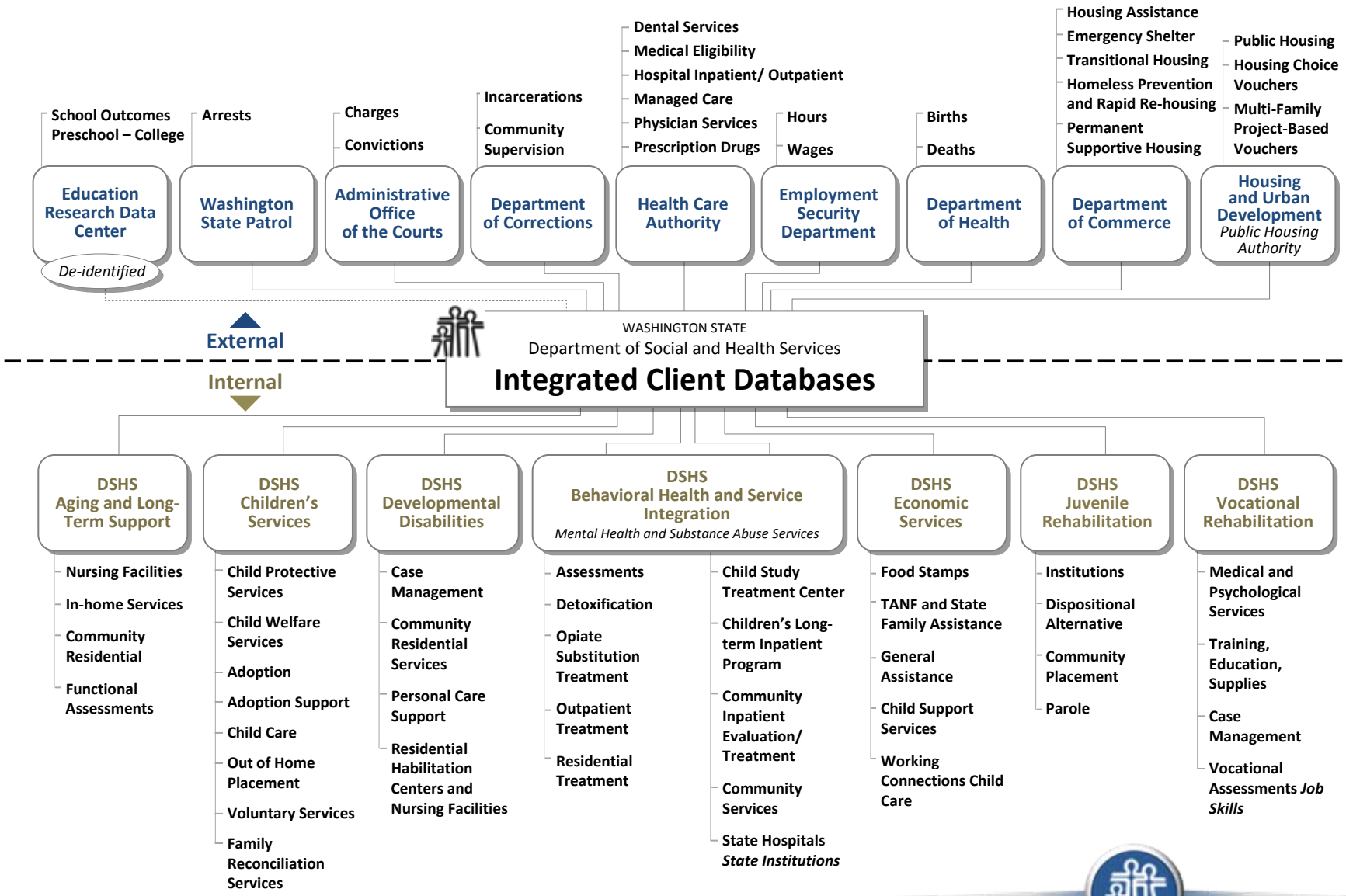
Supporting Delivery System Transformation Through Data Integration and Analytics

