So, You Want to Build a Dashboard?

Medicaid Innovation Accelerator Program - Data Analytics National Webinar

May 17, 2017
3:00 – 4:30 PM EDT

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Logistics for the Webinar

- To participate in a polling question, exit "full screen" mode

- Use the chat box on your screen to ask a question or leave a comment
  - Note: chat box will not be seen in "full screen" mode

Welcome!

- Jessie Parker, GTL and Analyst on Medicaid IAP Data Analytic Team, Data and Systems Group, CMCS
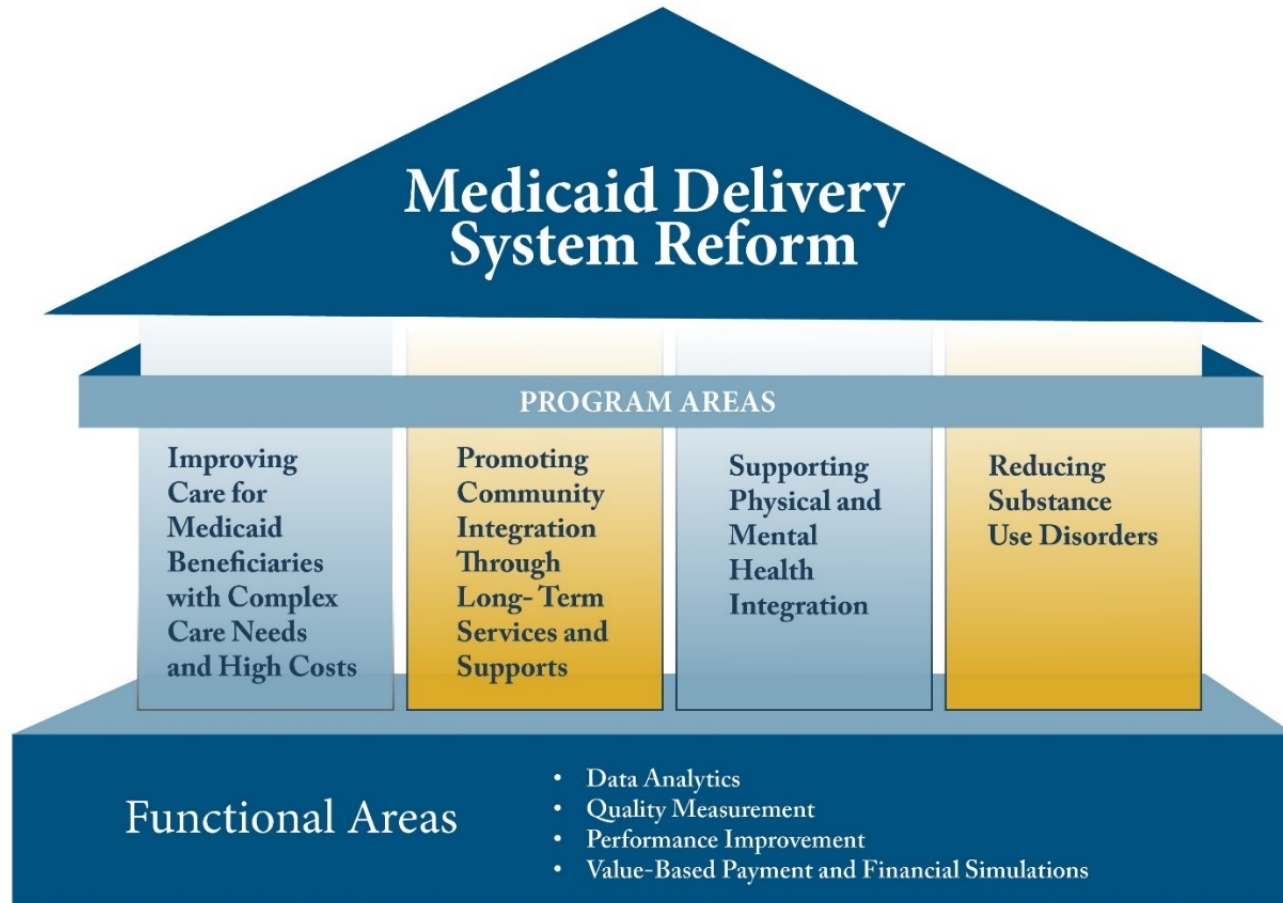
Agenda for Today's Webinar

- Overview of Medicaid Innovation Accelerator Program

- Planning & Preparation for Dashboard Building

- A State-University Partnership in Action: New Hampshire MQIS

- The Process for Designing and Creating Useful Dashboards

- Healthier Washington Data Dashboard Experience

- Questions and Answers

Today's Speakers

- Beth Schneider, Vice President, Practice Leadership, State and Local Government Health and Human Services, Truven Health Analytics

- Doris Lotz, MD, MPH, Chief Medical Officer, NH Department of Health and Human Services

- Jo Porter, MPH, Institute for Health Policy and Practice, University of New Hampshire

- Ashley Peters, MPH, Institute for Health Policy and Practice, University of New Hampshire

- Katherine Rowell, MS, MHA, Co-Founder and Principal, HealthDataViz

- Kirsta Glenn, AIM Director, Washington State Health Care Authority

Medicaid Innovation Accelerator Program (IAP)

Medicaid Delivery System Reform

PROGRAM AREAS

Improving Care for Medicaid Beneficiaries with Complex Care Needs and High Costs

Promoting Community Integration Through Long-Term Services and Supports

Supporting Physical and Mental Health Integration

Reducing Substance Use Disorders

Functional Areas
- Data Analytics
- Quality Measurement
- Performance Improvement
- Value-Based Payment and Financial Simulations

Goals for Today's Webinar

In this interactive webinar, states will learn about:

- The process of creating a data dashboard from planning stages through the design;

- Methods and approaches to building the right data team for creating a dashboard;

- Guidelines for designing a useful dashboard; and,

- Common pitfalls to avoid.

Planning & Preparation
Definitions, Uses, Building the Team

Beth Schneider, MBA, Truven Health Analytics, IBM Watson Health

Why States Use Dashboards

- Gain insight

- Drive action

- Save time

- Provide transparency

- Achieve program goals

Dashboards Defined
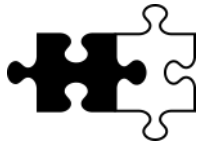
Infographics

- Inform, teach or persuade

- On a specific topic, e.g., emerging issue

- 1-2 page composite of words, numbers, graphics

- Usually one-time

Dashboards

- Monitor at-a-glance

- Key trends, patterns and variances

- To inform decisions and actions

- Concise visual and numeric displays

- Ongoing updates

Reports

- Access to detailed information

- By subgroups, e.g., payer, service, etc.

