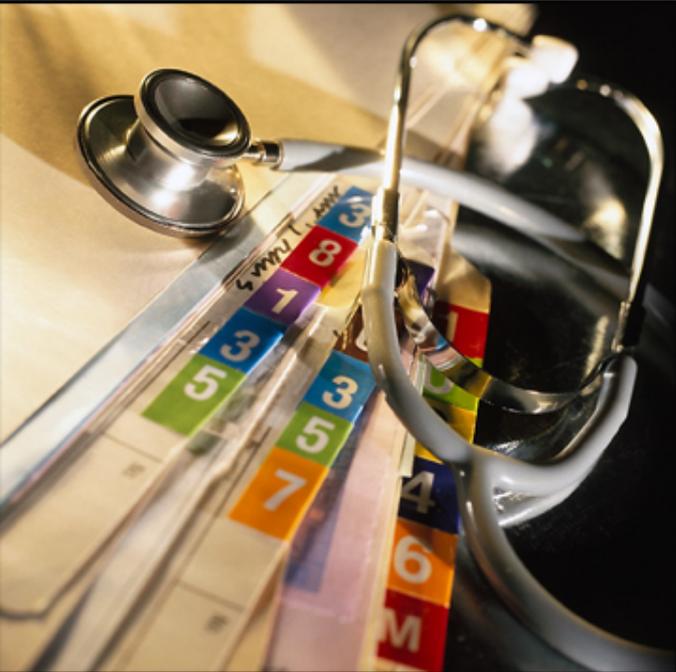
Google



Data: The Foundation.....

