Business case for integrating EHDI and other health information systems

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Alan Hinman
EHDI Conference
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Purpose of this presentation

• Define the business case for integrating child health information systems

• Explain basics of how a Business Case Model (BCM) works

• Describe how a BCM can help make the case for integration
“Using credible estimates based on factual inputs and expert opinion allows health officials to articulate the costs and benefits of information systems integration in terms of dollars, time, and other resources. Presenting a sound business case helps ensure stakeholder support and long-term sustainability of the program – especially when the benefits of integrating systems may not accrue for many years.”

Business Case Model User Guide
Public Health INFORMATICS Institute
Why do we need a business case for ICHIS?

- Limited public health resources
- Increasing focus on documenting outcomes
- Need data for sustainable funding
Current Problems in PH Information Systems

- Few or no linkages exist among information systems
- Information not shared among health providers, public health, social services, and families
- Lack of timely, complete, and accurate health information
- Duplicate or incomplete immunizations, screenings, and follow-up
- Preventable illness or even life-long disability
- Children, their families, and society pay the price
Business case for ICHIS must:

- Be specific to **added effects** of integrating CHIS
- Reflect difference in type and degree of costs and benefits to **stakeholders**
- Reflect the fact that the benefits may not **accrue** until some time in the **future**
- Be **flexible** to allow for data updates and modifications
What is a Model?

“Essentially, all models are wrong, but some are useful."

George E. P. Box
Professor of Statistics
University of Wisconsin

Public Health INFORMATICS Institute
Characteristics of the BCM

- Based on hard data, but also uses some assumptions and “guesstimates”
- Requires training to use and interpret correctly
- Will become more accurate over time
- A *representation* of the integration of CHIS—not exact data *(projection, not definite)*
Why use a business case model for ICHIS?

• Provides cost/benefit analysis
• Compares different integration scenarios
• Makes strong financial case
• Uses information from health economics, medicine, and public health
• Customizable to each state
What is the business case model for ICHIS?

- Tool to quantify **benefits** and **costs** of ICHIS
- Contains pre-loaded state-specific data
- Documents projected **ROI** of ICHIS
- Shows results by **stakeholder** group:
  - Family, Employer, Insurer
  - Government
  - Society (= total effects on all stakeholders)
Integration benefits reflected in Model

- Improved **effectiveness and efficiency** of services
- Increase in **quality and coordination of care**
- Support for child care **decisions**
- Improvement in **data quality**
- Providers have **complete picture** of child
- Better health **outcomes**
Questions addressed in Model - 1

• How can we quantify both the costs and the benefits on a yearly basis in order to decide whether it makes sense from a cost-benefit perspective to invest in the integration of child health information systems?

• Which systems should be integrated first in order to get the greatest impact at the least cost?
Questions addressed in Model - 2

• What needs to happen on the programmatic side to ensure that the potential benefits of integration are realized?
• What are the differences in benefits of a decentralized system vs. a centralized system?
• How can we make a convincing business case that clearly describes the cost/benefit analysis that supports a decision to integrate?
BCM terminology

Benefit assumptions: estimates of improvements based on expert opinion

• Benefit assumptions in BCM
  – Better tracking of children
  – Changes in referral patterns
  – Improved efficiency and timeliness of services
  – Improved decision-making
Assumption illustration

Newborns

↑ Screened

- ↑ Negative screens
  - ↑ Diagnosed
    - ↑ Early interventions and timely treatments
      - ↑ Benefits
  - ↑ Positive screens
    - ↓ Undiagnosed
      - ↓ No early intervention, late treatments
      - ↑ Benefits

↓ Not Screened

- ↓ Undiagnosed
  - ↓ No early intervention, late treatments
  - ↑ Benefits

Positive screens

Early interventions and timely treatments

Benefits
Working with the Business Case Model
Four steps to create a scenario

1. **Define** systems you are integrating
2. **Review** and change inputs
3. **Calculate** results
4. **View results:** tables and charts from calculations
Centralized system
Decentralized system

- Immunization Registry
- NDBS Information System
- EHDI Information System
- Vital Records
- Birth Defects Registry/Surveillance System
- WIC Information System
- EPSDT Information System
- Lead Information System

Data warehouse or record locator

*Public Health INFORMATICS Institute*
Hybrid system

- Immunization Records
- Lead Records
- EHDI Records
- Birth Defects Records
- NDBS Records
- EPSDT Records

Vital Records
WIC Records

Public Health Informatics Institute
What is already in the model

- Census Bureau data on population
- Average health care costs
- Lifetime medical costs per case
- Lifetime special ed costs related to diseases
- Lifetime lost earnings associated with disabilities
- Value/hour time saved from integration
- Disease morbidity and mortality rates
- Impact of CHIS integration on screening, follow-up, participation rates
- Cost of living data
Some information to gather before starting

• Systems currently integrated in your state
• System(s) that will be integrated in the future
• Type health information system your state has now (centralized, decentralized, or hybrid)
• State-specific start-up and maintenance costs
• What your state currently screens for in NDBS
Change if you have better data

