

CCBHC-E National Training and Technical Assistance Center

Population Health Management Series
Session 3

August 24, 2023

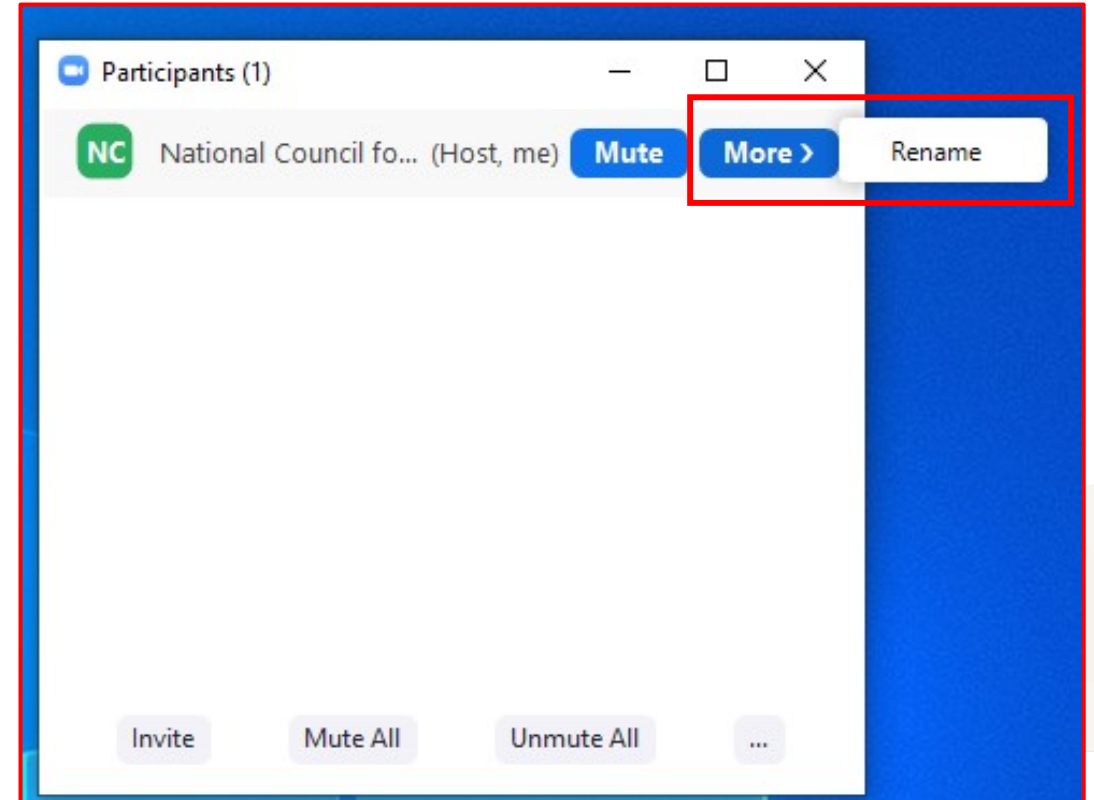
Acknowledgements and Disclaimer

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Today's Session: Slides and Recording

Slides and the session recording link will be available on the [CCBHC-E NTTAC website](#) under “Training and Events” > “Past Events” within 2 business days.

The screenshot displays the website's navigation and event calendar. On the left, the 'Training & Events' menu is highlighted with a red arrow. The main content area shows the 'Calendar of Events' section, which includes search filters for 'Search', 'Start Date', 'End Date', and 'Select Event'. A dropdown menu is open, showing 'Future Events' and 'Past Events' (highlighted in blue), with an 'Apply' button below it. A red arrow points from the 'Past Events' option to the main calendar area.



How to Enable Closed Captions (Live Transcript)

Next to “Live Transcript,” click the arrow button for options on closed captioning and live transcript.

