



Leveraging Predictive Analytics to Drive Acute Service to  
Patient Locations

*Driving Successful Population Health Management Strategies*

September 22, 2015

# Today's Speakers

## Danna Campbell, RN



Specialist Leader  
Deloitte Consulting, LLP  
Houston, TX

+1 281 906 4439

Danna is a Specialist Leader with over 30 years' experience including hospital/physician integration and assisting hospitals, academic medical centers, hospital-owned and independent physician groups in the areas of operational and performance improvement. She has been working with several clients to develop clinically integrated networks and care transformation tools and resources. Her background as a clinical nurse in the areas of orthopedics, transplant, cardiac service lines and cancer centers has been highly beneficial in identifying her clients' clinical and business needs in the areas of care management delivery.

## Nicholas Massiello



Specialist Leader  
Deloitte Consulting, LLP  
Pittsburgh, PA

+1 412 539 5611

Nicholas Massiello is a Specialist Leader in the ConvergeHealth by Deloitte product strategy group. Nicholas provides expertise in population health management, clinical integration, physician alignment, and healthcare IT, to address the challenges resulting from Healthcare Reform including the move from volume to value based reimbursement models, the need for integrated clinical operations and physician networks and the increasing demand for data. With a broad background in all aspects of practice management, revenue cycle management and hospital/physician alignment, he demonstrates a unique ability to apply predictive analytic algorithms to evolving operational models to drive next generation solutions.

# Today's Objectives

## Objective 1

Develop a high level understanding of how population care management needs drive predictive analytical models

## Objective 2

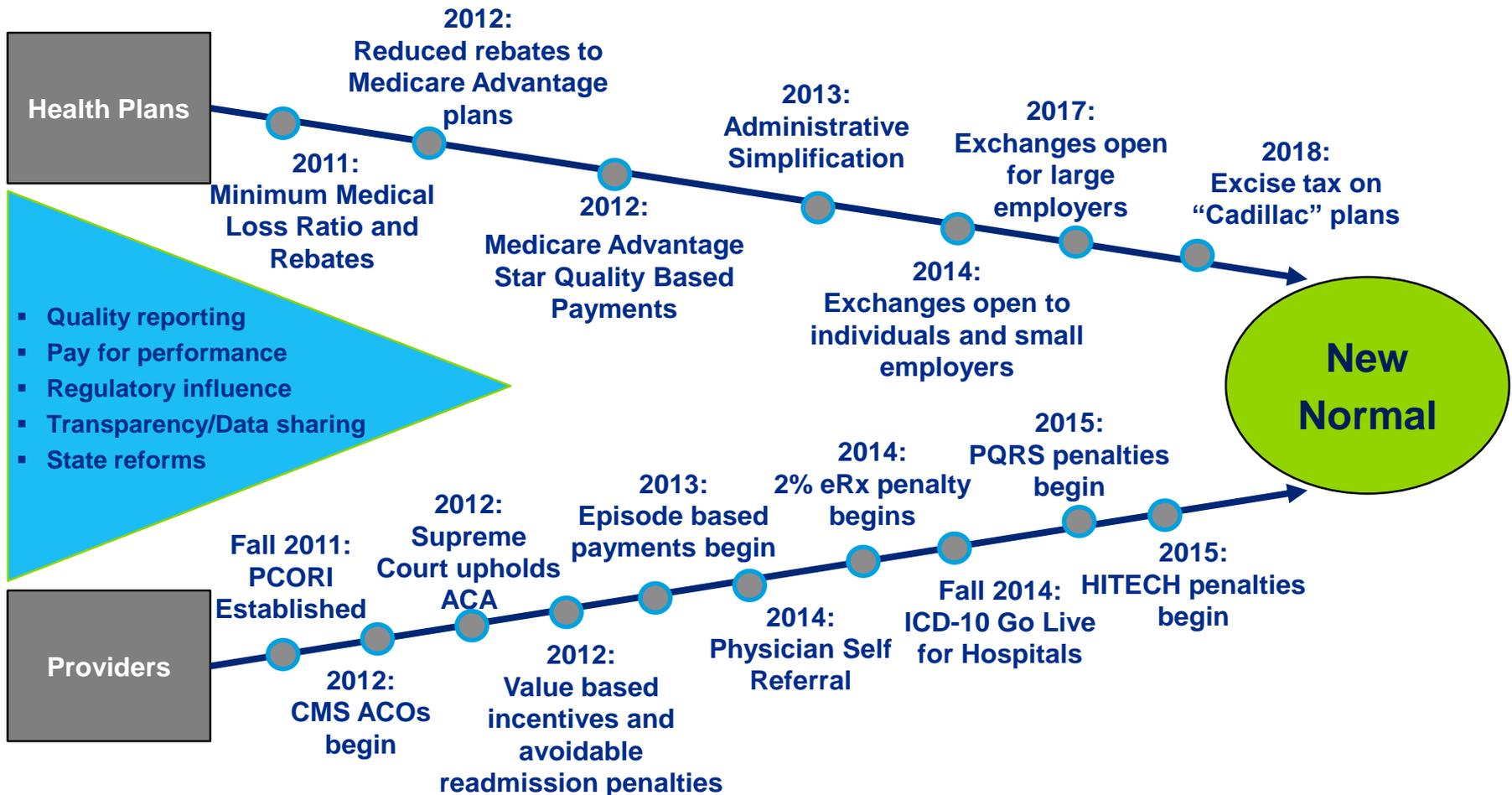
Be able to identify analytical tools to utilize in management of population health as it relates to quality metrics, performance metrics as a guide to implementing an expanded care management network across your market service area

## Objective 3

Explore how to integrate public health information to optimize the geographic distribution of your allied health service lines and resource mix

Value Based Care Overview  
*Why Population Health is Important?*

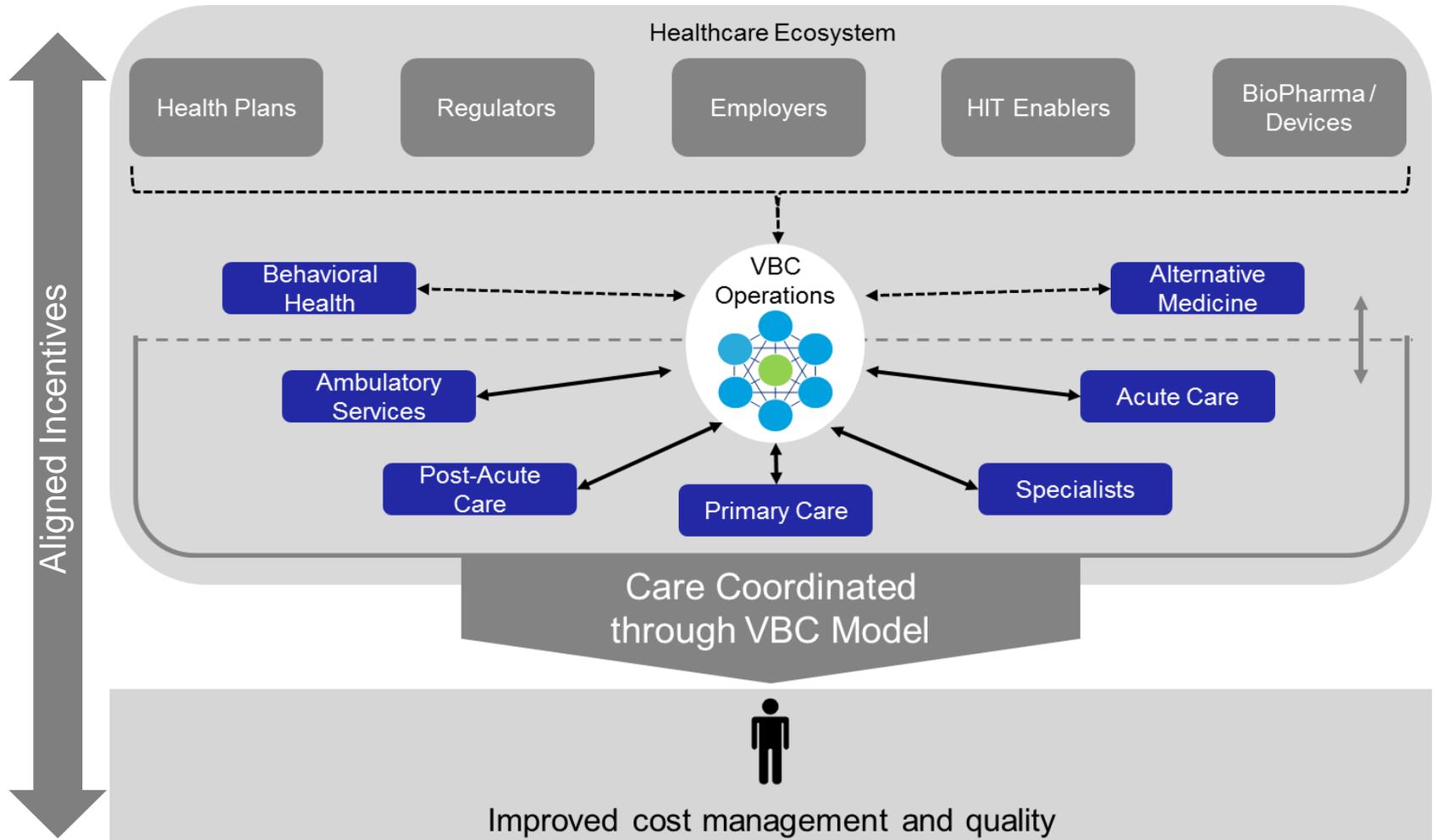
# The “New Normal” Focuses on Value Rather Than Volume