Nelson's: Data to Wisdom Continuum



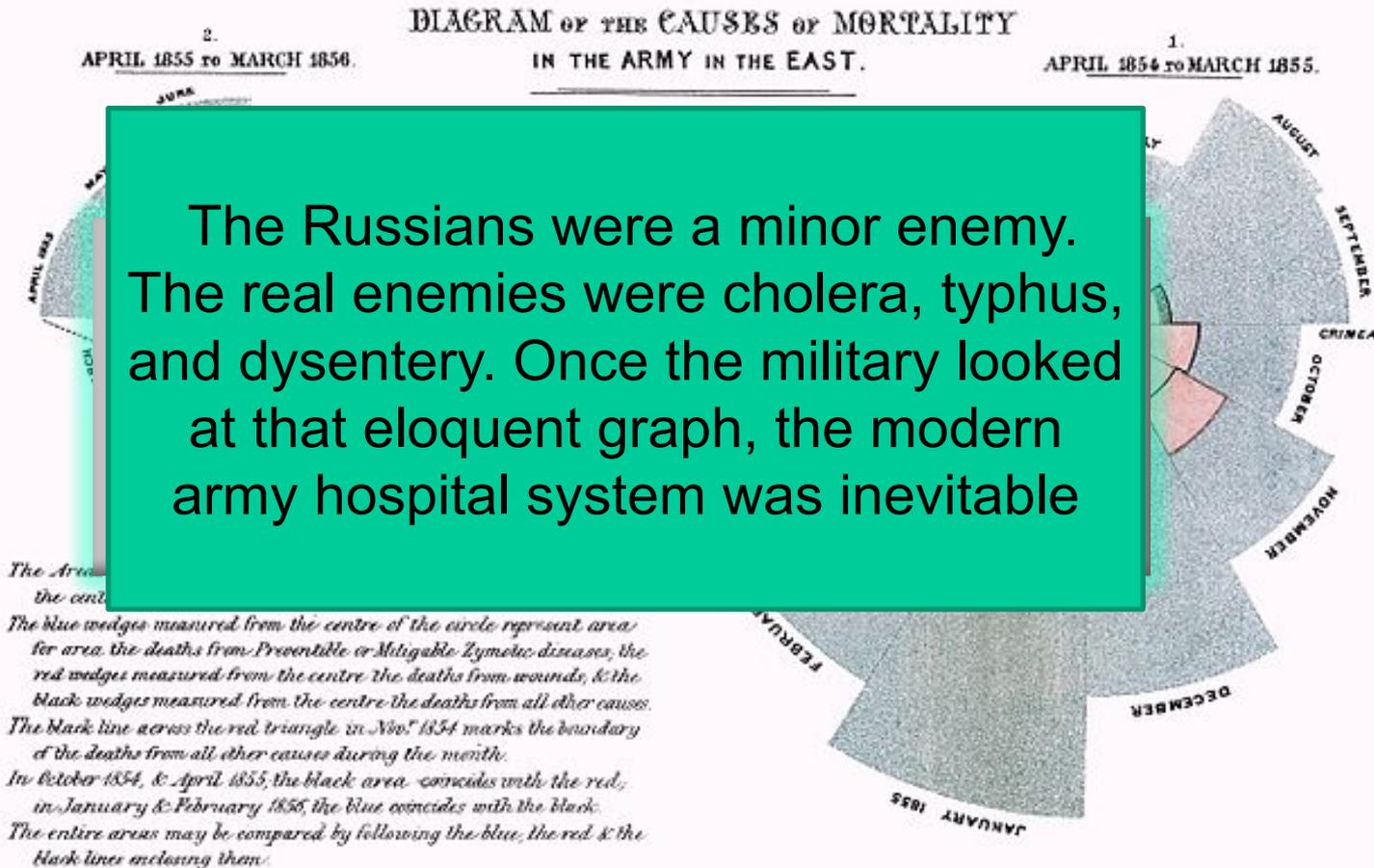


A Look Back

Historical Perspective of Data and Analytics



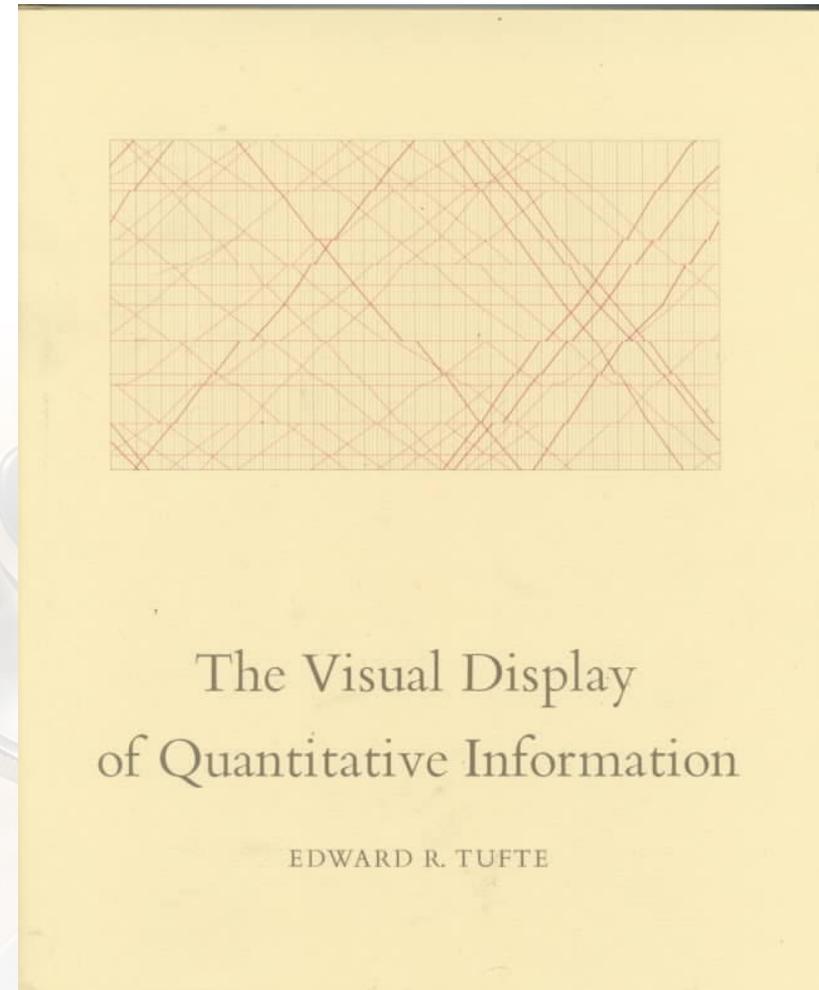
Reporting and Analytics Pioneers



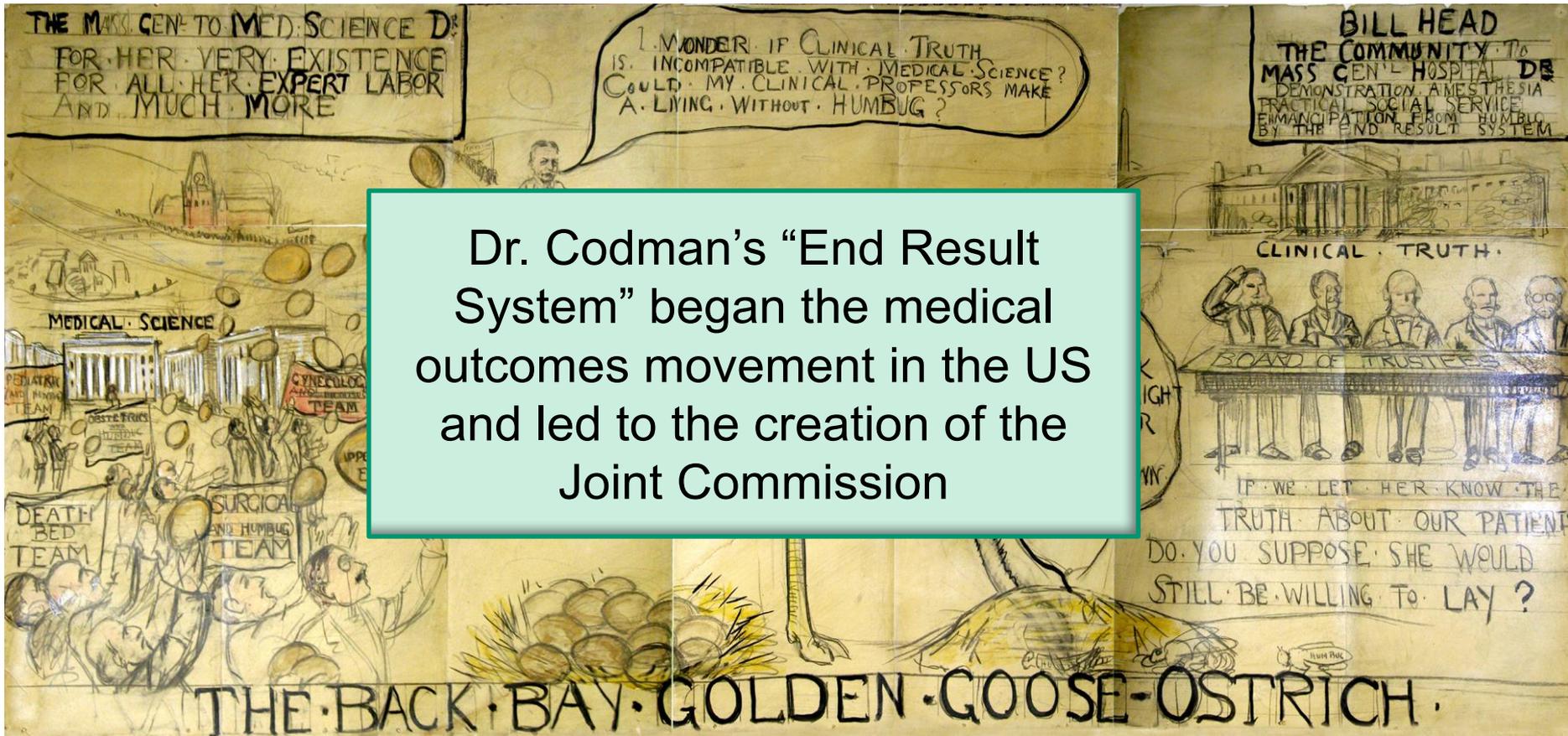
Florence Nightingale, 1856

Suggested Reading.....beside Notes on Nursing

- *The Visual Display of Quantitative Information*
- Author Edward R. Tufte
- Best 100 Non-Fiction books of the 20th Century, Amazon.com



