

## About Me

- Chief Information Officer for DBHIDS since 2014
- Leader of State of NJ Enterprise Data Management from 2000 through 2014
- Chief Technology Officer for K-12 school district from 1997 to 2000
- Cofounder, and CEO of DataStar International from 1991 through 1997
- MIS Director for Johnstone Training and Research Center from 1987 through 1991
- Keynote speaker at ten different technology events
- Presenter of more than 100 papers at more than 60 events in eight countries on three continents
- Coauthor of one book and technical editor of three books in data management field
- Contributing editor for four years for a monthly data management magazine
- Guest speaker at the Bloustein School of Planning and Public Policy, Hubert H. Humphrey Fellowship Program at Rutgers University and the Rohrer College of Business at Rowan University

2015 GMIS Government Best Practices Award for the NJ Data Governance Office

2015 GMIS Government-to-Government Award for the NJ Big Data Alliance

2013 DAMA International Government Achievement Award

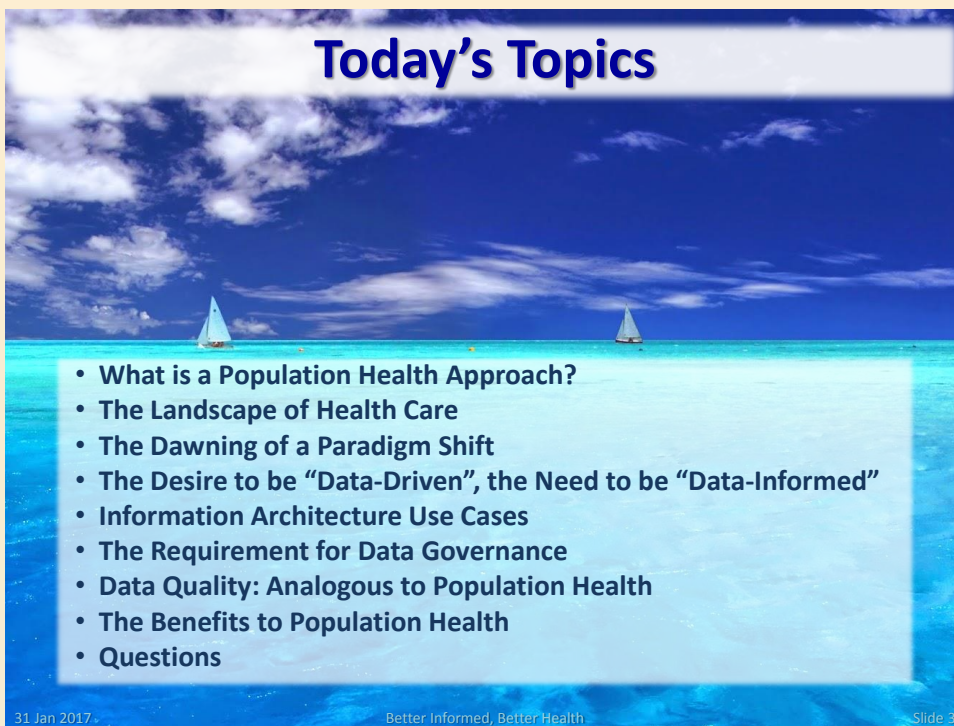
2011 NASCIO Government Transparency Award Finalist for YourMoney.NJ.gov

2002 US OMB Government Without Boundaries Superior Leadership Award

1994 *The Informant* Readers' Choice Award for best programming utility product

Served in fire and emergency medical service for 40 years, including seven years as chief officer

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A presentation slide with a background of a blue sky with white clouds and a turquoise ocean with two sailboats. A white rectangular box is overlaid on the bottom half of the slide, containing a bulleted list of topics.

## Today's Topics

- What is a Population Health Approach?
- The Landscape of Health Care
- The Dawning of a Paradigm Shift
- The Desire to be “Data-Driven”, the Need to be “Data-Informed”
- Information Architecture Use Cases
- The Requirement for Data Governance
- Data Quality: Analogous to Population Health
- The Benefits to Population Health
- Questions

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A presentation slide with a background of a blue sky with white clouds and a turquoise ocean with two sailboats. The text "WHAT IS A POPULATION HEALTH APPROACH?" is centered in the lower half of the slide in a large, bold, blue font.

## WHAT IS A POPULATION HEALTH APPROACH?

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# What is a Population Health Approach?

**Population Health**  
 “the distribution of health outcomes within a population, the health determinants that influence distribution and the policies and interventions that impact the determinants.”  
 (Nash, Fabius, Skoufalos, Clarke & Horowitz. 2016)

**1<sup>st</sup> Wave: Building the Foundation**

- De-institutionalization
- Expanding Provider Network
- Creating CBH as MCO
- Creating DBHIDS and single-payer system

**2<sup>nd</sup> Wave: Transformation Decade**

- Recovery, Resilience and Self-Determination
- Improving Quality of Life
- Creating Learning Organization

**3<sup>rd</sup> Wave: Population Health**

- Promoting Health and Wellness for the entire population
- Unified framework for all services and populations
- Reaching everyone efficiently and effectively

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## THE LANDSCAPE OF HEALTH CARE

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## Reactive Health Care

Our health care system has been programmed to treat people who present themselves and are diagnosed. We have not focused on the much larger population that is not yet diagnosed. The system is REACTIVE.

**Health Care Focus** → **Diagnosed**  
**At Risk**  
**Healthy**

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## The Black Box of Treatment

**Black Box of Treatment**

We measure this.

Symptom reduction, not wellness.

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## Outcomes are not Measured Well

The diagram features a black 3D box labeled "Black Box of Treatment" on a blue background with a white horizon line. To the left, a red stick figure points to the box. A dashed red arrow loops from the box to a red stick figure with a red arrow above its head, indicating a transition to a healthy state. Below this, a group of orange stick figures is shown, with one orange figure pointing to the box. A dashed yellow arrow loops from the box to this orange figure. At the bottom, a group of green stick figures is shown, with one green figure pointing to the box. A dashed green arrow loops from the box to this green figure. A small white sailboat is visible on the horizon to the right.

Symptom treatment does not automatically confer wellness. Rather than guided to the healthy tier, people are discharged from treatment and can land anywhere on the continuum.

