



# Optimizing Data Tools & Technology for Population Health Management

*Center of Care Innovations: Population Health Learning Network*

Mike Hirst, Director of Data Services

65,000 voices



# Objectives

- Apply Baldrige learning to data and population health
- Define the 4 layers of data interoperability
- Examine key factors that contribute to a successful population health data platform
- Evaluate and assess your organization's current capabilities and discuss your challenges

# Popular Population Health Tools

- HealthIntent Registries and EDW
  - Tableau
  - Business Objects
- Health Catalyst
  - Qlik
- i2i Tracks
  - Application Reports
- Azara DRVS
  - Application Reports

**No solution will be successful without a sound approach to data strategy, planning and data governance.**



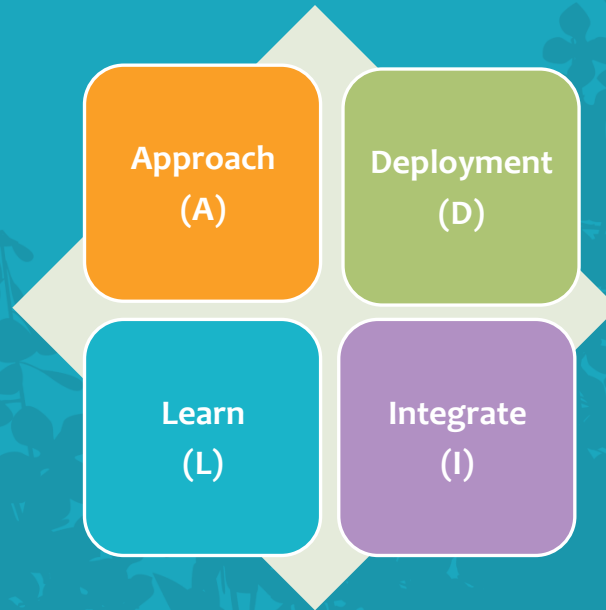
# Water, Water Everywhere, not a drop to drink!

“The Rime of the Ancient Mariner” Samuel Taylor  
Coleridge (1772-1834) English Poet

Data, Data Everywhere, not a thought to think!

Where do I begin?

# Baldrige A-D-L-I



# Data Management (ADLI)

- Approach
  - What is your organization's approach to data collection and reporting?
- Deployment
  - How do you deploy that approach to ensure it happens?
- Learning
  - How is your information structured and displayed to facilitate learning?
- Integration
  - How is information you are collecting integrated into the healthcare system?

