Medicaid Innovation Accelerator Program (IAP)

Substance Use Disorders (SUD) Targeted Learning Opportunities (TLO)

TLO #8: Merging Data Sources
Logistics

• Please mute your line and do not put the line on hold
• Use the chat box on your screen to ask a question or leave comment
  – Note: chat box will not be seen if you are in “full screen” mode
  – Please also exit out of “full screen” mode to participate in polling questions
• Moderated Q&A will be held periodically throughout the webinar
• Please complete the evaluation in the pop-up box after the webinar to help us continue to improve your experience
Moderator

- Tami Mark, PhD
- Vice President & Research Director, Evaluation and Economic Research Unit, Truven Health Analytics
Speakers

• David Mancuso, PhD
• Director, Division of Research and Data Analysis, Washington State Department of Social and Health Services
Speakers

• Jon Collins, PhD
• Manager, Health Programs & Measurement, Office of Health Analytics, Oregon Health Authority
Speakers

• Minakshi Tikoo, PhD

• University of Connecticut
  – Director, Business Intelligence & Shared Analytics
  – Health and Human Services Health Information Technology Coordinator
  – Professor, School of Nursing
Agenda

• The Utility of Merging Data Sources
• State Experience: Washington
  – Discussion Break
• State Experience: Oregon
  – Discussion Break
• State Experience: Connecticut
  – Discussion Break
• Wrap Up & Resources
Webinar Goals

- Participants will discuss benefits of linking data sources to Medicaid SUD data
- Participants will learn about different state strategies for linking data
The Utility of Merging Data Sources

Tami Mark, PhD
Evaluation and Economic Research Unit
Truven Health Analytics
Barriers to Merging Data Sources

**Resources**
- Staffing
- Time
- Political Support
- Funding

**Confidentiality**
- Working within the confines of 42 CFR Part II

**Technical Complexity**
- Linking claims and encounter records
- Varying quality of data sources

Describing the utility of the linked data is key to overcoming these barriers
State & Local Payers
Fund a Large Portion of SUD Treatment

Distribution of Spending by Payer, 2014

<table>
<thead>
<tr>
<th>SUD Spending</th>
<th>All-Health Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>16.5%</td>
<td>33.5%</td>
</tr>
<tr>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>5%</td>
<td>21%</td>
</tr>
<tr>
<td>25%</td>
<td>19.5%</td>
</tr>
<tr>
<td>28.5%</td>
<td>6%</td>
</tr>
<tr>
<td>11%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Percent Distribution:
- Out-of-Pocket
- Private Insurance
- Other Private
- Medicare
- Medicaid
- Other State/Local
- Other Federal

Much of SUD Treatment Costs Are Paid to Specialty Clinics & Providers

Distribution of SUD Treatment Spending, by Specialty and Non-Specialty Providers, 2014

- **Specialty Providers**
  (Psychiatric hospitals/units, psychiatrists, psychologists, social workers, MH/SUD outpatient or residential treatment)

- **Non-Specialty Providers**
  (General hospitals and outpatient clinics, PCPs)

Utility of Linked Data: Example Policy Questions

- What are the **service utilization trends** for SUD patients?

- Are patients being reimbursed under Other/State and local payments that are enrolled in Medicaid?

- Is there a disproportionate share of uninsured patients being treated in SUD specialty provider sector? Are they eligible for Medicaid?

- What are the outcomes from providing SUD treatment under Medicaid?

- What is the return on investment from providing SUD treatment under Medicaid?
Treatment Episode Data Set (TEDS)

- Client-level data
  - Demographic, substance abuse, socioeconomic characteristics
  - Reported at endpoints of treatment
  - Collected in state administrative data systems
- Two data sets
  - Admissions records
  - Discharge records

- Treatment programs receiving any public funds are requested to provide TEDS data on publicly & privately funded clients
- Mandatory key fields
  - Client identifier, client transaction type, type of service/setting, admission & discharge dates, date of last contact, state provider identifier, state code, reporting date
National Outcome Measures (NOMs)

- Provides outcomes measures on 10 domains for all state and federal block grant and formula grant programs