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## It is a Reactive System

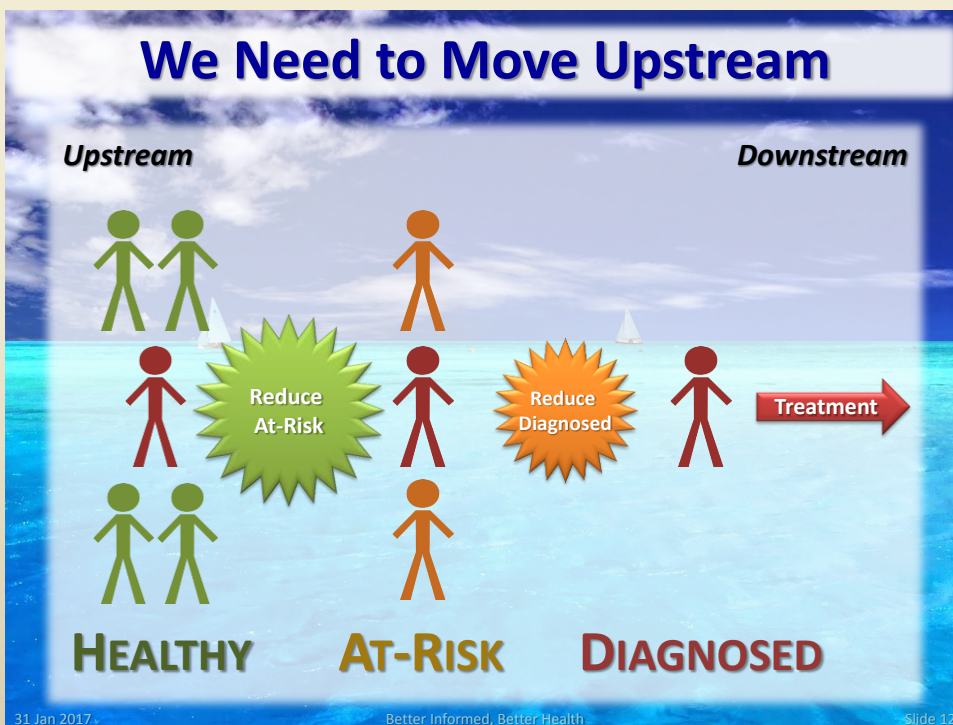
The diagram features a black 3D box labeled "Black Box of Treatment" on a blue background with a white horizon line. A dashed red arrow points from the box to a red stick figure. A dashed black arrow loops from the red stick figure to a group of purple stick figures. A dashed red circle encloses the red stick figure and the purple stick figures. A small white sailboat is visible on the horizon to the right.

Little or no awareness of the impact of other factors not seen in the treatment room.

Little or no insight into what moves someone from wellness to diagnosed.

Little or no effort to address issues before the need for treatment.

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## Population Health Approach

There are population health goals for each of the population tiers in a behavioral health care system. Resources are directed at keeping people healthy and at early intervention and mitigation.

Population Tier	Percentage	Focus Area
Top Tier	5%	Effective & Efficient Clinical Care
Middle Tier	20%	Mitigate Risk and Early Intervention
Bottom Tier	75%	Keeping People Healthy

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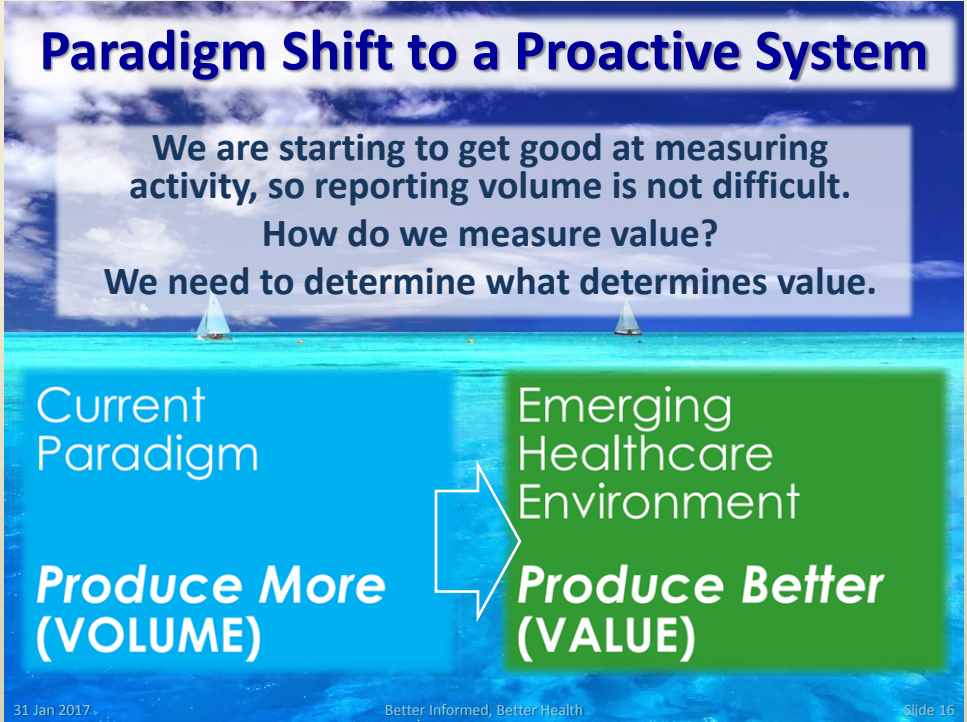
## Health Care is but a Small Component