# Population Health Approach:

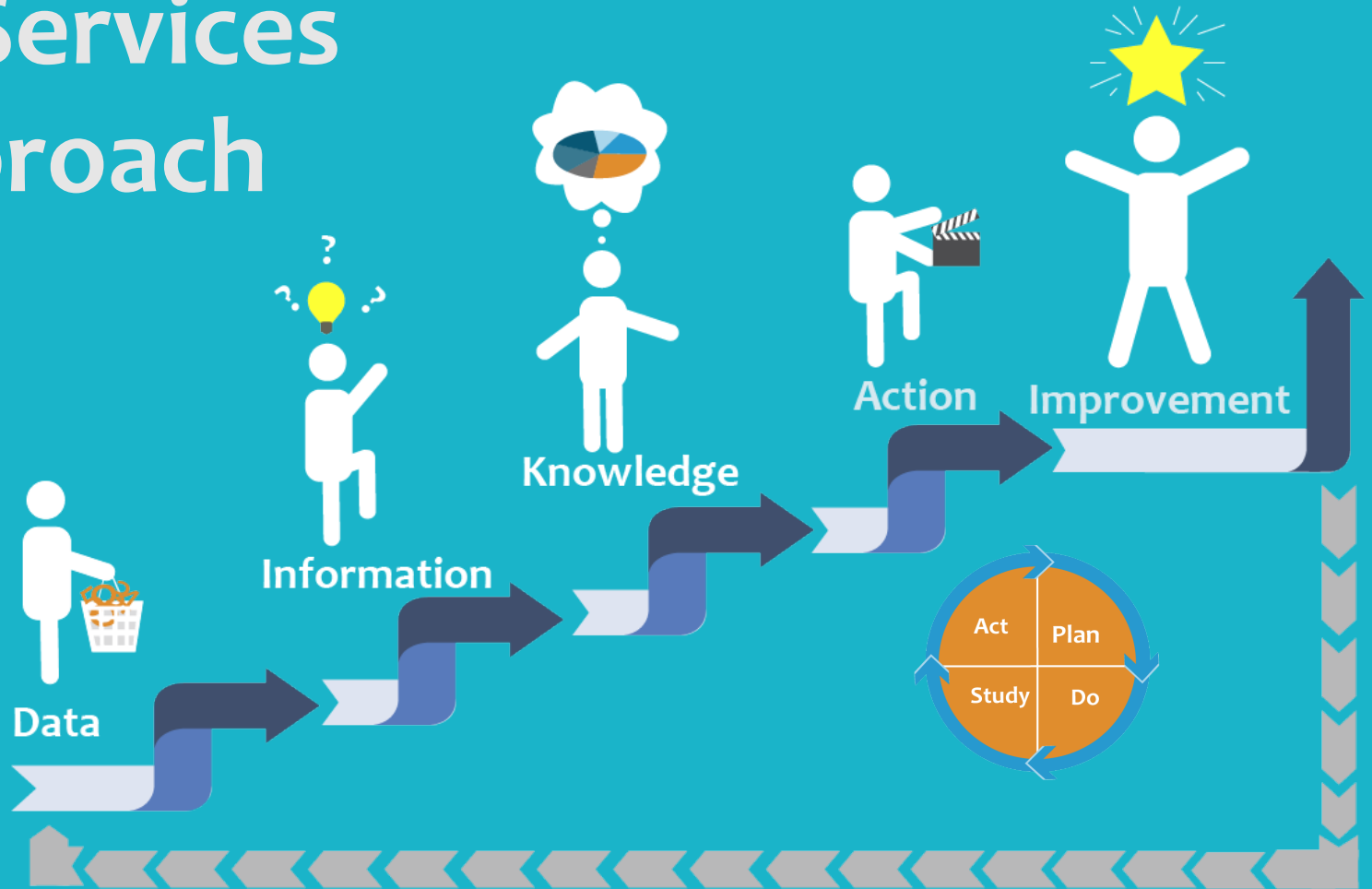
Transforming Research into Action

Hypothesis ? ► Research & Publication ► Professional Organization ► Recommendations & Guidelines ► NCQA, AHRQ, GPRA, NQF ► CMS

Organizational Objectives & Initiatives    Organizational Score    Clinic Score    Team Score    Individual Score

Empanelment    Action Lists    Work Plans    Evaluations    Compensation

# Data Services Approach





# Deploying Interoperability



Technology Layer



User Layer



Data Layer



Organization  
Layer

# Technology Layer

(Goal: Send/Receive/Store Data)



- Exchanging Data & Maintaining Interfaces
  - APIs, HL7, Data On-boarding
- No SQL Databases
  - Key Value Pair (Hadoop), Document (Mongo Db), Graphing (Neo4J), Columnar (HP Vertica)
- Changes to EHR
  - Change Management, Version Control
- External Technology, Equipment, Telehealth
  - Security, CommonWell Health Alliance HIE, transmission standards
- Master Data Management
  - Multiple Person IDs

# Data Layer

(Goal: Data Standardization)



- Standard Nomenclature
  - ICD-10, SNOMED, CPT, LOINC
  - Selection, curation, maintenance, updates
- Data Standardization
  - Mapping non-standard data to standard data
  - ETL processes
- Tags
  - Used for quick reference, approved standardized list
- Naming Conventions
  - Approved naming formats for data warehousing schema

# User Layer

(Goal: Data Models/ Visualizations)



- Data Warehousing, Data Modeling, Data Marts, Applications
  - Clinical, Operational, Financial, Customer-Focus
- Templates
  - All possible Diabetes codes across all nomenclatures (ICD-10, CPT, RxNorm)
- Concepts
  - Type 1 Diabetes, Type 2 Diabetes
- Context
  - HEDIS, UDS, Local
- Machine Learning & Discovery
- Reporting Tools / Data Modeling
  - Tableau, Business Objects, R, SAS, SPSS



# Organization Layer

(Goal: Integration/Sustainability)



- Workflows
  - Support Data Entry
  - Model Implementation back into source system
- Data Governance (Policies & Procedures)
- Security (HIPAA)
- Regulations (Medicare, Medicaid)
- Staff Education & Training
- Leadership Support and Funding

# Key Factors for Success



# Build Relationships

- Understand who your key stakeholders are and build working relationships with them
  - Value the differences and strengths each of your voices bring
- Who are the “Data Stewards” in your organization?
  - How do you communicate with them and build relationships?
- Integrated Information Teams
  - Information support is aligned with and an extension of the product line
    - Medical services, Behavioral Health, Finance, Human Resources

# Understand Stakeholder Needs

## ▪ Executive staff

- How well are we doing with corporate objectives?
- Are we meeting our targets?

