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# **METHODS: MIND THE GAP WEBINAR SERIES**

## **Investing in Prevention: Standards and Innovation in Economic Evaluation**

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**Max Crowley, Ph.D., M.S.**

**Penn State University**





# **INVESTING IN PREVENTION**

**Standards and Innovation in Economic Evaluation**



**Max Crowley PhD**  
**Director, Administrative Data Accelerator**  
**Assistant Professor of Human Development & Family Studies**



# OVERVIEW

- Best Practices for Economic Evaluation for Prevention
- Increasing Utility of Estimate for Budget making
- Opportunities to Include Economic Evaluation in Studies



# **ECONOMIC EVALUATION IN FEDERAL RESEARCH**

- National Institutes of Health
- Institute for Educational Sciences
- National Institute of Justice
- Administration for Children & Families
- USDA



## NIH Funding for Prevention-oriented Studies Referencing Economic Evaluations Methods



Source: NIH Reporter retrieved 2/1/2019; ("cost-effectiveness" OR "benefit-cost" OR "economic evaluation" OR "cost-benefit" OR "cost analysis" OR "budgetary impact" OR "Cost savings analysis") AND (prevention OR preventive OR preventative)



# **BEST PRACTICES FOR ECONOMIC EVALUATION FOR PREVENTION: CONSENSUS EFFORTS**

- ISPOR Health Economic Evaluation Publication Guidelines Good Reporting Practices Task Force
- Prevention Economics Planning & Research Network (PEPR)
- National Academies Economic Evidence for Investing in Children, Youth & Families
- 2<sup>nd</sup> Panel on Cost Effectiveness in Health & Medicine
- SPR Standards of Evidence for Economic Evaluations of Prevention



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# SPR TASKFORCE ON STANDARDS OF EVIDENCE FOR ECONOMIC EVALUATIONS OF PREVENTION

Max Crowley

Ken Dodge

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Mark Greenberg

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# OVERVIEW OF STANDARDS

- 24 standards identified over a multi-year process
- Adopted by the Society for Prevention Research as standards for the field
- Taskforce coordinated with other efforts and resulted in six standards categories
  - I. Standards for framing an economic evaluation
  - II. Standards for estimating costs of prevention programs
  - III. Standards for valuing effects of prevention programs
  - IV. Standards for summary metrics
  - V. Standards for handling estimate uncertainty
  - VI. Standards for reporting economic evaluations



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# STANDARDS FOR ESTIMATING COSTS OF PREVENTION PROGRAMS

II.1. Plan cost analyses prospectively and then conduct them concurrently with program trials

II.2. Use an ingredients method in cost analysis

II.3. Describe comprehensively the units and resources needed to implement the intervention, disaggregated by time

II.4. Include resources consumed but not paid for directly

II.5. Resources needed to support program adoption, implementation, sustainability, and monitoring should be included in cost estimates