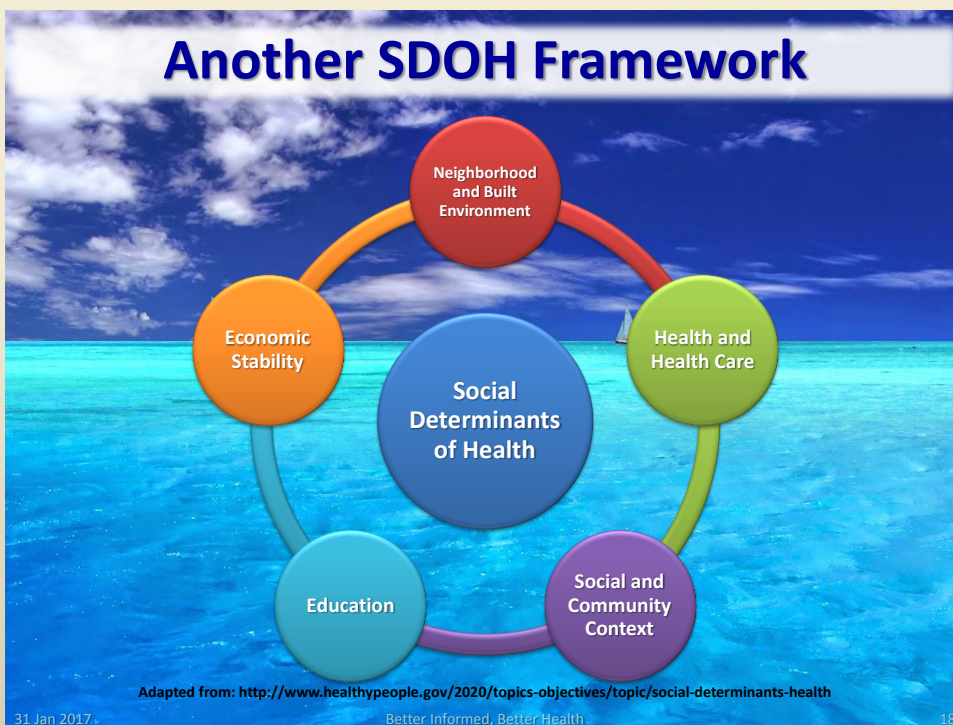
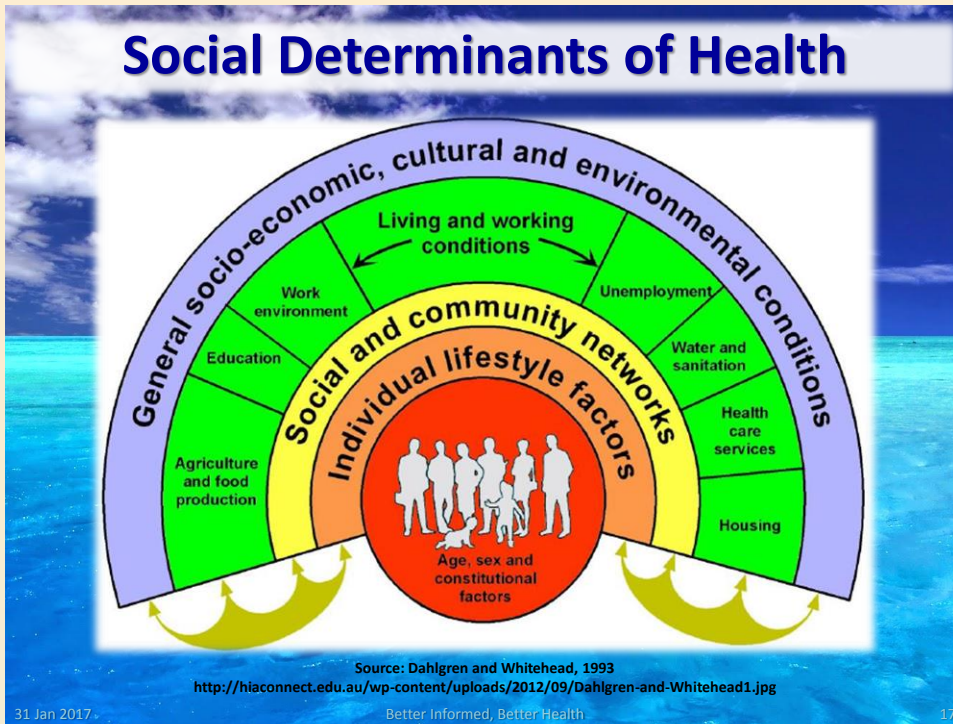
Environment and Lifestyle Factors have seven times more impact on overall population wellness than Health Care.

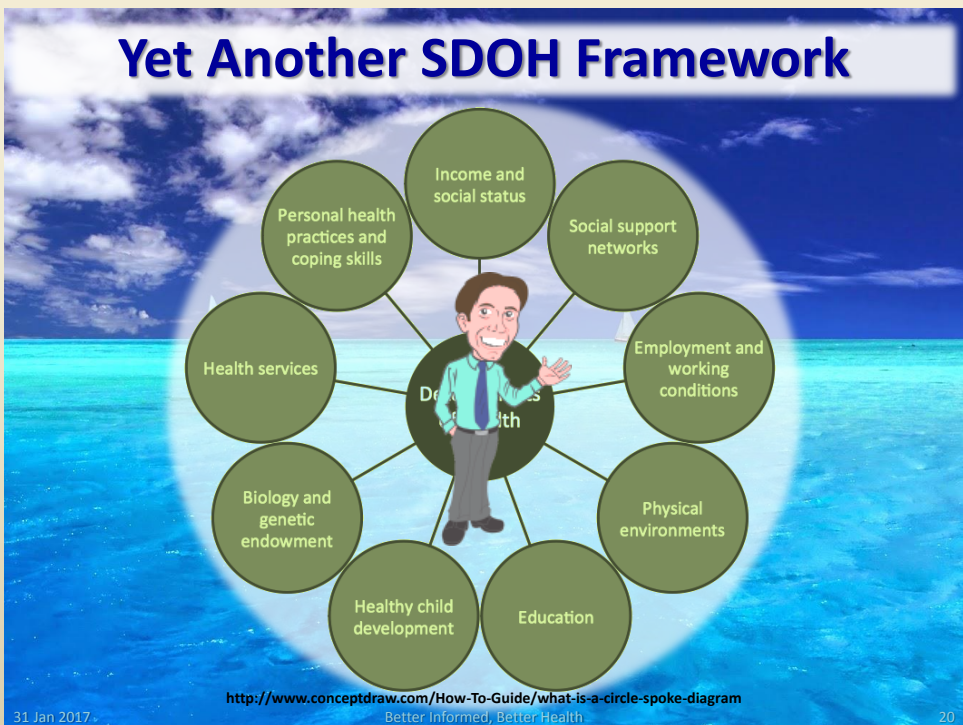
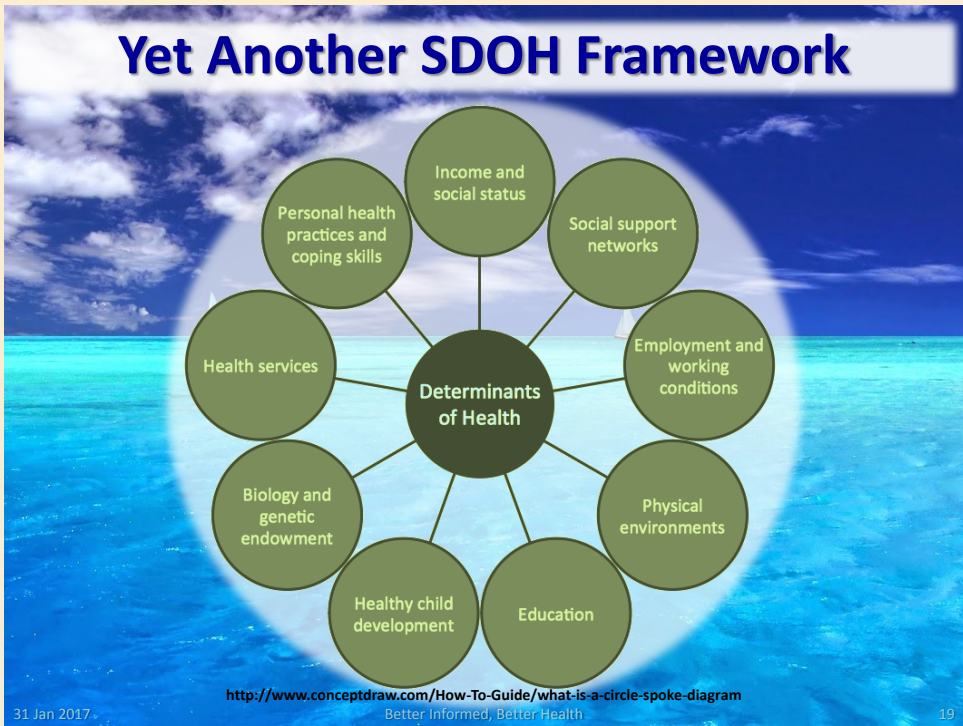
Factor	Percentage
LIFESTYLE	51%
HUMAN BIOLOGY	20%
HEALTH CARE	10%
ENVIRONMENT	19%