## ▪ Front line staff

- Do I have the information tools I need to proactively do my work?
- Do the information tools save me time?

## ▪ Customers

- I want to take a more active role in my health and wellness
- I'm in control of my healthcare
  - Shared decision making is between me and my healthcare team
- I want tools that give me access to my information

## ▪ Managers

- Are there variations occurring in our processes and how can I identify them?



# Get Leadership Buy-In

- Have an approach and be able to communicate that to leadership
- Demonstrate and communicate efficiency and value
  - Automate and standardize processes that required individual effort
  - Project Management 101 (Scope, Resources, Time)
  - Keep scope limited to what you have resources and time for
- Align with your corporate goals and objectives

# Data Governance

- Establish a Data Governance Committee
  - Organization wide representation
- Version Control
- Change Management
- Enterprise Naming Methods
  - Standard Tags
- Tool and Report Platform Selection
- Metadata
  - Business – user friendly methods
  - Technical – data dictionaries and models
  - Process – volume metrics, logs, process times
- Data Lifecycle
- Historical Data Decisions
- Standardization (concepts/context)
- Access and Security (active directory)
- Large Project Planning and Timelines
- Priority Setting / Request Tool & Process
- Resource Allocation (tools vs people)
- Alignment with Corporate Goals and Objectives
- Benchmarking
  - HEDIS, MGMA, Local, Similar Facilities
- Policies and Procedures

# Determining Data Collection Cost

- **“Where”** does the data reside?
- **“Who”** is going to collect it?
- **“How”** are they going to collect it?
- **“How frequently”** should it be collected?
- **“How much”** is needed to answer questions?
- **“How should it be stored”**? Sensitivity (PHI)?
- **“Who has access”** and how?
- What is the **“lifecycle”** of the data?
- **“Cost”** of Collection (human/other resources)?

# Workforce Development

## Checklist Categories

- General Skills
- Metadata Knowledge
- Querying Tools
- Data Sources and Databases
- Reporting Tools
- Coding Vocabularies and Nomenclatures
- Regulatory Measurement Requirements
- Information Security
- Querying Skills
- Chart/Graphing Skills Related to Improvement
- Statistical Skills
- Population Health and Patient Centered Medical Home
- ETL Tools

List skills in each category then score skills accordingly:

1= Little to No Experience  
2= Theoretical Knowledge  
3= Perform with Assistance  
4= Perform Independently  
5= Expert, Can Teach