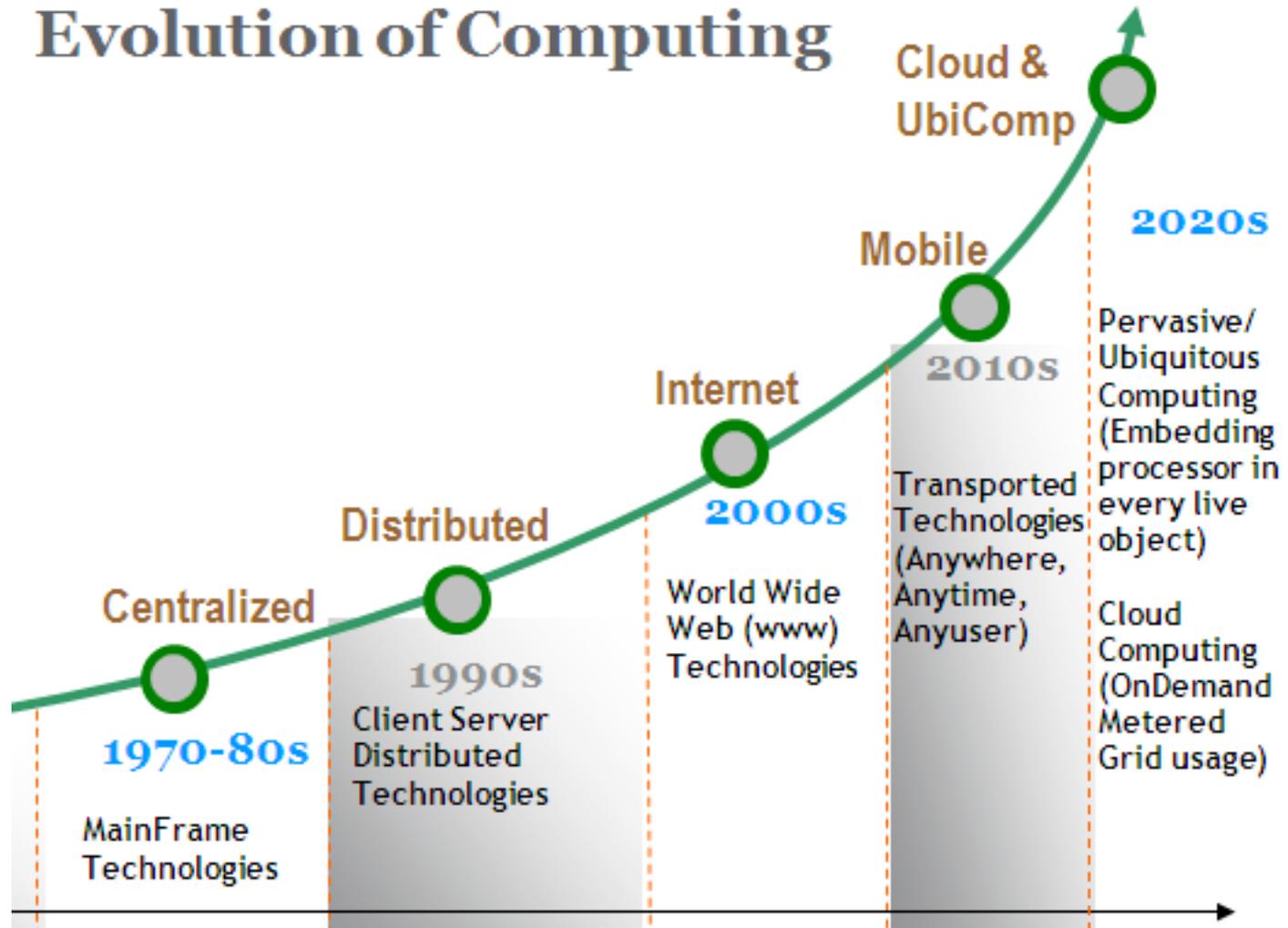
1915: Dr. Ernest Amory Codman



Dr. Codman's "End Result System" began the medical outcomes movement in the US and led to the creation of the Joint Commission

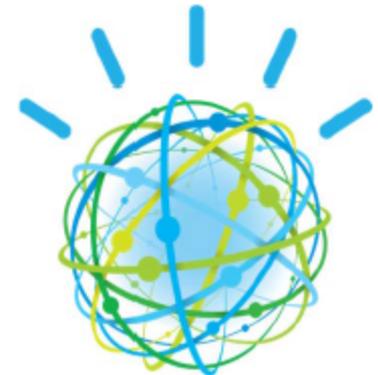
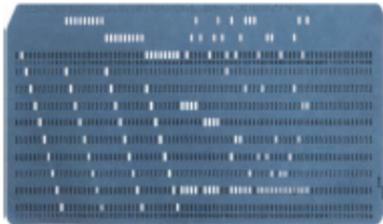


Evolution of Computing



History

We believe a historic shift in technology has occurred.



