Better Informed, Better Health

How being data-informed is essential to a Population Health strategy

Presented by Dan Paolini, DBHIDS CIO

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
- Co-founder, 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
- Co-author 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 GIMIS Government Best Practices Award for the NJ Data Governance Office
2015 GIMIS 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
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

What is a Population Health Approach?
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)

1st Wave: Building the Foundation
• De-institutionalization
• Expanding Provider Network
• Creating CBH as MCO
• Creating DBHIDS and single-payer system

2nd Wave: Transformation Decade
• Recovery, Resilience and Self-Determination
• Improving Quality of Life
• Creating Learning Organization

3rd Wave: Population Health
• Promoting Health and Wellness for the entire population
• Unified framework for all services and populations
• Reaching everyone efficiently and effectively

THE LANDSCAPE OF HEALTH CARE
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.

The Black Box of Treatment

We measure this. Symptom reduction, not wellness.
Outcomes are not Measured Well

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.

It is a Reactive System

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.
The behavioral health care system is no different. Most resources go to treating those diagnosed with serious mental illness.

We Need to Move Upstream

Upstream

Reduce At-Risk

Healthy

At-Risk

Diagnosed

Downstream

Reduce Diagnosed

Treatment

Source: DBHIDS
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.

But there is a problem...

Health Care is but a Small Component

Environment and Lifestyle Factors have seven times more impact on overall population wellness than Health Care.
We are starting to get good at measuring activity, so reporting volume is not difficult. How do we measure value? We need to determine what determines value.
Social Determinants of Health

- General socio-economic, cultural and environmental conditions
- Work environment
- Education
- Agriculture and food production
- Unemployment
- Water and sanitation
- Health care services
- Housing

Source: Dahlgren and Whitehead, 1993

Another SDOH Framework

Adapted from: http://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health
Yet Another SDOH Framework

Determinants of Health

- Income and social status
- Social support networks
- Employment and working conditions
- Physical environments
- Education
- Healthy child development
- Biology and genetic endowment
- Health services
- Personal health practices and coping skills

http://www.conceptdraw.com/How-To-Guide/what-is-a-circle-spoke-diagram
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

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”
The Desire to be Data-Driven; The Need to be Data-Informed

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

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
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”.

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The Traditional DBA Approach

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Shadow IT – The Analyst Approach

Me, again.

Me, really.

Me, again.

Me, again.

Me, again.
This is Happening Everywhere!

One Day, Our “System” Looks Like This
New Super System Approach

One System Solves All Our Problems!

...except for those not in the original system scope...
Multiple Independent Systems

These other systems are in different business units—or—

different business units

they are built to address (perceived) functional gaps—or—

(perceived) functional gaps

they are built to provide "control" somewhere else—or—

"control" somewhere else

they are built for a combination of these reasons.

Sensing a Pattern?

If we create a new, bigger, better super system, we still do not prevent the same problems from reoccurring...

Lather – Rinse – Repeat

Super SystemOne

Version 2
**INFORMATION ARCHITECTURE USE CASES**

The Provider Information Landscape

- **Operational Systems** (Concurrent)
  - Patient Level
  - Transaction Systems
  - External Population Mgmt Systems
  - External Transactional Systems

- **Analytics** (Retrospective)
  - Population Level
  - Public health and other providers
  - External Data (Claims, Reporting, Benchmarking)

- **Health Information Exchange**

- **System Interaction**

- **Use of Standard Terminologies**
  - Implement best practices

- **Ontology**

Adapted from Nash, D. B. et al. (2012.) (p. 242)

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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.

**Transaction Processing**
- 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.

**Operational Reporting**
- Traditional reporting against transactional systems about current operations with limited or no history, analysis or integration with multiple data sources.

**Data Integration and Persistence**
- The data warehousing layer that manages master data, reference data, metadata, and data for historical analysis; the authoritative source of data.

**Key Performance Indicators**
- 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.

**Analytical Reporting**
- Sophisticated reporting, visualizations and statistical analysis of historical data from purpose-built data publication environments (data marts).

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

Data Governance – Business & IT

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

Public Sector/Healthcare Sectors

Public sector and healthcare organizations are asking about/focused on

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

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.

*Source: Forrester surveys of clients*
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.

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**
**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.
Data Quality without Governance

One-Off Analysis or Integration

We measure this.

Transaction Data
Line-of-Business Data
Master Data

Reports and analysis are produced, but with no assurance of consistency.

We Need to Move Upstream

Upstream
Downstream

Transactional  Integrated Data  Error in Reports

Fix Data Quality at the Source  Data Integration Processes  Reporting

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Data Governance Leads to Quality

We’ve Seen a Similar Framework
Another Paradigm Shift

A Hub & Spokes Design for Data Reusability

The Benefits to Population Health
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.

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.
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... Thbfft!” - Bill

Questions?
References


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