- Benefit assumptions
- Cost inputs
- Data entry duplication information
- Integration cost assumptions
### Summary of Integration Scenario

**Scenario date:** 1/31/2008 4:39:48 PM  
**State:** Pennsylvania  
**Year:** 2007  
**Scenario Name:** PA

<table>
<thead>
<tr>
<th>State Integration</th>
<th>Integration Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vital Records</td>
<td>Already integrated</td>
</tr>
<tr>
<td>Immunizations</td>
<td>Newly integrated</td>
</tr>
<tr>
<td>NDBS</td>
<td>Already integrated</td>
</tr>
<tr>
<td>EHD1</td>
<td>Newly integrated</td>
</tr>
<tr>
<td>Lead</td>
<td>Newly integrated</td>
</tr>
<tr>
<td>EPSDT</td>
<td>Newly integrated</td>
</tr>
<tr>
<td>WIC</td>
<td>Newly integrated</td>
</tr>
<tr>
<td>Birth Defects</td>
<td>Not integrated</td>
</tr>
<tr>
<td>Chronic Diseases</td>
<td>Not integrated</td>
</tr>
<tr>
<td>Early Intervention</td>
<td>Not integrated</td>
</tr>
<tr>
<td>CSHCN</td>
<td>Not integrated</td>
</tr>
</tbody>
</table>

**Integration Cost Assumptions:**  
**Benefit Assumptions:**

[Buttons: Print, Back, Return to Table of Contents]
### Summary of Benefits and Costs of Integration: 2008 - 2012

#### Net Benefit <Costs> From Perspective Of:

<table>
<thead>
<tr>
<th>Benefits Category</th>
<th>Family/Employer/Private Insurer</th>
<th>Government</th>
<th>Medical Providers</th>
<th>Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunizations</td>
<td>$260,007,077</td>
<td>$36,560,408</td>
<td></td>
<td>$296,567,484</td>
</tr>
<tr>
<td>Newborn Dried Blood Spot Screening (NDBS)</td>
<td>$3,671,688</td>
<td>$1,924,820</td>
<td></td>
<td>$5,596,508</td>
</tr>
<tr>
<td>Early Hearing Detection and Intervention (EHDI)</td>
<td>$71,247,609</td>
<td>$4,331,761</td>
<td></td>
<td>$75,579,370</td>
</tr>
<tr>
<td>Lead Screening</td>
<td>$116,793,764</td>
<td>$58,392,175</td>
<td></td>
<td>$175,185,939</td>
</tr>
<tr>
<td>Early and Periodic Screening, Diagnostic, and Treatment (EPSDT)</td>
<td>$183,016,882</td>
<td>-$27,742,943</td>
<td></td>
<td>$155,273,940</td>
</tr>
<tr>
<td>Women, Infants, Child (WIC)</td>
<td>$6,232,751</td>
<td>-$5,577,473</td>
<td></td>
<td>$655,278</td>
</tr>
<tr>
<td>Benefits Unassigned to Child Health Programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Quantified Benefits of Integration</td>
<td>$640,969,771</td>
<td>$67,888,748</td>
<td>$27,326,082</td>
<td>$736,184,600</td>
</tr>
<tr>
<td>Annualized Start-Up and Maintenance Costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Quantified Net Benefits</td>
<td>$640,969,771</td>
<td>$67,888,748</td>
<td>$27,326,082</td>
<td>$736,184,600</td>
</tr>
</tbody>
</table>
## Integration Benefits to Immunization Program: 2008

### View results for: 2008

<table>
<thead>
<tr>
<th>Reduction in level of underimmunization</th>
<th>Number of Cases</th>
<th>Net Benefit &lt;Costs&gt; From Perspective Of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reduction in total days of under-vaccination</td>
<td>Reduction in Number of underimmunized children</td>
</tr>
<tr>
<td>DTP</td>
<td>72,760</td>
<td>6,960,000</td>
</tr>
<tr>
<td>Polio</td>
<td>50,160</td>
<td>4,320,000</td>
</tr>
<tr>
<td>Hib</td>
<td>60,600</td>
<td>4,920,000</td>
</tr>
<tr>
<td>HepB</td>
<td>56,480</td>
<td>5,440,000</td>
</tr>
<tr>
<td>PCV</td>
<td>120,520</td>
<td>11,040,000</td>
</tr>
<tr>
<td>VAR</td>
<td>43,880</td>
<td>6,080,000</td>
</tr>
<tr>
<td>MMR</td>
<td>39,460</td>
<td>5,000,000</td>
</tr>
</tbody>
</table>

| Reduction in invalid doses (from early vaccination) | $900,000 | |
| Reduction in extramunization | $12,000,000 | |

