



An ACCORDS Seminar Series 2020 - 2021

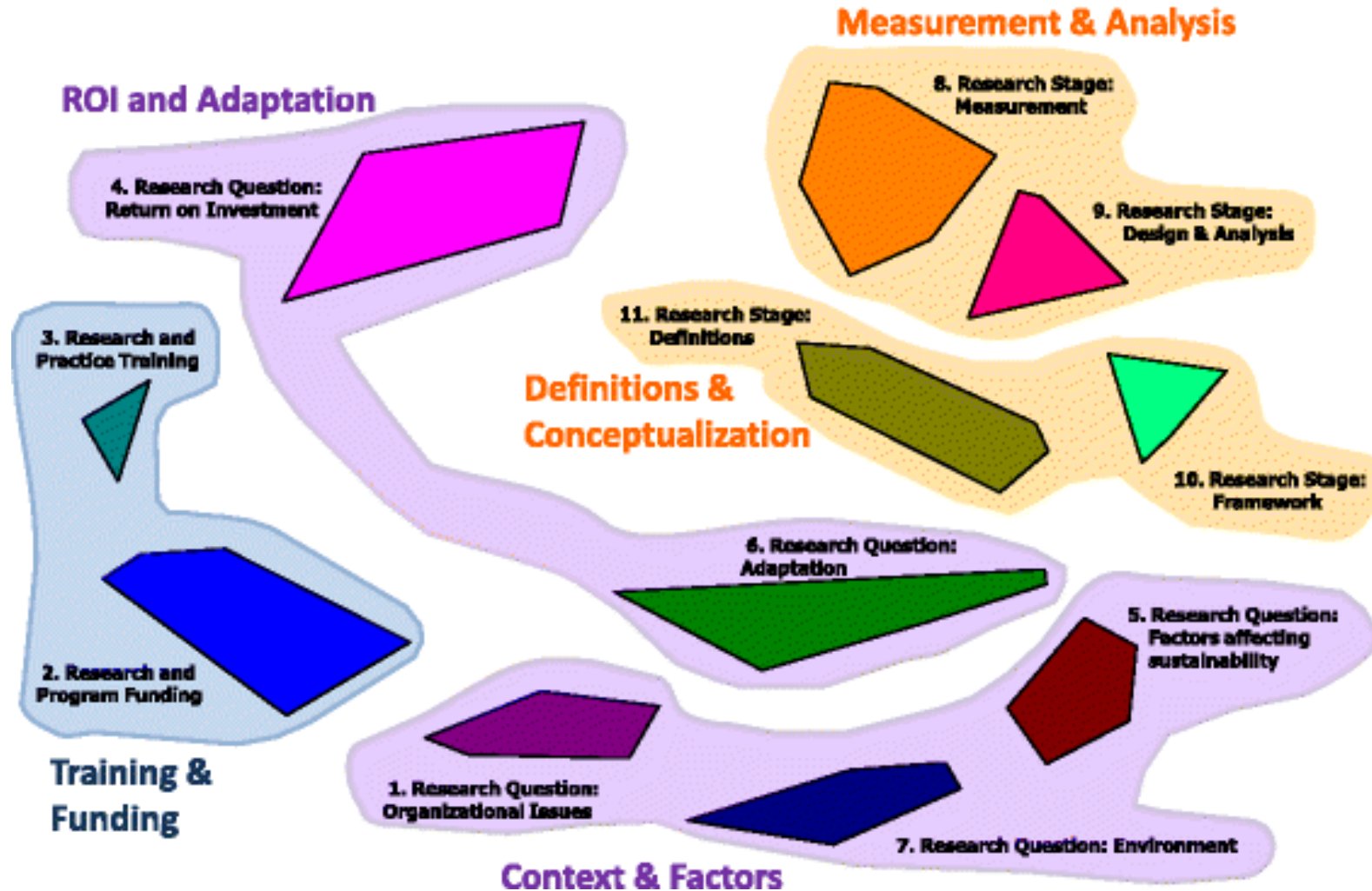
**AN INTRODUCTION TO
SUSTAINABILITY, VALUE,
AND COST: DEVELOPING
ENDURING HEALTH CARE
INTERVENTIONS**