Today's Objectives



- Increase knowledge of how population health management practices address preventative healthcare
- Introduce concept of predictive data analytics
- Provide several examples of how to engage in predictive data analytics

CCBHC Population Health Management Learning Series

Purpose

Designed for CCBHC grantees interested in learning about the core principles of population health management (PHM). This series will build on the foundational concepts covered in the Optimizing Data Series, this series will expand and advance on effective PHM approaches and strategies to drive clinical care decisions focusing on topics including risk stratification to identify gaps in care, continuous quality improvement to identify and address health disparities and using advanced data analytics assess to patient needs and support.

Population Health Management Learning Series



Today's Session

- Predictive Data Analytics



Your Learning Series Team



Renee Boak, MPH
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Matter Expert



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Project Manager



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Project Coordinator



Today's Presenters



Renee Boak, MPH
National Council, Coach and SME



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Owner and Managing Principle



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Wellbeing In Action
Sr. Clinical Analytics Advisor



Poll Questions

- Does your agency employ staff who have the skill set to engage in predictive data analytics?
- Does your organization perform its own primary care screening and monitoring data collection?

Predictive Data Analytics

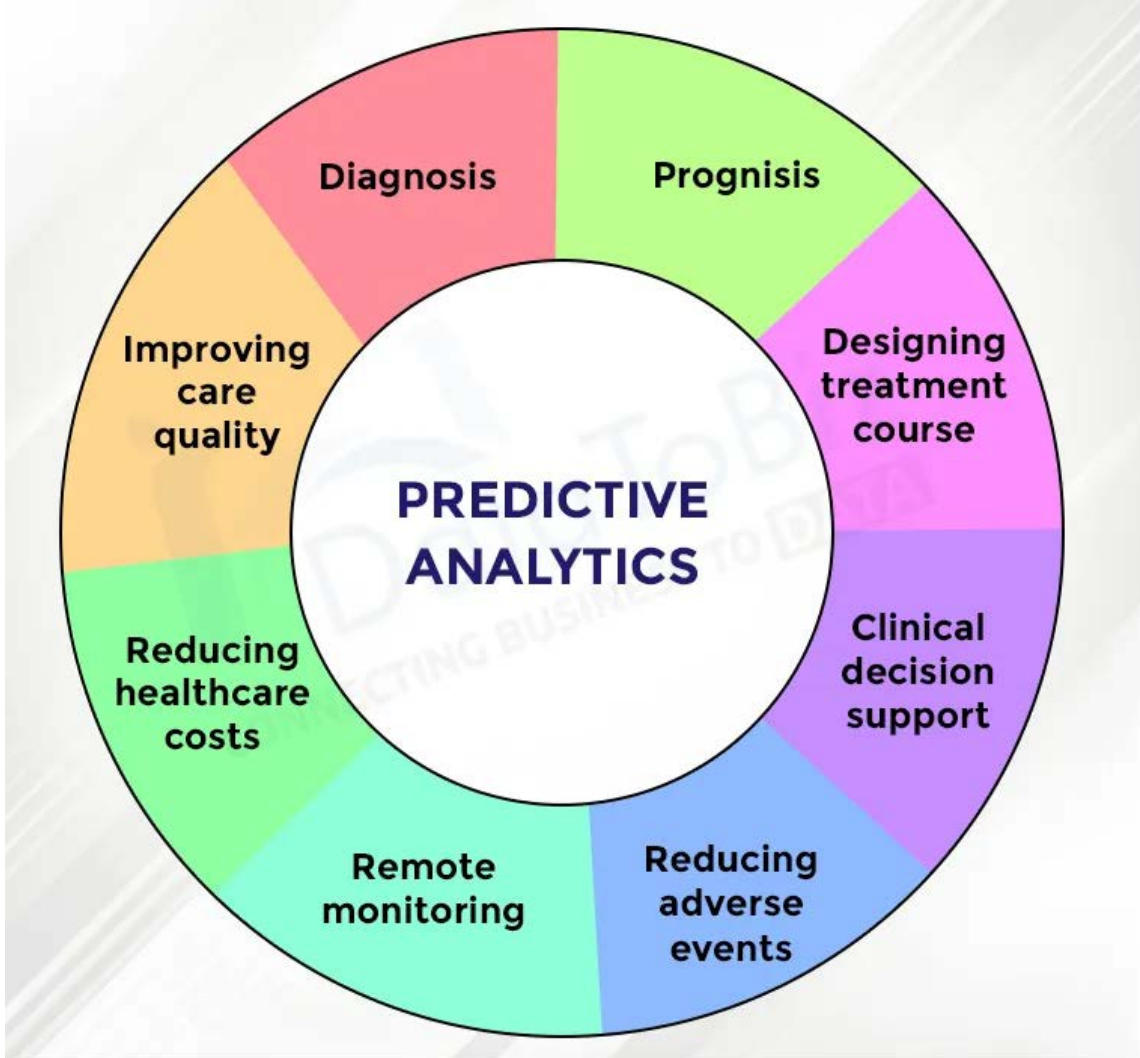
Predictive analytics are a type of advanced analytics that can be used to make predictions about future outcomes, such as health outcomes, using historical data combined with statistical modeling, data mining techniques, and machine learning. Based on logic drawn from theories to fit a hypothesis or prediction, predictive analytics can also seek patterns and structure in the data and cluster them into groups or insights.