LIFESTYLE factors: Smoking, Obesity, Stress, Nutrition, Blood Pressure, Alcohol, Drug Use.

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## New Approach – Dr. Arthur C. Evans

1. Working at the Community and Group Level
2. Working “Upstream”
3. Employing a Broad Set of Strategies
4. Working with “Non-Diagnosed” Populations
5. Delivering Health Promotion Interventions
6. Working in Community and Other Non-Clinical Settings
7. Using Health Activation Approaches and Empowering Others

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## Paradigm Shift to a Proactive System

- Addresses **social determinants** of health
- Is focused on **long-term outcomes**
- Has **health as the goal** (not symptom reduction)
- Requires **partnership**
- Requires **creativity and innovation**
- Utilizes a **data driven approach**
- Involves **systemic strategies**
- Can use **managed care approaches**

This necessitates identifying the right data, ensuring its quality, and using it to make policy and program decisions. “Data-informed”

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## The Desire to be Data-Informed

This necessitates identifying the right data, ensuring its quality, and using it to make better policy and program decisions.

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## The Desire to be Data-Informed

**This necessitates identifying the right data, ensuring its quality, and using it to make better policy and program decisions.**

**Data to inform policy making**

**Data to inform clinical care**

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## New Data Sources are Required

- Sources will need to be identified.
- Need to integrate new data with existing data.
- Meaningful data will need to be delivered to different communities of data consumers.
- The data will need to be evaluated.

*There are Four Common Approaches*

1. The DBA Approach
2. The Analyst Approach
3. Build a New Super System
4. The Information Architecture Approach

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## The Traditional DBA Approach

- I have Data
- I give people Reports
- I drink in the Power

I am the "System DBA", but I think it means I am the "Data Owner".

PLEASE???

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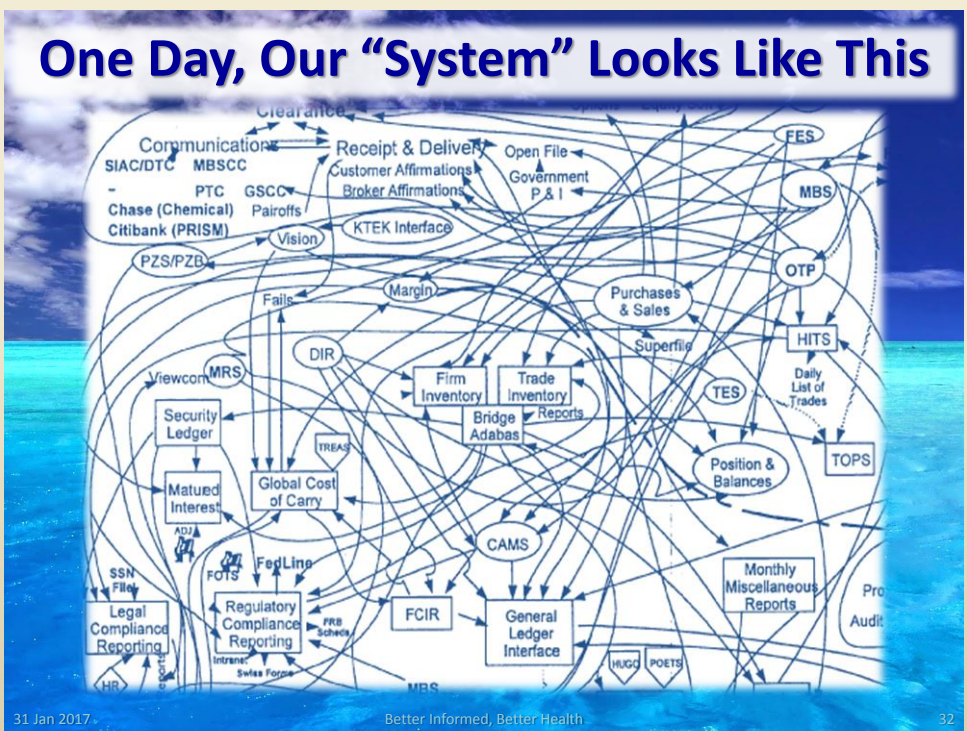
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# Shadow IT – The Analyst Approach

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# Shadow IT – The Analyst Approach

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## New Super System Approach