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NEED FOR APPLICATION AND ADVANCEMENT OF METHODS TO IMPROVE SUSTAINABILITY

- “...in spite of rapid advances in evidence-based medicine, we know very little about how well or under what conditions health innovations are sustained and their gains maintained once they are put into practice.... Sustained delivery of evidence-based interventions is essential to public health impact. Yet sustainability remains one of the least understood and most vexing issues for implementation research, largely due to unique methodological challenges.” Proctor et al 2015

Sustainability Research Landscape



Proctor E, Luke D, Calhoun A, McMillen C, Brownson R, McCrary S, Padek M. Sustainability of evidence-based healthcare: research agenda, methodological advances, and infrastructure support. *Implementation Science*. 2015 Dec 1;10(1):88.

SUSTAINABILITY, VALUE, AND COST: DEVELOPING ENDURING HEALTH CARE INTERVENTIONS

An ACCORDS seminar series on research methods for evaluating and communicating sustainability, cost, and value of health care innovations from multiple stakeholder perspectives

SEMINAR SERIES LEARNING OBJECTIVES

- Define terms ‘sustainability’ ‘cost’ and ‘value’ both conceptually and operationally
 - Describe different levels of analysis and stakeholder perspectives on sustainability, cost, and value of health care innovations
 - Identify methods appropriate for assessment of sustainability, cost, and value of health care innovations from different stakeholder perspectives
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DEFINING TERMS

- **Sustainability:** the continued use of program components at sufficient intensity for the sustained achievement of desirable program goals and population outcomes
 - **Cost:** the time, money and resources used to deliver services (e.g., program components) or make products
 - **Value:** the relative comparison of benefits and costs from all relevant perspectives individually and in aggregate, including pecuniary and non-pecuniary benefits and costs
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SUSTAINABILITY DETERMINANTS AND OUTCOMES

- *Determinants of sustainability*, in reference to correlates and predictors of sustainability (organizational, contextual, and strategies); and
- *Outcomes of sustainability or sustainability outcomes* in reference to subsequent impact (healthcare improvement or public health outcomes) of sustained intervention use.
 - May also be referred to as “sustainment”

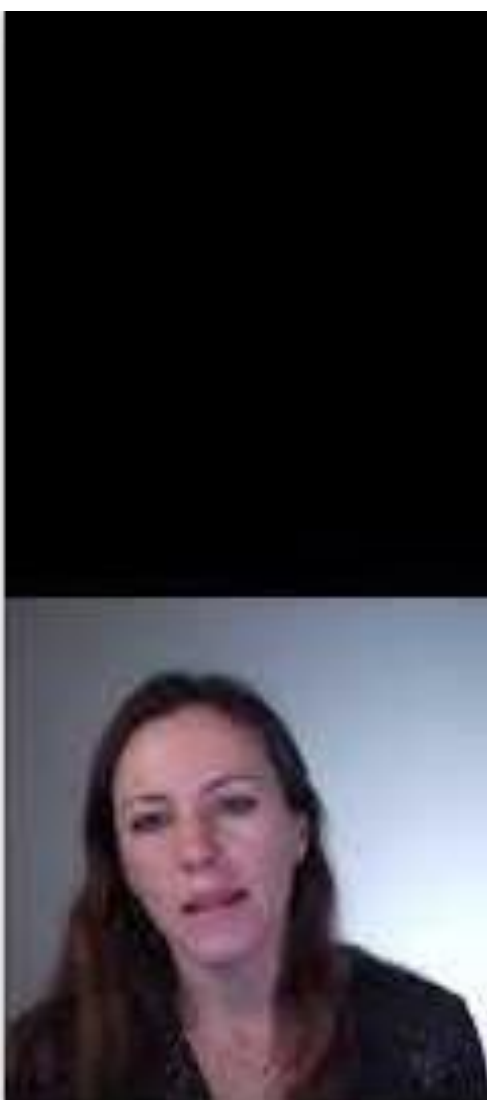
“Both determinants and outcomes can be measured at the individual provider, patient, organizational, health system, or community level. Studies should specify the unit of analysis and provide a rationale for its choice.”