1900
Tabulating

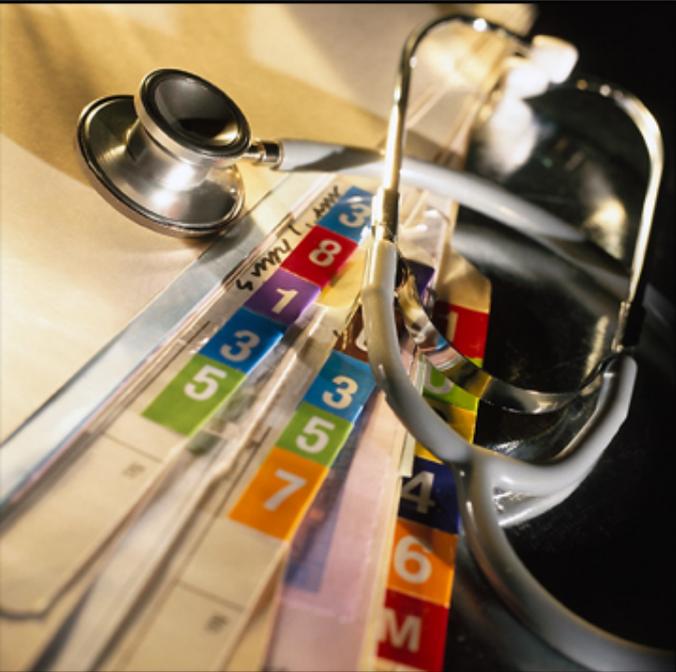
1950
Programmable

2011
Cognitive



Hidden Figures: Dorothy Vaughan





Fast Forward to the 21st Century

“BIG DATA” !!!!





Data Today

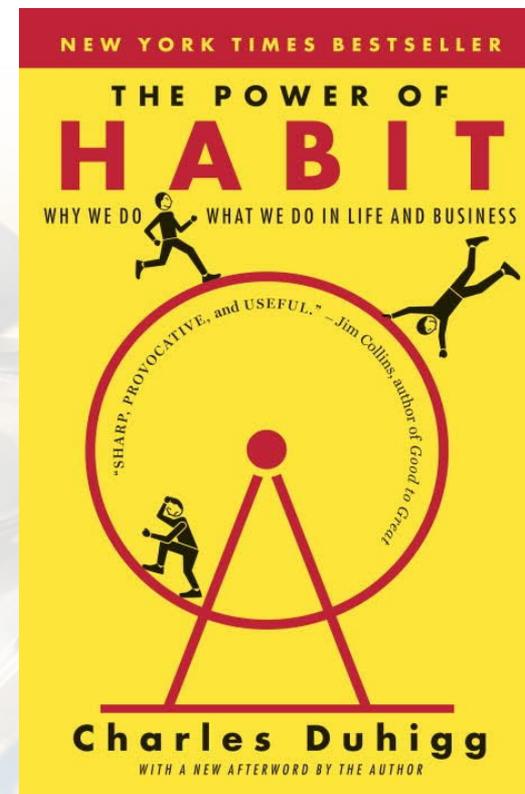
FEB 16, 2012 @ 11:02 AM 3,136,552 VIEWS

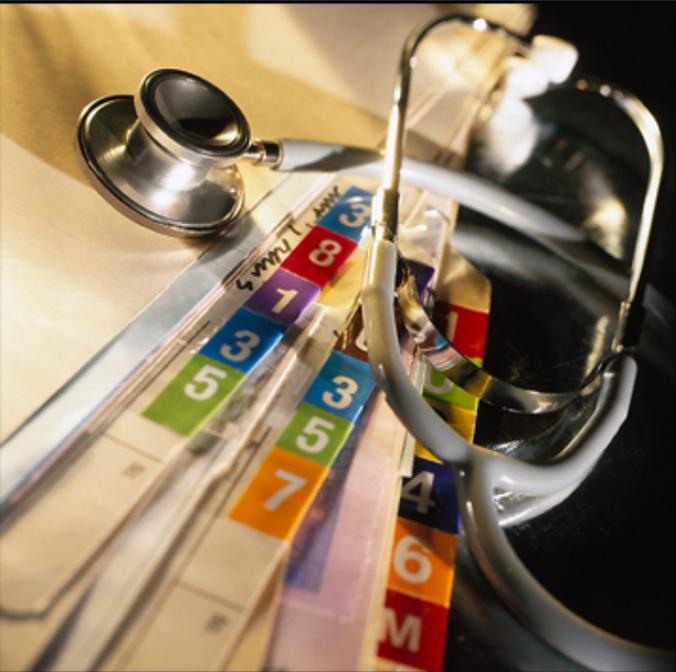
The Little Black Book of Billionaire Secrets

