Cost Estimation Methods and Foundational Public Health Capabilities

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First Principles

Estimating total economic costs of an activity

- **Costs** = value of resources used to produce activity
- **Resources** = people, facilities, equipment, supplies

...Key concept: **opportunity costs**
First Principles

Estimating economic costs of a capability

- **Capability** = resources required to produce an activity or set of activities

- Having a capability vs. using a capability
Developing a cost classification system

- Perspective: who incurs cost
- Timeframe: over what period
- Type of resource
  - Labor, equipment, supplies, facilities, etc
- Activity domains/areas
  - Training, surveillance, outreach & recruitment, screening, implementation, administration
  - Pre-implementation vs. post-implementation
- “Direct” vs. “indirect” activities
- Capital vs. operating costs (& depreciation)
Developing a cost classification system

Don’t overlook...

- Resources that are hard to measure or value
- Resources used in small amounts
- Resources procured without money
  - Volunteer time
  - Parent/caregiver time
  - Intervention recipient time
  - In-kind contributions/donated materials
  - Existing resources
Developing a cost classification system

Include measures of units of activity
- Unit costs

Fixed vs. variable costs
- Variable costs vary with activity level
- Fixed costs are constant despite volume of activity
- Long term, all costs are variable
Developing a cost classification system

Handling resources that are shared by multiple programs, activities, or organizations
- Joint costs

Cost allocation methods
- Time
- Intensity of use
Conducting a cost study

1. Define Purpose/Scope
2. Literature Scan
3. Solicitation of experts
4. Development of Cost Categories
5. Instrument Pilot Test/Validation
6. Data Collection
7. Cost Analysis
Cost data collection methods

- Prospective “expected cost” methods
  - Vignettes
  - Surveys with staff and/or administrators
  - Delphi group processes

- Concurrent “actual cost” methods (micro-costing)
  - Time studies with staff
  - Activity logs with staff
  - Direct observation

- Retrospective “cost accounting” methods
  - Modeling and decomposition using administrative records
  - Surveys with staff and/or administrators
Examples: Survey methods

Four dimensions of work:
- Time
- Cognitive effort
- Physical effort
- Stress

Additional cost components:
- Practice expense
- Malpractice expense
Examples: Survey methods

Table 4
Summary of Estimated Cost of Data Collection
(in 1991 dollars)

<table>
<thead>
<tr>
<th>Collection Method</th>
<th>Total Cost(^a)</th>
<th>No. of Completes</th>
<th>Cost per Complete(^b)</th>
<th>Cost per Rated Service(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone</td>
<td>$105,000</td>
<td>1200</td>
<td>$87.50</td>
<td>$175.00</td>
</tr>
<tr>
<td>1-Round Mail</td>
<td>$65,500</td>
<td>1200</td>
<td>$54.58</td>
<td>$109.17</td>
</tr>
<tr>
<td>2-Round Mail</td>
<td>$80,000</td>
<td>1267(^d)</td>
<td>$63.14</td>
<td>$133.33</td>
</tr>
<tr>
<td>Panel</td>
<td>$88,000</td>
<td>n/a</td>
<td>n/a</td>
<td>$146.67</td>
</tr>
</tbody>
</table>

\(^a\)Total cost of data collection includes all field activities (e.g., interviewing, survey distribution, data reduction), supervision, management, and instrument/materials development.

\(^b\)Cost per complete is derived by dividing the total cost of data collection by the number of completed cases. (This calculation is not applicable to the panel-rating methodology.)

\(^c\)Cost per service is derived by dividing the total cost of data collection by the 600 rated services.

\(^d\)667 completes for the first round and 600 completes for the second round.
Examples: Survey methods

- Surveys program managers
- Refers to expenditure records (not budgets)
- Explicit allocation of resources across multiple programs
- Available at:


Examples: Survey methods

**SASCAP™**
Substance Abuse Services Cost Analysis Program

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**Time Allocation Table for Non-Medical Direct Care Staff**

<table>
<thead>
<tr>
<th>Job Type</th>
<th># of People</th>
<th>Total Hours Worked Per Week by All the People Indicated in Column 2</th>
<th>Hours Spent in Average Week Providing Specified Patient Services</th>
<th>Hours Spent in Average Week Doing Administrative and Other Support Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Initial Patient Assessment and/or Orientation</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Initial Medical Services</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Outgoing Medical Services Other Than Pharmacological Doing</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pharmacological Doing</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other Pharmacological Doing</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Individual, Couples, and Family Counseling</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Group Counseling</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Outside of Counseling</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Patient Education Services</td>
<td>12</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Case Management/Care Support</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Any Other Patient Services</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Quality Assurance</td>
<td>15</td>
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<td></td>
<td>Program Evaluation</td>
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<td></td>
<td>Staff Education</td>
<td>17</td>
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<td></td>
<td></td>
<td></td>
<td>General Administrative</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Any Other Activity</td>
<td>19</td>
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</table>

**EXAMPLE: Social Worker (MSW/DSW)**

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>60</th>
<th>20</th>
<th>20</th>
<th>20</th>
<th>20</th>
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</thead>
<tbody>
<tr>
<td>Case Manager (certified)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Manager (non-certified)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degreed Counselor (licensed or certified)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degreed Counselor (non-licensed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Examples: Medicaid administrative claiming

- Public health agencies that claim Medicaid reimbursement for outreach and enrollment activities
- Requires periodic time studies to document agency time and effort devoted to reimbursable activities
Key issues: cost of capabilities

- Delineating state vs. local roles and division of effort
- Identifying scale and scope effects
  - By population served
  - By range of programs supported (portfolio effect)
- Identifying input factors that affect costs
  - Resource prices
  - Case mix
- Identifying key output differences across settings
  - Quality
Public Health Delivery and Cost Studies (DACS)

- Set of 11 new studies conducted by PBRNs
- Focus on 1 or more public health services
- Estimate costs and cost variation across multiple settings
- Identify factors that drive variation in costs
- Use standardized approaches to cost measurement and cost analysis