Budget Impact Analysis: Methods & Data

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Budget Impact Analysis: Overview

- Analysis of expenditures for a program over a short period (often 1-3 years), including the effect of any offsetting savings.
  - Evaluates a scenario rather than a single action
  - Includes comparison to the *status quo*
  - Includes sensitivity analysis

Budget Impact Analysis: Overview

- To estimate feasibility/affordability
- For budgeting/forecasting
- What are your partners asking?
  - How much will this cost
  - Now – later – much later?

Budget Impact Analysis: Framework

- Estimating
  - The cost of the intervention
  - Changes in staffing, schedules and use of technology
  - Changes in pt. access/throughput/demand
  - Potential Savings
  - Cost to operate

Budget Impact Analysis: Perspective

- BIA takes the buyer/provider/payer's perspective.

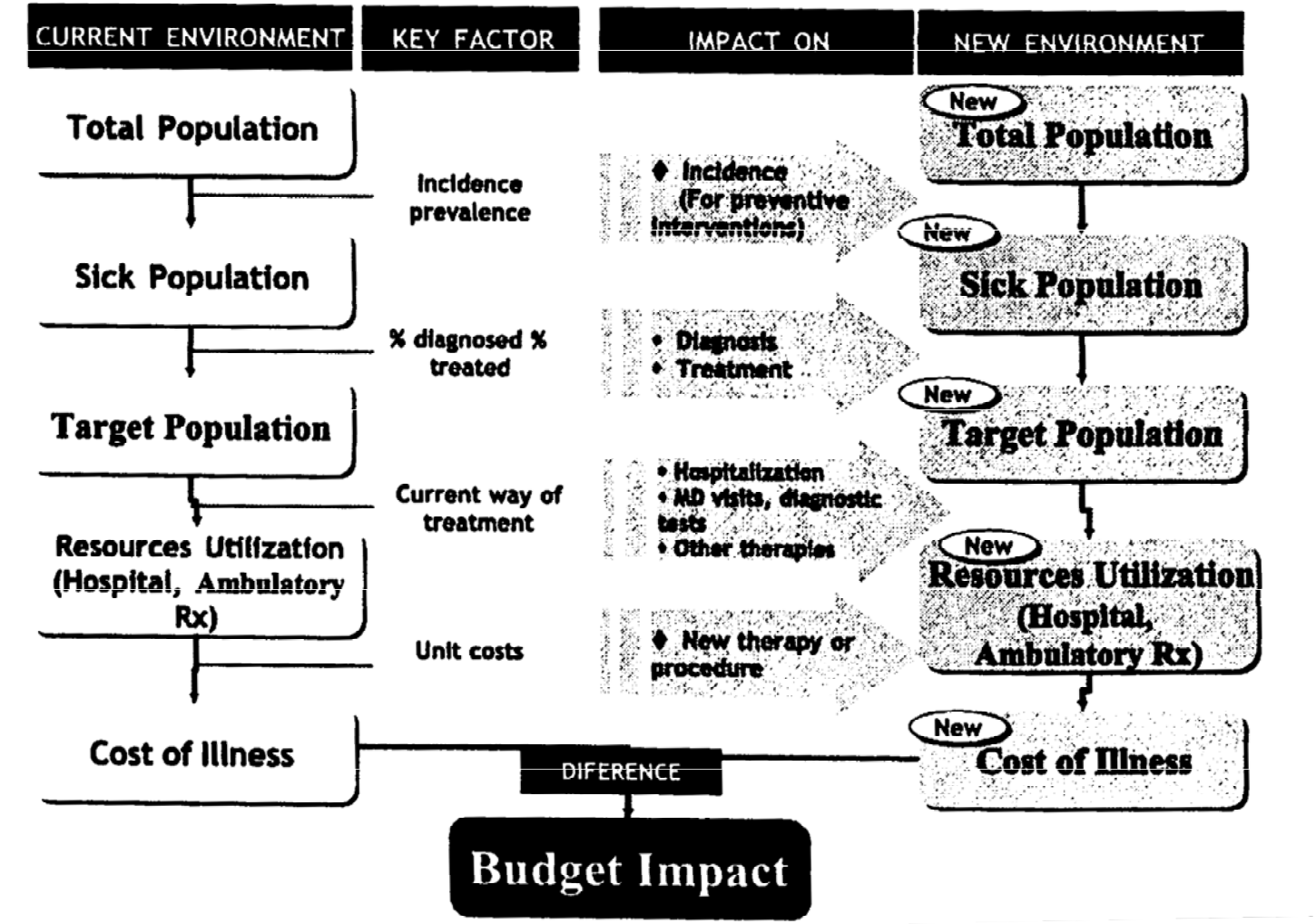
Budget Impact Analysis: Horizon

- BIA uses a short horizon – usually a few years at most.
- Long-term modeling is unnecessary.
- Costs are not discounted
- Savings in far future cannot offset initial/start-up or investment costs.

Budget Impact Analysis: Utility

- BIA does not measure utility.
- No need to survey patients.
- No calculation of QALYs.

Conceptual Diagram



Source: Mauskopf et al. (2007)

Diagram redux

Current Environment	Key Factors	Budget impact analysis	Impacts	New Environment
Total Population	Incidence and prevalence		Incidence and prevalence	New Total Population
Sick population	% diagnosed and % treated		Diagnosis and treatment	New Sick population
Target Population	Current treatment regimen		New therapy or procedure	New Target Population
Resource Utilization	Unit cost		Unit costs	New Resource Utilization
Cost of Illness				New Cost of Illness

Reference Scenario/ Current Environment

- Population

1. How many patients are getting care?
2. Who gets care?
   - essential: clinical characteristics
   - advanced: enrollment priority, VERA category
   - how many need VA-funded transportation?