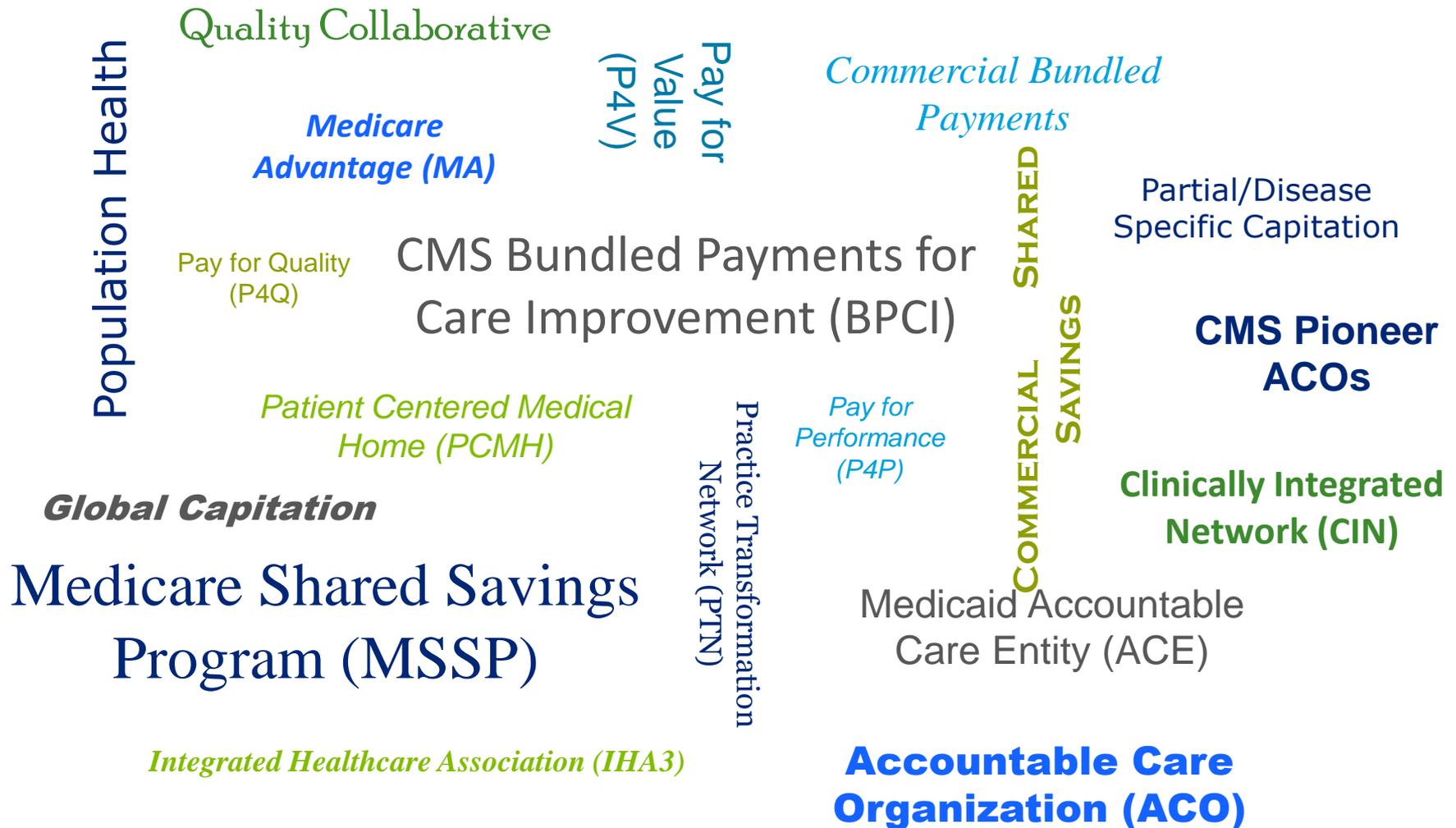
Organizations are now focused on population health and how they can drive improved outcomes through value based care delivery models

# How Does Value Based Care Fit Into Population Health?

Population focused, coordinated care replaces self directed fragmented care with incentives aligned across all stakeholders in the healthcare ecosystem



# What Value Based Care Programs are in Play?



# Population Health: Why Is It Important?

Population Health is a critical component to providing Value Based Care

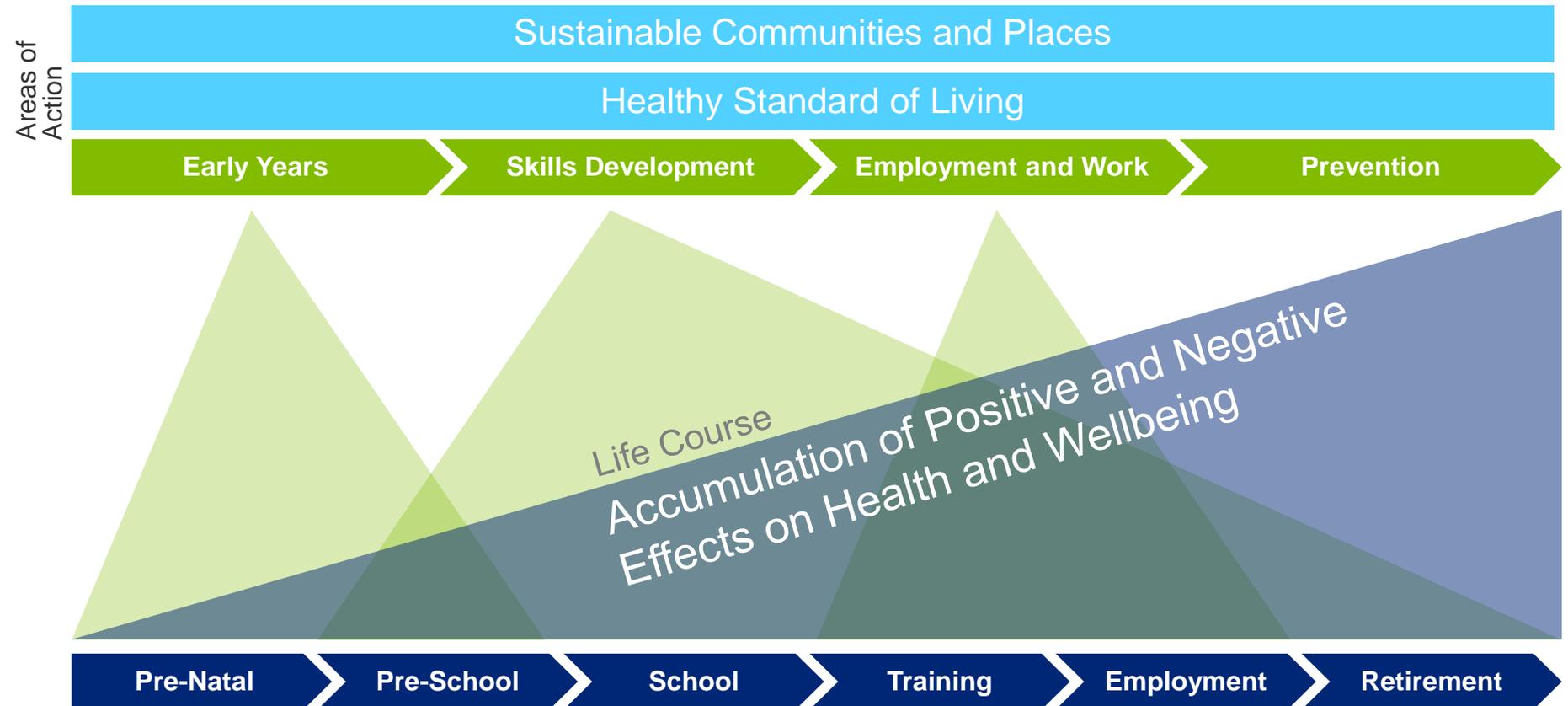
***Value Based Care (VBC) is a fundamentally different economic model that uses aligned incentives and care in order to create value***