- Select Domains
  - Reduced Morbidity
    - Outcome: Abstinence from alcohol/drug use
    - Measure: Absolute percent change of clients not using between admission & discharge
  - Retention
    - Length of stay, successfully completing treatment plan
  - Employment
    - Increased/retained employment
  - Crime & Criminal Justice
    - Decreased arrests
Case Study: Tracking Outcomes Post Detox

- Integrated database built from claims and other client-level data
- Data included for all clients receiving services from state MH/SA agencies in DE, OK and WA
- Analyzed rate of detox readmissions, factors associated with readmissions

Case Study: Tracking Outcomes Post Detox

Index Detox

Readmission Events:
25% of clients receiving follow-up
28% of clients without follow-up

Readmission for Second Detox

- 73% of sample did not receive follow-up care
- Clients receiving follow-up treatment experienced longer time to readmission
Polling Question

• Has your state begun linking / merging different data sources?
  – Yes, we have an operational system
  – Yes, we are building a system
  – No, but we are discussing the process
  – No, this is not a high-priority area for us
State Experience Linking Data: Washington

David Mancuso, PhD,
Director, Division of Research and Data Analysis,
Washington State Department of Social and Health Services
Agenda

• Motivation to Integrate Data
• Assessing Capacity
• Designing Meaningful Measurement Concepts
• Primary Uses
  – Descriptive Policy Analysis
  – Program Evaluation
  – Predictive Modeling and Clinical Decision Support
  – Performance Management
• Challenges & Keys to Success
Motivation to Integrate Data

• High Costs and Complex Needs
  – Program costs are often driven by a small proportion of clients with multiple risk factors and service needs
  – High-cost clients often have significant social support needs
  – Persons dually eligible for Medicare and Medicaid comprise a disproportionate share of high-risk, high-cost Medicaid beneficiaries

• Increased emphasis on quality/outcome measurement and performance-based payment structures

• States need analytic capability beyond traditional siloed data warehousing, business intelligence applications
Assessing Capacity for Integrated Data Analytics

**Support**
- Build support among agency data owners
  - Connect analytic investments to agency business needs
  - Ensure agency subject matter experts inform analytics strategies
  - Invest in agency staff expertise and capabilities
  - Leverage opportunities for external support to maintain and extend capabilities

**Staffing**
- Advanced degrees in quantitative social and health science disciplines
- Analytical programming skills focused on complex data transformation and massive-scale data processing
- Interest in public policy

**Expectations**
- Implementation timelines
- Scale of potential cost savings
- Resources required to maintain analytical environment in production
- Impact on state agency subject matter expert resources
Creating Analytically Meaningful Measurement Concepts

**Services**
- DD
- TANF
- SNAP
- Child Welfare
- Medical

**Housing**
- Homeless
- Stable

**Work**
- Hours
- Employment
- Earnings
- Unemployment

**Demographics**
- Gender
- Race/Ethnicity
- Age
- Language

**Geography**
- County
- Legislative District
- Locale
- Urban/Rural
- Community Risk Factors

**Health**
- Diagnoses
- ED Visits
- Disability
- Mental Illness
- Substance Use
- Primary Care
- Medications
- Hospitalization
- Chronic Conditions
- Pain

**School**
- Grades
- Test Scores
- Progress
- Stability
- Attendance
- Special Needs

**Family**
- Siblings
- Births
- Relationships
- Deaths

**Crime**
- Misdemeanors
- Incarcerations
- Arrests
- Felonies
- Convictions

**Medicaid.gov**
- Keeping America Healthy

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Big Picture: Integration Across Multiple Databases