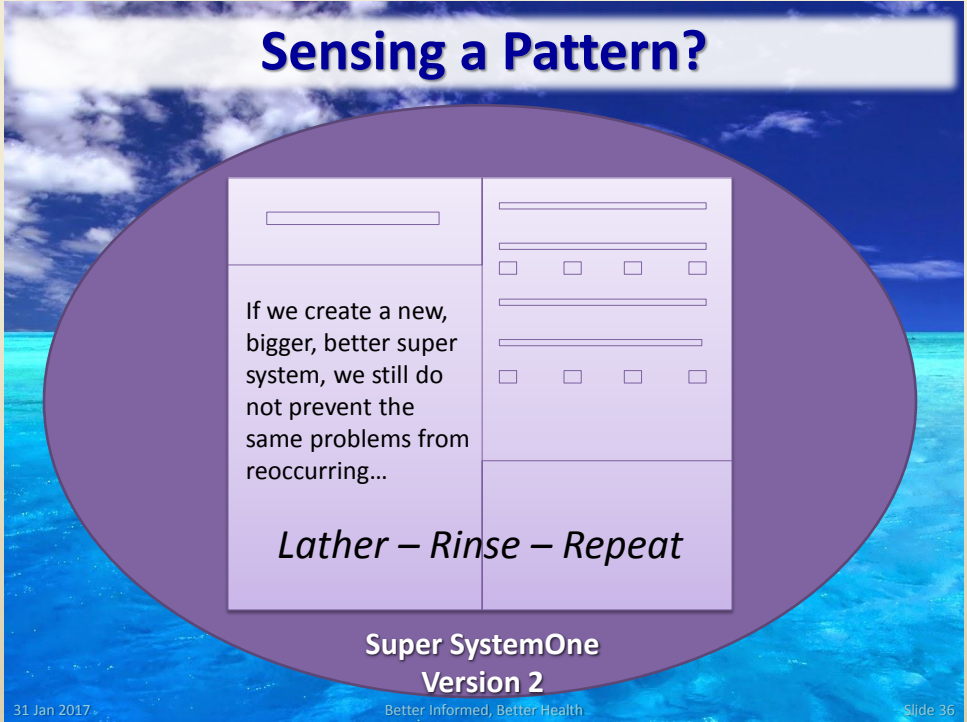
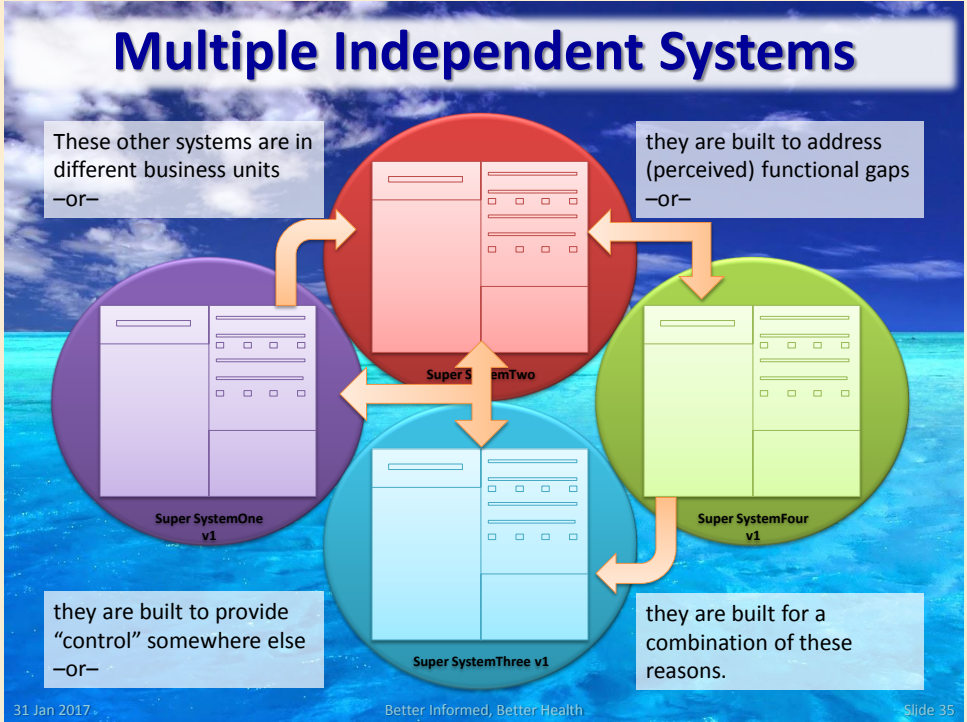
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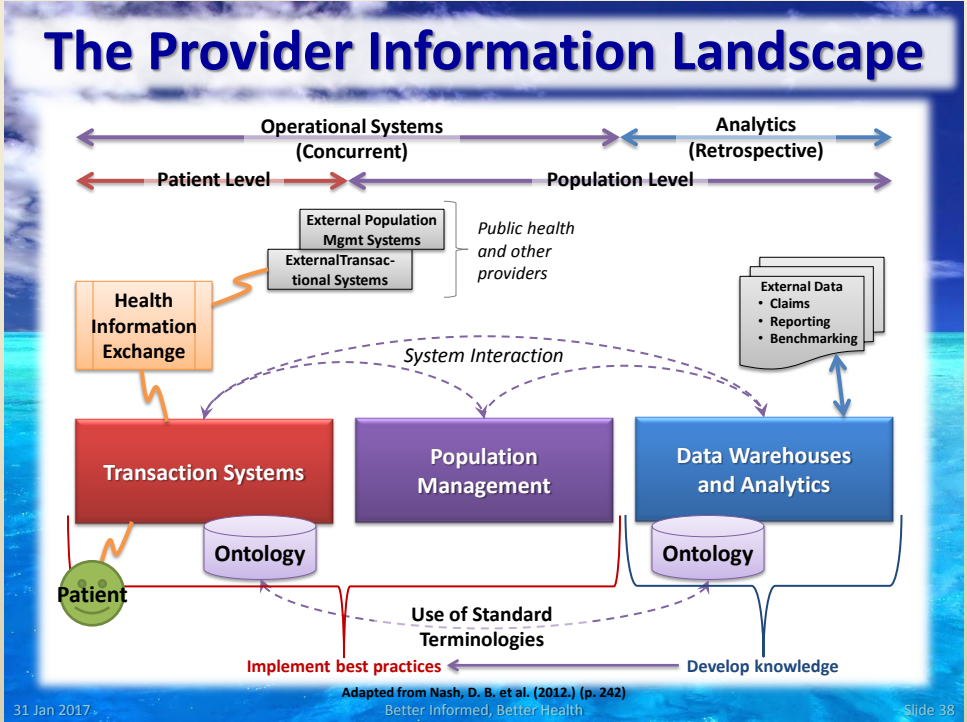
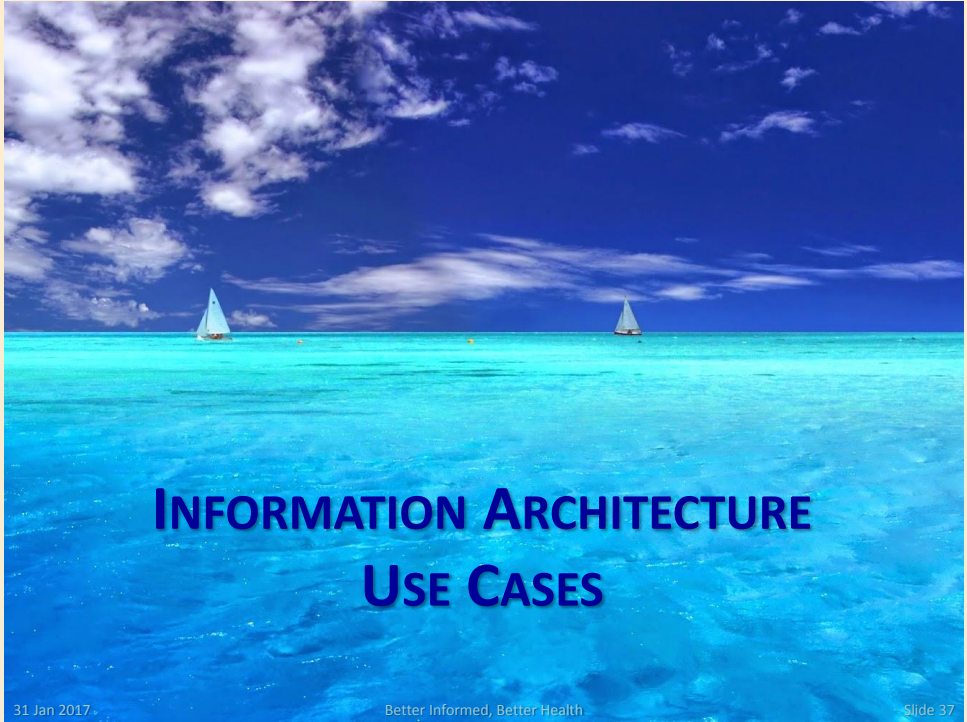
## One System Solves All Our Problems!