David Mancuso, PhD • May 10, 2016

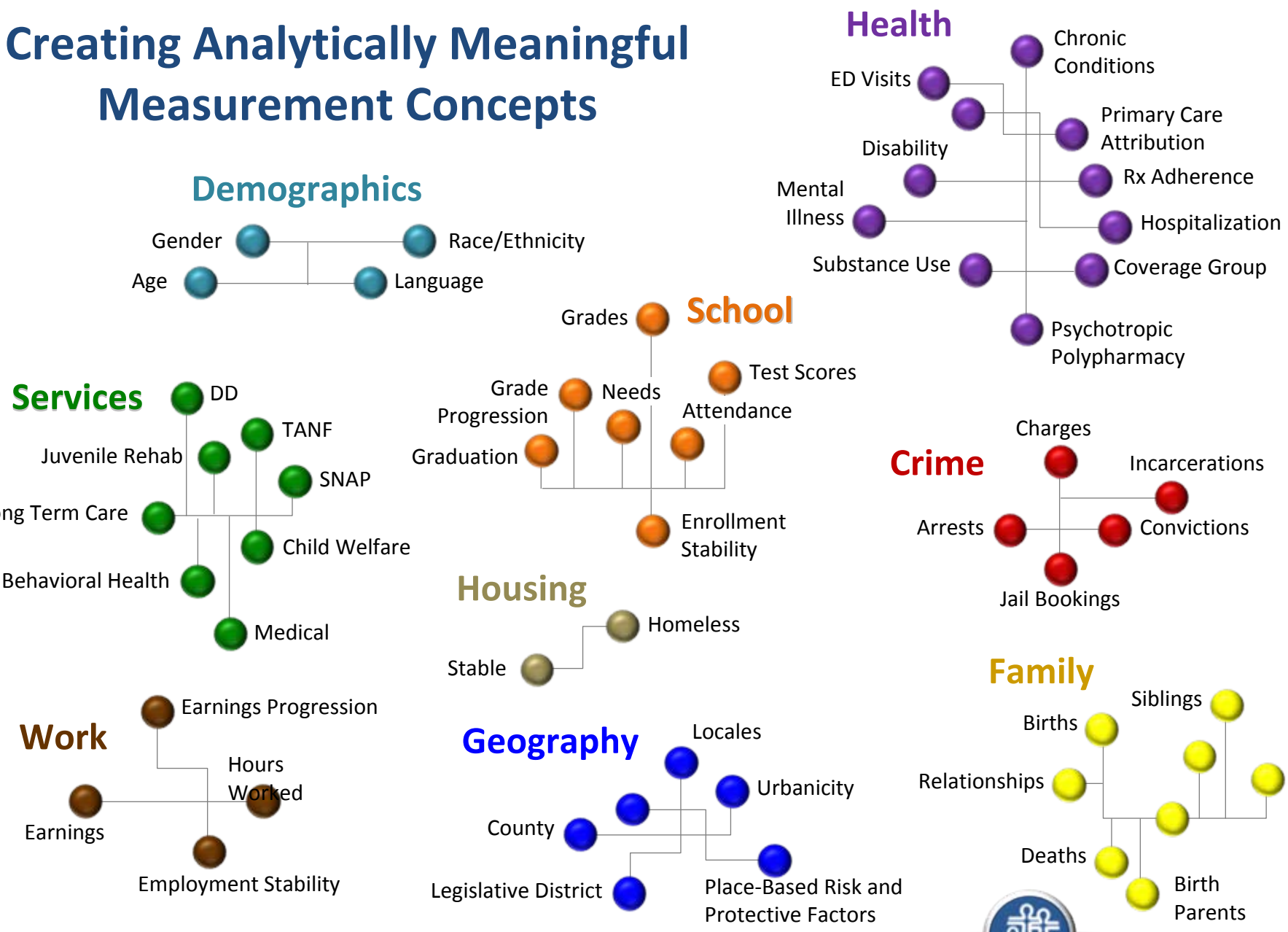
Analytics in the Medicaid Environment

- **Program costs are often driven by a small proportion of clients with multiple risk factors and service needs,** often exacerbated by extreme poverty, trauma, mental illness, substance use disorders, cognitive limitations or functional impairments
- **High-cost clients often have significant social support needs** such as the need for economic assistance, housing or employment support, or interventions to reduce the risk of criminal justice involvement
- **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**

RDA's Integrated Client Databases



Creating Analytically Meaningful Measurement Concepts



Data Integration Challenges

- Building and maintaining trust among data owners
- Establishing effective governance structures
- Maintaining an analytical data infrastructure in a constantly evolving policy, program and IT system environment
- Recruiting and retaining state agency staff with analytical expertise
- Finding contractors with program/policy subject matter expertise and familiarity with state agency data systems
- Data are plentiful – analytical skills informed by policy and program expertise are scarce

How do we use integrated administrative data?

