Using Decision-Making Tools for Planning and Service Delivery

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LEARNING OBJECTIVES

Learning Objective #1: The workshop will illustrate what types of challenges, questions, problems, decisions and/or needs can be best addressed through decision analysis and financial modeling in HIV organizations/systems.

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LEARNING OBJECTIVES

Learning Objective #2: Workshop participants will learn how the Commission has used decision analysis methods and financial modeling in concrete examples—all publicly available—that estimate: 1) the financial impact of modifying care coordination models; 2) funding losses from code-based surveillance; 3) fiscal effects of state budget cuts/decisions, and 4) cost-efficient use of resources for planning and implementing services.

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LEARNING OBJECTIVES

Learning Objective #3: By the workshop's end, participants should be able to identify different types of decision-making and modeling tools/practices used in organizational/systemic decision-making and the various decision-making and modeling techniques that can be employed at the agency/system level.

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- Not focusing on mathematical modeling
  - How to identify problems to be addressed by these methods
  - How to use logical processes that get you to a point where these methods are applicable
  - Usefulness of these techniques
- Intimidating subject
  - Easier if you can break a problem into its component pieces
  - Take it step by step
  - Answer each step
  - Logic process (logic modeling)

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- Types of questions that can be answered with decision analysis
- Identify problems suited to being addressed by modeling and analysis
- Comfort level applying logical thinking to get you the answers you need
- Forecasting or predictions can be fairly reliable if you can learn to apply decision analysis
- Decision analysis can advance your agenda

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- **Defining Decision Analysis**
  - A method of logical thinking used to problem-solve
  - Tools that can be used to help break down complex problems
  - A guide to help you lay out steps to answer problems

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- **Decision Analysis Tools/Concepts**
  - **"Back-of-the-envelope":** what you figure out in your head in a logical manner without even thinking of it as a mathematical model
  - EXAMPLE: how do you get to $1 with the change you have so you can buy a soda out of the vending machine: you know that four quarters will do it

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- **Decision Analysis Tools/Concepts**
  - **Mathematical Modeling**: a linear, step-by-step process where a problem is broken down into its component pieces, each component answered sequentially, affecting the next component and so on to the final answer
  - EXAMPLE: steps to figure out how to get to a dollar: count the change, add the totals, and then you can figure it out from there

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- **Decision Analysis Tools/Concepts**
  - **Optimization**: the most effective way of solving a problem that has multiple variables contributing to it with constraints.
  - EXAMPLE: getting to a dollar with the fewest coins, but want to save quarters for the laundry and at least ten pennies for your coin collection

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- **Decision Analysis Tools/Concepts**
  - **Decision Tree(s):** the logical step-by-step frame-work where all of the component pieces to a problem are layed out and quantified, along with the probabilities and values associated with one option over another, getting you to the answer
  - EXAMPLE: what's are the chances that the coin machine only accepts quarters and dimes and gives no change vs. accepts all coins, and what would the value be of each option for different purchases

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- **Decision Analysis Tools/Concepts**
  - **Scenario Analysis**: what is the likely answer in different scenarios.
  - EXAMPLE: how do you come up with $1 if you only use quarters or only use dimes

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- **Decision Analysis Tools/Concepts**
  - **Simulation:** using probabilities of uncertain inputs to see the likelihood of a particular answer
  - EXAMPLE: the likelihood that you use all quarters needs work

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- **Decision Analysis Tools/Concepts**
  - **Verification:** checking the validity of your answers in the real world
  - EXAMPLE: is using all quarters the best way to buy the soda? Maybe the vending machine accepts $1 bills needs work

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- Decision Analysis Can Drive the Data You Need to Collect, or
- It Can Use the Data You Have Available

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- Impact of budget cuts on both revenues and health/patient outcomes for care and prevention
- How effectively we are providing services
- What we can effectively purchase with funding/other sources of funding
- The fiscal impact of shifting models of care
- Integrating new allocations formulae

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- Service Planning Area (SPA) 1 Funding Allocations

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- SPA 1 Allocations Lesson: Importance of Verification
  - Antelope Valley, rural area, low overall HIV prevalence
  - Allocated funds distributed to the eight SPAs using Geographic Estimate of Need (GEN) formula: prevalence, incidence, poverty, disease burden
  - Continued feedback about disparities in service effectiveness, delivery and need in SPA 1
  - Using mathematical model, determined that clients in SPA 1 getting half the average LAC patient/allocation
  - Due to low provider capacity/greater patient reliance on Ryan White-funded services
  - **Results**: 2x SPA 1 allocation; new distribution formula

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- Evaluation of Service Effectiveness (ESE) Scorecard Weighting and Quantification

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- Medical Outpatient Capacity Resource Model (*for ESE*)
- Working draft of Provider Capacity Model

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- Model determining possible funding losses from failure to convert code-based to name-based HIV reporting system

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- More recent analysis of surveillance funding impact (*cit., Arleen Liebowitz, CHIPTS, UCLA*) verifying results from earlier model

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- Model determining impact of State Office of AIDS (OA) funding reduction options

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Microsoft PowerPoint Presentation

- Medical Care Coordination (MCC) Financial Impact Analysis
- Medical Care Coordination (MCC) Financial Modeling Presentation, including Simulations

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- "*Cost-Effective Allocation of Government Funds to Prevent HIV Infections*" (DCohen, et. al.)

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- Constructing a Resource Allocation Model
  - Decision Drivers/Primary Variables
    - Total award, or total funding
    - Need for the service(s)
    - Cost per service unit, or cost per patient
    - Other sources of funding and services
  - Other Variables To Be Factored
    - Cost Effectiveness
    - Resource Inventory
    - Provider Capacity
    - Quality Improvement
    - Service Effectiveness
    - Resource Capacity
    - Cost of Best Practices
  - Cascade Allocations According to Priority Ranking

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- If you choose to pursue this work further, statistical modeling has interesting health care applications:
  - Operational Studies
    - Analysis to optimize patient flows and service utilization
  - Linear/Multiple Regressions
    - Trends based on one or more variables
  - Multi-Variate Analyses
    - Weighting the impact of multiple variables on a result
  - Probabilities
    - Likelihood of certain scenarios occurring as predicted
  - Odds Ratios
    - Probability that variables will impact or that outcomes will occur

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- An example of an operational study: "*Linear Programming to Optimize Performance in a Department of Surgery*" (MMulholland, et. al.)

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