XCELERATOR TRAINING PROGRAM

How to measure cost.
How to measure break even.
How to measure impact.
How to measure cost effectiveness.

Amy Lockwood, UCSF
August 3-5, 2014, Washington DC
### HOW TO MEASURE COST

**Fixed costs**

A **periodic cost that doesn’t change with an increase or decrease in the output volume or sales revenue of a company.**

- Research & development
- Rent
- Staff salary
- Equipment & maintenance

**Variable costs**

A **periodic cost that varies with an increase or decrease in the output volume or sales revenue of a company.**

- Raw materials
- Energy usage
- Labor
- Distribution costs

**Total costs** = Fixed Costs + (Variable Costs * Output)
BREAK EVEN

Break even point
# of units where revenue = total costs

Revenue, slope = $/unit

Total costs = fixed costs + (variable costs * units)

Variable costs, slope = cost/unit

Fixed costs

$
BREAK EVEN:
PEDS FIXED DOSE COMBINATION ARVS

- Fixed costs = $800,000
- Variable costs, slope = $20/unit
- Total costs = $800,000 + ($20 * units)
- Revenue, slope = $100/unit

Break even point:
# of units where revenue = total costs

Fixed costs = $800,000
Variable costs, slope = $20/unit
Total costs = $800,000 + ($20 * units)
Revenue, slope = $100/unit
BREAK EVEN: Peds Fixed Dose Combination ARVs

Revenue = Total Costs
Price * Volume = Fixed Costs + (Variable Costs * Volume)

Solve for Volume

$100V = $800,000 +$20V
$80V = $800,000
V = 100,000 units
Can you sell 100,000 units?
If not...
BREAK EVEN:
PEDS FIXED DOSE COMBINATION ARVS

INCREASE YOUR PRICE

Revenue (new)
Revenue (original)
Costs

Break even point (original)
Break even point (new)

$ units
BREAK EVEN: PEDS FIXED DOSE COMBINATION ARVS

DECREASE YOUR COSTS

Revenue
Costs (original)
Costs (new)

Break even point (original)
Break even point (new)

units

$
Revenue = Total Costs
Price * Volume = Fixed Costs + (Variable Costs * Volume)

Solve for Volume

\[ 100V = 800,000 + 20V \]
\[ 80V = 800,000 \]
\[ V = 100,000 \text{ units} \]
IMPACT

• Remember your success statement.
• If you could measure one thing, what would it be?

• To have a meaningful impact, you need to
  1. Measure a change (against a baseline)
  2. Have confidence it’s real
  3. Show that it’s due to your product or intervention

Source: Mulago Foundation
IMPACT:
DISABILITY ADJUSTED LIFE YEARS

The DALY Show
James G Kahn MD MPH, Professor of Health Policy, Epidemiology, and Global Health at UCSF

https://www.youtube.com/watch?v=Exce4gy7aOk

Source: D-REV Blog
Cost Effectiveness = Total Costs / Impact

Pediatric FDC ARVs
Cost Effectiveness = \$800,000 + (\$80 \times 100,000) = \$88
100,000

BUT IS THAT GOOD?
## COST EFFECTIVENESS COMPARISONS

<table>
<thead>
<tr>
<th>Rank</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bundled Interventions to Reduce Undernutrition in Pre-Schoolers</td>
</tr>
<tr>
<td>2</td>
<td>Subsidy for Malaria Combination Treatment</td>
</tr>
<tr>
<td>3</td>
<td>Expanded Childhood Immunization Coverage</td>
</tr>
<tr>
<td>4</td>
<td>Deworming of Schoolchildren</td>
</tr>
<tr>
<td>5</td>
<td>Expanding Tuberculosis Treatment</td>
</tr>
<tr>
<td>6</td>
<td>R&amp;D to Increase Crop Yield Enhancements</td>
</tr>
<tr>
<td>7</td>
<td>Investing in Effective Early Warning Systems for Natural Disasters</td>
</tr>
<tr>
<td>8</td>
<td>Strengthening Surgical Capacity</td>
</tr>
<tr>
<td>9</td>
<td>Hepatitis B Immunization</td>
</tr>
<tr>
<td>10</td>
<td>Acute Heart Attack Low-Cost Drugs</td>
</tr>
</tbody>
</table>

Source: 2015 Copenhagen Consensus