- Longer displays, organized logically

- Ad hoc or scheduled updates

Dashboard Considerations

Audience	• Executive management • Program managers • Operations staff • Key stakeholders • General public
Purpose	• Executive • Strategic • Operational • Analytic
Dissemination	• Internal vs. Public • Desktop vs. Mobile • Static vs. Interactive

Examples of Medicaid Dashboards: Louisiana

Source: http://www.ldh.la.gov/HealthyLaDashboard/

Examples of Medicaid Dashboards: Oklahoma

Getting Started: Building the Team

Executive Sponsor

|	
Subject Matter Experts	Provide deep insights on business goals and functional requirements
Data Analyst(s)	Address requirements based on analytic expertise, knowledge of the data, and design principles
Project Manager	Manage project plan, communicate status, identify and mitigate risks
Data Manager(s) / Information Technology	Assure up-to-date and accurate data; advise on data nuances; provide secure access
External Partners	Bring specialized expertise, tools, or data assets for policy research and analysis

Role of the Subject Matter Expert

- Advise on dashboard-specific requirements and content

  – What questions will it answer?

  – Who is the intended audience?

  – How should measures be selected and defined?

  – Where will the dashboard be accessed?

  – When should data be refreshed?

- Provide input to report specifications

  – Populations/programs/areas of focus

  – Key performance indicators, other metrics

  – Breakouts and comparisons (e.g., to targets)

  – Time periods and views

- Review and comment on draft dashboard

Discover

Design

Prototype
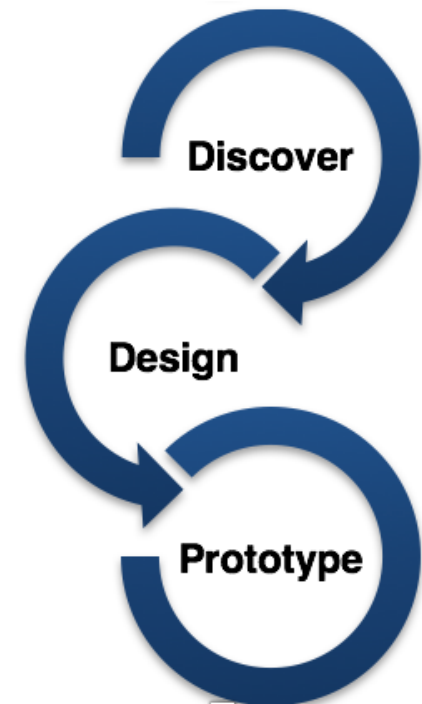
Role of the Data Analyst

- Translate requirements into design & development
    - Select the right data sets & data elements
    - Implement detailed measure specifications
    - Advise on data limitations and work arounds
    - Apply advanced methods as appropriate
    - Create meaningful, compelling displays

- Guide interpretation and use of the dashboard
    - Provide clear data labels and documentation
    - Mitigate risks of misleading or misinterpreted data
    - Relate findings to program implications -- the **"so what"**
    - Work with stakeholders on follow up analysis & action items
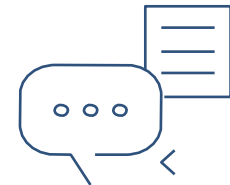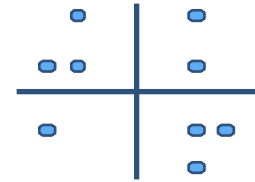
Sample Data Analyst Qualifications

- Masters in public health or social science with quantitative focus

- Minimum 3-5 years experience in health data analysis

- Demonstrated skills in math, statistics, health care measures

- Understanding of the data and how it may (or may not) be used

- In-depth knowledge of the underlying database architecture

- Fully leverages reporting and visualization applications
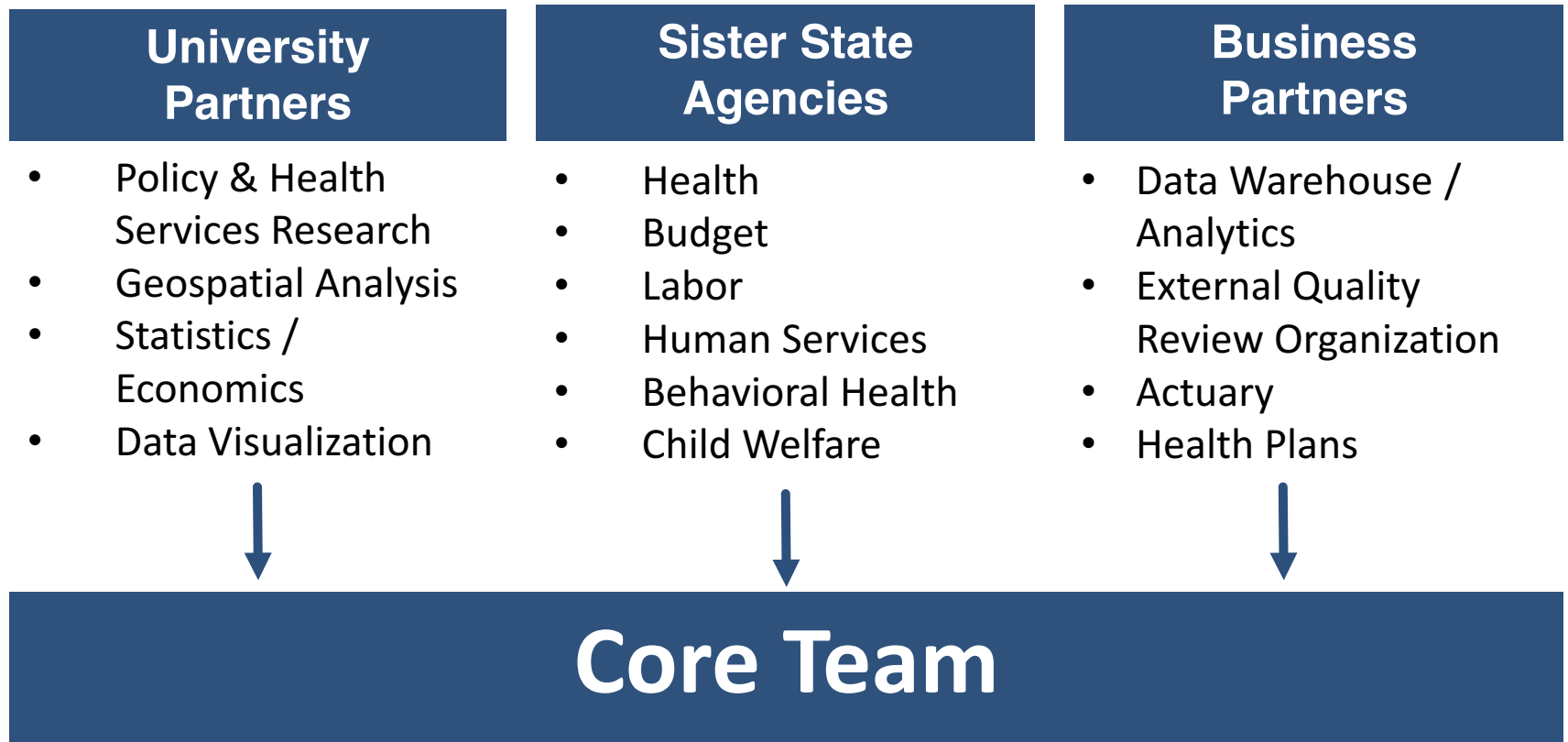
- Applies reporting & visualization best practice