However, there are many VBC models with varying degrees of incentive and care alignment. The “value” generated correlates to the degree of risk assumed by providers, the scope of the model, and the extent of care alignment interventions

# Understanding the Population Health Ecosystem

The influences on health and wellbeing are the physical and social environments in which people are born, grow, live, work and age



A population health ecosystem incorporates care coordination activities from cradle to grave. It affects the way people live, their consequent chances of illness and their risk of premature death

# Population Health Strategies Require Comprehensive Care Integration Programs

## Physician Leadership



Leadership from both the hospital and physician group have equal voice in the strategic direction of the partnership; share in the risks and rewards of effective and efficient care delivery

## Analytics & Reporting

Consumer-centric analytics provide insight into VBC performance: trends, gaps, and opportunities to improve population health management

## Patient Engagement

Online tools are available for chronic disease patients to track health and interact with providers between visits



Community Resources

Incentives

Provider

Contracting

Change Management

## Change Management



Nurses, care managers, and other providers from participate in training together to improve care across the continuum



## High-Risk Identification

Frequent ED utilizers are flagged in the system and immediately assigned a case manager (and a PCP, if necessary) upon discharge to ensure adequate follow-up care with health care providers

High-Risk Identification

Emerging Leading Practices

## Care Coordination

Care managers have access to an integrated delivery network of providers across clinics and the hospital to better manage transitions of care



Population Health Approaches

Physician Leadership

Clinical Integration & Transformation

Inpatient Care Mgmt

Ambulatory Care Mgmt

Analytics & Reporting

Product & Benefits

Patient Engagement

Care Coordination

# Population Health Care Issues

Achieving the Triple Aim of improving patient care

Key Question	CS	CM	DM	UM	PE
What analytics are typically used?	<ul style="list-style-type: none"> <li>• Unwarranted variation</li> <li>• Quality/Safety</li> <li>• ID &amp; Strat.</li> </ul>	<ul style="list-style-type: none"> <li>• Case finding</li> </ul>	<ul style="list-style-type: none"> <li>• ID &amp; Strat.</li> <li>• Care gaps</li> </ul>	<ul style="list-style-type: none"> <li>• Over-utilization analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Engagement analytics</li> </ul>
How is patient interaction initiated?	<ul style="list-style-type: none"> <li>• Inpatient</li> </ul>	<ul style="list-style-type: none"> <li>• Triggers / DRGs</li> <li>• Predictive modeling</li> </ul>	<ul style="list-style-type: none"> <li>• Predictive modeling</li> </ul>	<ul style="list-style-type: none"> <li>• Pre-authorizations</li> </ul>	<ul style="list-style-type: none"> <li>• DM handoff</li> </ul>
To what population of patients is it applied today?	<ul style="list-style-type: none"> <li>• Inpatient</li> <li>• Select DM</li> </ul>	<ul style="list-style-type: none"> <li>• Risk lives (HMOI / EHP planned)</li> <li>• Medicare DRGs</li> <li>• CS DRGs</li> </ul>	<ul style="list-style-type: none"> <li>• Medical group pilots (e.g., diabetes, HF)</li> </ul>	<ul style="list-style-type: none"> <li>• HMOI</li> <li>• EHP planned</li> </ul>	<ul style="list-style-type: none"> <li>• Medical group pilots (e.g., diabetes, HF)</li> </ul>
Who carries out the care methodology?	 <i>Providers</i>	  <i>RN Case Managers</i> <i>MSWs</i>	 <i>Disease Managers</i>	 <i>RN Utilization Managers</i>	 <i>DM Communication Staff</i>

# Everyone has not Moved at the Same Pace

Providers tend to fall into one of four groups regarding their current population health strategy maturity

	Wait and See	Toe Dippers	Active Changers	Leading Innovators
Description	Views VBC as a fad and not willing to commit to VBC models until see more traction	Taking initial steps towards VBC including participating in MSSPs. Beginning to manage their own employee populations.	Managing multiple VBC contracts. Considering direct to employer products and / or launching their own health plan	High level of clinical integration with experience in managing population health and risk. Seeking growth by commercializing IP and scale beyond their core footprint
Attributes	<ul style="list-style-type: none"> <li>• Focus primarily on cost reduction</li> <li>• Systems not in place to manage risk</li> <li>• FFS dominant payment mechanism</li> </ul>	<ul style="list-style-type: none"> <li>• Predominantly FFS with P4P and Shared Savings Incentives</li> <li>• Physicians begin to collaborate to reduce unwarranted cost variation</li> <li>• Some programs in place to target specific conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Sophisticated/ Integrated IT platform</li> <li>• Extensive protocols to support EBM</li> <li>• Collaboratives, joint ventures, or other affiliations to meet service and capability needs</li> </ul>	<ul style="list-style-type: none"> <li>• Fully integrated and aligned clinical delivery network</li> <li>• Owns and manages health plans</li> <li>• Footprint spans a wide geographic area</li> <li>• Focus on patient engagement</li> </ul>
Typical VBC Models	<ul style="list-style-type: none"> <li>• Pay for Performance (limited)</li> <li>• DRG/Episode Based Payments</li> </ul>	<ul style="list-style-type: none"> <li>• CMS MSSP / Pioneer ACO</li> <li>• Employee population pilot programs</li> <li>• Medical homes</li> <li>• Bundled payments</li> </ul>	<ul style="list-style-type: none"> <li>• CMS and Commercial shared savings ACOs (multiple)</li> <li>• Direct contracting with employers</li> </ul>	<ul style="list-style-type: none"> <li>• Capitation – population or disease specific</li> <li>• Limited or full risk ACOs</li> <li>• Provider-owned health plans</li> </ul>

# Successful Population Health Strategies are Dependent Upon Robust Clinical System Integration



## Data Integration and Management

Retrieve data from the data producers, in both structured and unstructured form, and transform it to align with core application data requirements as well as end user analytical needs

Data Integration and Management



## Data Analytics and Content

Using self-actualizing trends and business solution specific heuristics, analyze transactional data and create enriched information. Data delivery occurs via screen-reports and services/API

Data Analytics and Content



## Core Applications and Workflow / Automation

Orchestrate the execution of activities that constitute the care continuum, gathering contextual information from both the transactional systems as well as the data-warehouse

Core Applications and Workflow / Automation

Connectivity, Security and Interoperability



## Connectivity, Security and Interoperability

Connect to all the data producers, provides access to data consumers, and validates access rights



## Physician / Patient Engagement

Key interfaces for both patients and physicians to facilitate their interactions with the VBC system, leveraging workflow and analytics to enhance engagement and satisfaction for both these stakeholders