- School Outcomes (Preschool – College)
- Charges
- Incarcerations
- Dental Services
- Managed Care
- Hospital Inpatient/Outpatient
- Prescription Drugs
- Physician Services
- Community Supervision
- Hours
- Wages
- Births
- Deaths
- Housing Assistance
- Emergency Shelter
- Transitioanal Housing
- Vouchers
- Multi-Family
- Project-Based
- Permanent Supportive Housing
- Housing Choice Vouchers
- Public Housing
- Washington State Patrol
- Departments
- DSHS
- Aging and Long-Term Support
- Developmental Disabilities
- Children’s Services
- Behavioral Health and Service Integration
- Economic Services
- Juvenile Rehabilitation
- Vocational Rehabilitation
- Nursing Facilities
- In-home Services
- Community
- Residential
- Functional Assessments
- Case Management
- Community Residential Services
- Personal Care Support
- Residential Habilitation Centers and Nursing Facilities
- Child Protective Services
- Child Welfare Services
- Adoption
- Adoption Support
- Child Care
- Out of Home Placement
- Voluntary Services
- Family Reconciliation Services
- Assessments
- Detoxification
- Opiate Substitution Treatment
- Outpatient Treatment
- Residential Treatment
- Child Study Treatment Center
- Children’s Long-term Inpatient Program
- Community Inpatient Evaluation/Treatment
- Community Services
- State Hospitals
- State Institutions
- Food Stamps
- TANF and State Family Assistance
- General Assistance
- Child Support Services
- Working Connections Child Care
- Institutions
- Dispositional Alternative
- Community Placement
- Parole
- Medical and Psychological Services
- Training, Education, Supplies
- Case Management
- Vocational Assessments Job Skills
Utility of Integrated Administrative Data

1. Descriptive Policy Analysis
   - Explore cross-system risks, service utilization, outcomes
   - Develop algorithms adding analytical value to raw data

2. Program Evaluation
   - Randomized trial simulation w/ matching methods
   - Mitigating impact of selection bias on casual interferences

3. Predictive Modeling & Clinical Decisions
   - PRISM
   - Stability risk models: employment, housing

4. Performance Measurement
   - Access to services, quality of care
   - Social and health outcomes

Explore cross-system risks, service utilization, outcomes.
Develop algorithms adding analytical value to raw data.
Randomized trial simulation w/ matching methods.
Mitigating impact of selection bias on casual interferences.
Access to services, quality of care.
Social and health outcomes.

PRISM
Stability risk models: employment, housing.
Descriptive Policy Analysis

Designed to describe client experiences in a given policy environment

- As opposed to making causal inferences about program effectiveness or impact of policy changes on client outcomes

Requires development of new analytical concepts with broader applicability as risk factors or outcome measures in future impact analyses

- For example, creating behavioral health risk indicators or housing stability metrics

First stage of analysis when exploring newly available areas of data integration

- For example, describing education outcomes for youth receiving different types of social and health services
Program Evaluation

Randomized Trial Simulations Using Matching Approaches

**Employment Rate**
- Unmatched Control Group
- Matched Control Group
- Intervention Group

**Average Annual Earnings**
- Unmatched Control Group
- Matched Control Group
- Intervention Group

Graphs showing employment rate and average annual earnings over academic years.
Program Evaluation: Care Coordination

- Care Coordination Program for WA Medicaid enrollees reduced inpatient hospital costs
  - Statistically significant reduction in hospital costs
  - Promising reduction in overall Medicaid medical costs

<table>
<thead>
<tr>
<th>OVERALL Savings</th>
<th>Cost Detail Estimated per member per month impact</th>
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</thead>
<tbody>
<tr>
<td>TOTAL MEDICAL</td>
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<tr>
<td>− $248</td>
<td>+ $23</td>
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<tr>
<td></td>
<td>Nursing Home</td>
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<tr>
<td></td>
<td>All Long-Term Care Costs</td>
</tr>
<tr>
<td></td>
<td>− $18</td>
</tr>
<tr>
<td></td>
<td>Inpatient Hospital Admission</td>
</tr>
<tr>
<td></td>
<td>− $318</td>
</tr>
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</table>
Program Evaluation

Considerations

Randomized evaluation designs are rarely available, so primarily use matching-based “quasi-experimental” approaches.

A pre/post design without a comparison group is rarely adequate, especially if the intervention group is targeted based on extreme baseline behavior.

Fundamental challenge to building a credible evaluation is identify a valid comparison group.

Matching approach is extremely intuitive, but does not fully address the fundamental issue of selection bias.