Organizations can use predictive analytics to find patterns in data to identify risks, such as using data to detect and manage the care of chronically ill patients. Predictive analytics can be used at the individual level to help providers deliver the right care to the right patient at the right time. This tool can help health systems identify and understand larger trends, such as strategies that can be used for improving population health.

- Journal of Health Information Management Association

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What Can Predictive Data Analytics Do?



- Improve outcomes and safety
- Predict utilization patterns
- Risk stratification for chronic disease
- Decrease 30-day hospital readmissions

Types of Predictive Modeling

- Forecast model
- Regression model
- Classification model
- Outliers model
- Clustering model





Data and Technology Needs

- Robust Data Platform
- Predictive Analytics
Expertise and Institutional
Knowledge
- Machine Learning
Technology

Healthcare Prevention and Predictive Analytics

Dr. Jesse Sieger-Walls, PhD, MSW, LCSW

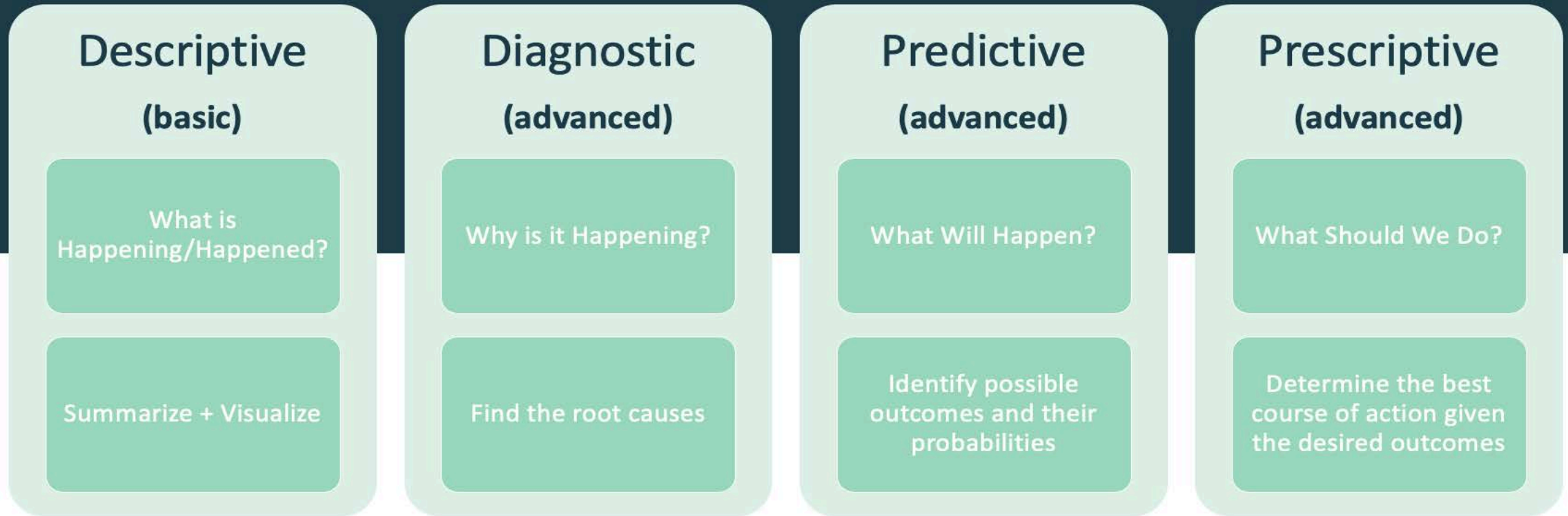
Seda Follis, MS, LMSW

August 24, 2023



Past and Present

Future



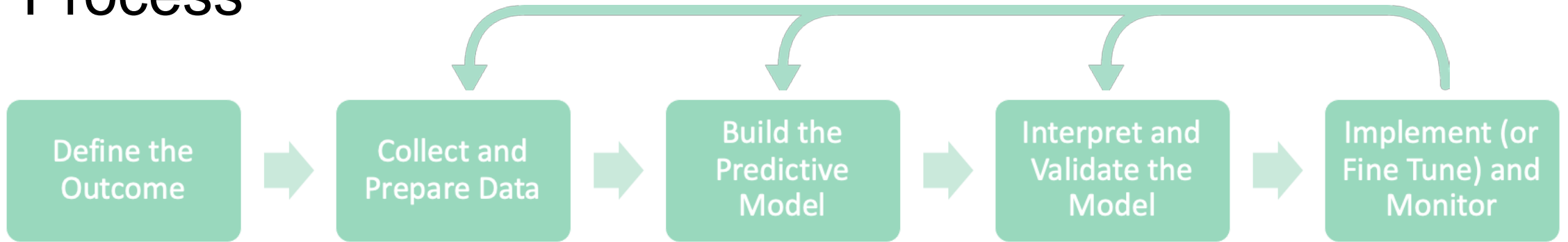
Analytic Activities

The organization's questions determine the analytic activities that must be applied to answer the respective analytic questions. Predictive analytics are one of several advanced analytic techniques an agency can deploy for population health management.