*...except for those not in the original system scope...*

**Super SystemOne  
Version 1**

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## Information Architecture Use Cases

**Different information needs must be met with different solution design patterns, for both data preparation and publication.**

<b>Transaction Processing</b>	<ul style="list-style-type: none"> <li>• Applications that collect and maintain data about interactions within the business units in support of their business functions. They exchange data with each other in real time.</li> </ul>	<b>Do</b>
<b>Operational Reporting</b>	<ul style="list-style-type: none"> <li>• Traditional reporting against transactional systems about current operations with limited or no history, analysis or integration with multiple data sources.</li> </ul>	<b>Know</b>
<b>Data Integration and Persistence</b>	<ul style="list-style-type: none"> <li>• The data warehousing layer that manages master data, reference data, metadata, and data for historical analysis; the authoritative source of data.</li> </ul>	<b>Remember</b>
<b>Key Performance Indicators</b>	<ul style="list-style-type: none"> <li>• Integration of operational metrics to provide a 360-degree view of the organization with an ability to track changes and trends over time through dashboards.</li> </ul>	<b>Measure</b>
<b>Analytical Reporting</b>	<ul style="list-style-type: none"> <li>• Sophisticated reporting, visualizations and statistical analysis of historical data from purpose-built data publication environments (data marts).</li> </ul>	<b>Learn</b>

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## Information Architecture in a Slide


<b>TRANSACTION PROCESSING</b>  <b>DO</b> <b>DO</b>	<b>OPERATIONAL REPORTING</b>  <b>KNOW</b> <b>KNOW</b>
<b>OPERATIONAL DATA STORE</b> <b>METADATA MANAGEMENT</b> <b>REMEMBER</b> <b>MASTER DATA MANAGEMENT</b> <b>ENTERPRISE DATA WAREHOUSE</b>	
<b>MEASURE</b> <b>MEASURE</b>  <b>KEY PERFORMANCE INDICATORS</b>	<b>LEARN</b> <b>LEARN</b>  <b>ANALYTICAL REPORTING</b>

The "Remember" use case is the essential piece to being data-informed.

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# Why Data Warehousing?

- Improve Performance of Operational Systems
- Improve Performance of Reports
- Improve Security of Operational Data
- Provide Timelier Reporting Solutions
- Reduce the Cost of Development and Maintenance of Reports and Interfaces
- And the Most Important Reason...



**DATA QUALITY**  
*a Single Source of the Truth*

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# THE REQUIREMENT FOR DATA GOVERNANCE



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## What is Data Governance?

- Data Governance is the exercise of decision-making and authority for data-related matters.
- Data Governance also refers to the organizational bodies, rules, decision rights and accountabilities of people and information systems as they perform information related processes.
- Data Governance is how we “decide how to decide.”



WWW.DATAGOVERNANCE.COM

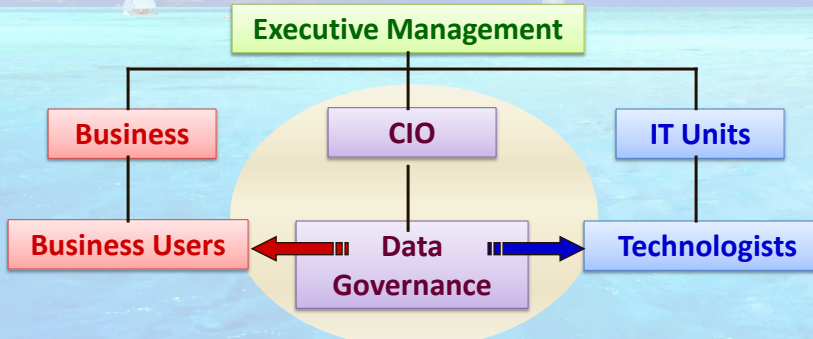
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## Data Governance – Business & IT

- It is NOT a Technology Function
- It is NOT a Business Function
- It is a Business/Technology Fusion



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## Data Governance 2.0

From a brief produced by Forrester Research entitled *Establish A Data Governance Journey Toward Data Citizenship*

- Organizations are starting the journey toward **Data Citizenship**
- Data Citizenship is the state where everyone understands, learns, and acts according to their responsibility in light of current and future data objectives.
- What this tells us:
  - Data governance involves more stakeholders.
  - Objectives become more complex with more dependencies.
  - Collaboration supplements process to involve multiple viewpoints.