Critical to understand the process that “selects” clients into the intervention under study, and to use this knowledge to define a credible comparison group.
Predictive Modeling & Clinical Decision Support: PRISM Example

• Rapid-cycle predictive modeling and data integration delivered in a clinical decision support web application

• Data sources
  – Medical, mental health, LTSS services from multiple IT systems
  – Medicare data for duals
  – Housing status

• Data are refreshed weekly for the entire Medicaid population

• Dynamic alignment of patients to health plans and care coordination organizations, with global patient look-up capability for providers
Selected PRISM Uses

- Triaging high-risk populations through predictive modeling to more efficiently allocate scarce care management resources
- Informing care planning and care coordination for clinically and socially complex persons through integrated and intuitive display of risk factors, service utilization and treating providers
- A source of regularly updated client and provider contact information to support outreach, engagement and coordination efforts
- Identification of child health risk indicators including mental health crises, substance abuse, excessive ED use, and nutrition problems
- Medical evidence gathering for determining eligibility for disability programs
Predictive Modeling

Is the risk model sufficiently predictive to be actionable?

Are the identified risk factors actionable?

Improving risk scoring transparency to the end user may be more important than maximizing predictive accuracy

Invest in staff readiness to use data in decision-making

Incorporate user feedback in designing information display

Recognize potential limitations in the timeliness and completeness of available administrative data
Performance Measurement: Outpatient Emergency Department Visits

ED utilization among SSI clients is driven by behavioral health risk

AGES 18-64 • Visits per 1,000 Member Months

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<tbody>
<tr>
<td>Mental Health Need</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>169.9</td>
<td>153.4</td>
<td>149.6</td>
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<tr>
<td>SUD Need</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>278.5</td>
<td>253.6</td>
<td>241.3</td>
</tr>
<tr>
<td>Co-Occurring Mental Health and SUD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>296.5</td>
<td>270.9</td>
<td>258.1</td>
</tr>
<tr>
<td>No Behavioral Health Disorder</td>
<td>45.6</td>
<td>41.9</td>
<td>44.1</td>
</tr>
</tbody>
</table>

SOURCE: DSHS Research and Data Analysis Division, Managed Medical Care for Persons with Disabilities and Behavioral Health Needs: Preliminary Findings from Washington State, JANUARY 2015.
Performance Measurement

Considerations

Outcome over process

Objective over subjective

Using administrative data may minimize cost and promote comparability across accountable entities

Use of national standard where feasible

Case-mix adjustment reduces incentives for accountable entities to avoid serving high-risk clients

Performance measurement algorithms require ongoing updating and refinement
Data Integration Challenges: Keys to Success

**Trust**
- Building and maintaining trust among data owners

**Evolve**
- Maintaining an analytical data infrastructure in a constantly evolving policy, program and IT system environment

**Governance**
- Establishing effective governance structures

**Expertise**
- Data are plentiful – analytic skills informed by policy and program expertise are scarce
Polling Question

• What are the biggest challenges your state faces regarding data integration? Select all that apply.
  – Resources (money, time, staff)
  – Leadership buy-in
  – Quantitative expertise
  – Privacy concerns
  – Competing priorities
  – Other challenges
Discussion and Questions
State Experience Linking Data: Oregon

Jon Collins, PhD,
Manager, Health Programs & Measurement
Christopher Coon
Data Management Lead
Office of Health Analytics, Oregon Health Authority
Agenda

• Overview of the Measures and Outcomes Tracking System (MOTS)
• Details of Linking Data
• Analyzing Outcomes with MOTS
• Challenges & Lessons Learned
Overview of the Measures and Outcomes Tracking System

• MOTS is a comprehensive electronic data system used by behavioral health service providers in Oregon to:
  – Improve care
  – Control costs
  – Share information

• MOTS replaced the Client Process Monitoring System (CPMS)
  – CPMS was a 30 year-old system designed and maintained on a mainframe system
  – It no longer met the business needs of the organization
  – Did a good job of reporting TEDS
The Vision

TEDS Episode Data – Profile Data in MOTS

Medicaid Service Data - MMIS

Non-Medicaid Service Data - MOTS
Details of Linking Data:
Client Profile Data

- Agency or facility
- Name, date of birth, Medicaid ID
- Treatment status
- Race/ethnicity
- Gender
- Marital status
- Veteran status
- Employment
- Living arrangement
- Counties of residence and responsibility
Details of Linking Data: Behavioral Health Data