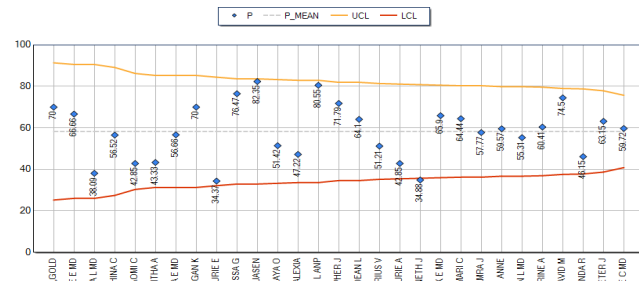
# Workforce Progression

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	<b>Name:</b>												
2	<b>Hire Date:</b>												
3	<b>Last Promotion Date: N/A</b>												
4													
5	<b>Data Analyst</b>												
6	0= Not applicable												
7	1= Little or No Experience												
8	2= Theroretical Knowledge												
9	3= Perform with Assistance												
10	4= Perform Independently												
11	5= Expert can teach												
12													
13													
14													
15	<b>Skills &amp; Knowledge Career Progression Checklist</b>	<b>Eval</b>	<b>Date</b>	<b>Eval</b>	<b>Date</b>	<b>Eval</b>	<b>Date</b>	<b>Eval</b>	<b>Report Writer Level 1</b>	<b>Business Analyst Level 2</b>	<b>Senior Business Analyst Level 3</b>	<b>Data Arch &amp; ETL Prog.</b>	<b>DBA</b>
16	<b>Coding Vocabularies</b>												
17	ICD-9 Codes	1							X	X	X		
18	ICD-10 Codes	1							X	X	X		
19	CPT Codes	1							X	X	X		
20	HCPCS Codes	1								X	X		
21	LOINC Codes	1								X	X		
22	DRG Codes	1								X	X		
23	Dental CDT Codes	1								X	X		
24	SNOMED	1								X	X		
25	Cerner Code Values	1							X	X	X		
26	Rx Norm	1									X		
27	RPMS Codes	1							X	X	X		
28	RVUs	1									X		
29	Principle Types/ Cerner Code Sets related to Vocab. Ref. (Code Sets 400, 401, 12100)	1									X		
30	Code Set Hierarchies	1									X		
31	Works with Cerner Core Personnel to Define User Defined Code Sets	1									X		
32	<b>SUBTOTAL:</b>	<b>15</b>	<b>Apr-15</b>	<b>0</b>		<b>0</b>		<b>0</b>					
33													
34	<b>Healthcare Performance Measurement Methods</b>												
35	HEDIS	1								X	X		
36	GPRA/CRS	1								X	X		
37	UDS	1								X	X		
38	Meaningful Use Functional Measures	1								X	X		
39	Meaningful Use Clinical Quality Measures	1								X	X		
40	Accountable Care Organization Measures (ACO)	1								X	X		
41	TCHIC	1								X	X		
42	PQRS (GPRO Submission)	1								X	X		
43	Balanced Scorecard	1							X	X	X		
44	<b>SUBTOTAL:</b>	<b>9</b>	<b>Apr-15</b>	<b>0</b>		<b>0</b>		<b>0</b>					
45													
46	<b>Information Security</b>												
47	Annual HIPPA Training	1							X	X	X	X	X

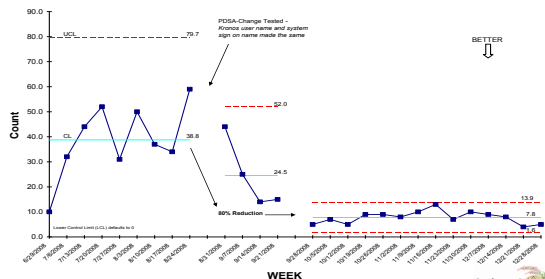
# Visual Learning

Team	Provider	Numerator	Denominator	% Screened
		696	1194	58.3 %
		660	1104	59.8 %
1 East		79	157	50.3 %
1 West		89	160	55.6 %
2 East		123	210	58.6 %
2 West		111	176	63.1 %
3 East		134	207	64.7 %
3 West		124	194	63.9 %
	JAMES, DAVID M	38	51	74.5 %
	KANTOR, LINDA L ANP	29	36	80.6 %
	LINFIELD, JANA L	16	19	84.2 %
	NORRIS, KENNETH J	15	43	34.9 %
	WRIGHT, TAMRA J	26	45	57.8 %

Diabetes Eye Exam (20 or More Diabetic Patients)



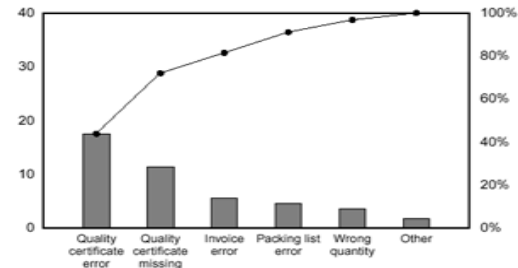
Southcentral Foundation IT Kronos Sign-On Related Helpdesk Calls