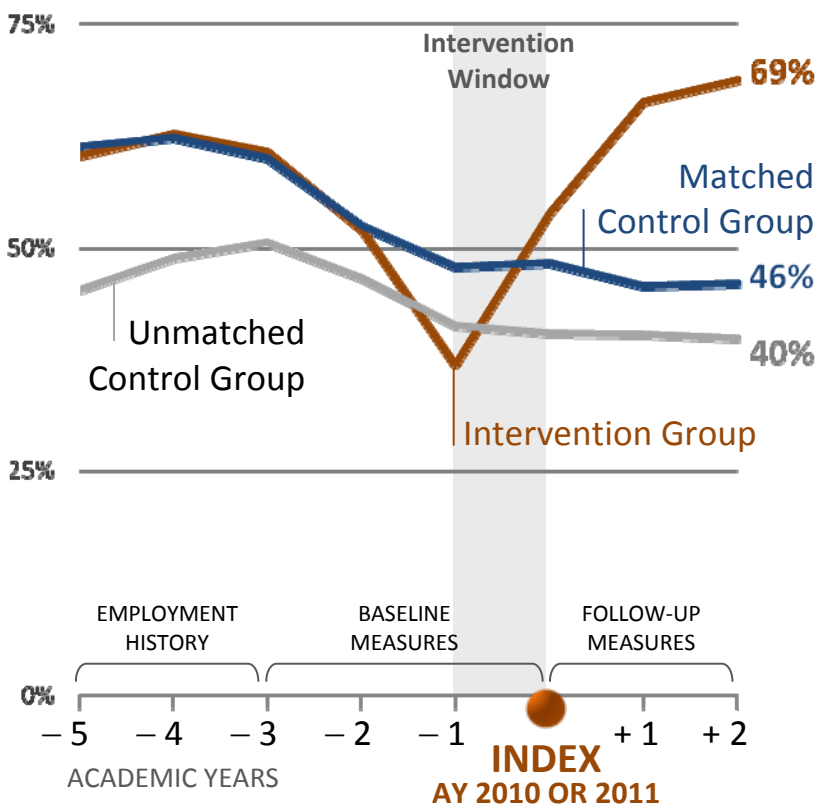
- **Program evaluation**
  - Randomized trial simulation using matching methods
  - More comprehensive integrated client-level data reduces impact of selection bias by making more client characteristics observable
- **Predictive modeling and clinical decision support**
  - PRISM
  - Housing stability risk models
- **Performance measurement**
  - Access to services
  - Quality of care
  - Outcomes

PART 1

Program Evaluation

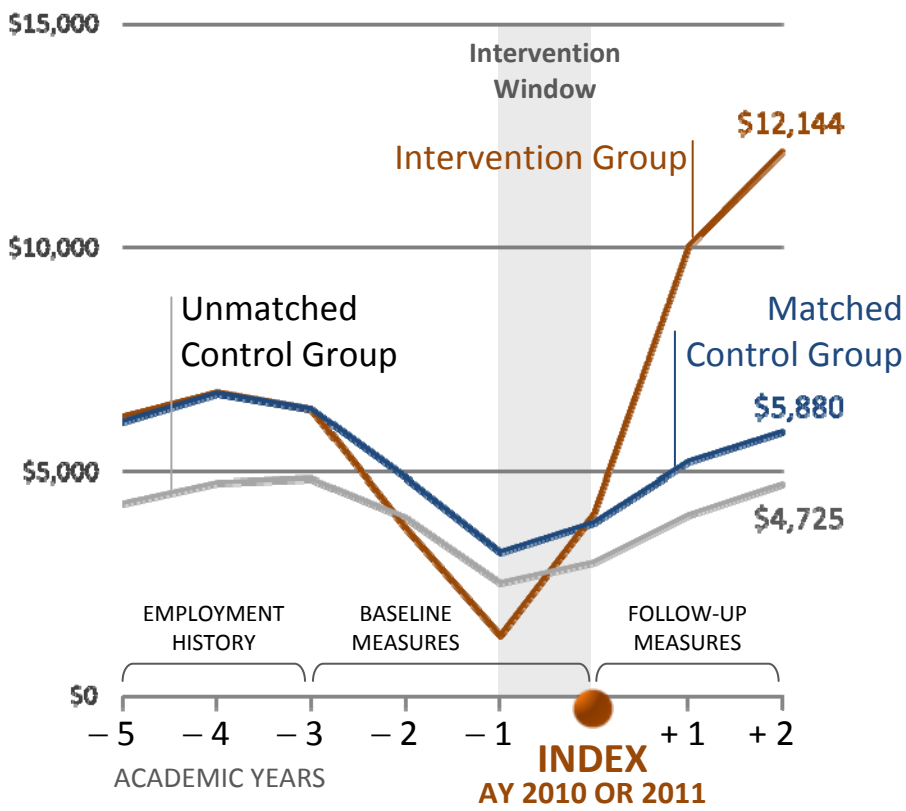
Randomized Trial Simulations Using Matching Approaches