Conceptualizing Sustainability

- **Sustainability:** the continued use of program components at sufficient intensity for the sustained achievement of desirable program goals and population outcomes (*Scheirer & Dearing, 2011*)
 - **Components of Sustainability:** (*Shelton, 2018*)
 - Continuation of program components/core elements of intervention
 - Continuation of health benefits/health outcomes
 - Capacity-building and maintaining community-level partnerships
 - Institutionalization?
- Static → Dynamic

Scheirer PM, Dearing DW (2011). An agenda for research on the sustainability of public health programs. *Am J Public Health* 101:2003.

Shelton R, C. Coates, B. R., & Jensen, E. W. (2018). The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care. *Journal of Public Health, 19(1)*, 1-8. doi:10.1093/pubmed/kxy017



POLL

- Is sustainability based primarily on cost and what we can (or are willing to) pay for?
 - Or, is it based on motivation to participate in and/or deliver a service? (i.e., perceived benefit or value?)
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ECONOMIC EVALUATIONS AND IMPLEMENTATION SCIENCE

- Economics of evidence-based practices (EBPs) as implemented in community settings (e.g., is an intervention cost effective)
- Economics of implementation strategies – assessing the cost of change
- “Such research provides critical information for health system administrators, policymakers, payers, and provider organization leaders, who must make decisions about when and how to invest in EBPs.”
- Adapting traditional economic evaluation methods
 - Cost-effectiveness and benefit-cost analysis from a health care provider perspective
 - **Expanded focus on different costs and outcomes from a health system perspectives**

ECONOMIC EVALUATION METHODS IN IMPLEMENTATION SCIENCE

- “The aim of economic evaluation is to present evidence on the costs and consequences (in terms of patient outcomes) [or benefits] of quality improvement strategies and methods for increasing the uptake of evidence-based practices compared to the ‘status quo’. In doing so, it informs whether specific initiatives are (or have been) a worthwhile (or ‘cost-effective’) use of the limited resources of health systems.”

ECONOMIC EVALUATION METHODS IN IMPLEMENTATION SCIENCE

- Implementation (roll out and scale up) costs
 - Training staff in new care delivery pathways
 - Impacts of new processes on patient and caregiver costs
 - Costs of developing new processes
 - Costs of delivering new interventions
 - Capital equipment and other materials/supplies
- Consideration of funding sources

ECONOMIC EVALUATION METHODS IN IMPLEMENTATION SCIENCE

Methodology

- Cost effectiveness analysis
- Cost-utility analysis
- Cost-benefit analysis
- Cost-consequence analysis
- Burden of disease