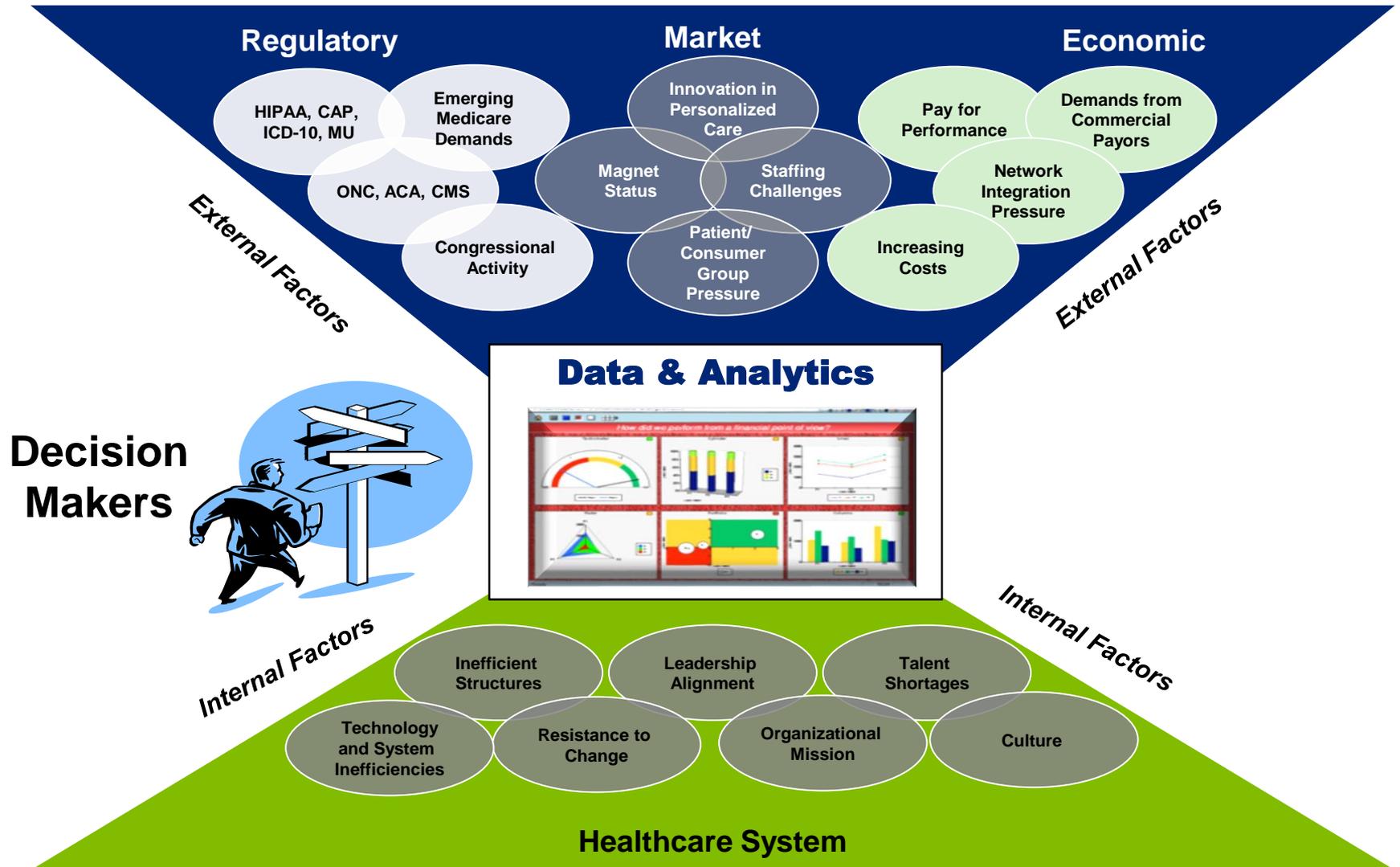
Physician / Patient Engagement

# Analytics Enable 4 Critical Population Health Competencies



**Case Studies describing two practical applications are discussed later in the presentation**

# The Healthcare Environment is Changing – Organizations have Challenging Decisions to Make



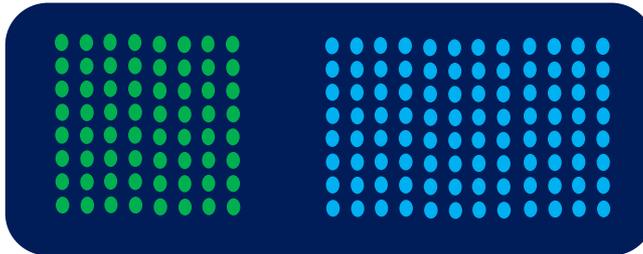
Predictive Analytics Case Study Number 1  
*Care Pattern Analysis*

# Problem Statement: Understanding Physician Care Pattern Behavior

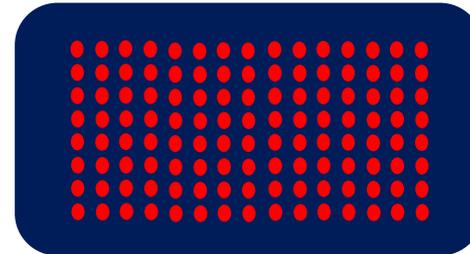
Health systems have traditionally viewed their networks as contained, with employed and affiliated physicians referring in-network as instructed; however, physicians do not practice in such a manner

## Traditional View

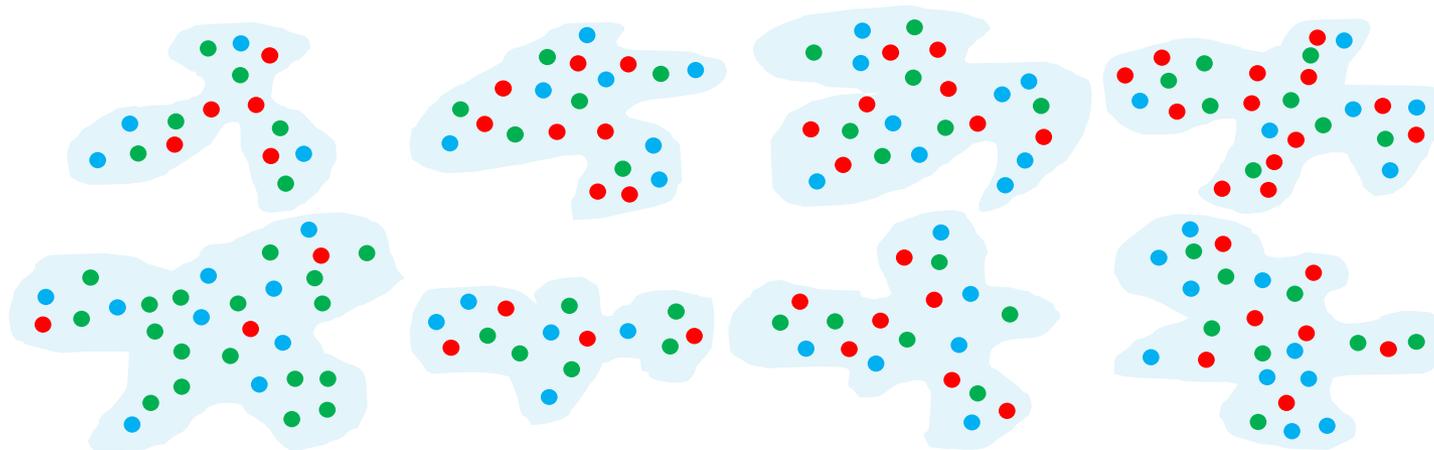
Employed and Affiliated Physicians



Market Physicians



## Actual Behavior

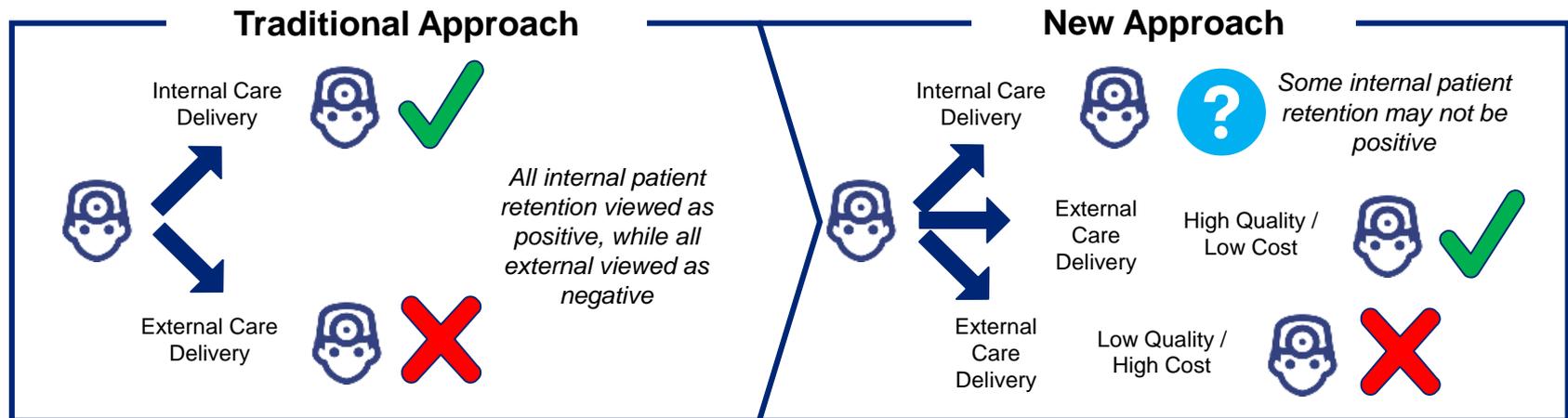


- = Employed
- = Affiliated
- = Market

**Actual physician behavior is much more organic and you must understand how individual networks are formed in order to drive lasting change**