Employment Rate



Average Annual Earnings

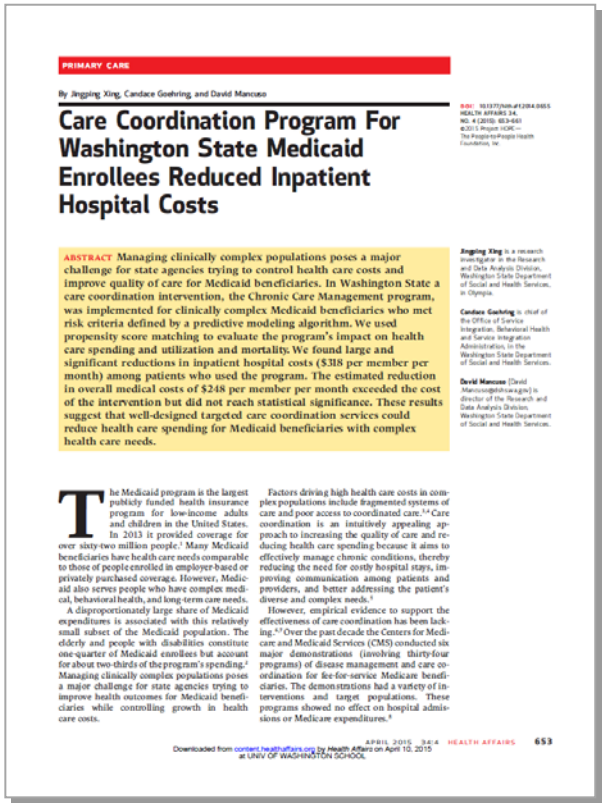
Includes $0 earnings



Randomized Trial Simulations Using Matching Approaches

Care Coordination Program for Washington State Medicaid Enrollees Reduced Inpatient Hospital Costs

- Statistically significant reduction in hospital costs
- Promising reduction in overall Medicaid medical costs



PRIMARY CARE

By Jingping Xing, Candace Goehring, and David Mancuso

Care Coordination Program For Washington State Medicaid Enrollees Reduced Inpatient Hospital Costs

ABSTRACT Managing clinically complex populations poses a major challenge for state agencies trying to control health care costs and improve quality of care for Medicaid beneficiaries. In Washington State a care coordination intervention, the Chronic Care Management program, was implemented for clinically complex Medicaid beneficiaries who met risk criteria defined by a predictive modeling algorithm. We used propensity score matching to evaluate the program's impact on health care spending and utilization and mortality. We found large and significant reductions in inpatient hospital costs ($318 per member per month) among patients who used the program. The estimated reduction in overall medical costs of $248 per member per month exceeded the cost of the intervention but did not reach statistical significance. These results suggest that well-designed targeted care coordination services could reduce health care spending for Medicaid beneficiaries with complex health care needs.