Predictive Analytic Process

The analytic process is similar to other analytic activities; however, the final step is iterative and requires ongoing monitoring after implementation.



Example Methods

- Regression Models
- Classification Models
- Survival Analysis Models
- Time Series Models
- Bayesian Models

Analytic Workforce

CCBHCs need internal or external technical skills and analytic competencies to execute these advanced analyses.

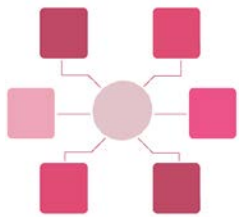


Use Case: Comorbidity/Risk Indexes

- Comorbidity Indexes are like health-oriented credit scores
- People with higher scores are likelier to experience poor health outcomes or experience acute/adverse events.
- **Clinical Applications**
 - Prevention-oriented treatment planning/Clinical risk management
 - Support resource allocation
 - Help with quality improvement
 - Inform rate-setting negotiations

Predictive Analytics in Action

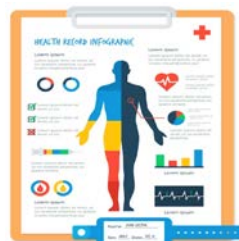
Build the Risk Index
from Existing Data



Calculate New
Client Risk Scores



Integrate Scores into
Profiles or Registries



Team-Based
Care Decisions





Integration of Social Determinants of Health

- Most comorbidity indexes were designed to capture medical conditions
- Often developed from administrative data, which have little SDOH information.