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## Public Sector/Healthcare Sectors

Public sector and healthcare organizations are asking about/focused on

- **Business alignment (17%)**
- **Privacy (12%)**
- **Big data (9%)**

Source: Forrester surveys of clients

Much of the data is regulated. Thus, privacy, and the need to balance more-complex objectives, will be a key driver for the data governance journey in these industries.

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## Data Governance Center of Excellence

- As data becomes increasingly central to how organizations function, data governance must become central to organizational process.
- The CoE will provide support to the data governance process and evangelize the strategy to involve all data citizens.
- Data Governance must be federated, with data ambassadors working with the CoE to address business concerns, provide direction and guidance, and formulate strategy.
- Moving toward data citizenship requires a culture shift toward more transparency as well as more shared responsibility.

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## The New World of Data Governance

- All employees have to become **Data Citizens**
- Instead of “Data Stewards”, we need **Data Ambassadors**
- Data Governance is not a responsibility of the CIO, it is a responsibility of **Executive Management**
- Data Stewardship is not a CIO-led activity, but a collaboration, a **United Nations of Data Ambassadors**



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**DATA QUALITY**  
***ANALOGOUS TO POPULATION HEALTH***

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## The Goal of Data Governance

To improve Data Quality System-wide, by improving processes and controls at the point of data collection, not at data publication.

**Reliability**

**Accuracy**

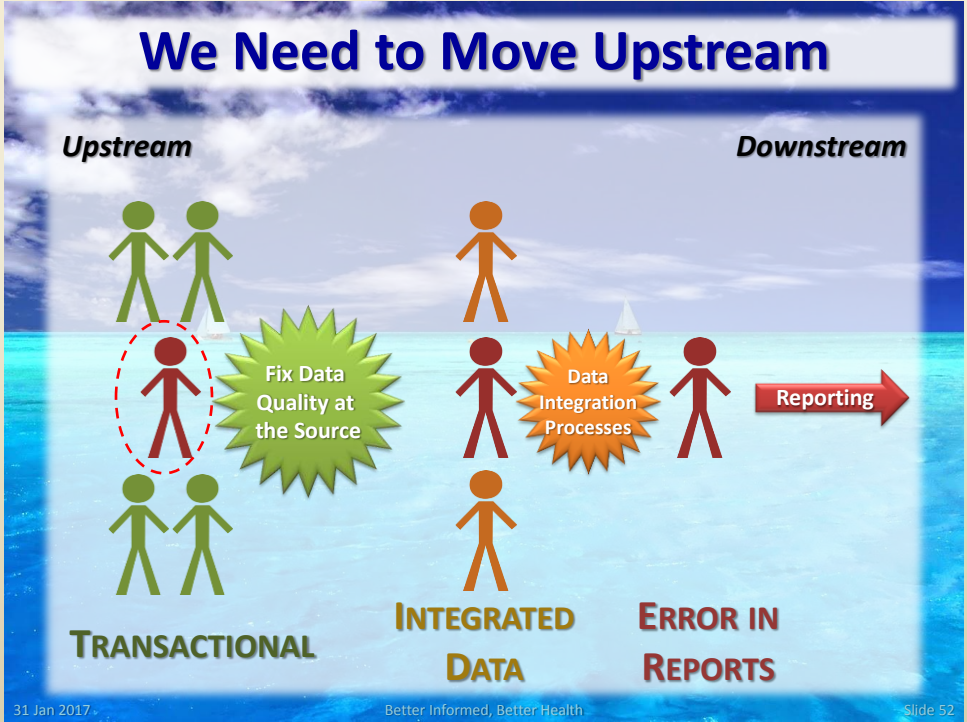
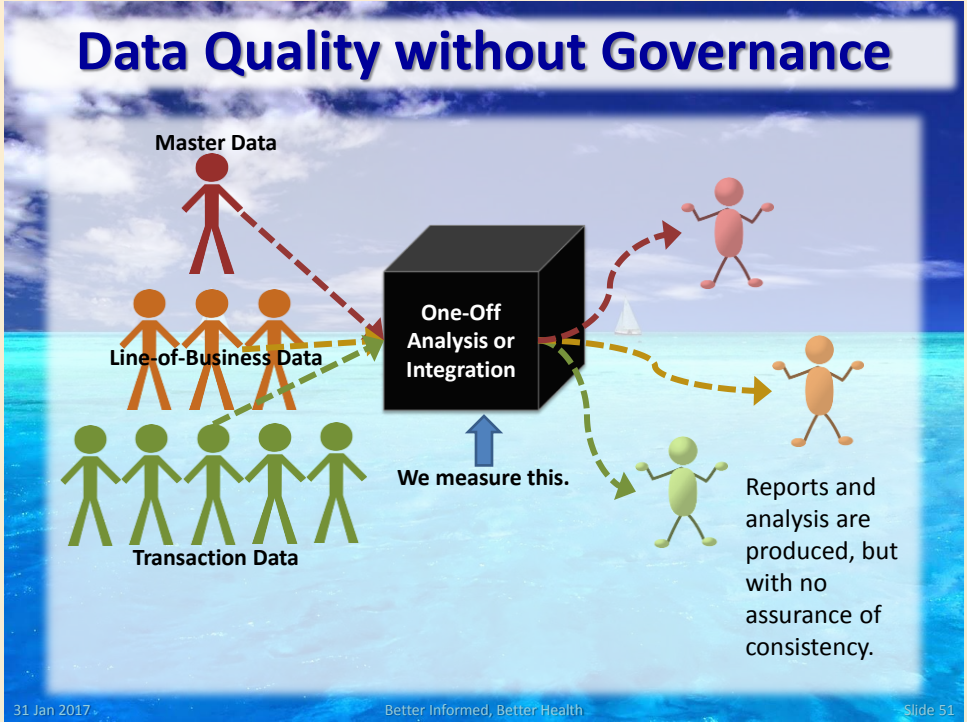
**Timeliness**