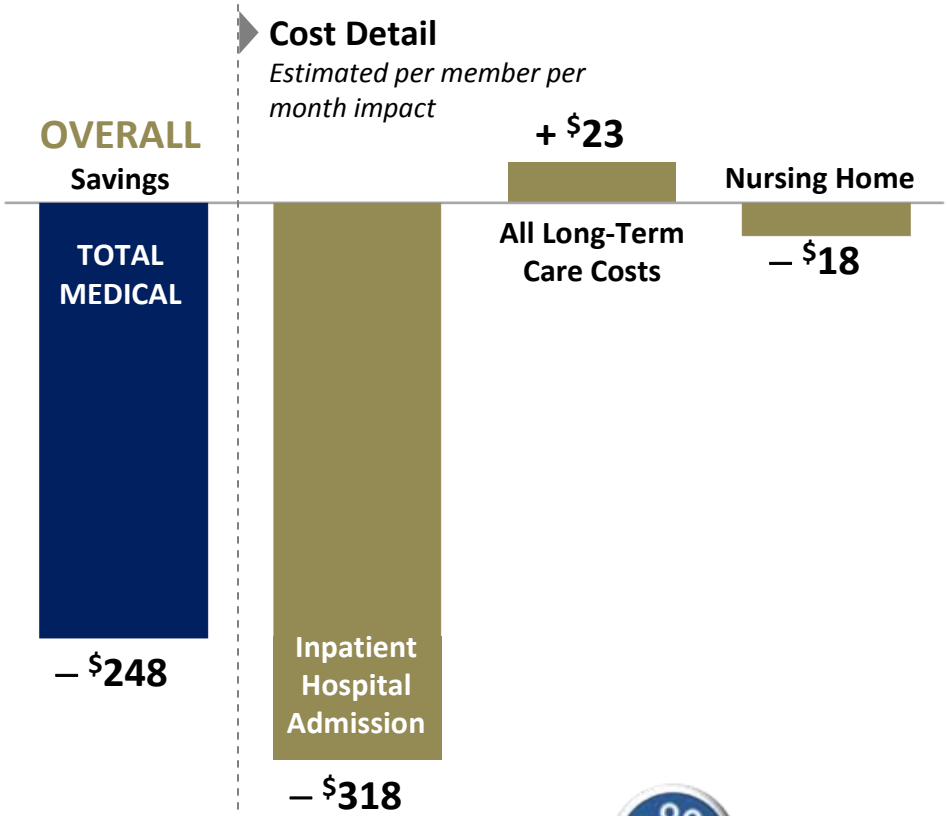
The Medicaid program is the largest publicly funded health insurance program for low-income adults and children in the United States. In 2013 it provided coverage for over sixty-two million people.[1] Many Medicaid beneficiaries have health care needs comparable to those of people enrolled in employer-based or privately purchased coverage. However, Medicaid also serves people who have complex medical, behavioral health, and long-term care needs.

A disproportionately large share of Medicaid expenditures is associated with this relatively small subset of the Medicaid population. The elderly and people with disabilities constitute one-quarter of Medicaid enrollees but account for about two-thirds of the program's spending.[2] Managing clinically complex populations poses a major challenge for state agencies trying to improve health outcomes for Medicaid beneficiaries while controlling growth in health care costs.

Factors driving high health care costs in complex populations include fragmented systems of care and poor access to coordinated care.[3,4] Care coordination is an intuitively appealing approach to increasing the quality of care and reducing health care spending because it aims to effectively manage chronic conditions, thereby reducing the need for costly hospital stays, improving communication among patients and providers, and better addressing the patient's diverse and complex needs.[5]

However, empirical evidence to support the effectiveness of care coordination has been lacking.[6,7] Over the past decade the Centers for Medicare and Medicaid Services (CMS) conducted six major demonstrations (involving thirty-four programs) of disease management and care coordination for fee-for-service Medicare beneficiaries. The demonstrations had a variety of interventions and target populations. These programs showed no effect on hospital admissions or Medicare expenditures.[8]

http://content.healthaffairs.org/search?submit=yes&fulltext=care+coordination+program+for+washington+state+medicaid+enrollees+reduced+inpatient+hospital+costs&x=0&y=0



Program Evaluation Challenges

- Randomized evaluation designs are rarely available, so we work primarily with matching-based "quasi□experimental" approaches.
- A pre/post design based on before/after comparisons for the intervention group is generally inadequate. This is particularly true if the intervention group is targeted based on extreme baseline utilization, as is commonly the case with super-utilizer interventions.
- The fundamental challenge in building a credible evaluation is identifying a valid comparison (quasi□control) group.
- The matching approach is extremely intuitive. However, it does not fully address the fundamental issue of selection bias.
- It is critical to understand the process that "selects" clients into the intervention under study, and to use this knowledge to define a credible comparison group.