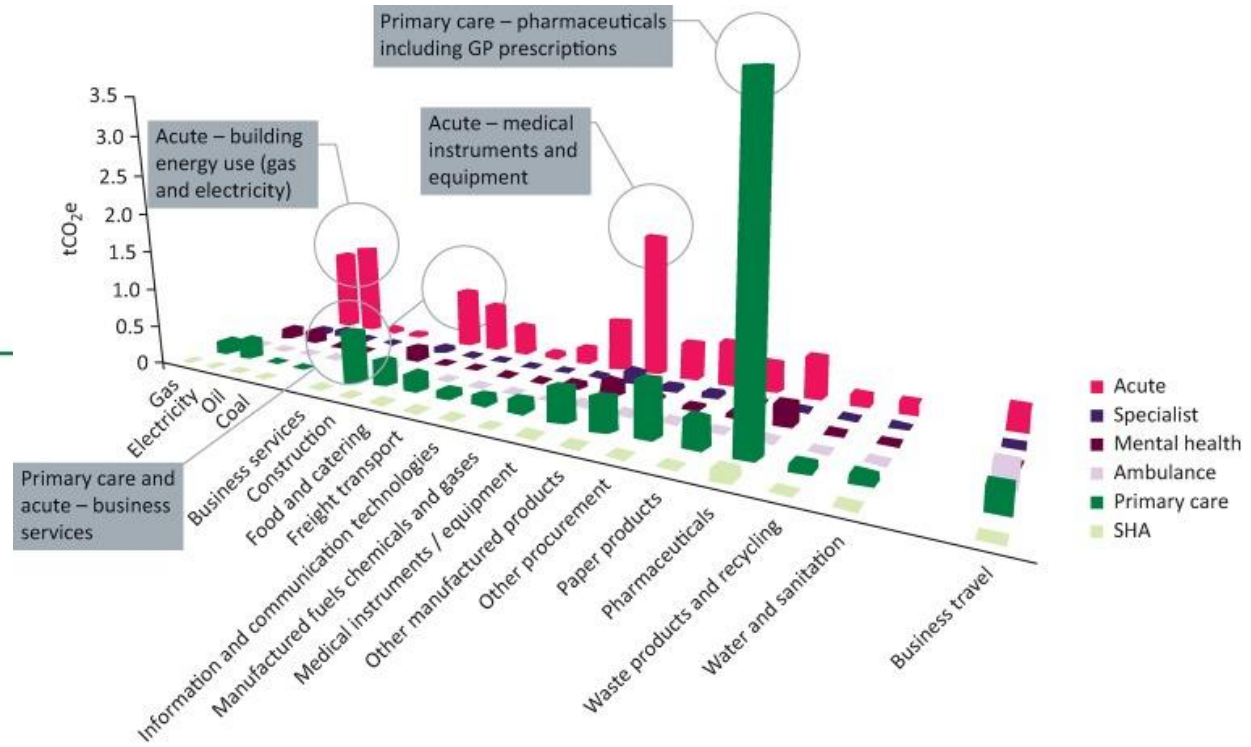
Data Sources

- Self-report
 - Service inputs
 - Out of pocket costs
 - Patient reported outcomes
- Observations
- Administrative and Clinical Data
- Claims data

UK PERSPECTIVE: NATIONAL HEALTH SERVICE (NHS) SUSTAINABILITY

- “With the increasing demand on the health service and an already large financial deficit, the major threat to health service sustainability is most often identified as financial. However, healthcare, as with all human activity, takes place within a social and environmental context, not just an economic one. Important social and environmental constraints exist alongside the well-publicised financial restrictions.... In order for the NHS to survive, it must be able to anticipate and respond to changes across all three spheres.”

Value = $\frac{\text{Outcomes for patients and populations}}{\text{Environmental + social + financial impacts (the 'triple bottom line')}}$



“...people engaged in improving services can nonetheless consider the current level of resource use and the impact of proposed changes [on carbon budgets].”

MULTIPLE LEVELS OF ANALYSIS AND PERSPECTIVES ON SUSTAINABILITY, COST AND VALUE IN HEALTH CARE SETTINGS

- Patient level and perspectives
- Provider and staff level and perspectives
- Practice and organizational level and perspectives
- Health system level and perspectives
- Payer and purchaser level and perspectives
- Government or policy level and perspectives
- Societal level and perspective

...over to Mark!

ECONOMIC ANALYSES CONSIDERATIONS IN SUSTAINABILITY, COST AND VALUE

- Benefits and Costs
 - Need to be specific about concepts of benefits and costs
 - Types of Benefits and Costs
 - Pecuniary and non-pecuniary
 - Direct and indirect
 - Opportunity costs
 - Externalities
- What perspectives are relevant to the analysis?

ECONOMIC ANALYSES COVERED IN SEMINAR SERIES

- Implementation/Program/Replication Cost
- Cost Effectiveness Analysis
 - Cost Utility Analysis
- Return on Investment Analysis
- Benefit-Cost Analysis

IMPLEMENTATION/PROGRAM/ REPLICATION COST

- Analysis to calculate the cost of specific intervention or program usually from provider and/or clinic/health system/healthcare organization perspective
 - Measures direct and indirect costs of ongoing program and start-up costs
 - Quantify and attach values to all inputs/resources used
 - Exclude all “research” related costs
 - Macro/Gross- and Micro-costing approaches
 - Macro/Gross-costing not easily adapted to specific interventions
 - Micro-costing using Time-Driven Activity Based Costing (TDABC) aka Time and Motion Studies (Kaplan et al., *Journal of Healthcare Management* 2014;59(6):399-412)