Building a Data Analytic Team: Sample Interview Questions

Tailor questions to dashboard content, data sources, methods

- Analysis:
  - How have you applied statistical techniques in past analysis?
- Software:
  - What is your level of expertise using different statistical analysis and data visualization tools?
- Data Quality:
  - What are some examples of data quality issues to screen for in conducting health data analysis?
- Dashboards:
  - Can you describe a dashboard you helped design and the audience it served?

Engaging External Partners

External partners bring specialized policy knowledge, methodological expertise, and data assets, e.g.:

University Partners	Sister State Agencies	Business Partners
• Policy & Health Services Research • Geospatial Analysis • Statistics / Economics • Data Visualization	• Health • Budget • Labor • Human Services • Behavioral Health • Child Welfare	• Data Warehouse / Analytics • External Quality Review Organization • Actuary • Health Plans

Core Team

Polling Question

Has your state agency utilized any of the following for dashboard creation or other data reporting?

- University partners

- Sister state agencies

- Business partners

- None of the above

A State-University Partnership in Action: New Hampshire MQIS

Doris Lotz, MD, MPH
NH Department of Health and Human Services

Jo Porter, MPH
Institute for Health Policy and Practice, University of New Hampshire

Ashley Peters, MPH
Institute for Health Policy and Practice, University of New Hampshire

Institute for Health Policy and Practice

Overview of Partnership

- Long-standing partnership
  - University of New Hampshire Institute for Health Policy and Practice (IHPP)
  - NH Department of Health and Human Services (NH DHHS), including:
    - Medicaid Business and Policy
    - Elderly and Adult Services
    - Quality Assurance and Improvement
- Contracted for core work
- Can add work specific to projects and grants
  - Medicaid Quality Information System (MQIS) was one example

Institute for Health Policy and Practice

Why is MQIS important for Medicaid?

The NH DHHS wants to make Medicaid program and other data useful

- Easy to find

- Easy to understand

- And helpful to a great variety of users (including DHHS!)

Institute for Health Policy and Practice

What is the partnership that brought this forward?

- Who are the players
  - NH DHHS
    - Brought project goals, system and reporting needs
    - Relationship with data submitters
    - Relationship with CMS
  - IHPP
    - Provided a centralized project management approach
    - Brought an understanding and translation of NH DHHS needs to technical team
  - RCC
    - Brought system development as well as methods expertise
- How the team functioned
  - A complete team effort!
- Ongoing
  - Formalized MQIS enhancement request process

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Medicaid Quality Information System (MQIS)

MQIS web address: https://medicaidquality.nh.gov/

What has made this partnership successful?

- A great team! Bringing together a team to perform necessary functions with open and clear communication makes this project successful.

- Clear goals and expectations from NH DHHS

- Technical expertise from RCC

- A defined and efficient project management structure with participation from all organizations

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Thank you!

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Designing and Creating Useful Dashboards

Katherine Rowell, MS,MHA, HealthDataViz

Have a Compass, Set a Course, Communicate It Often

"If you don't know where you are going, any road will take you there." Lewis Carroll

Establish a Process For Discovery, Analysis, Design, Development & Deployment (And Stick With It)

Discovery – Requirements Gathering

- Identify, evaluate **available data**

- Review the **analysis** and ensure you can **explain and defend it**

- Articulate **project goals**

- Interview, create personas, and **research** users' **mental models**

- Establish the right **team**

- Identify **final-sign off authority**

- Create and disseminate **Project Discovery Document**

Identify & Evaluate Available Data

Evaluate Your Data to Ensure It's:

- Accessible

- Accurate

- Well Defined

- Enough (Appropriate Amount of Data)

- Complete

- Understandable

- Objective

- Relevant

- Timely

Explain & Defend the Data Analysis & Statistics

Test Yourself:

- Have the correct **statistics** been used to **analyze** the data?

- Can you explain them in *plain language*?

- Can you **defend** the analysis?

Design – Sketches

AFTER you have **analyzed the data** and have some ideas about what you want to communicate on your dashboard start sketching

Low Tech -- High Value:

- **Anyone** can do it

- Helps **teams explore and design** in a fast and **collaborative manner**

- Helps teams quickly see **how to group and arrange the data** in a logical and compelling way

Development – Prototypes

- **Early sample**, or release of dashboard, report or infographic to be built

- **Sample** data, **limited** functionality

- **Test concepts**, solicit feedback

- **Never** send out prototypes cold

- **ALWAYS demonstrate the prototype first!**
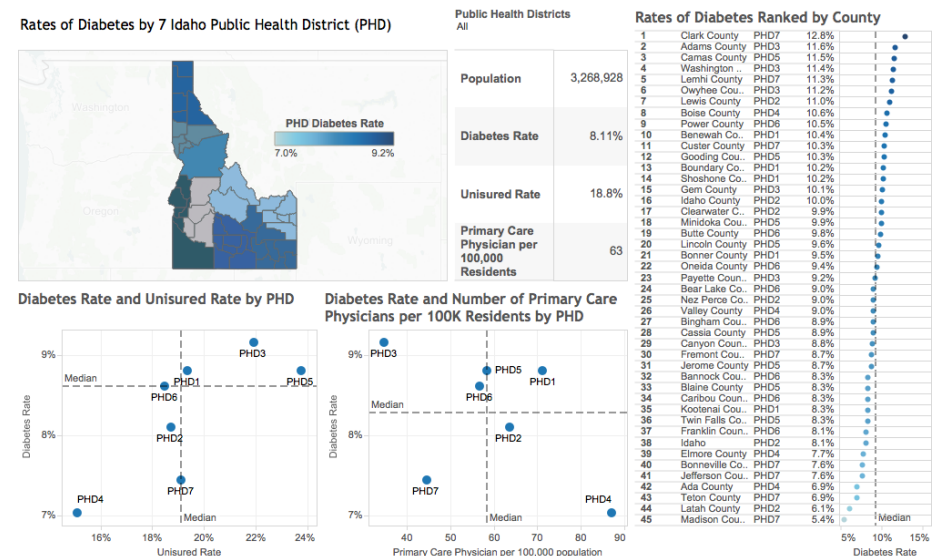
Development – Final Production Ready