Innovation Opportunity! CCBHCs can develop custom indexes that incorporate SDOH information.

Remember

All CCBHC must assess for social determinants of health.

Consider

How your agency can use that information to strengthen risk stratification and select and stage match interventions.





Use Case: Prevent Adverse Events

CCBHC Question: How can we enhance client outcomes by determining which individuals are at higher risk for specific adverse events (e.g., suicide, hospitalizations, ED admissions, arrests, detox nights)?

Predictive Question: Based on available information, how can we predict which clients are at higher risk for *suicide*?

EHR Information: Diagnoses; Tx engagement; SDOH; Adverse event Hx; PROMs; Progress notes.

Outcomes

Likelihood of a client dying by suicide.

Application

Establish a risk stratification effective for matching prevention efforts across service lines.



Use Case: Prevent T2DM

CCBHC Question: How can we enhance client outcomes by determining which individuals are at risk for T2DM?

Predictive Question: Based on the information, how can we predict which clients may develop T2DM?

EHR Information:

- Demographic Information/Comorbidity Index
- Diagnoses
- Family History
- Current and Past Physical health indicators/Lab results
- Social determinants of health
- Behavioral information (e.g., alcohol use, dietary habits, physical activity)



Outcomes

Likelihood of a client advancing in their T2DM status (i.e., non-T2DM to pre-T2DM, pre-T2DM to Stage 1, etc.)

Application

Robust risk stratification beyond single measure stratification (i.e., A1c, plasma glucose)





Use Case: Improve 6-Month Depression Remission

CCBHC Question: How can we improve depression remission rates?

Predictive Question: What information most predicts depression remission at 6 months within our client population?


EHR Information: Client demographics, diagnostic information, comorbidity index, previous Tx Hx, PROMs, SODH, service utilization, personnel providing Tx, behavioral/social factors, and medication use.

Outcomes

The likelihood of depression remission at 6 months, based on the PHQ-9.

Application

Strengthen the CCBHC's treatment protocol, treatment, and stage matching.



—

How can we put
predictive analytics
into practice and
avoid pitfalls?



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Analytic Maturity Domains

Analytic maturity refers to an organization's ability to effectively collect, manage, analyze, and interpret data, reflecting its capabilities in leveraging analytics to drive informed decision-making and achieve strategic goals.

Lessons Learned Advanced Analytics Journey Health Care Organizations	Culture <ul style="list-style-type: none"> Aligning strategically and creating accountability across the organization, starting with the executive leaders and throughout the organization, including the frontline staff 	Data <ul style="list-style-type: none"> Treating data as an asset for the organization where access to this asset is 'democratized' after data quality is assured 	Analytic Workforce & Structures <ul style="list-style-type: none"> Acquiring and developing talent across the organization to include general data literacy and specific analytic skills and competencies
	Technology <ul style="list-style-type: none"> Ensuring data platforms and applications are complementary to each other and maintained with proper investment 	Processes <ul style="list-style-type: none"> Applying various project management processes and analytics management tools in developing and deploying data products such as predictive models 	Analytic Opportunities <ul style="list-style-type: none"> Identifying the right opportunity with the data and analytics champions in the organization



Culture

Over the past two decades, many companies invested heavily in technology as a first step to becoming data-driven organizations, but more was needed for most of them.

Organizational and leadership alignment is essential

Analytics maturity accelerates when governed data is shared and used across the organization.

- Involvement from frontline staff and service line leaders
- Internal subject matter experts/clinical experts become enablers and tend to be the best data translators

72%

Survey participants from big corporations reported that they were not able to develop a data culture

93%

Of them identify people and process issues as their obstacles





Data

When data is seen as an asset for the organization, **data quality** becomes a priority.

Providing **access** to this asset needs to be 'democratized' to help with maturing the analytics in the organization.