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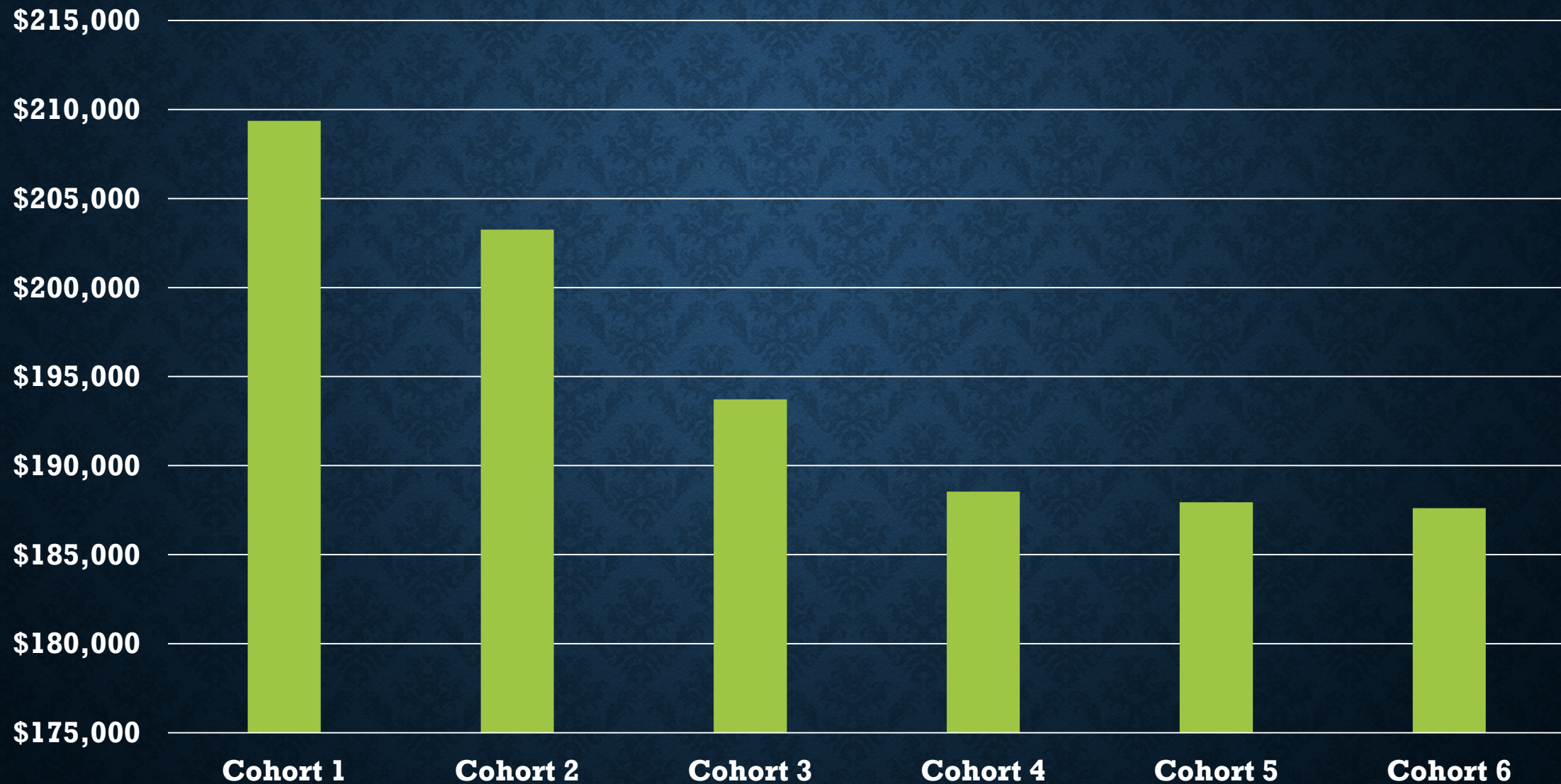