- After feedback begin to build **final, or production** ready displays

- Set a **clear direction and plan**

- Perform thorough rounds of quality checks and **regression testing,** i.e., data displayed reconciles to the source data

The Pitfalls to Avoid

Pitfalls to Avoid

- Displaying poor quality data

- Providing inadequate context

- Implying correlations that do not or may not exist

- Displaying unimportant and incomplete data

- Displaying unnecessary precision

- Incorrect encoding of the data

- Misuse or overuse of color

- Using incorrect statistics

- Displaying unreconciled data
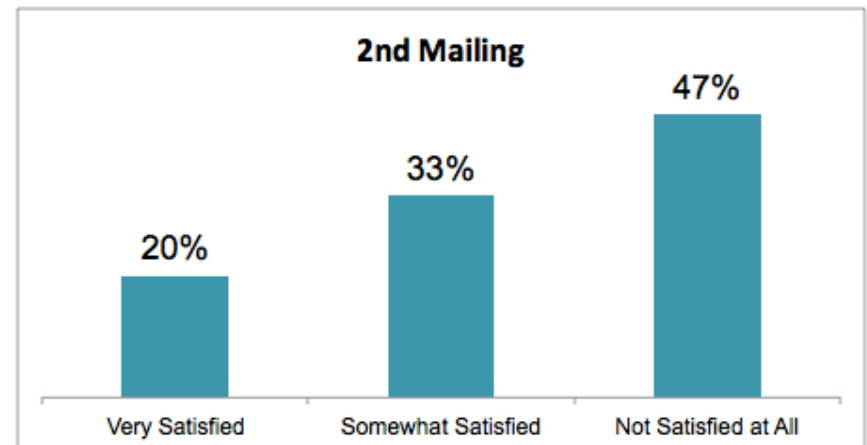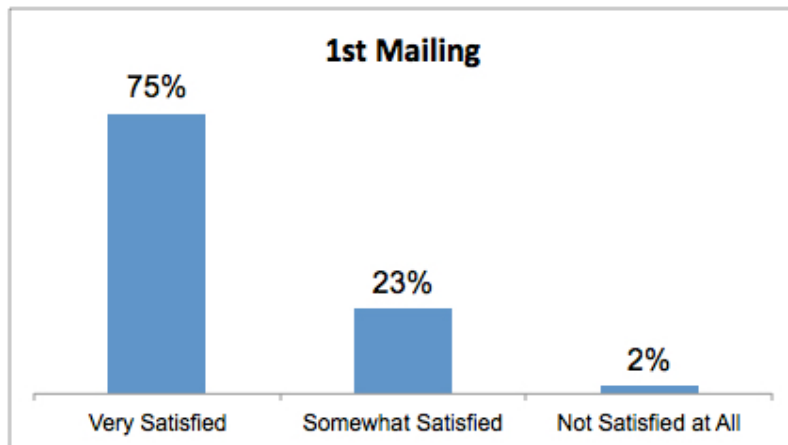
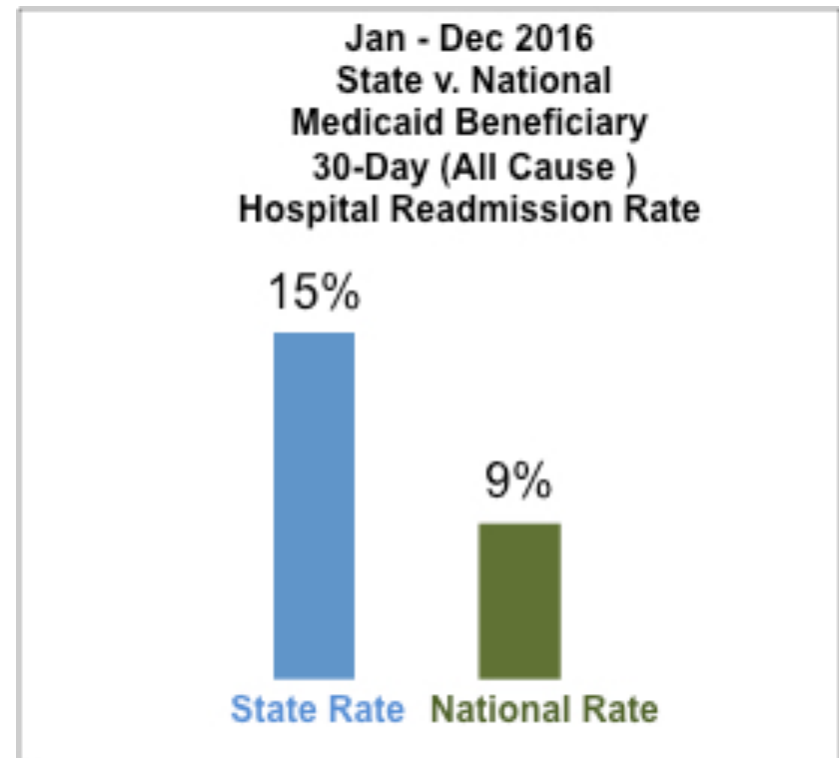# Not Enough or Incomplete Data

Example Data NOT Actual

Providing Inadequate Context for the Data

Don't Do This:
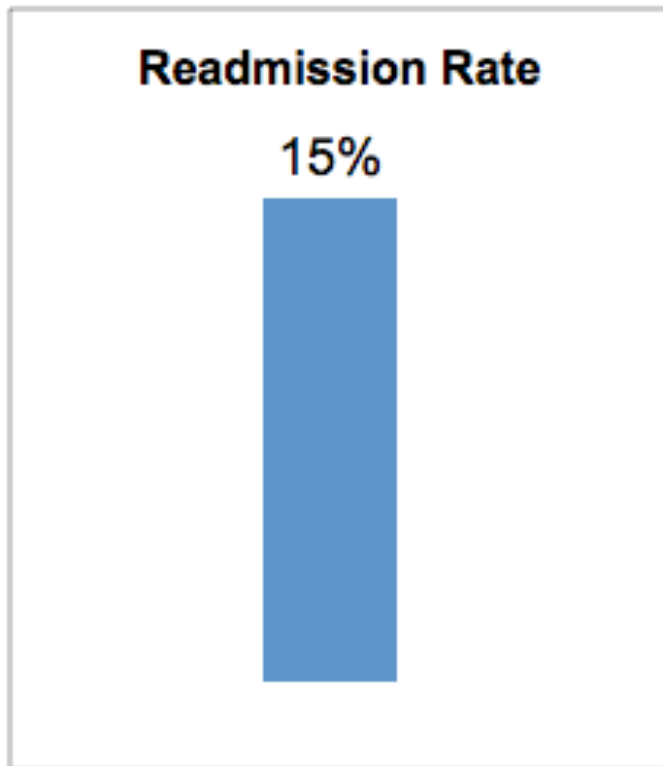
Do This:

Example Data NOT Actual

Implying Correlations (Relationships/Causality) That Cannot Be Substantiated or Are Not True

State Teen Sexual Behavior Outreach Program Attendance Rates
& State Teenage Pregnancy Rates

Five (5) Year Trends

85%

80%

85%

87%

86%

% of Teens
Attending Program

35%

33%

30%

25%

22%

State Teen
Pregnancy Rate
Per 1.000 Women
(15-19 Years)

Year 1   Year 2   Year 3   Year 4   Year 5
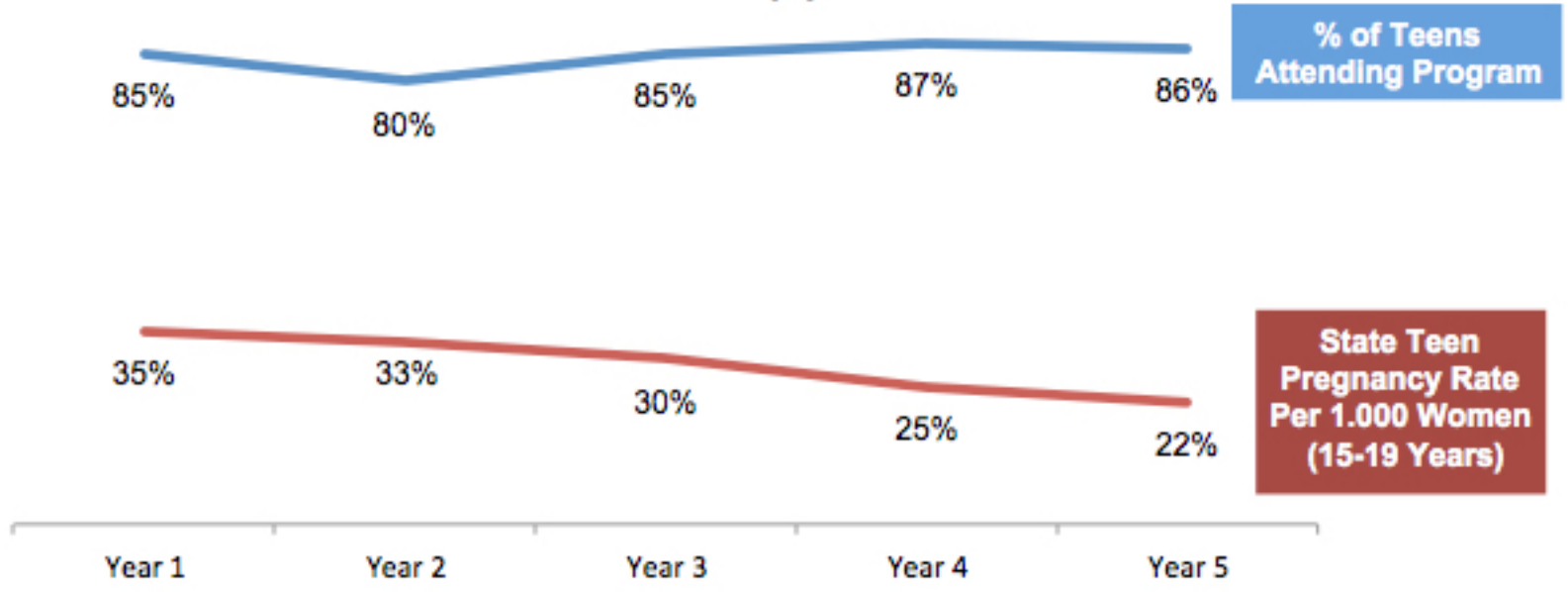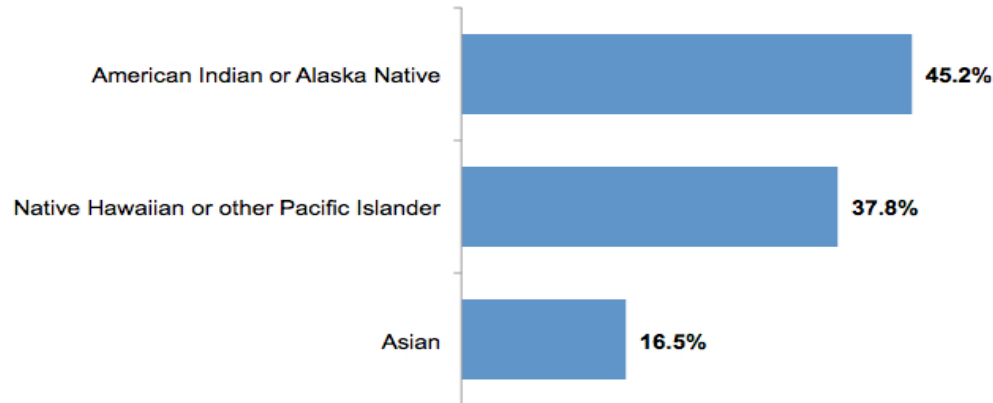
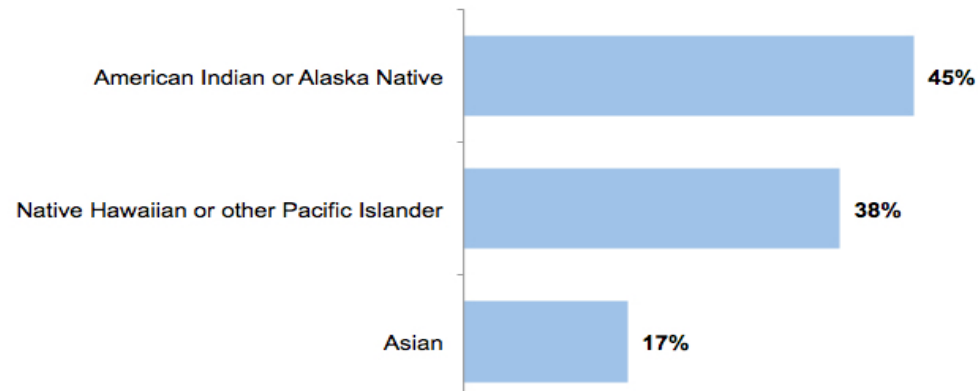**Example Data NOT Actual**