IMPLEMENTATION/PROGRAM/ REPLICATION COST (CONTINUED)

- How, when and where to use this type of analysis for sustainability
 - Should always be incorporated in considering sustainability
 - Suggest using a micro-costing approach
 - If intervention limited in scale, suggest TDABC
 - If multiple sites, consider survey/KII approach or administrative/EHR data
 - Establish specific aim involving cost analysis to support overall sustainability
 - D2V program resource hub for micro-costing methods

<http://www.ucdenver.edu/academics/colleges/medicalschoo1/programs/d2V/tools/Pages/PSV-Resource-Hub.aspx>

IMPLEMENTATION/PROGRAM/ REPLICATION COST (CONTINUED)

- Nine steps used to measure cost as part of sustainability
 1. Identify and define the delivery process or intervention to be studied
 2. Define the activities performed in the development, adoption, implementation and full delivery process or intervention
 3. Develop process maps of these activities that identify the direct and indirect resources involved in each activity and specify the sequencing of these activities
 4. Collect information on the time required to complete each activity and the quantity of each resource used in completed the activity including staff time
 5. Collect information on the unit cost of each resource used in the direct completion of each activity and calculate the capacity adjusted unit cost
 6. Collect information on the cost of indirect resources required to complete each activity
 7. Combine the information on quantity of resources with the capacity adjusted unit cost information to calculate the direct total cost of each activity
 8. Combine the direct costs of all activities and the indirect costs to obtain the total cost of delivery or the intervention
 9. Calculate and report costs in units that are relevant to stakeholders (e.g., per procedure, per patient, percentage of revenue)
- If conducting a comparative study need to apply micro-costing to each intervention

COST EFFECTIVENESS ANALYSIS

- Cost Effectiveness Analysis (CEA) and the special case of Cost Utility Analysis (CUA) compare the incremental effectiveness of two or more alternatives: Neumann et al *Cost-Effectiveness in Health and Medicine, 2nd edition* Oxford University Press 2016.
- Incremental Cost Effectiveness Ratio (ICER)

$$ICER = \frac{Cost_A - Cost_B}{Outcome_A - Outcome_B}$$

COST EFFECTIVENESS ANALYSIS (CONTINUED)

- Originally developed as an alternative to Benefit-Cost Analysis to address concerns related to monetizing all benefits
- CEA and CUA typically took a payer perspective
- Outcomes measured in non-pecuniary units
 - CEA uses a relevant health outcome (e.g. mortality, morbidity)
 - CUA uses Quality Adjusted Life Years (QALYs) as outcome

COST EFFECTIVENESS ANALYSIS (CONTINUED)

- Issues to consider in measuring costs for sustainability
 - Related and unrelated direct medical costs
 - Time frame and modeling future costs
 - Discounting
 - Inclusion of non-medical costs
- Issues to consider in measuring outcomes for sustainability
 - Identifying proximate outcomes relevant to intervention
 - Modeling future outcomes

COST EFFECTIVENESS ANALYSIS (CONTINUED)