# PROSPER PREVENTION DELIVERY SYSTEM

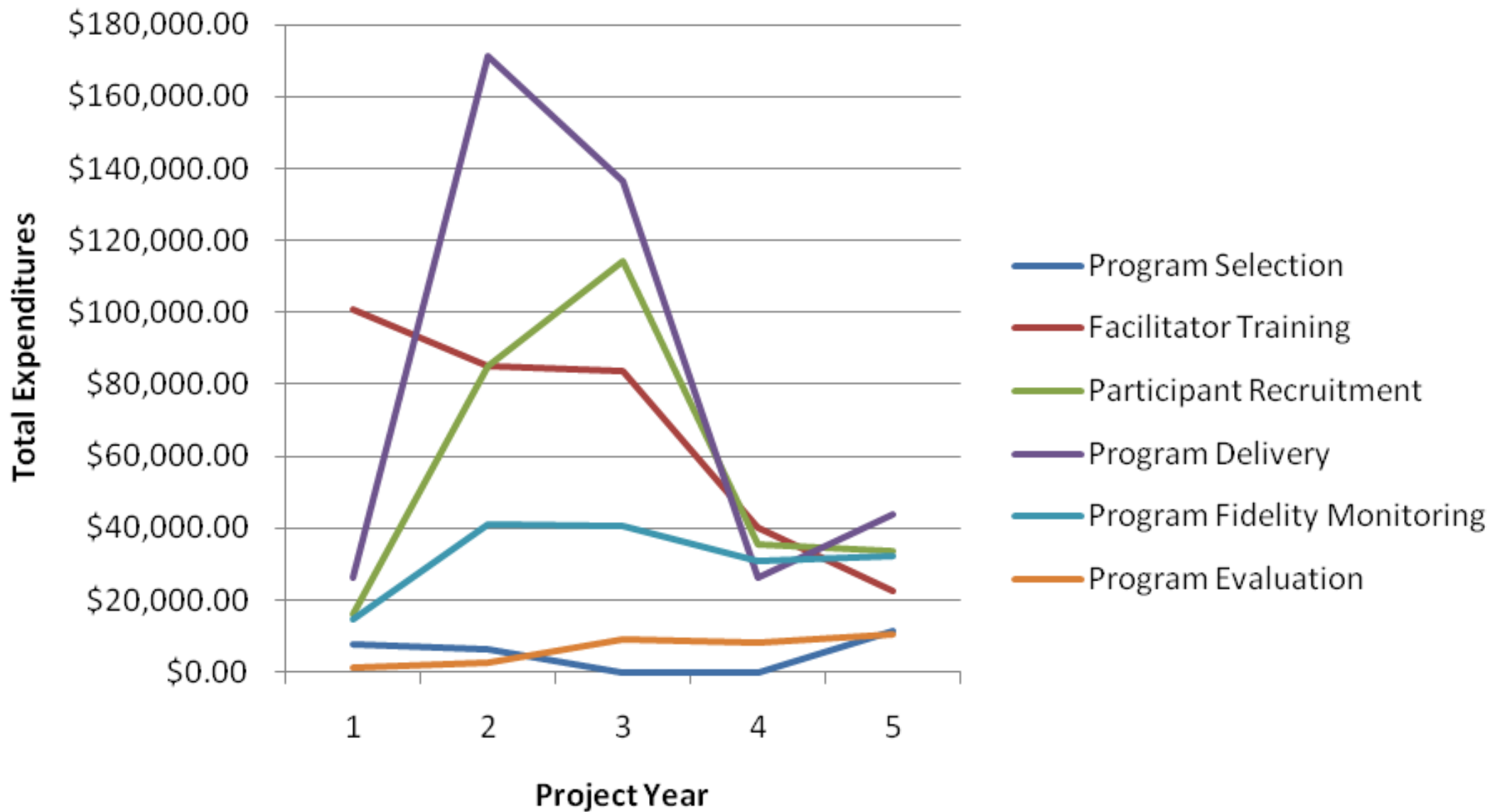
- Randomized Controlled Trial of 28 Communities in Iowa and Pennsylvania
  - Delivery of School and Family-based Prevention Programs
  - Delivered 6 cohorts of services to over 30K youth
  - Demonstrated reduction of substance abuse and delinquency
  - Tracking of budgetary and non-budgetary resource consumption
- 
- Spoth, R., Greenberg, M., Bierman, K., & Redmond, C. (2004). PROSPER community–university partnership model for public education systems: Capacity-building for evidence-based, competence-building prevention. *Prevention Science*, 5(1), 31-39.
  - Spoth, R., Redmond, C., Shin, C., Greenberg, M., Feinberg, M., & Schainker, L. (2013). PROSPER community–university partnership delivery system effects on substance misuse through 6 1/2 years past baseline from a cluster randomized controlled intervention trial. *Preventive medicine*, 56(3-4), 190-196.
  - Schlomer, G. L., Cleveland, H. H., Deutsch, A. R., Vandenberg, D. J., Feinberg, M. E., Greenberg, M. T., ... & Redmond, C. (2018). Developmental change in adolescent delinquency: modeling time-varying effects of a preventative intervention and GABRA2 haplotype linked to alcohol use. *Journal of youth and adolescence*, 1-15.



## PROSPER Implementation Costs by Cohort







Crowley, D. M., Jones, D. E., Greenberg, M. T., Feinberg, M. E., & Spoth, R. L. (2012). Resource consumption of a diffusion model for prevention programs: The PROSPER delivery system. *Journal of Adolescent Health, 50*(3), 256-263.