Displaying Unnecessary Precision

Too Much Detail is Not Required and Can Be Distracting

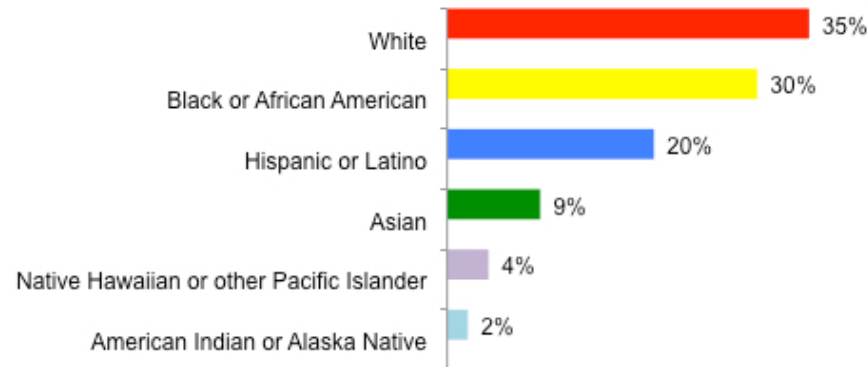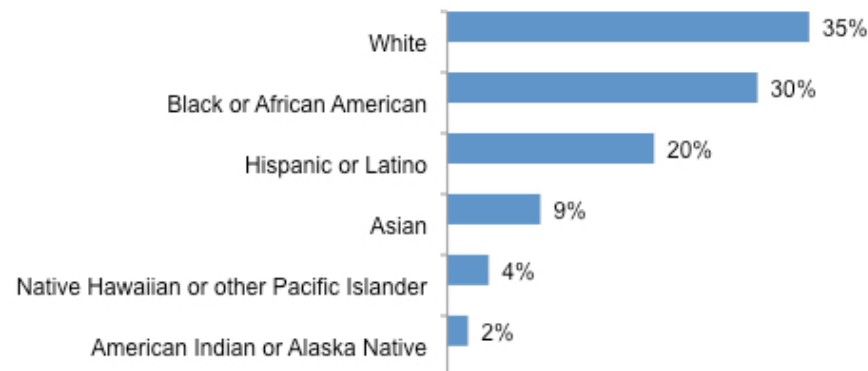American Indian or Alaska Native — 45.2%

Native Hawaiian or other Pacific Islander — 37.8%

Asian — 16.5%

Keep it Simple

American Indian or Alaska Native — 45%

Native Hawaiian or other Pacific Islander — 38%

Asian — 17%

Example Data NOT Actual

Misuse and Overuse of Color

The Overuse of Color Can Be Distracting

- White — 35%
- Black or African American — 30%
- Hispanic or Latino — 20%
- Asian — 9%
- Native Hawaiian or other Pacific Islander — 4%
- American Indian or Alaska Native — 2%

When What We Want Viewers to See Is the Shape of The Data

- White — 35%
- Black or African American — 30%
- Hispanic or Latino — 20%
- Asian — 9%
- Native Hawaiian or other Pacific Islander — 4%
- American Indian or Alaska Native — 2%

Example Data NOT Actual

Incorrect Encoding of the Data
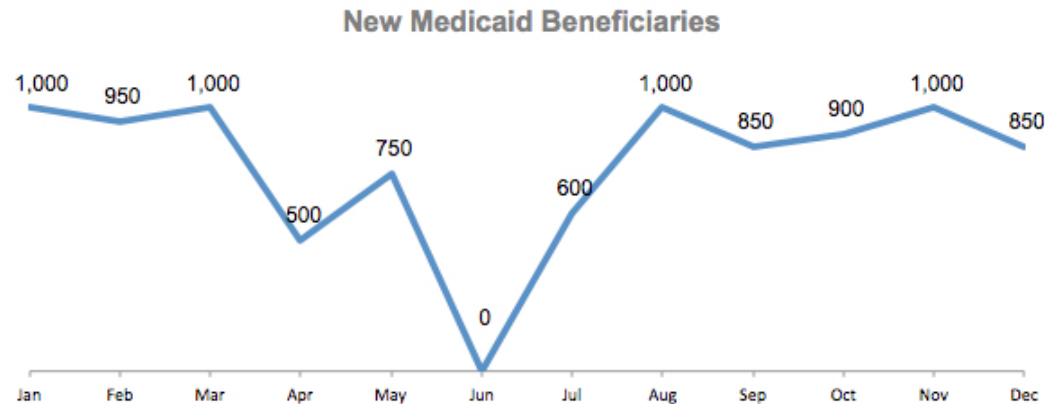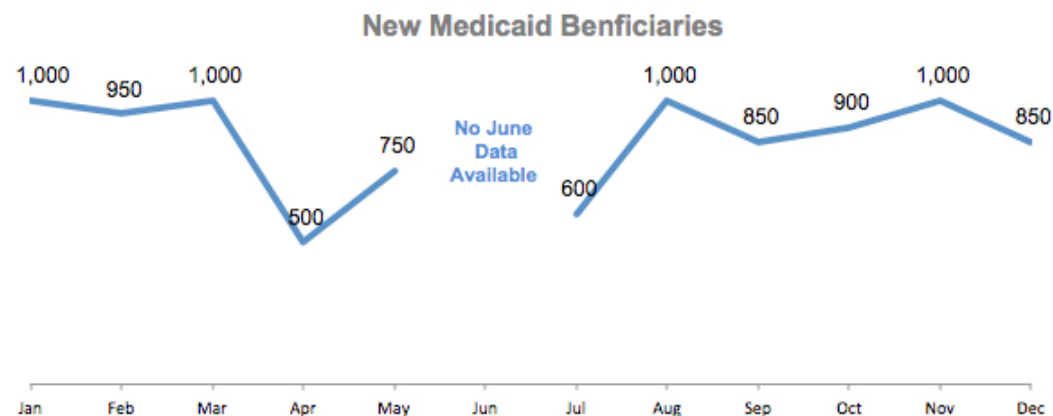
Example Data NOT Actual