# Population Health Management Requires a New Approach

Most health systems recognize the need to retain patients and enhance physician loyalty, and many are banking on it for market share growth and improving margins, but traditional approaches are not capable of delivering on the value proposition of higher quality, lower cost care



Developing and executing on a patient retention and physician loyalty strategy can have short and long term advantages:

- Revenue growth in fee-for-service environment
- Improved quality and coordination of care that value based arrangements require
- Market share growth
- Better continuity of care among clinicians operating under aligned delivery processes
- Greater patient satisfaction
- Enhanced physician engagement and alignment

**Developing a traditional patient retention program can bring immense benefits, but organizations must change their approach to meet the demands of a value based world**

# Predictive Analytics Case Study Number 1 (1 of 3)

## Care Pattern Analytics

## Network View

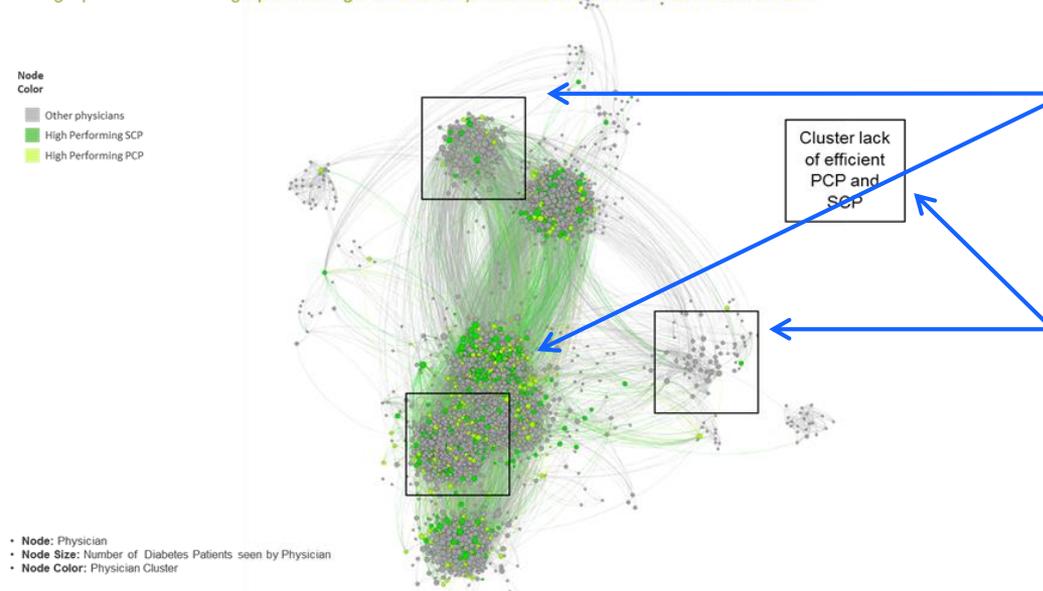
### Why

In order to provide transparency to how populations of patients are treated we first need to evaluate how these a patients are treated in the market place. From full population level claims data we can provide analytical views into naturally formed care patterns by therapeutic area or disease state

### What

Advanced analytics by therapeutic area that measure the value of natural care patterns can reveal “leading practices” in the application of evidence-based protocols and care management approaches - approaches that then can be deployed across the broader set of providers

*This graph shows how high performing PCPs and specialists are distributed in the network*



### How

Shared patient analysis based on claims data identifies provider clusters, how they relate to a health system’s existing physician network, with color coding to indicate performance value of the cluster.

Node placement quickly identifies areas of potential best practice as well as areas of greatest urgency

Node size and thickness of line indicates volume of shared patients with out of network physicians/clusters

# Predictive Analytics Case Study Number 1 (2 of 3)

## Care Pattern Analysis Case Study

## Cost/Quality View

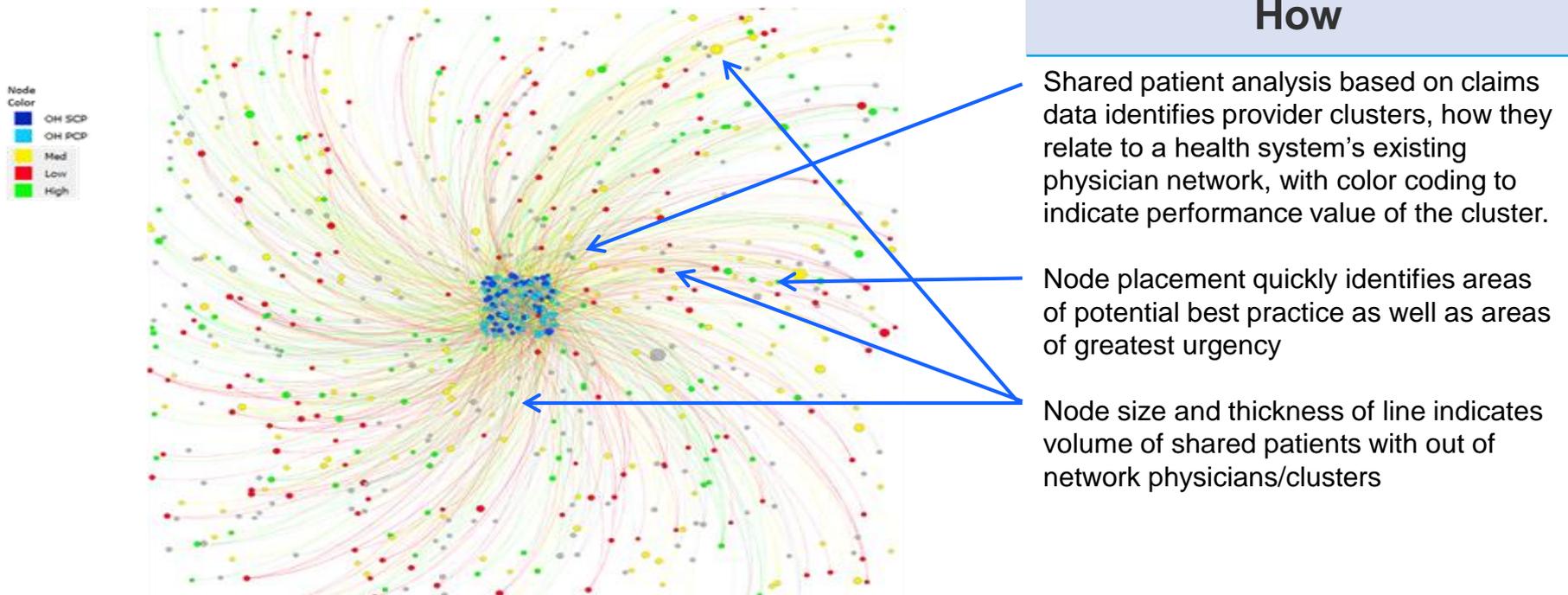
### Why

In order to understand how to drive cost and quality improvement in a specified disease state at the population level, we can isolate a cluster of physicians sharing patients in a market

### What

Applying cost and quality performance metrics to the outcomes of clusters of shared patients in a market, we can identify and prioritize those providers whose population level outcomes are below expectation and target those populations of shared patients for Care Management interventions

### How



# Predictive Analytics Case Study (3 of 3)

## Care Pattern Analysis Case Study

## Performance View

### Why

Targeting a population whose collective outcomes are below expectation, we can then identify and direct our allied health resources to provide supporting care coordination/management activities to both the treating providers and the shared patient pools