3. What is the size of the target population?

Reference Scenario/ Current Environment

- What treatment(s) are the current population getting?
- What other healthcare resources is the current population getting?

Reference Scenario – The Intervention(s)

- What is “the intervention”?
- Where is it provided?
- How often is it provided?
- Who provides the care?
- What do the providers do when they are “providing the care”?
- What resources, technologies, etc are used?

Comparison Scenario

- Relative to reference scenario, how will these change?
  - Demand for care (number of patients seeking care)
    - will new patients be drawn into the system?
    - will new patients become eligible for contract care, home care, anything else outside VA?
    - Is the incidence or prevalence changing
  - Future need for care, within BIA horizon
  - Copayments collected, VERA payments received

Comparison Scenario

- Relative to reference scenario, how will these change?
  - Staff mix & consequent costs
    - mix of MDs, NPs, RNs
    - how will staff changes affect costs?
  - Space and other overhead costs
    - clinical space requirements
    - will new space be rented, purchased, or built?
  - Technology purchase/repair costs

Modeling

- Static models
  - Simple calculation of cost impact from changing one or two factors, holding everything else constant
  - May be sufficient if the alternative and reference scenarios are quite similar and probabilities are well known
- Dynamic models
  - Decision model, such as a Markov model: captures uncertainty, such as over impact on enrollment or probability of clinical outcomes
  - Discrete event analysis

BIA in Implementation Research

- Include cost of implementation program

- Consider:
  - What implementation costs should be included?
  - Will implementation costs change/disappear over time?
  - Can implementation be made more efficient?
  - How generalizable is the local implementation approach?

- You may need to develop alternative scenarios for other locations.

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Why Both CEA and BIA?