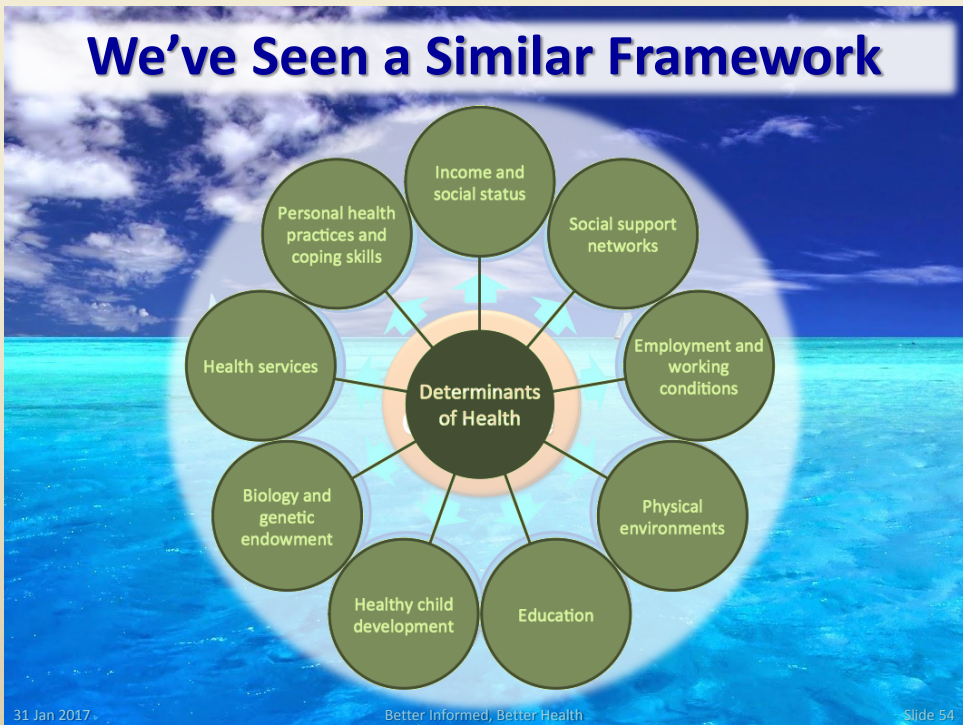
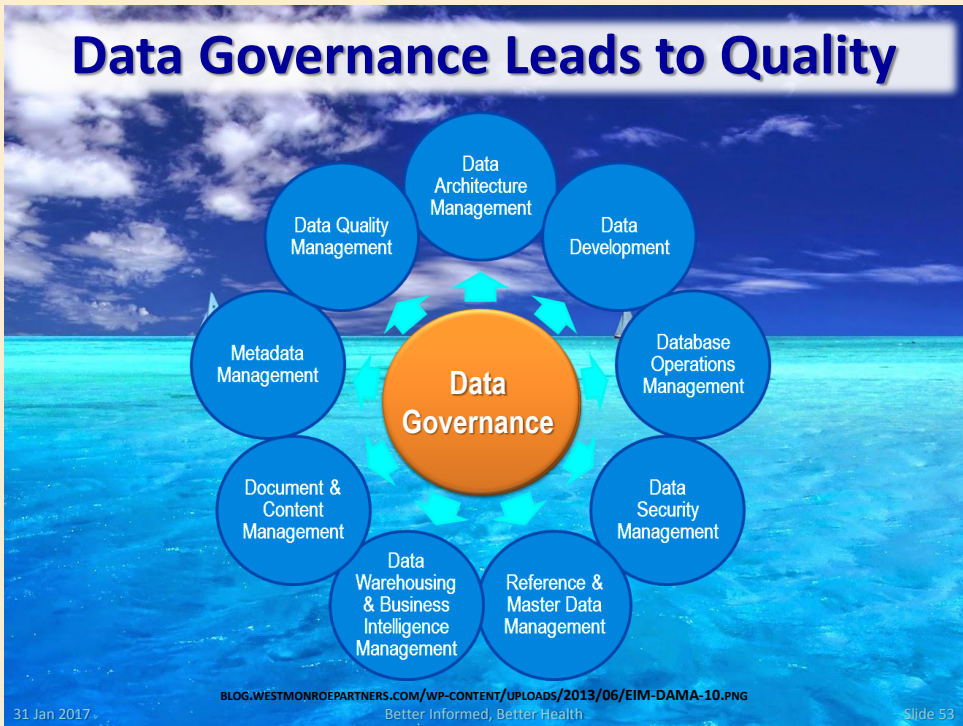
**Completeness**

**Consistency**

**Relevance**

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## How to Realize the Benefits

- A data quality-driven approach requires data governance.
- A data quality-driven approach will lead to a better data-informed healthcare system.
- Better data available to the right components at the right time will inform not just providers but patients and policy makers.
- Using the right information service delivery use case reduces inefficiency and improves reusability.

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## A Very Important Lesson

- The solution to empowering population health will not be “Big Data”.
- Big data technologies will likely assist with developing better information, but...

We must not abdicate our responsibility for better health care by turning over decision-making to algorithms, what Cathy O’Neil calls

***“Weapons of Math Destruction”***

We must be data-informed, not data-driven.

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## And Remember...

**Be sure that your Steering Committee or Project Team avoids Don, Carl and Bill...**



*"Andy, this is terrible. We'll never be able to enter all of this data in time!" - Don*



*"It will never work! So long, boys! I'll send you a postcard from Paradise Falls!" - Carl*



*"I wouldn't have done it that way... Thbbft!" - Bill*

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## Questions?



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## References

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O'Neil, C. (2016.) *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*. New York, NY. Crown Publishing.

Peyret, H. (April 2016.) Brief: Establish A Data Governance Journey Toward Data Citizenship. Cambridge, MA. Forrester Research Group, Inc. retrieved 1/31/2017 from [HTTPS://KLOUDRYDERMCAAS.S3.AMAZONAWS.COM/MCAAS/FORRESTER/RES132243.PDF](https://KLOUDRYDERMCAAS.S3.AMAZONAWS.COM/MCAAS/FORRESTER/RES132243.PDF)

Whitehead, M., Dahlgren, G. & Gilson, L. (2001.) Developing the Policy Response to Inequities in Health: A Global Perspective. In T. Evans, M. Whitehead, F. Diderichsen, A. Bhuiya & M. Wirth (eds.), *Challenging inequities in health care: from ethics to action* (pp. 309-322). New York, NY: Oxford University Press.

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