- More recently CEA analyses are taking more of a societal perspective

Elements of Value

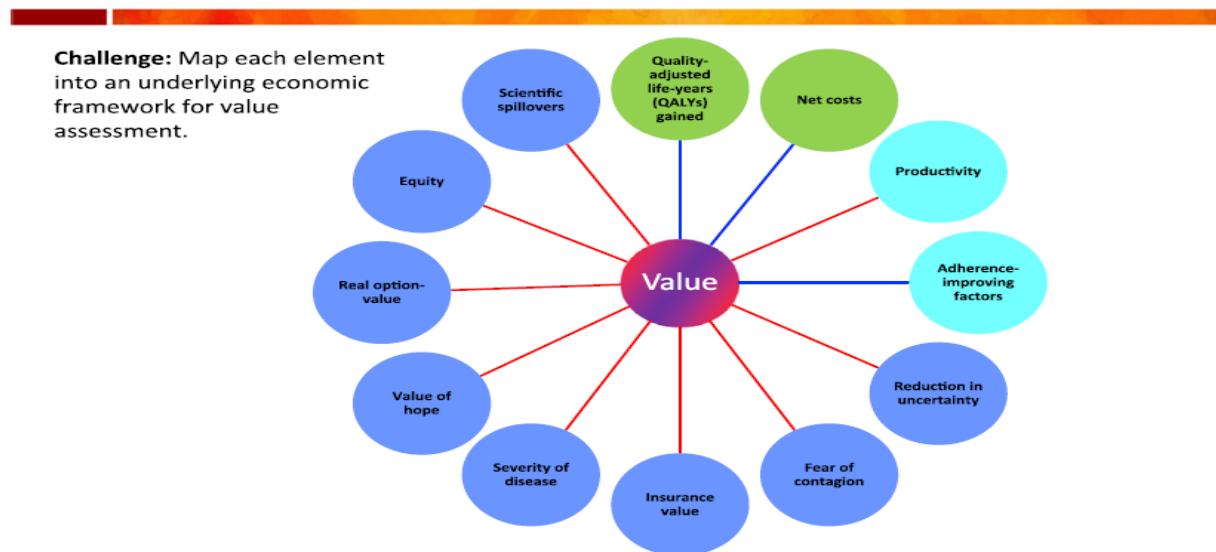


Fig. 1 – Elements of value. Note. Green circles: core elements of value; light blue circles: common but inconsistently used elements of value; dark blue circles: potential novel elements of value; blue line: value element included in traditional payer or health plan perspective; and red line: value element also included in societal perspective.

RETURN ON INVESTMENT ANALYSIS

- Return on Investment Analysis (ROI) is a standard business model comparing benefits (financial returns) to the cost (investment) for an intervention
- Measures a rate of return as a ratio of Net Benefits to Costs: $(\text{benefits} - \text{costs}) / \text{costs}$
- Perspective specific analysis
- Considers only pecuniary benefits and costs
- Essential analysis to inform financial sustainability from multiple perspectives
- Issues to consider in measuring cost for ROI analysis
 - Typically intervention/program costs
 - Inclusion of startup, development and indirect costs
 - Time frame and discounting

RETURN ON INVESTMENT ANALYSIS (CONTINUED)

- Benefits and costs are perspective specific
 - A benefit from one perspective (health system) could be a cost from a different perspective (payer)
- Should not aggregate benefits and costs across perspectives for ROI analyses
- Issues to consider in measuring benefits for financial sustainability
 - Very context specific
 - Inclusion of indirect benefits
 - Time frame and modeling future benefits
 - Discounting
- Example: DPP ROI for self-insured employers <https://www.colorado.gov/pacific/cdphe/ndpp-economic-tool>

BENEFIT-COST ANALYSIS

- Originated in late 19th Century as central to social welfare analysis
- Includes all benefits and all costs measured in common monetary units
- Includes all perspectives and can aggregate perspectives together
- Not generally favored in healthcare
 - Requires placing a monetary value on non-pecuniary benefits and costs
 - For example, requires valuing human life including both pecuniary and non-pecuniary benefits, such as additional life years

“Analysts recognize that benefit-cost analysis as traditionally conducted is one of many sources of information, and must be supplemented by consideration of other concerns including non-quantified effects and equity.”

SOME CONCLUDING THOUGHTS

- Value – easy to conceptualize, challenging to operationalize in pragmatic ways
 - Dynamic sustainability and need for adaptation over time
 - Contextual dependence
 - Health system and payment models
 - Tailoring cost and value perspectives to the context and the decision makers
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UPCOMING SEMINAR SERIES TOPICS

- Patient perspective - Marcelo Peraillon (patient-reported outcomes, quality-adjusted life years, cost-effectiveness analysis)
 - Provider and practice perspective – Doug Luke (program sustainability)
 - Health systems perspective – Laura Panattoni (implementation cost and ROI)
 - Policy/societal perspective – Rich Lindrooth (benefit-cost and cost-effectiveness analysis)
 - Falls Prevention: A Sustainability Example – Marcia Ory
 - And more!
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ACCORDS ECONOMIC ANALYSIS CORE

- Consult requests on ACCORDS website
 - General consults
 - D&I-specific
 - No cost for one-time consults
 - Encouraged to include FTE for economist co-investigators on grants
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