How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did

Data Today

- Ubiquitous
- The Internet of Things
- ?Privacy
- Social Media
- eCommerce





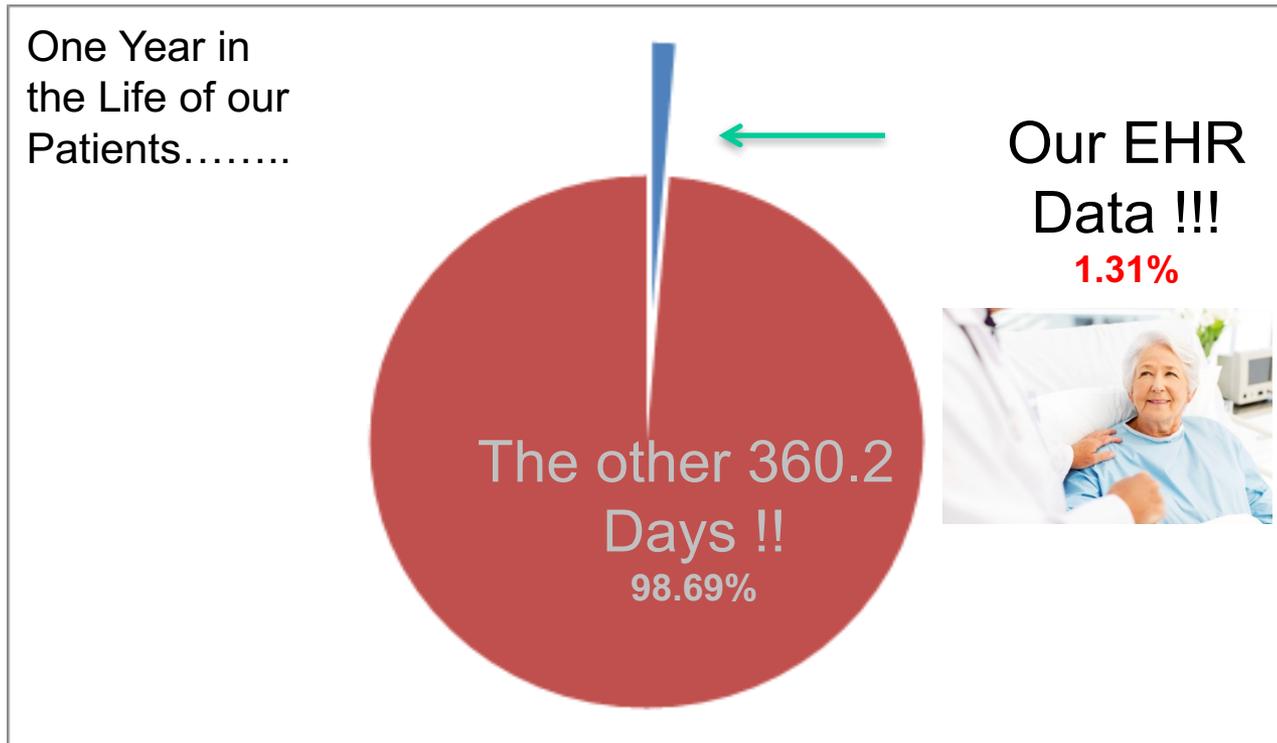
Healthcare Data and Analytics





EHR = Big Data?... I Don't Think So !!

If the average length of stay in a hospital is 4.8 Days



Bigger Data



Stefano Bertozzi

Dean and professor of health policy and management

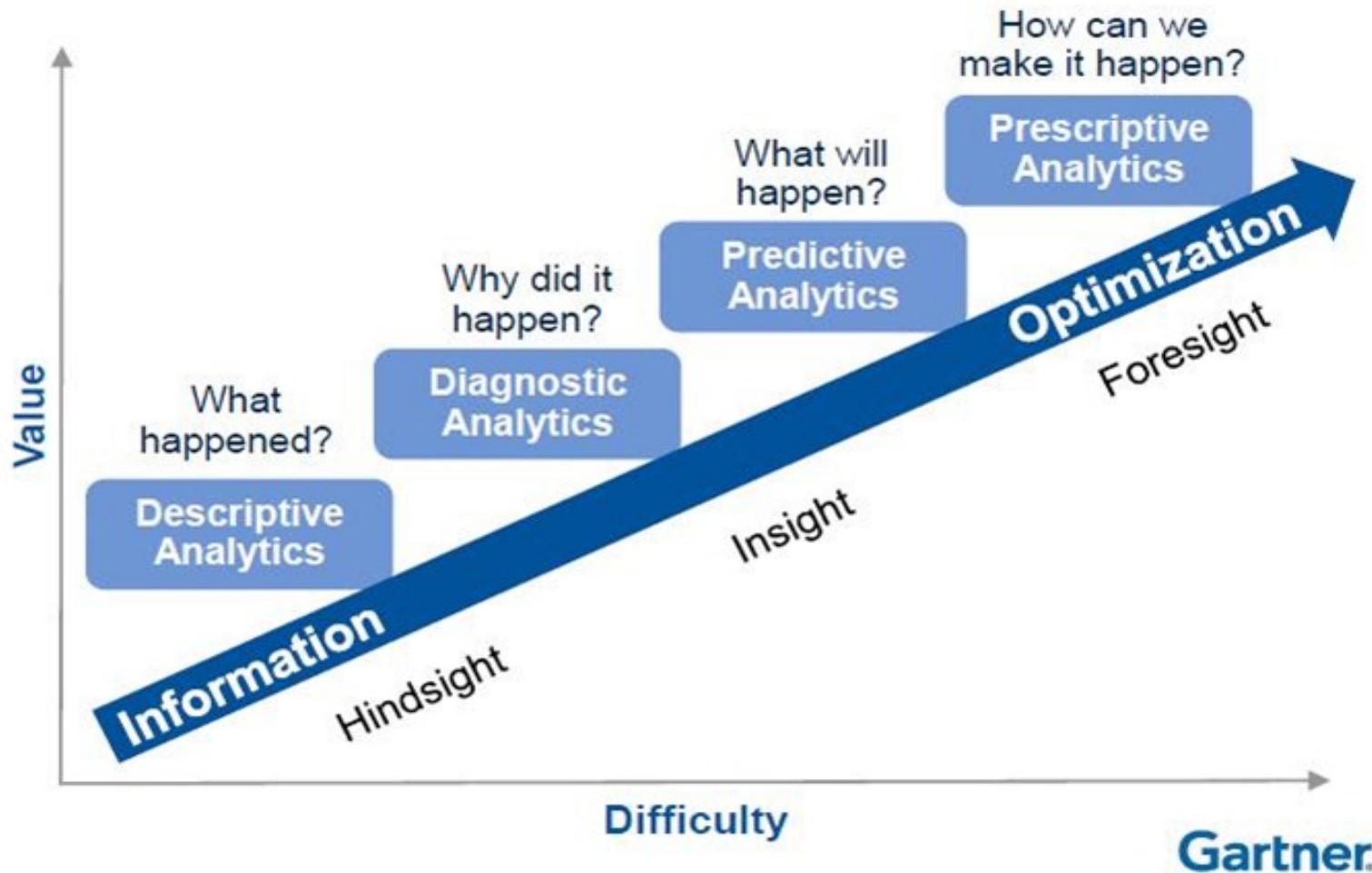
UC Berkeley School Of Public Health

“Healthcare data is **getting bigger all the time**, just look at EHRs alone: Medical records becoming electronic, with the ability to access vast amounts of data about patients and the health system, is increasing rapidly.