<table>
<thead>
<tr>
<th>Change in number of disease cases</th>
<th>Family/Employer/Private Insurer</th>
<th>Government</th>
<th>Medical Providers</th>
<th>Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Tetanus</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Pertussis</td>
<td>$456,000</td>
<td>$252,000</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Polio</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Haemophilus influenzae</td>
<td>$12,000,000</td>
<td>$8,000</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Streptococcus pneumoniae</td>
<td>$11,456,000</td>
<td>$3,252,000</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Varicella</td>
<td>$208,000</td>
<td>$4,000</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Measles</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Mumps</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Rubella</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>

| Reduction in child mortality | $0                              | $0         | $0               | $0     |

**Improved efficiency (hours)**

**Total net benefit**

$24,460,000    $3,688,000    $0    $28,148,000
Benefits to Families/Employers/Private Insurers of Improved Immunization Timeliness

- Reduction in invalid doses (from early vaccination)
- Reduction in extra immunization
- Reduction in medical costs of preventable childhood disease
- Reduction in child mortality

Year:
- 2008
- 2009
- 2010
- 2011
- 2012
## Integration Effects on EHDI Program: 2007

### View results for: 2007

<table>
<thead>
<tr>
<th>Description</th>
<th>Number of Children</th>
<th>Family/Employer/Private Insurer</th>
<th>Government</th>
<th>Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in screening and follow-up after integration</td>
<td></td>
<td>-$36,800</td>
<td>-$36,800</td>
<td>-$73,600</td>
</tr>
<tr>
<td>Initial screenings</td>
<td>2,300</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receive recommended follow up audiological exam</td>
<td>124</td>
<td>-$9,200</td>
<td>-$9,200</td>
<td>-$18,400</td>
</tr>
<tr>
<td>Enroll in early intervention program by six months of age</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional hearing loss cases detected before 6 months after integration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate to profound bilateral hearing loss (# infants)</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild and/or unilateral hearing loss (# infants)</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs and savings of early hearing loss detection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional cost for hearing interventions prior to age 5</td>
<td>-$84,800</td>
<td>-$84,400</td>
<td>-$169,200</td>
<td></td>
</tr>
<tr>
<td>Reduction in medical costs</td>
<td>-$23,200</td>
<td>-$15,200</td>
<td>-$38,400</td>
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<tr>
<td>Reduction in special education costs</td>
<td>$0</td>
<td>$371,200</td>
<td>$371,200</td>
<td></td>
</tr>
<tr>
<td>Increase in lifetime productivity</td>
<td>$1,430,800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total net effect</td>
<td>$1,276,800</td>
<td>$225,600</td>
<td>$1,502,400</td>
<td></td>
</tr>
</tbody>
</table>

### Additional Notes:
- The net benefit from the perspective of the family/employer/private insurer is calculated as the difference between the costs and savings.
- The net benefit from the government's perspective is calculated similarly.
- The net benefit from the societal perspective considers the benefits for all stakeholders, including the family, employer, private insurer, government, and the society at large.
- The calculations are based on the number of children and the associated costs and savings.
Enroll in Early Intervention <6Mo.  Mod. hear loss cases detected  Mild hear loss cases detected
Increase in EHDI participation after integration Effects on Families, Employers, and Insurers
What the Business Case Model does

• Performs cost/benefit analysis of integration
• Compares alternative integration scenarios
• Makes a financial case for integration
• Produces summary tables and charts showing effects of integration
• Customizes integration scenarios by state
What the Business Case Model does NOT do

• Produce exact cost/benefit figures for integration – it provides educated estimates
• Produce calculations on stand-alone information systems
• Include preloaded (default) data about costs of integration and maintenance
Possible uses of the Model

• Provide a detailed picture of the specific costs and benefits related to integration of HIS
• Present the systems integration proposal to funders, decision-makers, and other stakeholders to stimulate discussion and generate buy-in based on facts and figures
• Make adjustments to a project’s scope or identify an unfeasible proposal before committing resources to it
• Produce a wide variety of scenarios and compare results, making better, more fiscally sound decisions about investing in CHIS integration
Acknowledgements

• Tim Dall and colleagues at the Lewin Group
• Workgroup and technical advisors, PHII staff
• HRSA/MCHB (Genetic Services Branch) and RWJF funding
Learn More
# Training and Support for Business Case Model

<table>
<thead>
<tr>
<th>Feature</th>
<th>Leader/Advocate</th>
<th>Casual user</th>
<th>Advanced user</th>
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</thead>
<tbody>
<tr>
<td>Web site with printable materials</td>
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<td>X</td>
</tr>
<tr>
<td>Presentation: Value of a Business Case Model</td>
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<tr>
<td>Presentation: Creating a Basic Business Case Scenario</td>
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<tr>
<td>User guide</td>
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<td>Technical Report</td>
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<tr>
<td>User group</td>
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<td>Public Health Informatics Institute</td>
</tr>
</tbody>
</table>
Additional BCM training sessions

• AMCHP – March 2, 2008
• Webinar - May 13, 2008
• For more information:
  – Email: Businesscasemodel@phii.org
  – Call: Jim Mootrey, (404) 592-1416
    Karen Torghele, (404) 687-5622
    Alan Hinman, (404) 687-5636