PART 2

Predictive Modeling and Clinical Decision Support

Odds of Experiencing Homelessness after Aging Out of Foster Care

Study Timeline

Baseline risk measures
Prior 24 months

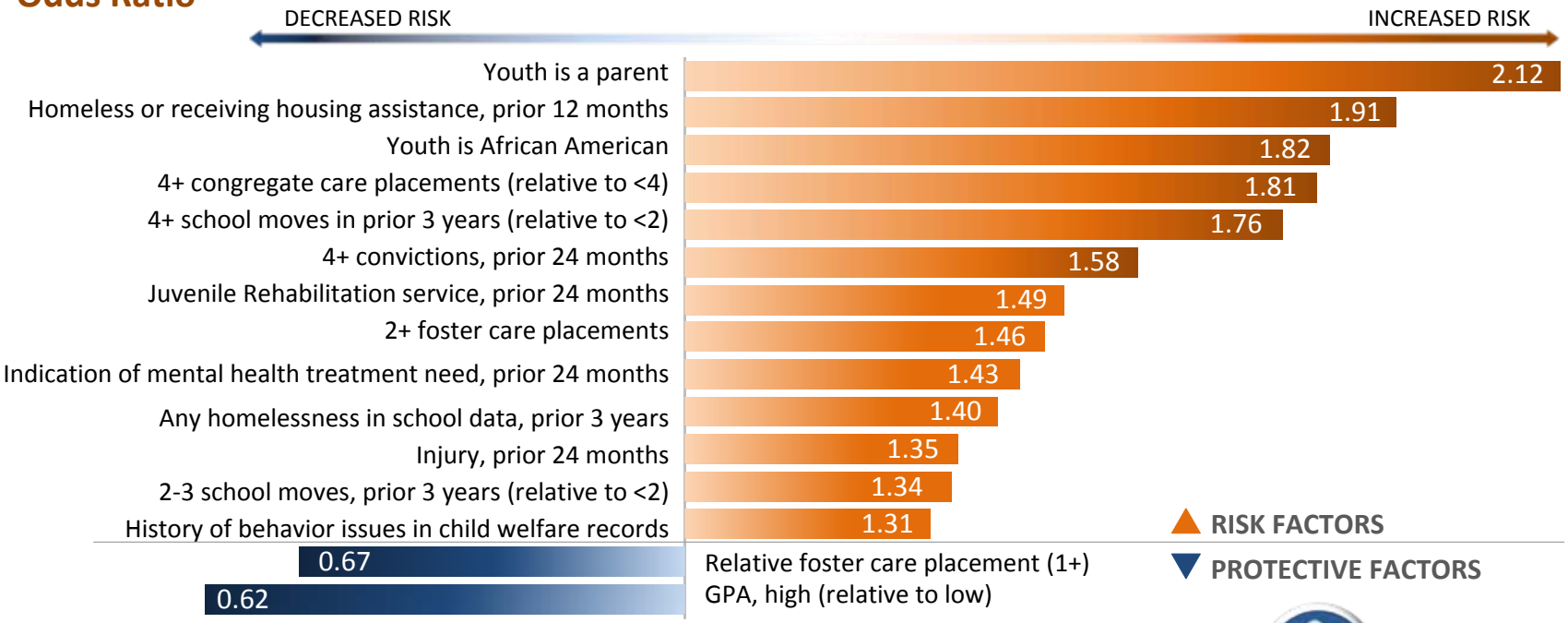
Experience in the school system
Prior 3 academic years

Child welfare history
Since first entering the child welfare system

INDEX MONTH
Last month of foster care placement
SFY 2011 or 2012

Q. *Homeless in following 12 months?*
*Starting the month **after** the index month*

Odds Ratio



PRISM: Rapid-Cycle Predictive Modeling and Data Integration in a Clinical Decision Support Web Application

- **Data sources**
  - Medical, mental health and LTSS services from multiple IT systems
  - Medicare Parts A/B/D data integration for dual eligibles
  - LTSS functional assessments
  - Housing status (including some local jail stay data) from the State's eligibility data system
- **Data refreshed on a weekly basis for the entire Medicaid population**
- **Dynamic alignment of patients to health plans and care coordination organizations, with global patient look-up capability for providers**
- **1,000 currently authorized users**
- **700,000 page views in past 12 months**

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
- **Identification of opiate abuse, psychotropic medication polypharmacy and poor medication adherence**

Getty Images

Predictive Modeling Considerations

- Are risk models sufficiently predictive to be actionable?
- Focus on the intervention strategy and the end user
  - Consider the tradeoffs between predictive accuracy and risk scoring transparency to the user
  - Prepare staff to use analytics in clinical decision making
  - Engage end users in the design of data display
- Predictive models require periodic recalibration and updating to changing source data