### What

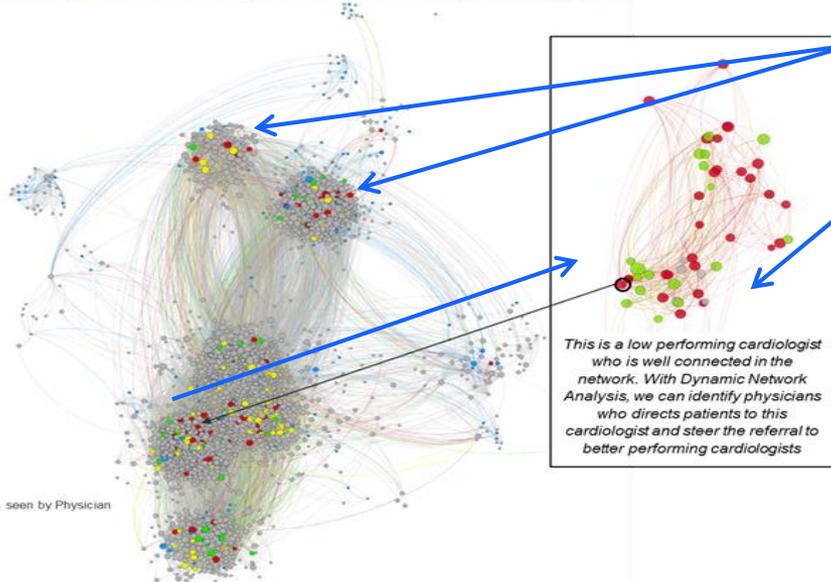
Identifying targeted areas of below expectation population outcomes we can then correlate our care management resources to areas of greatest risk and provide targeted support to improve both quality outcomes and subsequently minimize risk to the shared risk pools

*When adding specialist performance information into network relationship analysis, it becomes clear that network improvement opportunity exists in steering members from low performing specialist to high performing specialist*

**Node Color**

- PCP
- Cardiology (High Performing)
- Cardiology (Med Performing)
- Cardiology (Low Performing)
- Cardiology (Performance NA\*)

\* Not enough information



- Node: Physician
- Node Size: Number of Diabetes Patients seen by Physician
- Node Color: Physician Cluster

### How

Shared patient analysis based on claims data identifies provider clusters, how they relate to a health system's existing physician network, with color coding to indicate performance value of the cluster.

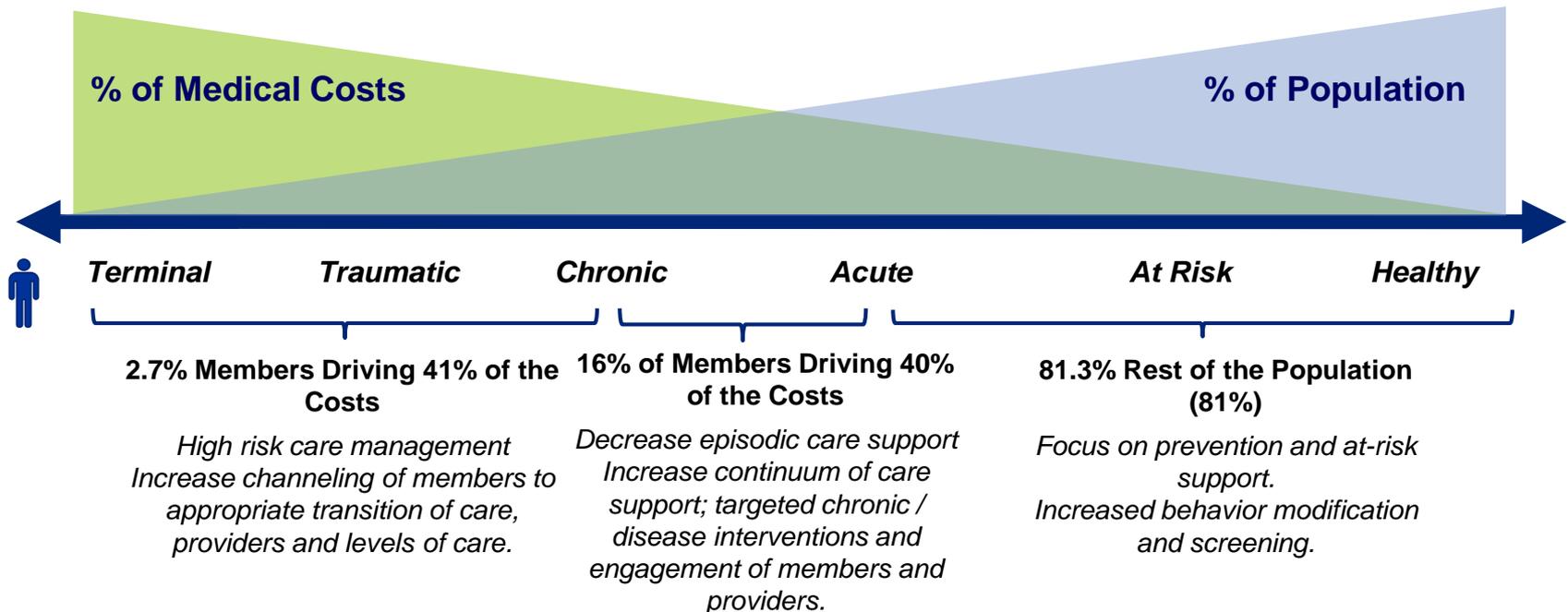
Node placement quickly identifies areas of potential best practice as well as areas of greatest urgency

Node size and thickness of line indicates volume of shared patients with out of network physicians/clusters

Predictive Analytics Case Study Number 2  
*Resource Efficiency Analysis*

# Identifying Populations for Prevention and Strategic Alignment of Allied Health Resources

Effective value based care programs use targeted interventions to prevent the patient population from moving towards the left side of the care continuum

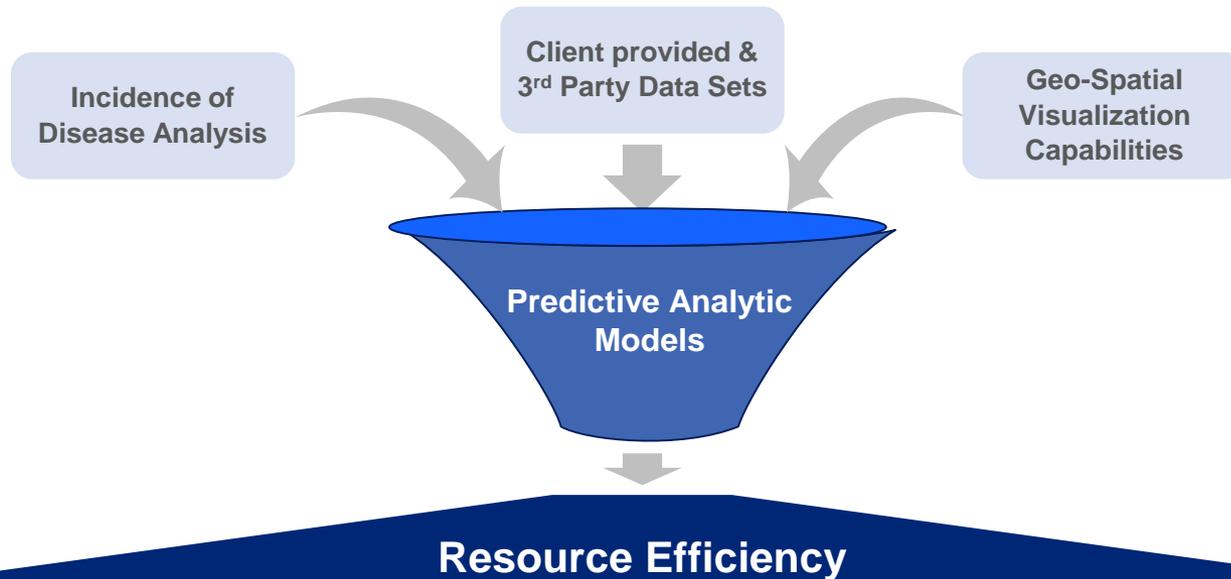


## Using predictive analytics can help us to visualize the following:

- Target the populations that have the biggest impact on outcomes and cost
- Combining multiple data sources to identify strategic locations to target prevention programs at current at risk and healthy groups
- Enhance integration across the full continuum in the services we provide – from healthy beginnings, to primary care, acute care, complex chronic care and rehab, and end of life care