- **Service history**
  - Admission date, state, zip code
  - Referral information
  - Diagnosis, treatment plan
  - Peer delivered service
  - Intensity of service needed

- **Legal**
  - Legal status
  - DUI and arrest history
  - OR Driver License Number
  - State Police ID Number

- **Income and payment source, health insurance**
- **Interpreter needs**
- **Pregnancy status**
- **Number of dependents**
- **Tobacco and substance use history**
- **Academic attendance & improvement**
Details of Linking Data: Substance Use Disorders Data

- Substance problems
- Age of first use, frequency of use
- Route of administration
- Positive alcohol/drug tests, self-help programs
- DUI treatment completion date

- Medication assisted treatment
- Assessed and current level of care based on ASAM
- Children living in residential treatment with parents
Details of Linking Data: Non-Medicaid Services Data

- Date of service
- Procedure code
- Place of service
- Number of units and billed charges
- Diagnosis
- Mirrors Medicaid claims
The Vision

TEDS Episode Data
Profile Data in MOTS updated every 90 days of active service

Linked via dates of service and Medicaid ID

Linked via dates of service and MOTS ID

Medicaid Service Data
MMIS

Non-Medicaid Service Data
MOTS

Converted to episodes of active service via business rules and linked via common Medicaid ID
Communication Between Data & Payers

Client Entry Web Tool

(Client Entry)

Provider’s Electronic Health Record

Medicaid Data (MMIS)

Measures & Outcomes Tracking System

State Behavioral Health

Coordinated Care Organizations

Community Mental Health Programs

Medicaid.gov

Keeping America Healthy

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Analyzing Outcomes with MOTS

• Using data from MOTS, State Behavioral Health can track and analyze outcomes
  – Employment improvement
  – Education improvement
  – Stable housing
  – Criminal justice involvement
  – Access to and volume of services

• Equally important, the data can be shared back with Medicaid and non-Medicaid providers

• TEDS data or claims data could not do this alone
Challenges & Lessons Learned

• Does it really work that easily?
  – No, not really
  – Challenges
    • Matching up episodes of active treatment and profile data
    • Quality of data input

• 42 CFR Part II
  – The Oregon Health Authority operates with a consolidated Office of Health Analytics
    • A covered entity integrating data across all funding sources and healthcare areas associated with OHA
    • Any data shared back out of the organization is protected and managed by all the regular rules associated with HIPAA and 42 CFR Part II
Challenges & Lessons Learned

• Working with providers to switch to the new system
  – Challenges
    • Providers were not initially on-board with the change
    • Providers were not required to report non-Medicaid services under the old system
    • Providers needed to amend their data collections processes, including EHRs
  – Strategies to overcome challenges
    • Working with providers to teach them how to submit complete data
    • Reminding providers that the goal of MOTS is to generate data that is also useful to providers
    • MOTS is a work-in-progress but holds a lot of promise
Polling Question

• If your state is currently using an integrated database, which kinds of stakeholders receive system feedback? Select all that apply.
  – Providers
  – Criminal justice agencies
  – Social services agencies
  – Health services agencies
  – It does not directly feedback to agency
  – We are not using integrated databases
Polling Question

• If your state is using an integrated database, do you screen data for completion?
  – Yes, we have a benchmark data level
  – Yes, we use a standard form to ensure completeness
  – Yes, some other method
  – No / not sure
  – We are not integrating data at this time
Polling Question

• If your state is currently linking data, which databases are you integrating?
• Please use the ReadyTalk ‘Raise Your Hand’ feature to respond to this question.
Discussion and Questions
State Experience: Connecticut

Minakshi Tikoo, PhD
Health Information Technology Coordinator
Director, Business Intelligence & Shared Analytics
Health and Human Services
Agenda

• Motivation to Link Data
  – The Magic “Mantra” – Triple Aim
  – The Challenge

• Possible Solution:
  – Overview of Distributed Data Networks

• Where is Connecticut?