SCF Breast Cancer Screening



Types of Document Complaints  
Second Quarter 2005



# Segmentation



## HEDIS Breast Cancer Screening Scores

Breast Cancer Screening Rates as of: 5/16/2015

2014 HEDIS Medicaid Benchmark 75th Percentile = 65.12%

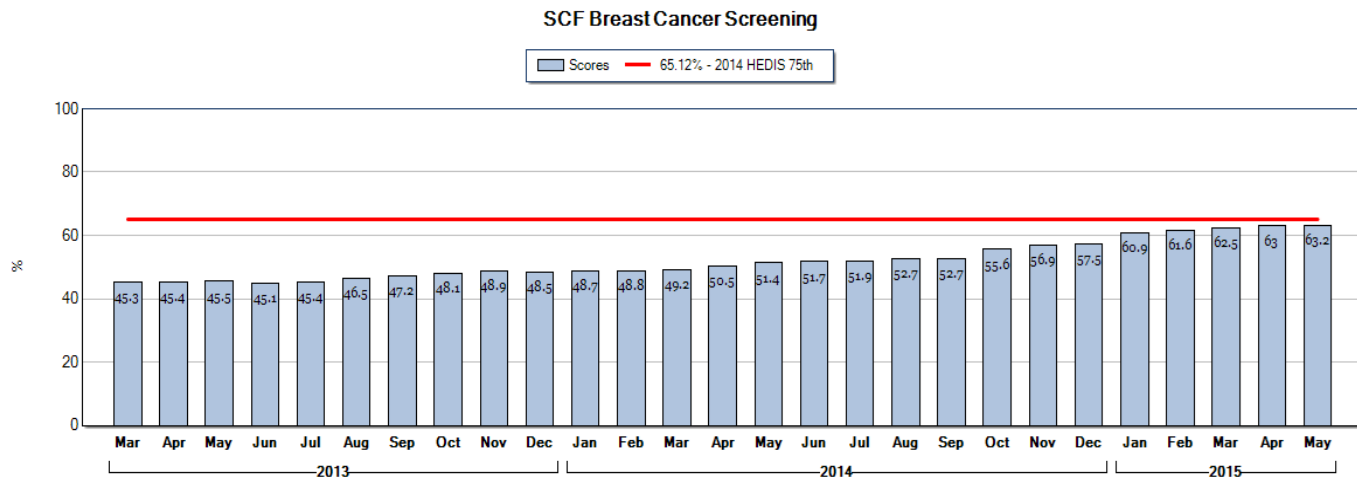
Methodology

Organization	Clinic	Provider	Numerator	Denominator	% Screened
SCF			2738	4332	63.2
	☐ 1 East		398	625	63.7
		Carrick, Erin P, PA-C	44	78	56.4
		Heggen, Leslie N, PA	60	117	51.3
		Leoncio, Ferritha A, MD	81	111	73.0
		McWilliams, Ryan T, MD	70	114	61.4
		Ott, Laurie A, PA-C	76	118	64.4
		Zimmer, Laurie E, MD	67	87	77.0
	☐ 1 West		412	683	60.3
	☐ 2 East		372	574	64.8
	☐ 2 West		329	572	57.5
	☐ 3 East		388	598	64.9
	☐ 3 West		347	540	64.3
	☐ Life House Rural CHC		2	7	28.6
	☐ Nilavena		52	71	73.2
	☐ Pediatrics				
	☐ Quyana Clubhouse		3	5	60.0
	☐ St. Paul Health Center		11	14	78.6
	☐ Upper Kuskokwim		38	61	62.3
	☐ VNPCC East		171	285	60.0
	☐ VNPCC West		215	297	72.4

# Assessment Over Time



## HEDIS Breast Cancer Screening Scores





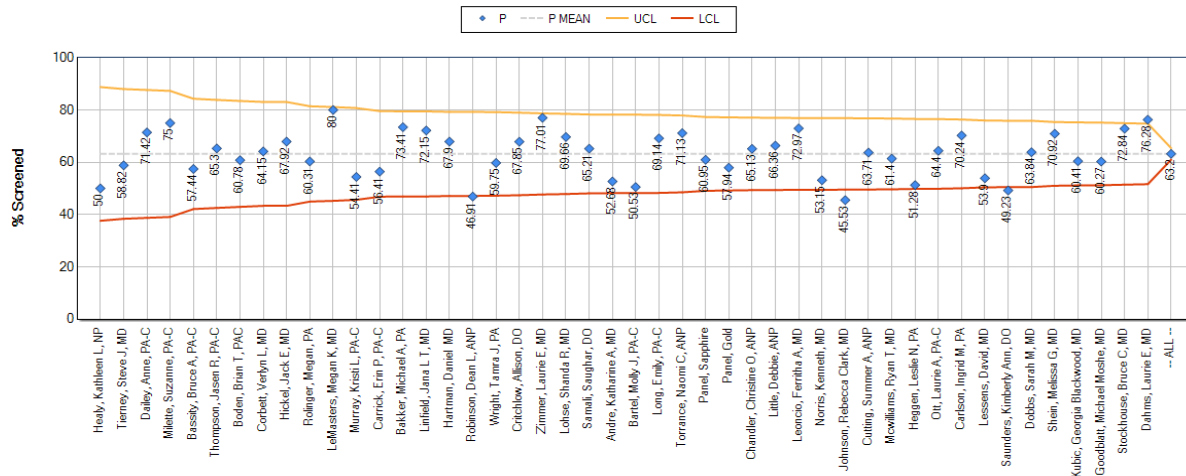
# Comparison Chart (Variation)