Using Incorrect Statistics

**Medicaid Beneficiaries
Inpatient Length of Stay (Days)
Community v. Academic Hospitals**
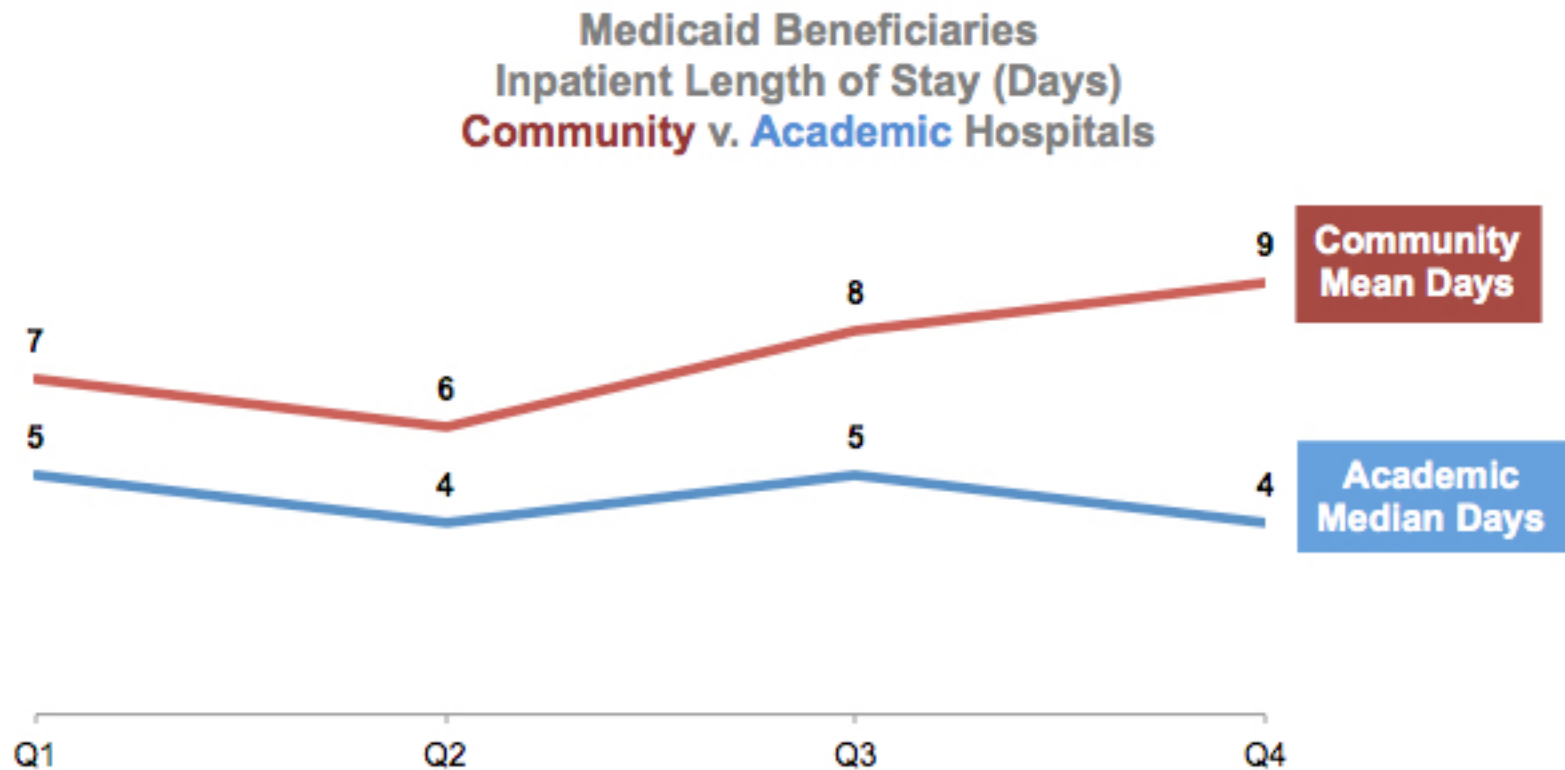
Example Data NOT Actual

A Few Other Pitfalls to Avoid

- Trying to do **too much** in one project

- Not having the **right subject matter experts and stakeholders** involved on a project (from day one)

- Trying to display **too much information** and **detail**

- Not having a clear authority who can **off sign-off** on a dashboard design, build and deployment strategy

Beware of the Weeds

Dashboard are *Executive Summaries* of the information stakeholders need to monitor *At-a-Glance*

Therefore it is essential to:

- Know the **categories** data may be summarized by -- stay anchored in them

- Have an awareness that **too many details** can crowd out the overview summary that is needed

- Remember the details aren't lost, rather, accompanying reports and lists provide **supporting information**

Don't Attempt to "Boil The Ocean"

Select Initial Projects Thoughtfully And Set a Steady Pace

For dashboards try a 3 x 3 x 3 month approach:

- 3 months to research, understand and prove what is possible

- 3 months to a **final**/production ready dashboard

- 3 months to socialize what you have created with users and **foster adoption**

For infographics and reports, try a faster 1 x 1 x 1 month approach

Failure to Identify & Engage the Right Team Will Jeopardize Your Projects

Failure to Identify Who Will Have Final Sign-Off

- Building **consensus** is great

- But at the end of the day someone must have the **authority for FINAL sign-off**

- **Otherwise your entire project may never see the light of day!**

Create Feedback Loops For Improving Your Work

CELEBRATE YOUR SUCCESS!

Healthier Washington Data Dashboard

Washington State's journey to create a data dashboard.

Kirsta Glen, Aim Director

Decided to build a Data Dashboard to provide actionable information:

Supports Washington's community health transformation **by building a regularly refreshed,** interactive dashboard tool

Goal: meet data and performance measurement needs of Washington's Accountable Care Organizations (ACHs)* under SIM grant.

* ACHs are composed of managed care organizations, providers, and many other community organizations. They are focused on improving health and transforming care delivery for the populations that live in their regions.

Requirements of Dashboard

- Publically reportable information

- ACH as primary customer

  - Variety of technical skills

  - Interested in community geographic detail

  - Members include public health, clinical, and other local service providers

- Use state health and claims data resources

- Focus initially on state Common Measure set

The Journey

- 2015 start of SIM grant with three staff members:

    - Subject matter expertise

    - IT knowledge

    - Project Management

- Advantages:

    - Well articulated goal

    - Support of leadership

    - Funding

How to quickly complement skills of team to create an interactive dashboard?

- Providence Health & Services Center for Outcomes Research and Education (CORE)

- Contract

  - Calculate measures (analysis)

  - Build dashboard in Tableau (visualization)

  - Knowledge transfer for AIM analysts (sustainability)

Rollout

- June 2016 first quarterly release

- Target to have at least three new measures a quarter and increased functionality

- Added some health outcome measures and diagnosis rates

- Technical documentation

- Underlying data file (in process)

  - Suppressed

  - Unsuppressed

- Trend data (future)