# STANDARDS FOR VALUING EFFECTS OF PREVENTION PROGRAMS

- III.1. Estimate findings for each program outcome separately from benefit estimates and describe the context of the evaluation
- III.2. Balance the rigor of direct valuation of outcomes with the validity of indirect valuation in contemporary society
- III.3. Consider outcomes with negative monetary values as negative benefits rather than part of program costs



# STANDARDS FOR VALUING EFFECTS OF PREVENTION PROGRAMS

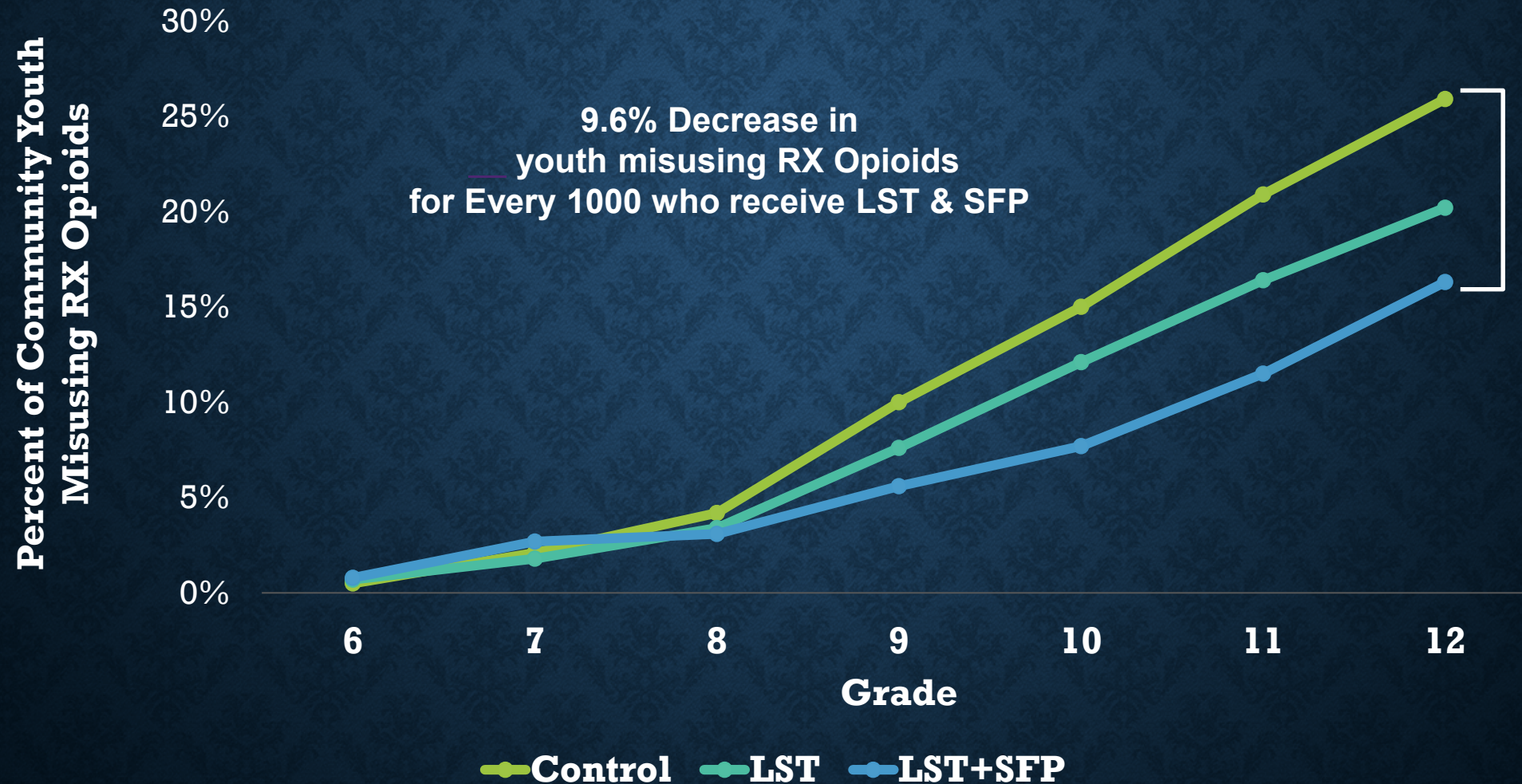
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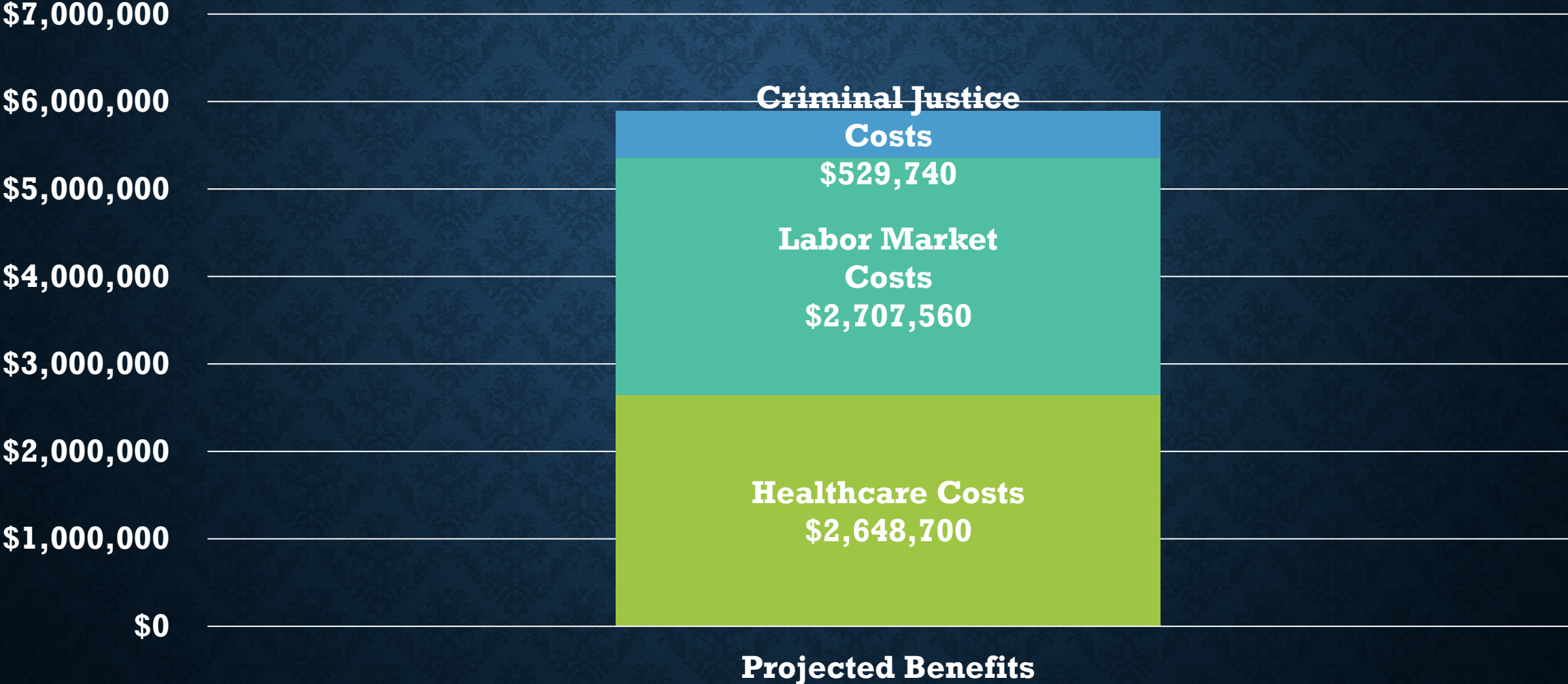
# PROSPER: RX OPIOID PREVENTION