## HEDIS Breast Cancer Screening Scores

Breast Cancer Screening Comparison Chart (30 or More @ Risk Patients)

As of 05/16/2015



# Customer Focus

5 The provider listened carefully to me.	SCF	MSD			97.0	
					96.9	
			Primary Care 1 East		98.3	122
			Primary Care 1 West		93.6	110
			Primary Care 2 East		90.6	121
			Primary Care 2 West		100.0	105
			Primary Care 3 East		93.5	92
			Primary Care 3 West		97.6	176
6 I was provided with enough information to make decisions.	SCF	MSD			95.9	
					95.8	
			Primary Care 1 East		95.7	122
			Primary Care 1 West		95.4	110
			Primary Care 2 East		89.8	121
			Primary Care 2 West		98.0	105
			Primary Care 3 East		93.5	92
			Primary Care 3 West		94.6	176

# Access

## Past and Future Appointment Availability as of 8:00 am

**Clinic in Report:** VNP PC East

Open = Unbooked Appointments

Booked = Booked Appointments

Blocked = Blocked Schedule for Meetings, Desk Time etc.

Methodology

Location - Click plus to expand providers	Provider - Click name for details	Unbooked (Min)	Appts (Min)	Blocked (Min)	Total (Min)	Blocked %	Unbooked %	Appts %
VNP PC East		6495	1950	1995	10440	19.11%	62.21%	18.68%
5/20/2015		1680	1005	495	3180	15.57%	52.83%	31.6%
	Bassity, Bruce PA	180	240	30	450	6.67%	40%	53.33%
	Boden, Brian PAC	150	225	75	450	16.67%	33.33%	50%
	Goff, Kylea Pharm.D.	420	0	60	480	12.5%	87.5%	0%
	Lohse, Shanda R MD	240	120	90	450	20%	53.33%	26.67%
	Nardini, Neil PA-C	300	150	0	450	0%	66.67%	33.33%
	Thompson, Jasen PA	225	45	180	450	40%	50%	10%
	Wright, Tamra PA	165	225	60	450	13.33%	36.67%	50%
5/21/2015		1230	615	435	2280	19.08%	53.95%	26.97%
5/22/2015		705	135	510	1350	37.78%	52.22%	10%
5/25/2015		0	0	0	0	0%	0%	0%
5/26/2015		1170	165	465	1800	25.83%	65%	9.17%
5/27/2015		1710	30	90	1830	4.92%	93.44%	1.64%

# Registries (Action Lists)

## Fictitious Customer-Owner Information

### Diabetes Action List

Links to Documentation: [Report Methodology](#)

[Data Resolution/Error Correction Process](#)

Diabetic Patient Status as of Week Ending: 3/13/2009

HRCN	Patient	New Diabetic (< 90 Days) *Click Link to see Diagnosis Details*	Sex	Age	HBA1C Result	HBA1C Date	Most Recent LDL Result	LDL Date
Ko, Patricia A		Total Diabetic Patients: 47						
72048	Abbasi, Darren	<a href="#">No</a>	M	71	5.8	2009/01/13	67	2009/01/13
42457	Abell, Frederick	<a href="#">No</a>	M	67	6.3	2009/03/06	86	2009/03/06
12916	Allen, Marcus	<a href="#">No</a>	M	82	6.4	2008/06/03	129	2008/06/03
72098	Armston, George	<a href="#">No</a>	M	81	5.3	2008/12/01	90	2008/12/01
1192	Bark, Samuel	<a href="#">No</a>	M	85	6.9	2009/01/22	110	2009/01/22
45979	Bevis, Michael	<a href="#">No</a>	M	76	5.7	2009/03/09	79	2009/03/09
32158	Black, Lewis	<a href="#">No</a>	M	36	6.3	2009/03/03	116	2008/11/15
19202	Caldwell, Charlotte	<a href="#">No</a>	F	80	5.8	2009/02/23	93	2009/02/23
84893	Evarza, Wallace	<a href="#">No</a>	M	40	5.7	2008/06/24	113	2008/06/24
61328	Ferris, Adam	<a href="#">No</a>	M	40	6.8	2009/02/12	86	2009/02/12
19492	Gafford, Joseph	<a href="#">No</a>	M	41	6.3	2008/03/31	64	2008/03/31