Data Governance

Data and information life-cycle framework can be used with proper policies in a secure data environment:

- Capture/Collect
- Store
- Access
- Display and Use
- Dispose

Analytic Workforce Development and Structures

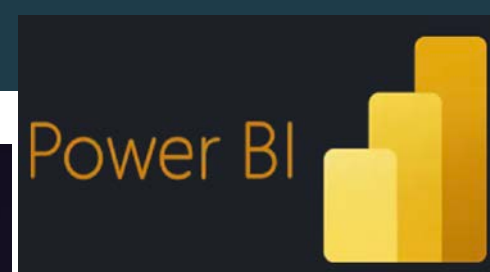
- Define the level of analytic personnel you need (internally and externally)
 - What skills and competencies does your analytical workforce need?
- Establish a staffing plan for recruitment, placement, and development.
 - Roles may include data managers, analysts, data scientists, and engineers.
 - How much capacity do you need to develop internally or establish external partnerships/contracts for targeted analyses?

Organizing Analytics Workforce Structures

- Centralized
- Decentralized
- Federated/Hub and Spoke



Microsoft Machine Learning Studio



Technology

The analytic software/platform market is crowded and choosing platforms can be complicated.

Select technology platforms based on:

- The questions you want to answer with analytics
- The data types you'll use to answer questions
- Compatibility with your operational systems/EHR
- The personnel that will use the analytic software



Analytic Opportunities

- Collecting use cases and selecting a few strategically
- Identifying a project sponsor and champions
- Failing forward fast and iterating to unlock the potentials

Predictive Analytics Use Case Examples to help improve care, manage supplies, and lower costs