Crowley, D. M., Jones, D. E., Coffman, D. L., & Greenberg, M. T. (2014). Can We Build an Efficient Response to the Prescription Drug Abuse Epidemic? Assessing the Cost Effectiveness of Universal Prevention in the PROSPER Trial. *Preventive Medicine*, 62, 71-77. doi:10.1016/j.ypmed.2014.01.029

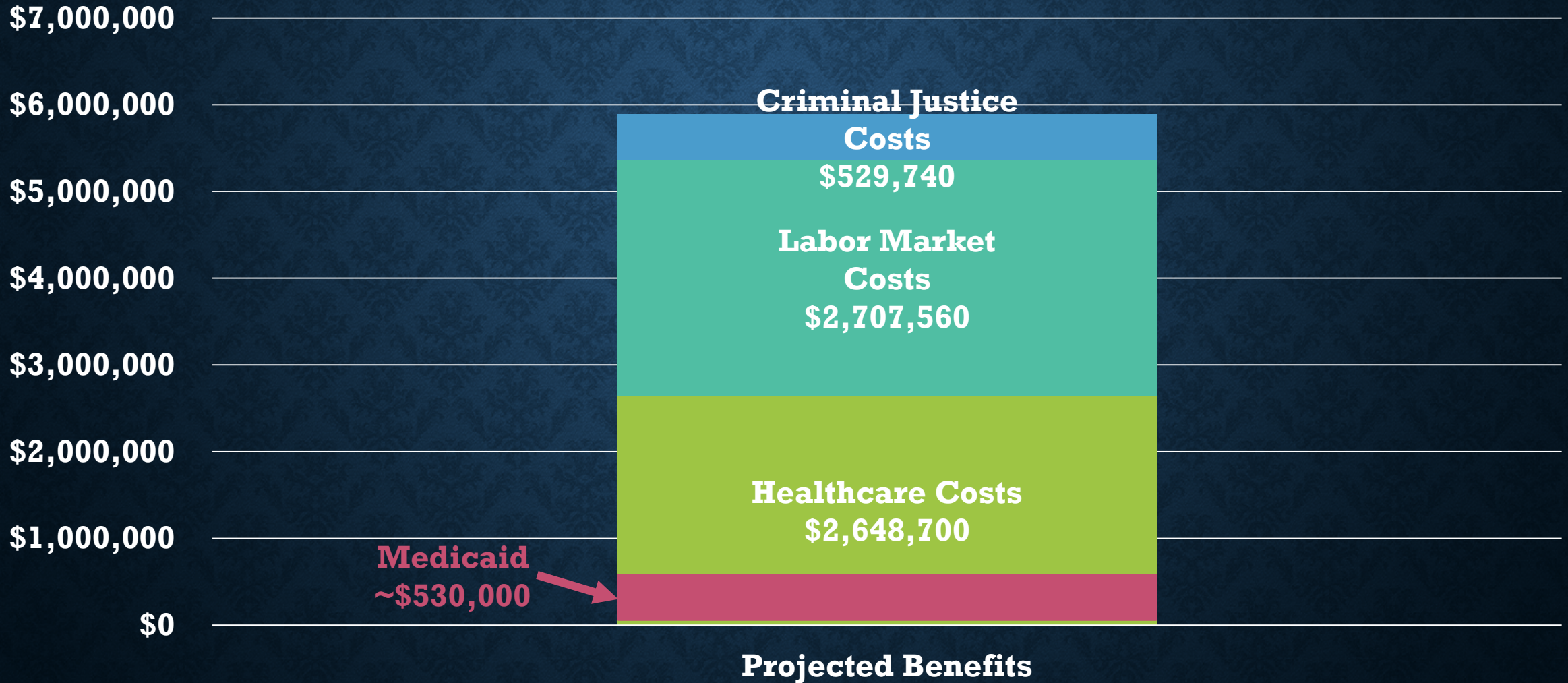


# PROJECTED BENEFITS OF PROSPER





# PROJECTED BENEFITS OF PROSPER





# INCREASING UTILITY OF ESTIMATE FOR BUDGET MAKING

- Cost data should include administrative records of budgetary expenditures
- Outcome data should include variables with meaning to the policy and practice communities
  - E.g., reduced diagnoses, service use. Reduced special education, increased graduation, reduced criminal behavior, increased employment
- Uncertainty of estimates should not only be reported, but what is driving that uncertainty should be unpacked so others can make projections based on your findings
  - Market forces vs effectiveness uncertainty