- CEA addresses societal perspective
  - implementation won't occur without proof that "best practice" is cost-effective
- BIA addresses provider perspective
  - influential in implementation decisions

Costing in the BIA

- Using the perspective of VA:
  - VA's costs: yes
  - Patient's costs: no (earnings, transportation, time)
  - Society's costs: no (other payers, employer, caregivers)
- Estimate the amount of change in units of care
- Estimate the amount of change in cost per unit of care

Cost Data Sources: Encounters

- Decision Support System (DSS) National Data Extracts (NDEs)
  - Inpatient files
    - discharge (one record per stay)
    - bedsection (one record per bedsection segment of the stay)
  - Outpatient files
    - Encounters: one record per person-clinic-day
    - Pharmacy: one record per prescription

Cost Data Sources: Encounters

- HERC Average Cost data
  - Inpatient files
    - discharge: can be linked to PTF discharge files
    - med/surg discharges and non-med/surg discharges: can be linked to PTF bedsection files
  - Outpatient files
    - encounters: can be linked to OPC
    - pharmacy: none except when delivered in clinic (use DSS or PBM pharmacy data)

Cost Data Sources: Encounters

- HERC Average Cost data vs. DSS
  - Uses Medicare relative value units (RVUs) not DSS RVUs
  - Less granularity = more similarity in costs across encounters
- For comparison to DSS costs, see HERC publications:
  - Go to HERC intranet web site
  - Choose Publications
  - Choose Technical Reports

Cost Data Sources: Staff

- Average hourly staff cost for 70+ occupation categories can be figured using either of two sources:
  - DSS ALBCC
  - Financial Management System

OR

- Use HERC technical report #12 supplement, which has figured them for FY2001-FY2008.

Cost Data Sources: Supplies, Machines

- National Prosthetics Patient Database (NPPD)
  - records purchase price of all items ordered through the VISTA Prosthetics and Sensory Aids package
  - includes nearly all medical items for internal and external use, not just prosthetics or sensory aids (glasses, hearing aids)
  - stored and handled by NPPD data manager at Hines VAMC
- Your local A&MMS purchasing officer

Cost Data Sources: Indirects

- PG Barnett, M Berger. Indirect Costs of Specialized VA Mental Health Treatment. HERC Technical Report #6. (on HERC web site)

- Rosenheck R, Neale M, Frisman L. Issues in estimating the cost of innovative mental health programs. *Psychiatric Quarterly* 1995;66(1):9-31

Sensitivity Analyses

- Purpose: to test the robustness of your results
- Method: change assumptions in your model and see how the final outcome changes
- Univariate: change one at a time
  - Easy, but possibly misleading
  - Not considered state-of-the-art
- Multivariate: change multiple assumptions at once
  - Probably will require software and/or a formal model
  - High credibility
  - Allows useful graphing

Summary

- BIA requires six items:

1. Size and characteristics of patient population
2. Usual care: current mix of care offered to current population
3. Cost of usual care
4. New care: mix of care under the new intervention
5. Cost of new care/intervention
6. Use and cost of other health care services related to the intervention and the condition under study

Source: Mauskopf et al. (2007)

Resources

- HERC web site (www.herc.research.va.gov)
  - Guidebooks [most on intranet site only]
  - Technical reports [most on intranet site only]
  - FAQ responses
  - Slides from training courses (cyber-seminars)

- VIREC web site (www.virec.research.va.gov)
  - Research user guides (RUGs) on DSS, PTF, OPC
  - Technical reports (pharmacy)

Resources

- Many articles on decision modeling and discrete event analysis appear in these journals:
  - *Medical Decision Making*
  - *Health Economics*
  - V*alue in Health*

Resources

- ISPOR recommendations on BIA:

  Mauskopf J, Sullivan SD, Annemans L, et al.
  Principles of Good Practice for Budget Impact Analysis: Report of the ISPOR Task Force on Good Research Practices – Budget Impact Analysis.
  Value in Health 2007;10(5):336-347.

- VA-funded literature review on budget impact analysis:

  Luck J, Parkerton P, Hagigi F.
  What is the business case for improving care for patients with complex conditions?
  Journal of General Internal Medicine 2007;22(Suppl 3):396-402

Next HERC Course

"How can Cost Effectiveness Analysis be Made More Relevant to US Health Care?"

Paul Barnett, PhD

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