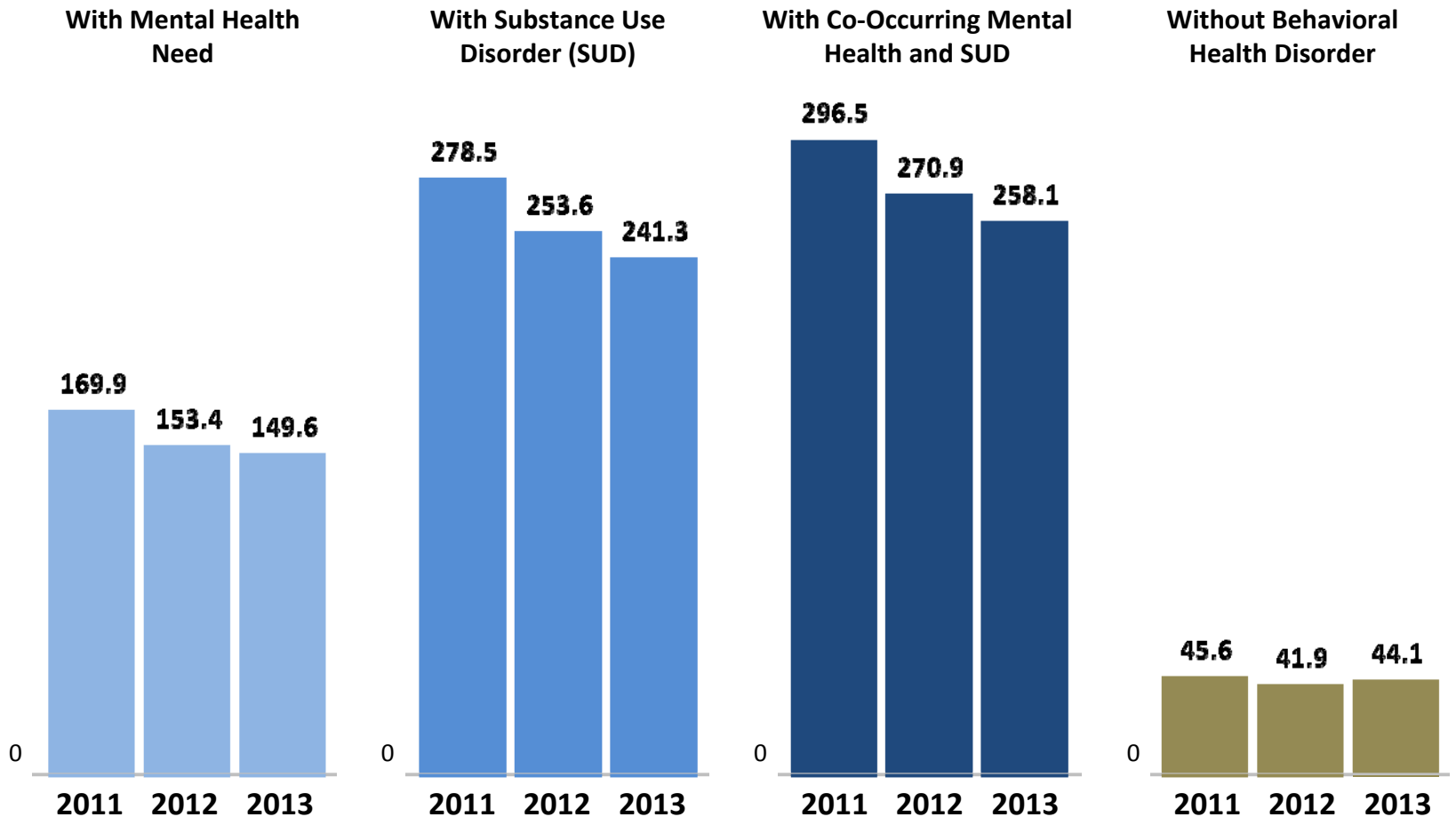
PART 3

Performance Measurement

Outpatient Emergency Department Visits

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

ED utilization among SSI clients is driven by behavioral health risk

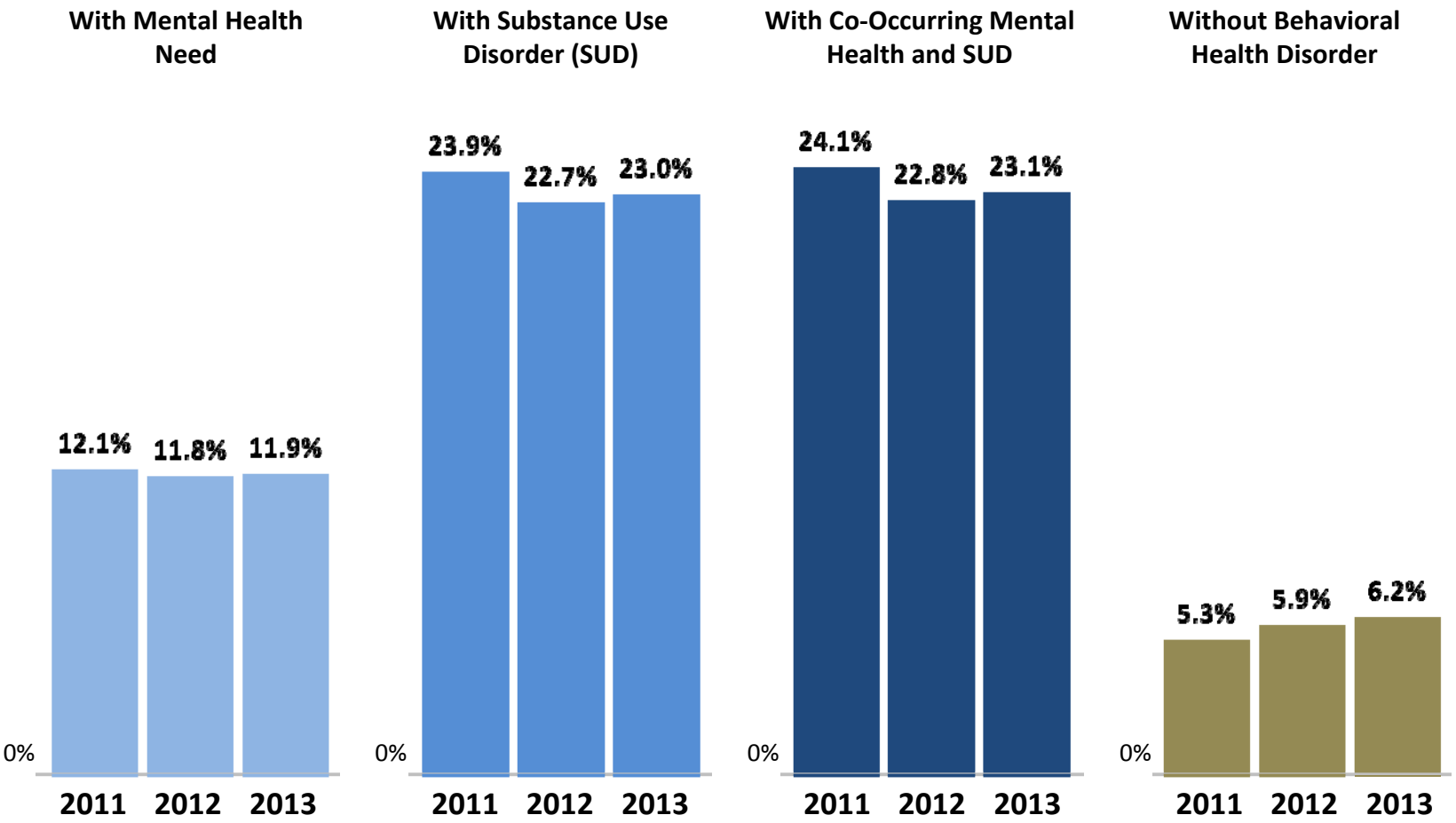


SOURCE: DSHS Research and Data Analysis Division, *Managed Medical Care for Persons with Disabilities and Behavioral Health Needs: Preliminary Findings from Washington State,* JANUARY 2015.

Percent Arrested

Disabled Medicaid Adults Ages 18 – 64 (Excludes Duals)

Individuals with substance abuse issues are much more likely to be arrested



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
- Uniform centralized data collection using administrative data minimizes the cost of data collection and promotes comparability across accountable entities
- Use of national standards where feasible
- Case-mix adjustment reduces incentives for accountable entities to avoid serving high-risk clients
- Performance measurement algorithms require ongoing updating and refinement

Questions?

https://www.dshs.wa.gov/sesa/rda/research-reports