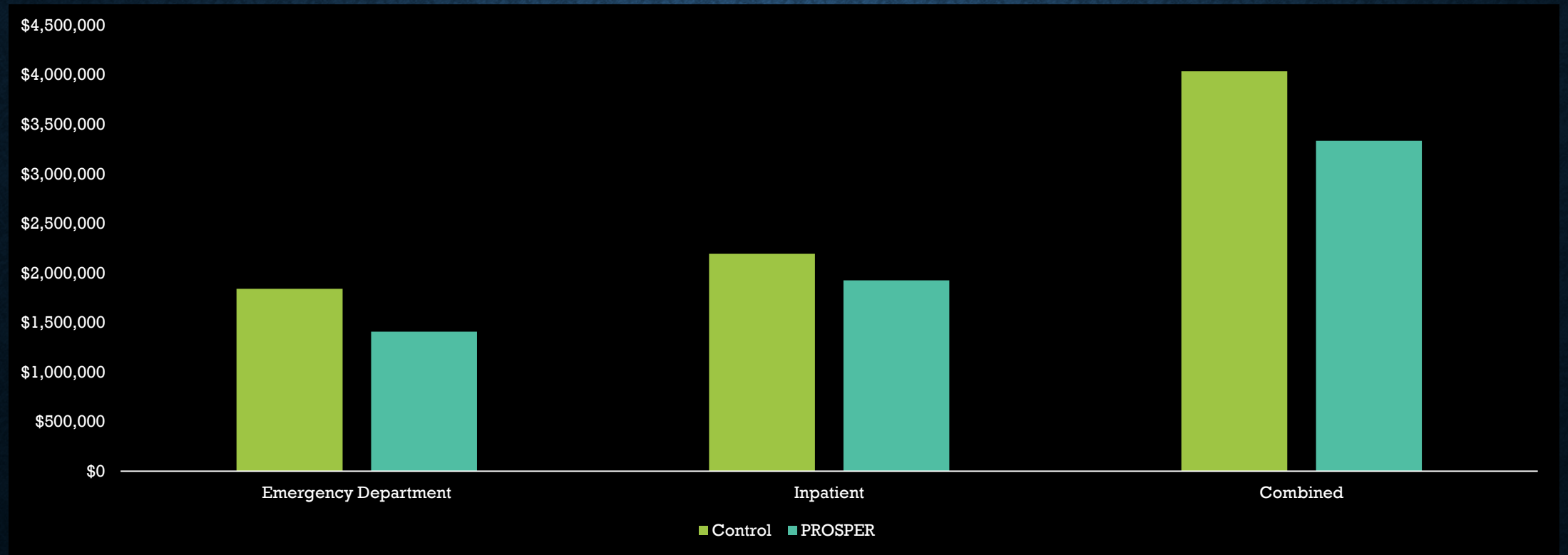


# PSU ADMINISTRATIVE DATA ACCELERATOR

- Born out of recognized need to access high quality administrative records to understand the costs and benefits of prevention programs
- Founded in 2015, PSU Administrative Data Accelerator (ADA) facilitates use of national, state and local individual and aggregated administrative data from health, criminal, child welfare and labor market data systems for health and social science research.
- Infrastructure allows researchers to access, link, and analyze key healthcare, criminal justice, tax, and social security (mortality) records.
  - Particular focus on supporting evaluation of different programs, policies and practices being delivered by public or private entities.