....and when you **start to combine that data** with things like human resources, supply chain, characteristics of clinics and hospitals, provider training, reimbursement schemes – it just gets bigger.

When I was a graduate student, data was extensive and analysts were plentiful. Now, data is ubiquitous and **the bottleneck is our analytic capacity.”**

Reporting Maturity





Data: Drinking from the fire house !!





understanding the data deluge: comparison of scale with physical objects

1 megabyte

(A large novel)



A tiny ant



1 gigabyte

(Information in the human genome)



Height of a short person



1 terabyte

(Annual world literature production)



Length of the Auckland Harbour Bridge



1 petabyte

(All US academic research libraries)



Length of New Zealand



1 exabyte

(Two thirds of annual production of information)



Diameter of the Sun





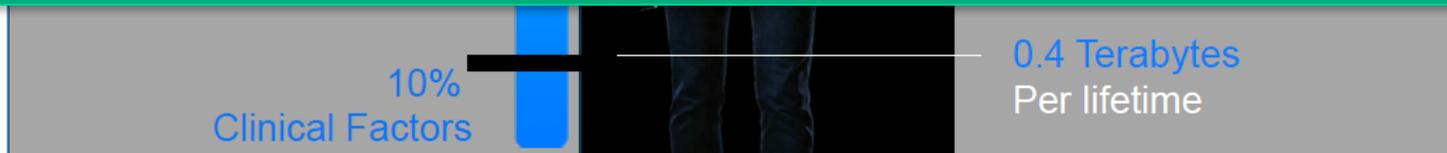
Vast amounts of data that can have a great impact on our health remains

🐦 #HIMSS16

IT IS ESTIMATED THAT

80%

OF CLINICAL DATA IS UNSTRUCTURED



HIMSS16

© 2015 International Business Machines Corporation

IBM Watson Health // SOURCE: ©2015 J.M. McGinnis et al.,
"The Case for More Active Policy Attention to Health Promotion,"
Health Affairs 21, no. 2 (2002):78-93



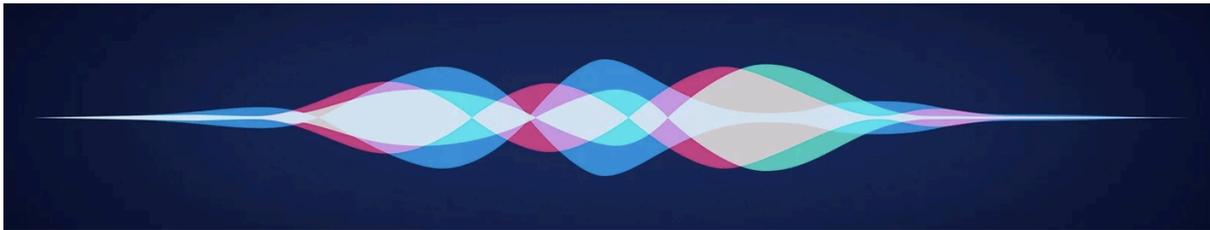


Natural Language Processing

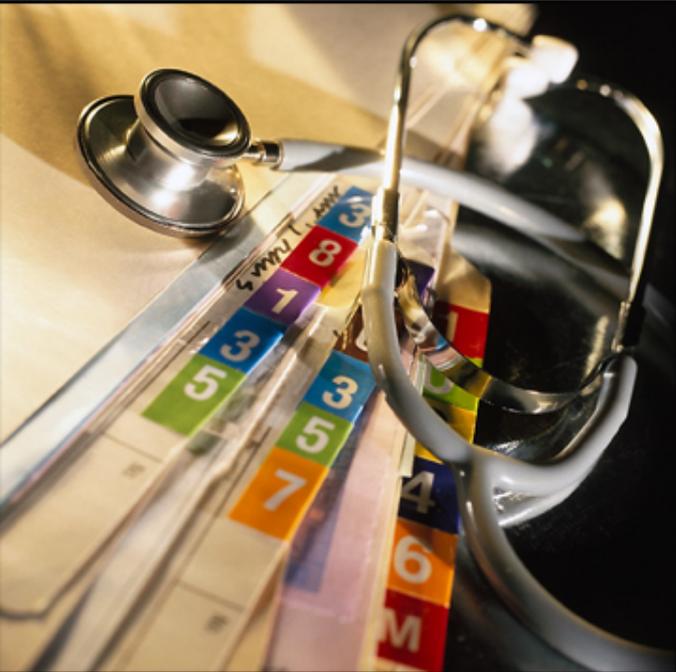
amazon alexa



DRAGON
NATURALLY SPEAKING



Soon... Many, Many Others....