# Predictive Analytics Case Study Number 2: Resource Efficiency Analysis

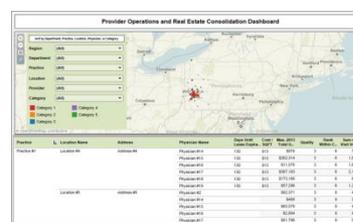
Integrating publicly available data sets from AHQR, CMS Centers for Innovation and Physician and Hospital Compare with Incidence of Disease Models and Geo-Spatial Technology we can provide targeted staffing models to drive prevention activities in targeted market areas



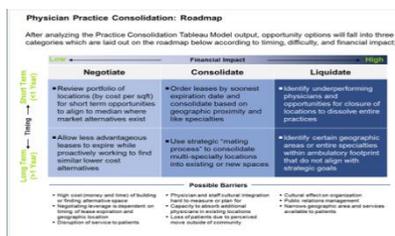
Deliver a five point asset efficiency value score categorizing the footprint by cost per sq. ft., lease expiration, location quality and efficacy



The module landing page delivers an overview of each entity enhanced with links to the catchment area and the risk stratified attributed population they service



The Provider Operations and Real Estate Consolidation Dashboard enables real time filtering of the asset value score criteria to deliver an optimized ambulatory services Roadmap



Locate attractive Medicare and Medicaid markets based on enrollees, eligibility, plan penetration and projected growth, and key market indicators

# Predictive Analytics Case Study Number 2 (1/4)

## Resource Efficiency Analysis

Landing Page

### Why

Provide transparency to the ambulatory services footprint in regards to geographic dispersion of ambulatory service facilities categorized by a proprietary asset value scoring criteria

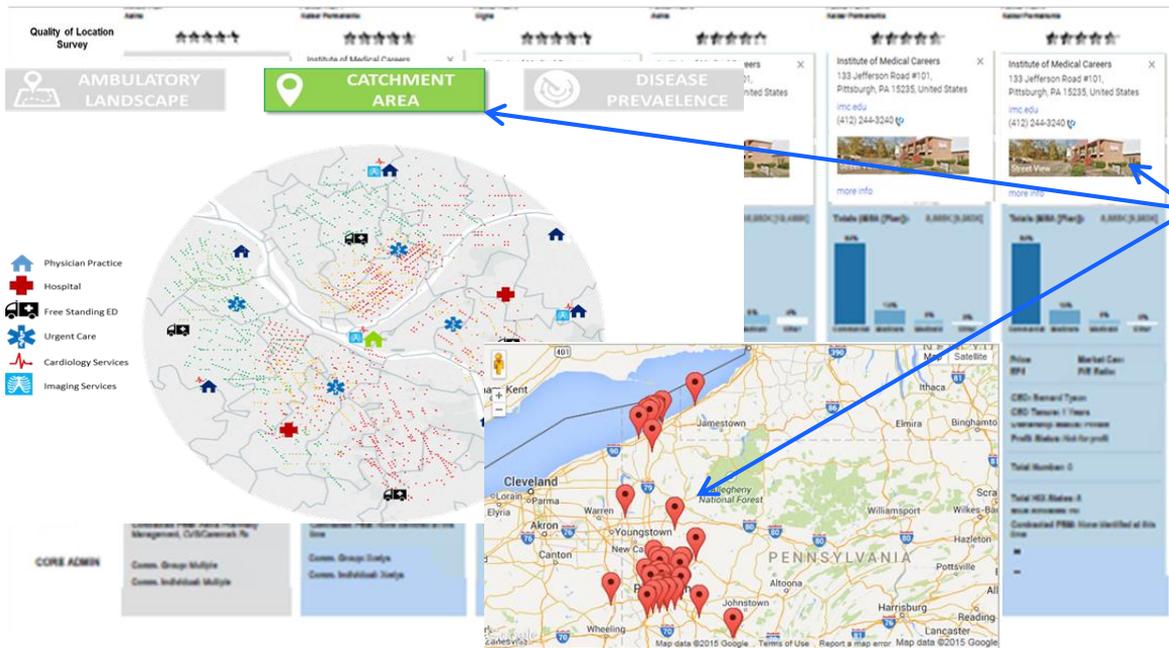
### What

Our resource efficiency dashboard provides a view of the aggregate information collected during the analysis and filtered by scoring criteria, disease prevalence, and drive time polygons

### How

#### Detailed View: Categorization Methodology

Compare statistics by selecting one or more of the practice locations below, marked in green, holding shift. Deselect by clicking the blue highlighted names.



The aggregate dashboard leverage street view capabilities with links to views of the scoring criteria data in respective detail

From the landing page links can isolate the catchment area of each facility allowing the user to optimize the services to both employed and affiliated physicians, risk stratified attributed lives sorted by contract

Links provide access to view details about a specific footprint element  
*Details include: Street Level of View of the Facility, Visit Volume, Gross Margin, Lease Expiration, Cost per Square Foot, Quality of Location Survey, Extended Hours, Language Spoken, Exam Room/Patient Per Day Ratio*

# Predictive Analytics Case Study Number 2 (2/4)

## Resource Efficiency Analysis

## Optimization Service

### Why

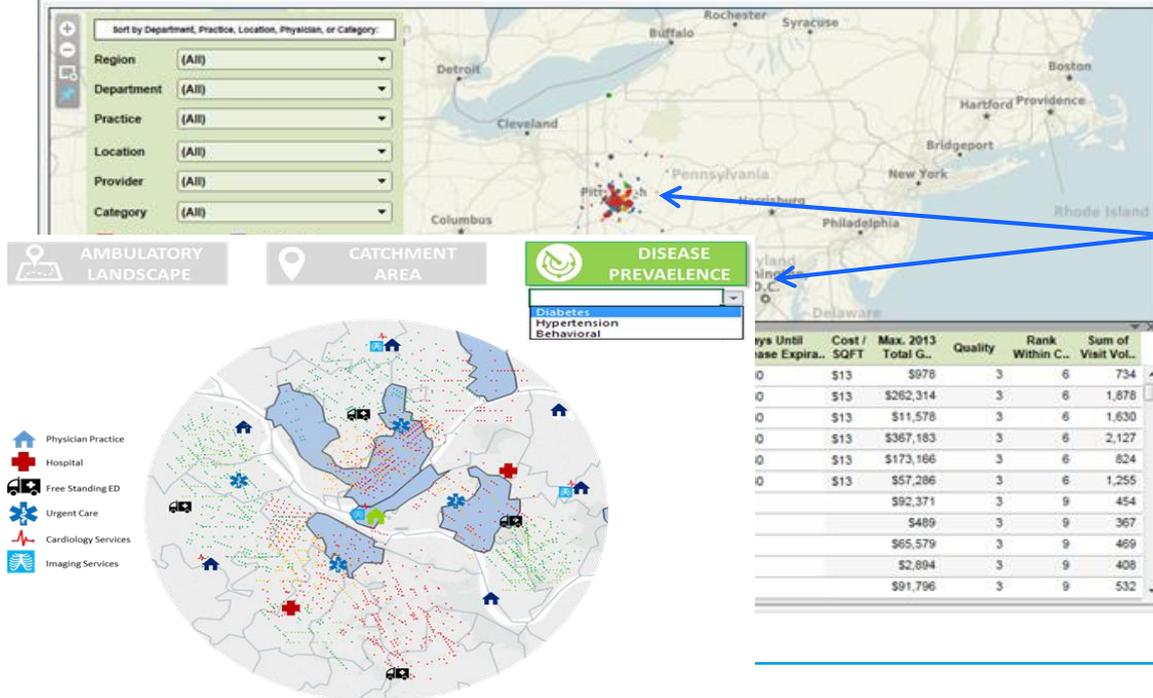
Visualization of an organizations ambulatory footprint and placement of concentrations of their risk stratified attributed patient populations we assess access to care issues using drive time analytics

### What

Targeting placement of allied health professionals validate that the right services are in the right locations judged by incidence of disease in a geographic market is key to engaging patients in prevention programs