HEALTHIER WA DASHBOARDS – Front Page

HEALTHIER WA DASHBOARDS –
Some of the Options

Population Explorer
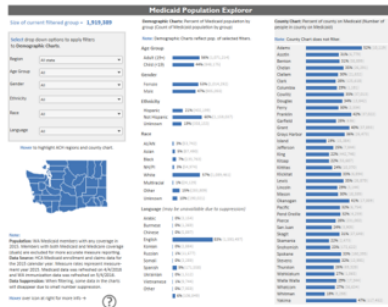
Measure Explorer
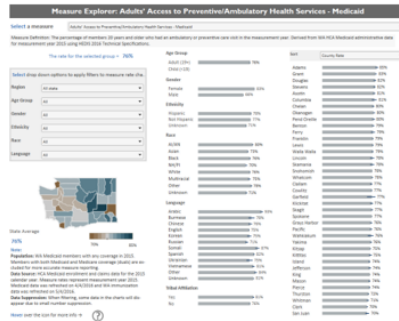
Statewide Measures
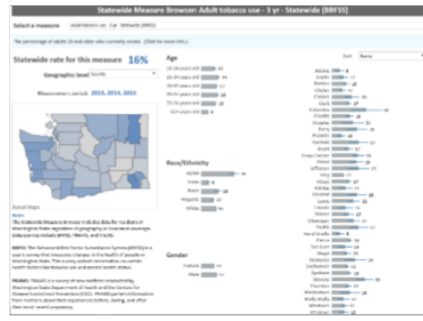
Measure Maps
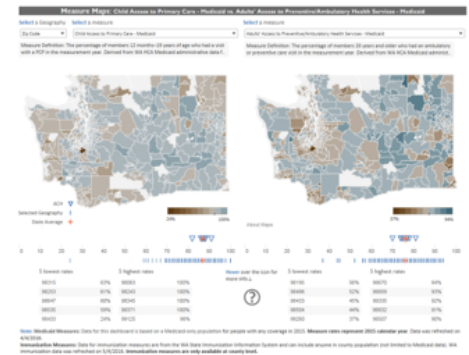
One Example: Side-by-Side Comparison of Measures by Geography
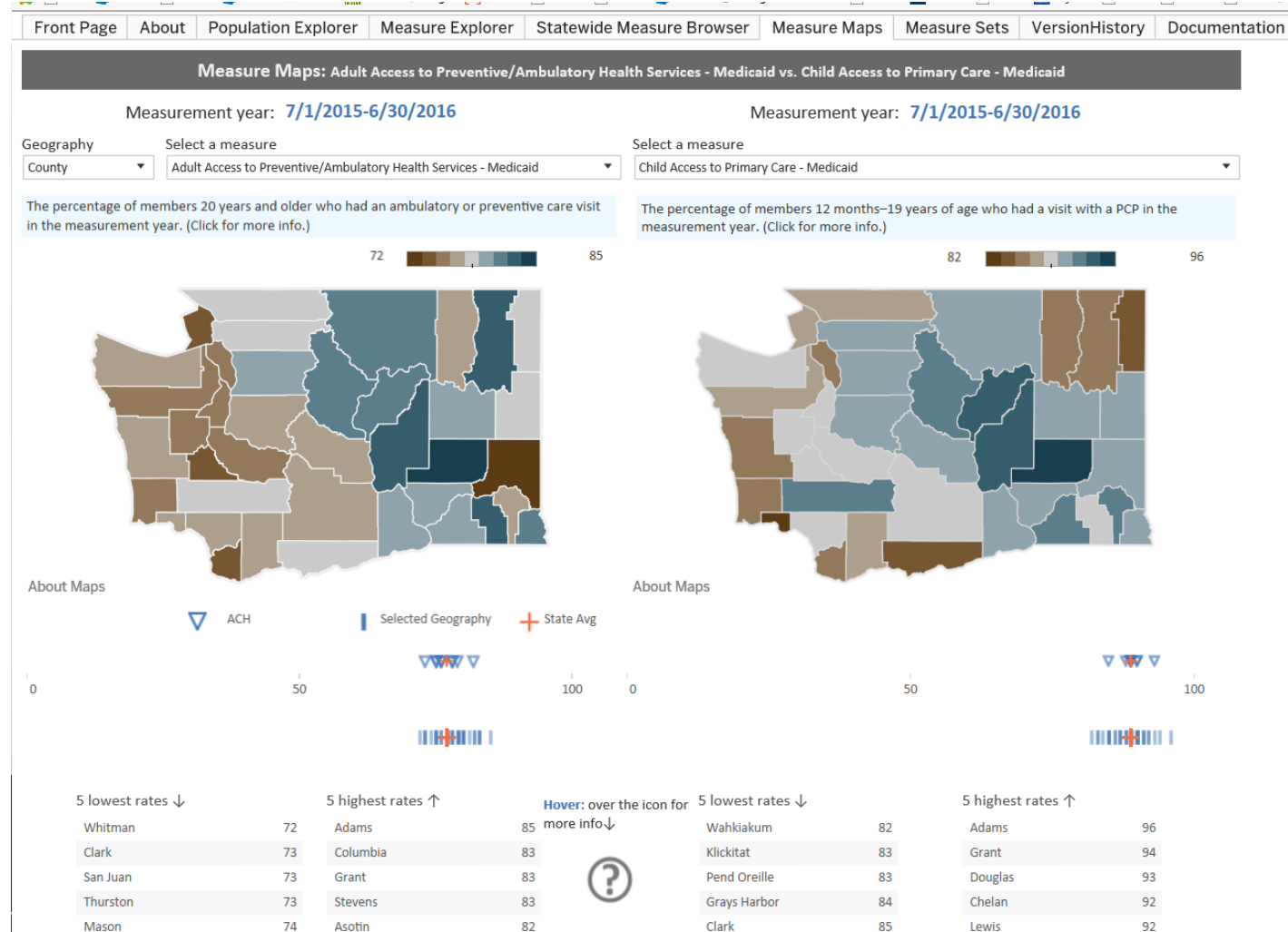
What We Are Glad We Did

- Used contractor initially; and chose contractor with health claims dashboard experience

- Built team analytic skills over time, and used contractor as mentor

- Based dashboard on our own data

- Carefully constructed underlying database

- Worked closely with customer user-group

- Fully leveraged strengths of visualization tool

- Planned for multiple releases and evolution

Lessons Learned

- Analytic capacity takes time to build

- Clear roles and responsibilities for contractor/home team

- Clear communication and project management between teams

- Customer needs change over deployment timeline

- Align work with other burgeoning dashboards

- Importance of growing external communication

- Technical documentation

- First step in a long process, create flexible and nimble product

Building the Team

Since Spring 2016 we have:

- Hired seven data analysts with broad skills and expertise in large claims based data bases; health services and policy analysis; pharmacy; epidemiology and public health; and actuarial analysis.

- Partnered with other teams in agency who have expertise in health system transformation initiatives; regulations; contracting; finance; eligibility; and clinical care Aligned with an agency initiative to build out data and analytic environment and improve data governance.

- Aligned with an agency initiative to build out data and analytic environment and improve data governance.

The Future

- Sustainable vision and commitment

- Sustainable funding

- Staffing

  - Competition for talent

  - Analytics as a "team sport"

  - Understanding of a broad array of expertise across many skill sets and disciplines

- Aligning with related efforts

Summary and Wrap-Up

Final Takeaways

- Build a strong data analytic team

- Consider external partners

- Establish a process for data discovery and analysis

- Beware of incomplete or misleading data

- Continuous improvement is key

Questions?

Thank You

Thank you for joining today's webinar!

Please take a moment to complete

the post-webinar survey.

We appreciate your feedback!

For more information & resources, please
contact MedicaidIAP@cms.hhs.gov