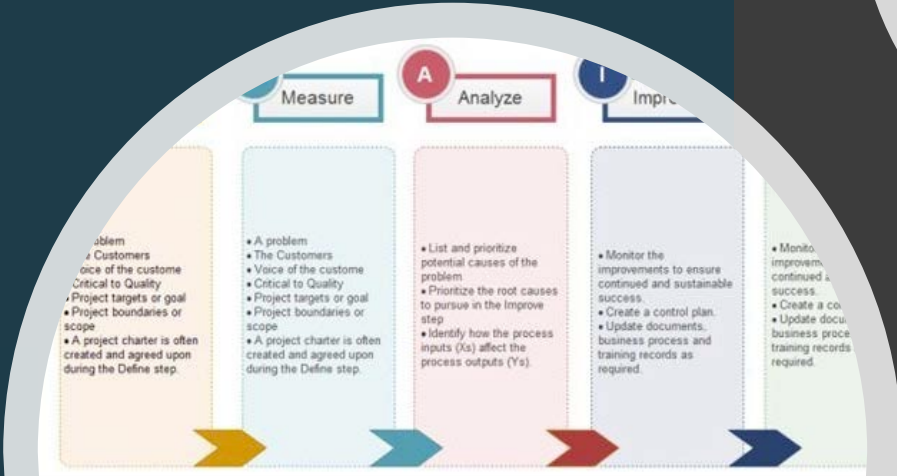
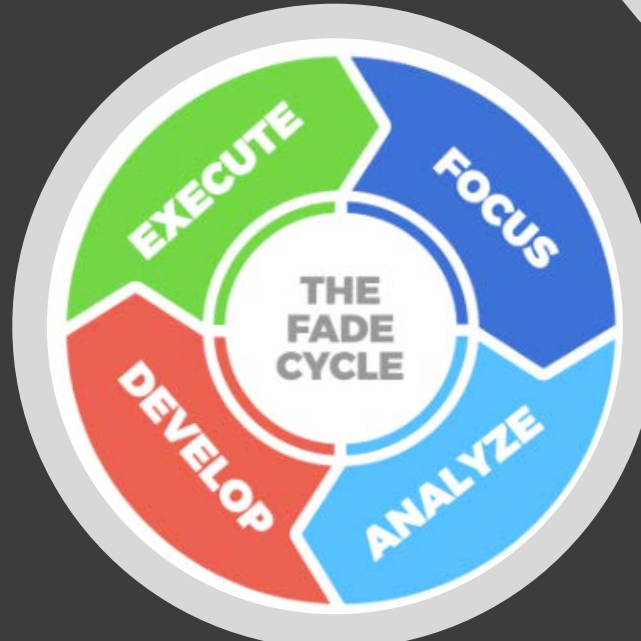
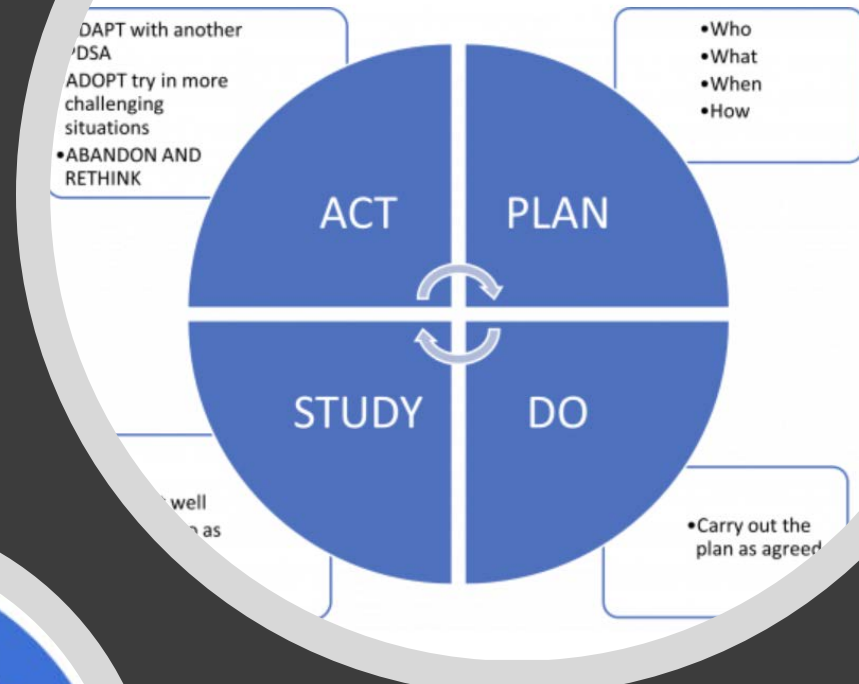
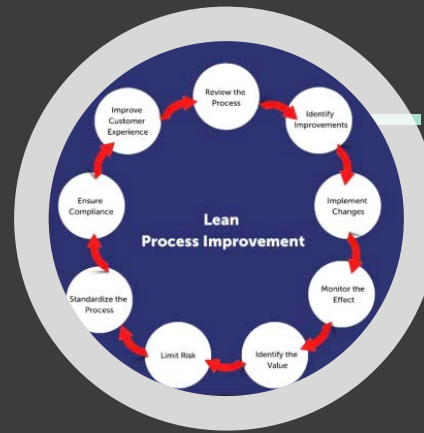
- Clinical predictions
- Disease progression and comorbidities
- Hospital overstays
- Hospital readmissions
- Resource allocations
- Resource acquisitions
- Supply chain management
- Patient engagement and behavior
- Consumer choice
- Optimal best treatments
- Insurance reimbursements
- Command center capabilities



Processes

Advanced analytics (including predictive analytics) should be nested within your CQI process and administrative analytic processes.

- Project identification and selection process
- Analytic model development, deployment, and monitoring processes
- Integration with CQI activities
- Retiring legacy data platforms, models, and tools



Summary

- Predictive Analytics are an advanced analytic activity
- There are many use prevention-related use cases e.g., elevated risk scores, adverse events, clinical outcomes, process outcomes, etc.
- Advanced analytic techniques (including predictive models) are best performed in analytically mature organizations
- Analytic Maturity includes
 - Culture
 - Data
 - Workforce Development and Governance Structure
 - Technology
 - Analytic Opportunities
 - CQI Process integration

Q & A

Next steps...

Closing



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Thank You!





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