### Physician Practice Consolidation: Roadmap

#### Provider Operations and Real Estate Consolidation Dashboard



### How

The Resource Efficiency Roadmap allows the user to filter through the criteria to compare and display against their value score

The Resource Efficiency Aggregate Dashboard allow the end-user to navigate their footprint through an increasingly selective set of a criteria including disease prevalence

Facilities meeting the filter criteria are displayed dynamically in the table and ranked by their resource efficiency score

Categorized facilities are displayed geospatially and once filtered can shift to a filtered "landing page view"

# Predictive Analytics Case Study Number 2 (3/4)

## Resource Efficiency Analysis

## Optimization Service

### Why

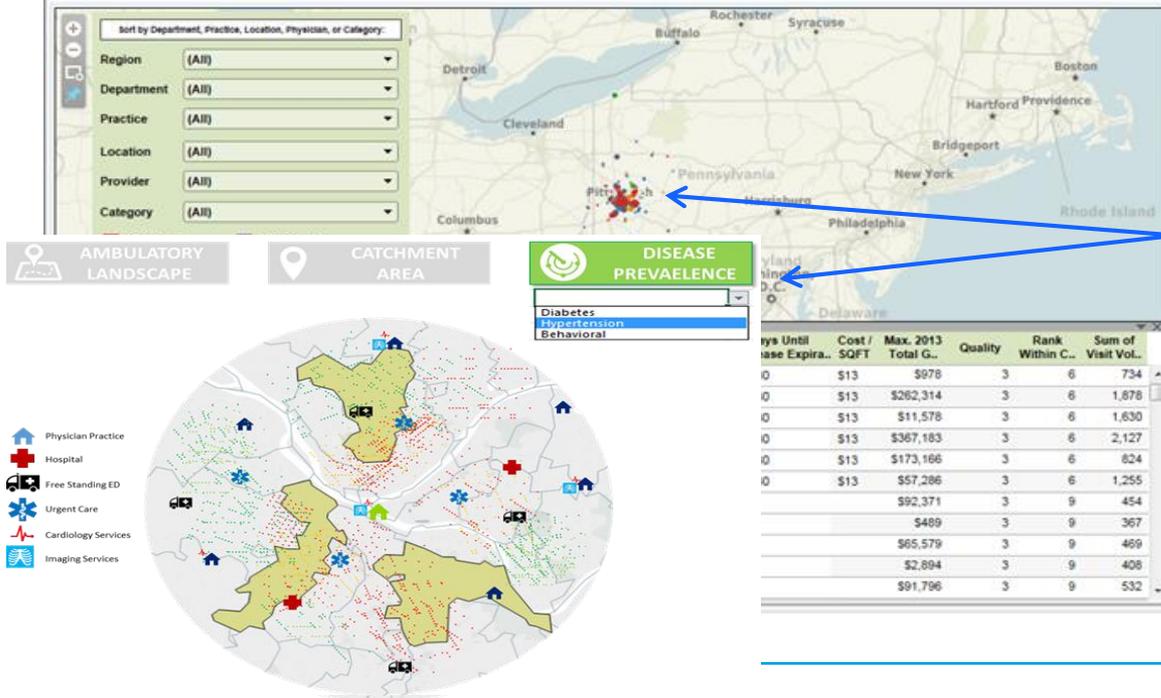
Visualization of an organizations ambulatory footprint and placement of concentrations of their risk stratified attributed patient populations we assess access to care issues using drive time analytics

### What

Targeting placement of allied health professionals validate that the right services are in the right locations judged by incidence of disease in a geographic market is key to engaging patients in prevention programs

### Physician Practice Consolidation: Roadmap

#### Provider Operations and Real Estate Consolidation Dashboard



### How

The Resource Efficiency Roadmap allows the user to filter through the criteria to compare and display against their value score

The Resource Efficiency Aggregate Dashboard allow the end-user to navigate their footprint through an increasingly selective set of a criteria including disease prevalence

Facilities meeting the filter criteria are displayed dynamically in the table and ranked by their resource efficiency score

Categorized facilities are displayed geospatially and once filtered can shift to a filtered "landing page view"

# Predictive Analytics Case Study Number 2 (4/4)

## Resource Efficiency Analysis

## Optimization Service

### Why

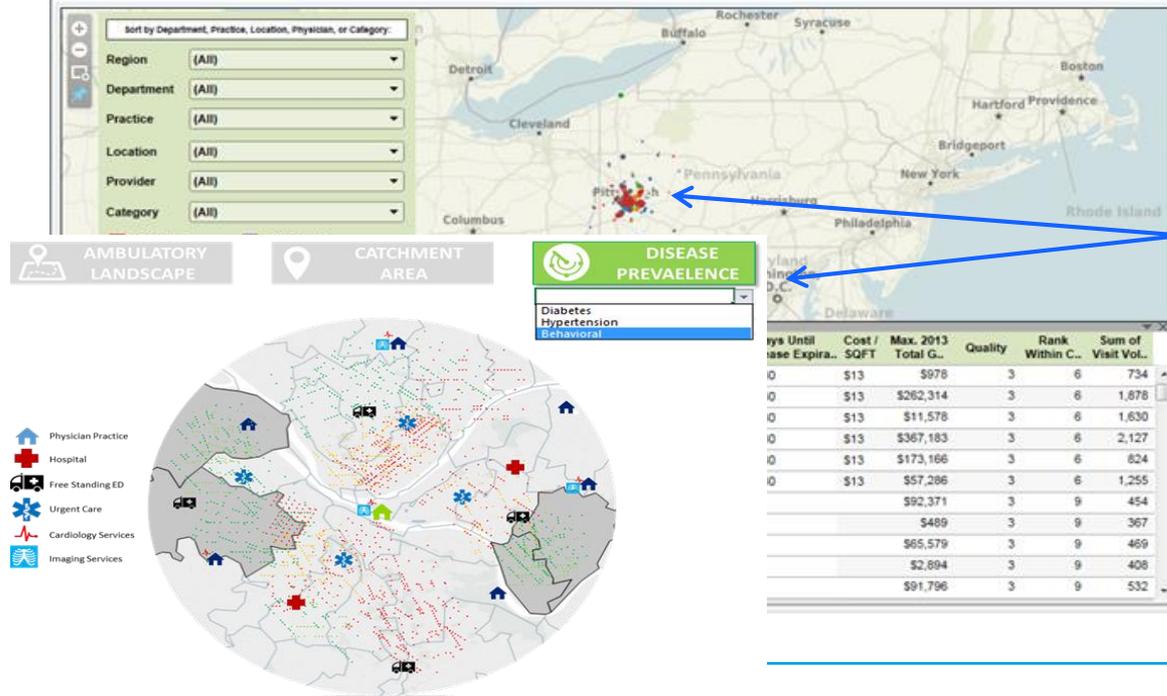
Provide transparency to the Ambulatory Services Footprint (ASF) in regards to geographic dispersion of ambulatory service facilities categorized by a proprietary asset value scoring criteria

### What

Targeting placement of allied health professionals validate that the right services are in the right locations judged by incidence of disease in a geographic market is key to engaging patients in prevention programs

### Physician Practice Consolidation: Roadmap

#### Provider Operations and Real Estate Consolidation Dashboard



### How

The Resource Efficiency Roadmap allows the user to filter through the criteria to compare and display against their value score

The Resource Efficiency Aggregate Dashboard allow the end-user to navigate their footprint through an increasingly selective set of a criteria including disease prevalence

Facilities meeting the filter criteria are displayed dynamically in the table and ranked by their resource efficiency score

Categorized facilities are displayed geospatially and once filtered can shift to a filtered "landing page view"

# Conclusions

## Conclusion

# 1

The current regulatory climate is pushing organizations into value based payment models at a rapid pace. To date, government incentives have been in place to help organizations through the transition period however, the penalty phase is starting and is scheduled to increase annually.

## Conclusion

# 2

Organizations have not moved at the same pace in adopting and implementing population health level strategies that are required for success in value based delivery models. Additionally, there is increased pressure on hospitals and health systems to adopt preventative care models that require the organization to expand programs into their ambulatory footprint.

## Conclusion

# 3

Technology integration, big data and advanced analytics are proving to be the key to aggregate the clinical, population and claims data to understand how current and planned treatment models can have a sustainable impact on the organizations ability to deliver high quality low cost healthcare



Questions?