# Beyond Reporting

- Machine Learning
- Data Modeling
- Workflow Modeling/Testing/Integration
- Proactive/Integrated Population Health

# Why Is All This Important?





# Self Assessment Exercise



Level	1	2	3	4	5
	Surviving	Understanding	Applying	Analyzing	Integrating
Characteristics	<p><b>Capability:</b> Canned Reports/ Extracts/ Excel Spreadsheets</p> <p><b>Workforce:</b> Department Staff Run Reports.</p> <p><b>Governance:</b> No clear data ownership, no proactive data planning</p> <p><b>Infrastructure:</b> Data primarily in transactional systems. Query options are limited.</p>	<p><b>Capability:</b> Metrics/ Reports (Not Standardized/ Not Centralized).</p> <p><b>Workforce:</b> IT support through ticket system.</p> <p><b>Governance:</b> Limited to specific projects, informal, siloed.</p> <p><b>Infrastructure:</b> Query tools for specialized staff from transactional system.</p>	<p><b>Capability:</b> Dashboards/Registries (Standardized); Align with Corporate Goals and Objectives.</p> <p><b>Workforce:</b> Centralized Data Services Department (report writers and data analysts)</p> <p><b>Governance:</b> Data Governance Committee mostly IT and EHR focused (security, change management)</p> <p><b>Infrastructure:</b> Data Warehousing with multiple data sources. Data available for querying, but data not standardized</p>	<p><b>Capability:</b> Statistical Data Models/ Machine Learning.</p> <p><b>Workforce:</b> Data Scientists, Data Architects join Data Services</p> <p><b>Governance:</b> Data Stewardship &amp; Information Focused (standardization, mapping, priority setting, data lifecycles)</p> <p><b>Infrastructure:</b> Data warehouse data with cleansed, standardized, and modeled data. Reference tables, report tools integrated.</p>	<p><b>Capability:</b> Models integrated into Workflows.</p> <p><b>Workforce:</b> Data Scientists, Application Developers and Data Services aligned</p> <p><b>Governance:</b> Organizational Planning and Funding align with Data Steward and Data Governance objectives</p> <p><b>Infrastructure:</b> Certified metrics in the warehouse, APIs, multiple database and applications integrated</p>

Capability, Workforce, Governance, Infrastructure

# Discussion



# Thank You!

**Qa̕gaasakung**

*Aleut*

**Quyanaa**

*Alutiiq*

**Quyanaq**

*Inupiaq*

**Awa'ahdah**

*Eyak*

**Mahsi'**

*Gwich'in Athabascan*

**Igamsiqanaghalek**

*Siberian Yupik*

**Háw'aa**

*Haida*

**Quyana**

*Yup'ik*

**T'oyaxsm**

*Tsimshian*

**Gunalchéesh**

*Tlingit*

**Tsin'aen**

*Ahtna Athabascan*

**Chin'an**

*Dena'ina Athabascan*

# Upcoming Nuka Events

Event Name	Date
Core Concepts Training	May 23-25, 2018
Nuka System of Care Conference	June 18-22, 2018
Motivational Interviewing	June 25-26, 2018
Coaching and Mentoring Program	June 25-29, 2018
Quality Management Training	June 25-29, 2018
Integrated Primary Care Team Training	June 27-29, 2018
Behavioral Health Integration Training	June 27-29, 2018

907-729-6852 | [www.scfnuka.com](http://www.scfnuka.com) | [SCFEvent@scf.cc](mailto:SCFEvent@scf.cc) | [@SCFNuka](https://twitter.com/SCFNuka)



Questions?