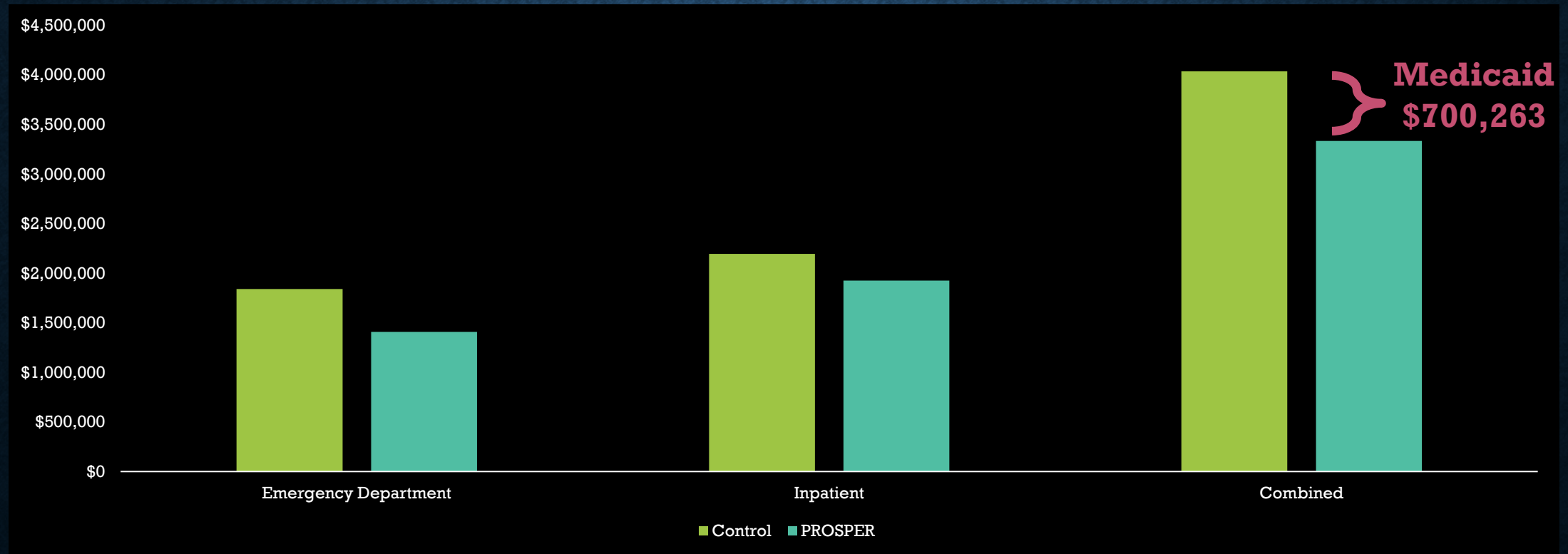


# OBSERVED BENEFITS OF PROSPER (MEDICAID)





# OBSERVED BENEFITS OF PROSPER (MEDICAID)





# OPPORTUNITIES TO INCLUDE ECONOMIC EVALUATION IN STUDIES

- Track budgetary and non budgetary costs prospectively
- Pay attention to R&D costs and keep them separate from your implementation
- Consent participants for linkage to administrative data and/or randomize based on geographic/demographic markers in administrative datasets
- Map impacts directly on to public benefits (service utilization and payment)
- Report findings in a way meaningful to a variety of stakeholders



# RESOURCES

- National Academy of Medicine, Board on Children, Youth, and Families, Division of Behavioral and Social Sciences and Education, and National Academies of Sciences, Engineering, and Medicine. *Advancing the Power of Economic Evidence to Inform Investments in Children, Youth, and Families*. Edited by Eugene Steuerle and Leigh Miles Jackson. Washington, D.C.: National Academies Press, 2016. <https://doi.org/10.17226/23481>.
- Crowley, D. Max, Damon E. Jones, Mark T. Greenberg, Mark E. Feinberg, and Richard Spoth. “Resource Consumption of a Diffusion Model for Prevention Programs: The PROSPER Delivery System.” *Journal of Adolescent Health* 50, no. 3 (March 2012): 256–63. <https://doi.org/10.1016/j.jadohealth.2011.07.001>.
- Crowley, D. Max, Kenneth A. Dodge, W. Steven Barnett, Phaedra Corso, Sarah Duffy, Phillip Graham, Mark Greenberg, et al. “Standards of Evidence for Conducting and Reporting Economic Evaluations in Prevention Science.” *Prevention Science* 19, no. 3 (April 2018): 366–90. <https://doi.org/10.1007/s11121-017-0858-1>.



# RESOURCES

- Levin, and McEwan. “Cost-Effectiveness Analysis: Methods and Applications,” 2000.  
[http://books.google.com/books?hl=en&lr=&id=HniLG23vYDwC&oi=fnd&pg=PR15&dq=%22comparison+group\\*%22+in+cost-effectiveness+analysis&ots=closgGlSjI&sig=-H4khQJnQCjqPlzUAgAR-Mwsc5E#v=onepage&q=comparison%20group&f=false](http://books.google.com/books?hl=en&lr=&id=HniLG23vYDwC&oi=fnd&pg=PR15&dq=%22comparison+group*%22+in+cost-effectiveness+analysis&ots=closgGlSjI&sig=-H4khQJnQCjqPlzUAgAR-Mwsc5E#v=onepage&q=comparison%20group&f=false).
- Haddix, Anne C, Steven M Teutsch, and Phaedra S Corso. *Prevention Effectiveness : A Guide to Decision Analysis and Economic Evaluation*. Oxford; New York: Oxford University Press, 2003.
- Sanders, Gillian D., Peter J. Neumann, Anirban Basu, Dan W. Brock, David Feeny, Murray Krahn, Karen M. Kuntz, et al. “Recommendations for Conduct, Methodological Practices, and Reporting of Cost-Effectiveness Analyses: Second Panel on Cost-Effectiveness in Health and Medicine.” *JAMA* 316, no. 10 (September 13, 2016): 1093. <https://doi.org/10.1001/jama.2016.12195>.
- Drummond, M. F. *Methods for the Economic Evaluation of Health Care Programmes*. Oxford; New York: Oxford University Press, 2005.