• Challenges
Motivation to Link Data

- The “Magic Mantra” – the Triple Aim
  - Requires increased sophistication in the use of data to simultaneously address the Triple Aim

- Improving population health
- Improving patient experiences
- Reducing costs
Challenges to Big Data Linkage

• Expensive to build warehouses to combine data
• Data is constantly changing requiring constant updates to data warehouse
• Wealth of data from state agencies
  – Not accounted for in a systematic manner
  – No or limited documentation
  – Need inventory and management process
• Quality of data limits analytics
• Work with small data before getting into big data
Data Integration: the Conceptual Model

Individuals
Data Sources

• Generic Information
• Primary Care
• Pharmacy
• Hospitals
• Specialty Care
• Laboratories
• Allied Health Care Settings
• HIEs
• PHRs

Data Integration

Education on data uses

Increased use & access to info across care settings

OUTCOMES
Seamlessly connected:
Effective, efficient, timely, equitable, safe, person-centered

Electronic copy of health information:
Diagnostic test results, problem & medication lists, medication allergies
Data Integration Using Distributed Data Networks

• Purpose
  – Improve ease of locating data and run analyses
  – Enables you to analyze data across data silos without aggregation

• Zato Health Interoperability Platform
  – Secure Federated Analysis Across Data Silos

• Cooperative computing ‘at the Edge’ with Cross-Network Information Fusion
  – Processing of indexes in parallel across data silos
## Advantages to Distributed Data Networks

<table>
<thead>
<tr>
<th>Traditional Approach</th>
<th>Cross-organizational Data Interoperability Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centralized processing</td>
<td>Decentralized processing</td>
</tr>
<tr>
<td>Standardized application for 1 org</td>
<td>Diverse applications among many orgs</td>
</tr>
<tr>
<td>Data warehouses &amp; data lakes</td>
<td>Health information sharing environments</td>
</tr>
<tr>
<td>Centralized privacy protection</td>
<td>Decentralized privacy protection</td>
</tr>
<tr>
<td>Centralized security</td>
<td>De-centralized security</td>
</tr>
<tr>
<td>N/A</td>
<td>Indexes are reusable, performance data are verifiable</td>
</tr>
<tr>
<td></td>
<td>Pricing model with multiple returns on investment</td>
</tr>
<tr>
<td></td>
<td>Decentralized analysis</td>
</tr>
<tr>
<td></td>
<td>Applications are freely distributed</td>
</tr>
</tbody>
</table>
Developing a system that answers all of our questions:

**Population**
- How many people do we serve within an agency?
- Number of unique people and families served

**Outcomes**
- Who is getting better? Who is getting worse?
- How? Why?
- Are there geographic variations?

**Costs**
- What are the costs?
- Are we buying the right services?
- Can we predict what needs to be in our service mix?
# Next Steps for Connecticut

## Data Types & Sources
- Claims
- Patient-level clinical data
- eCQMS
- Patient & provider satisfaction data
- Participating org-level data
- Community-level population-based data
- Other secondary data

## Data Integrator / Warehouse
Create a continuous quality improvement cycle with iterative feedback loops

## Outcomes
- **Performance Measurement domains**
- Data use for operations & evaluation
  - Quality improvement
  - Monitoring & management
  - Value-based purchasing
  - Policy development

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**Data** | **Information** | **Knowledge**
---|---|---

![Medicaid.gov](https://example.com/medicaid.gov)
Challenges

• Agencies do not want to share data
  – Data quality is questionable
  – Fear of looking bad

• Iterative learning process
  – Must acknowledge problems to find solutions
  – Logically connected, slow, build-up

• Support for continued systems development
  – Leadership & vision
  – Retaining talented workforce
Discussion and Questions
Polling Question

- Would your state be interested in having a post-webinar discussion with the speakers to address any additional questions or reflections on today’s webinar?
  - Yes
  - No
Resources

• **Integrating State Administrative Records to Manage Substance Abuse Treatment System Performance**, SAMHSA
  

• **Linking Client Data Records from Substance Abuse, Mental Health and Medicaid State Agencies**, National Council for Behavioral HealthCBH, SAMHSA
  
Resources

• *The California Treatment Outcome Project (CalTOP) Final Report, University of California, Los Angeles Integrated Substance Abuse Programs*
  
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