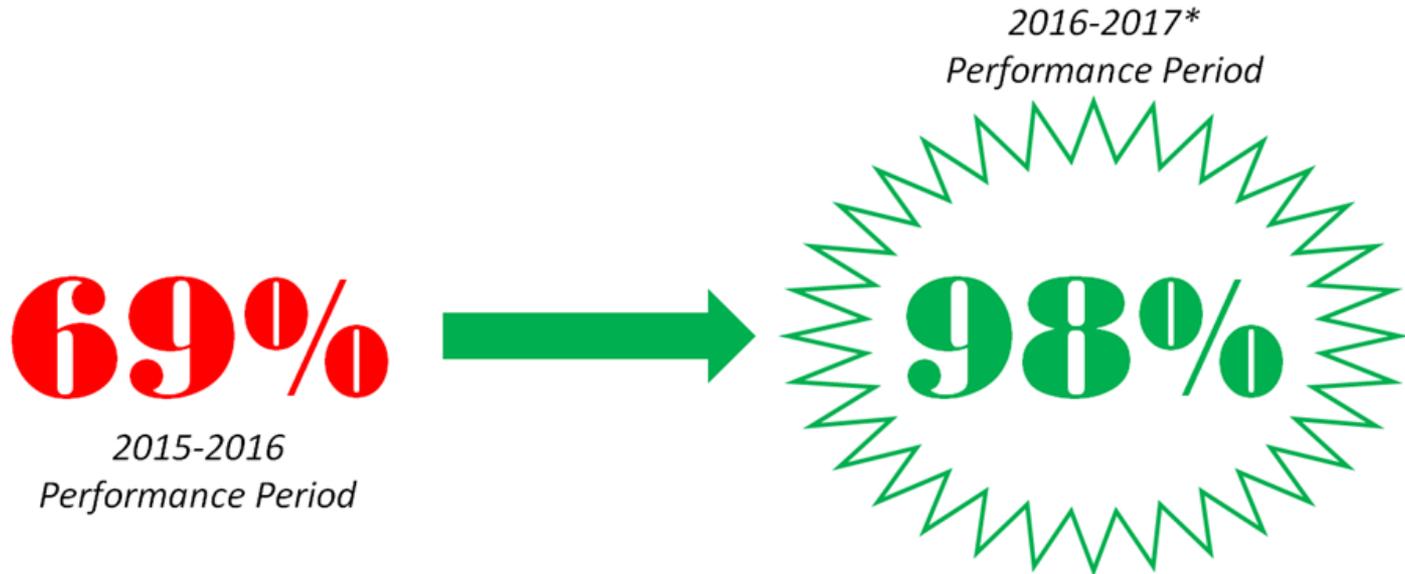
Making Data Actionable

Applied Analytics





Lahey Health: Inpatient Influenza



MEWS (Modified Early Warning System)

	3	2	1	0	1	2	3
Respiratory Rate per minute		Less than 8		9-14	15-20	21-29	More than 30
Heart Rate per minute		Less than 40	40-50	51-100	101-110	111-129	More than 129
Systolic Blood Pressure	Less than 70	71-80	81-100	101-199		More than 200	
Conscious level (AVPU)	U nresponsive	Responds to P ain	Responds to V oice	A lert	New agitation Confusion		
Temperature (°c)		Less than 35.0	35.1-36	36.1-38	38.1-38.5	More than 38.6	
Hourly Urine For 2 hours	Less than 10mls / hr	Less than 30mls / hr	Less than 45mls / hr				

EARLY WARNING SCORING SYSTEM FOR DETECTING ADULT PATIENTS WHO HAVE OR ARE DEVELOPING CRITICAL ILLNESS

IS THE SCORE FOR YOUR PATIENT 1-2? PERFORM 2 HOURLY OBSERVATIONS AND INFORM NURSE IN CHARGE

IS THE SCORE FOR YOUR PATIENT 3? PERFORM 1-2 HOURLY OBSERVATIONS AND INFORM NURSE IN CHARGE

IF THE MEWS SCORE IS DETERIORATING : THE WARD S.H.O. OR DUTY DOCTOR MUST ATTEND

IS THE SCORE FOR YOUR PATIENT 4 OR MORE? PERFORM OBSERVATIONS AT LEAST 1/2 HOURLY. ENSURE MEDICAL ADVICE IS SOUGHT AND CONTACT OUTREACH TEAM (see below)



“Code Blue !!”

400 → **54**
(2006) (2016)





Sepsis: John's Hopkins

“Computer algorithm could aid in early detection of life-threatening sepsis”



Science
Translational
Medicine

5 August 2015

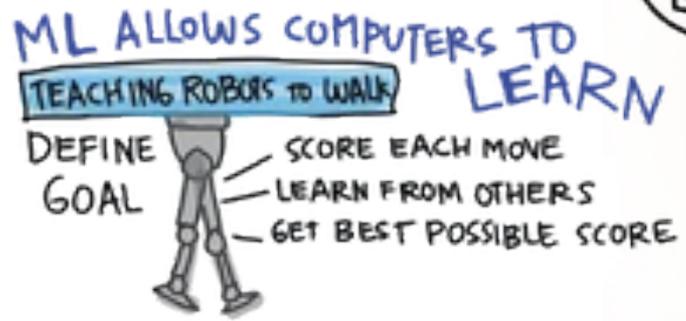
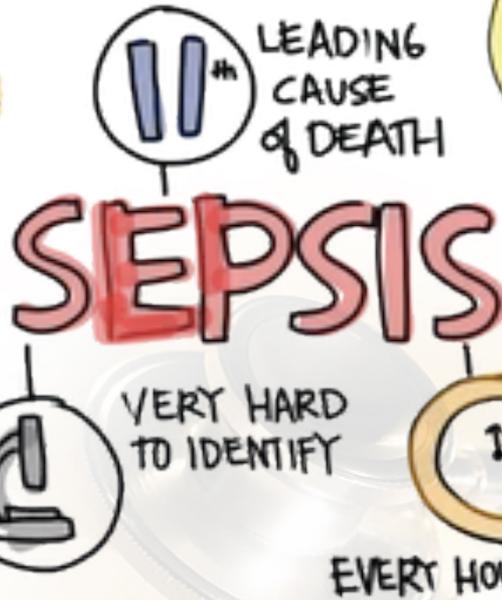
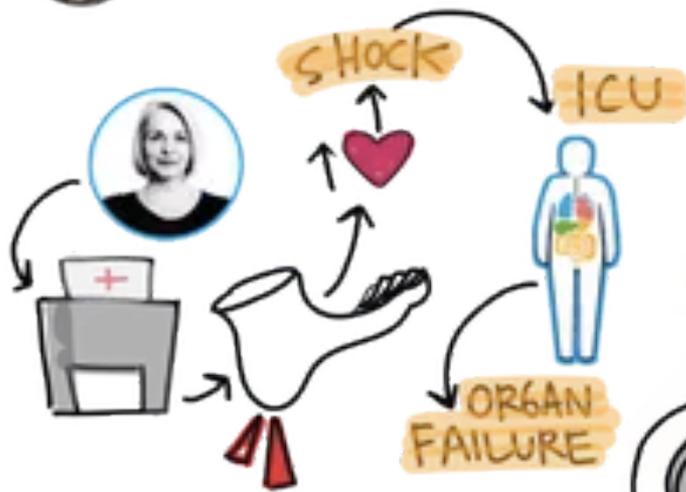
- TREWS – Targeted, Real-time, Early Warning System
- *Science Translational Medicine*, August, 2015
- Combines 27 factors to assess patient risk
- Henry, Hager, Pronovost, Saria



John's Hopkins



BETTER MEDICINE THROUGH MACHINE LEARNING
Suchi Saria / Johns Hopkins University



- WORKING 24/7
- SCALABLE
- SOLVING A SMALL DATA PROBLEM



Johns Hopkins: Sepsis

"Our methods are reaching a point where they can be a real aid to clinicians," Saria said, "especially in noticing subtle hints, buried deep in a chart, that a problem is developing."

"The tricky issue is thinking about **how the clinical team is provided with the information**," David Hager, MD said. A hospital's electronic health records system could be set up to convey alerts to clinicians via pager or cellphone at regular intervals, he said. More than two-thirds of the time, the method was able to predict septic shock before any organ dysfunction. That is a 60 percent improvement over existing screening protocols.

"But we have to do this in a way that it **is well-integrated into the existing clinical workflow** and does not cause alarm fatigue," Saria said. That is the focus of ongoing study.

Alexa and Boston Children's Hospital

'Alexa, pull those lab results': A hospital tries out virtual assistants



Florence Nightingale

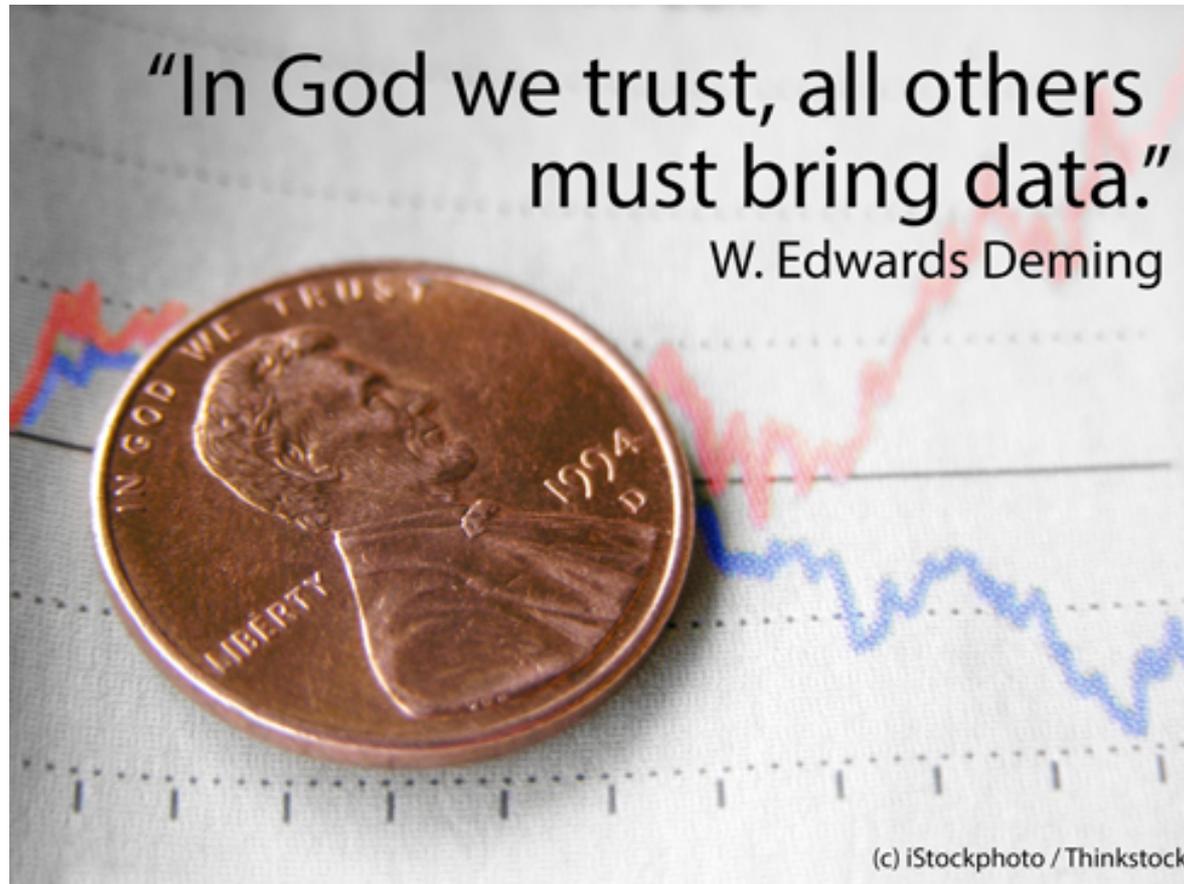


“The real heroes are those who find a way to improve things around them through the course of their daily lives.

In the nursing industry, there are many heroes who leave fine imprints of positive change because they deliver exceptional care to patients than what’s expected of them.

Keep doing whatever you’re doing and you could be one of them.”

A Closing Thought





Thank You and Questions !!



Mark Sugrue, RN-BC, FHIMSS, CPHIMS
MSugrueRN@gmail.com