

DevTreks –social budgeting that improves lives and livelihoods

Monitoring and Evaluation Analysis 1

Last Updated: August 13, 2014, Original Release: March 28, 2013

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Version: DevTreks 1.6.8

A. Introduction

This reference documents how to complete Monitoring and Evaluation (M&E) analyses using M&E Calculator 1. The DevTreks reference, *Monitoring and Evaluation 1: Food Nutrition* introduces the background logic for M&E analysis in DevTreks. The *Monitoring and Evaluation 1* reference explains how this calculator works.

B. Data

Fictitious data for Malnutrition Improvement projects were used in this reference (real data couldn't be found).

The Calculators and Analyzers explained in this reference can be found at the following URIs:

- **M&E Calculators**

[https://www.devtreks.org/hometreks/preview/farmworkers/linkedviewgroup/M and E Calculators/53/none/](https://www.devtreks.org/hometreks/preview/farmworkers/linkedviewgroup/M%20and%20E%20Calculators/53/none/)

- **M&E 1 Analyzers**

[https://www.devtreks.org/hometreks/preview/farmworkers/linkedviewgroup/M and E 1 Analyzers/52/none/](https://www.devtreks.org/hometreks/preview/farmworkers/linkedviewgroup/M%20and%20E%201%20Analyzers/52/none/)

C. Work Breakdown Structure (WBS)

DevTreks recommends using standard Work Breakdown Structures to structure data. The WBS labels are used to aggregate and analyze data for all clubs throughout a network. Although some

malnutrition codes can be found in the World Health Organization’s International Classification of Diseases (ICD10), a complete WBS for malnutrition interventions does not exist (to the author’s knowledge). Each of the M&E element sections below include the WBS used with the data. All of the data used in this reference, including the indicators, were aggregated using these labels. Although the examples below show the same labels being used by both an M&E element and its associated indicators, the two labels can be different.

D. Analyzers

Separate M&E analyzers are available for each M&E element, including Inputs, Outputs, Operations, Components, Outcomes, Operating Budgets, and Capital Budgets. The *Calculator and Analyzer 1* reference documents how all DevTreks’ Analyzers work. The *Analysis Type* property of M&E Analyzers is used to specify the type of analysis to run. Each analysis will display up to 10 aggregated indicators for each separate M&E element. The number of displayed indicators is somewhat arbitrary and may be changed in future releases.

E. M&E Indicator Analyses

M&E analyses are carried out in two stages. The first stage aggregates base elements using standard Analyzer aggregators, such as Label or Group Id (3*). The second stage then aggregates the indicators associated with each base element. Unlike NPV and LCA analysis, the number of observations is not based on the number of aggregated base elements, but the number of distinct indicators in the aggregated base elements.

Analysis Result Properties

The results of running analyses are displayed using the following basic properties for all base elements (3*):

M and E Type: The stage of the monitoring and evaluation analysis. Options include baseline, actual, realtime, post. Each M&E Analyzer includes a selection list for setting this property.

Total Name: name of the total indicator

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Total Label: WBS indicator label used to aggregate indicators

Total Q1: total indicator quantity 1

Total Q1 Unit: unit of the Q1 indicator quantity

Total Q2: total quantity indicator quantity 2

Total Q2 Unit: unit of the Q2 indicator

Total: total of the Q1 (+, -, *, /) Q2 results

Total Unit: unit of the total indicator

F. Multipliers

Base element multipliers, such as an Operation Amount, Time Period Amount, or Input Times, do not change the quantity of indicators in any analysis.

G. M&E Analyzers

The current version supports the following analyses:

1. Statistics 1 Analysis

This type of analysis uses the Totals calculations to measure basic statistical properties of aggregated indicators. Total, Median, Mean, Variance, and Standard Deviation statistics are generated for all of the indicators that have the same Label property. Only indicators with an Indicator Type property set to Actual are used in the aggregation.

The following Output Statistics Analysis displays basic statistics associated with output indicators. These statistics measure the proportion of families with malnourished children receiving food nutrient packages. Q1 is the number of families receiving a minimal quantity of food nutrient packages. Q2 is the total number of families in the targeted group. The statistics for the output series aggregates 8 observations consisting of 2 separate Output Series with 4

quarterly indicators. All 8 indicators have the same Label. Year 2012 included 1 Benchmark indicator and 4 Actual quarterly indicators. 2013 included 4 Actual quarterly indicators. Note that the analysis takes certain indicator properties, such as name and description, come from the first indicator only (admittedly a little misleading, but a standard convention used throughout DevTreks).

The 2013 Output Series (and 2014, 2015 ...) name will be shown in the analysis, even though its indicators were added to the 2012 results, to make it clear that its indicators are included in the analysis.

Output Series : 2012 Number of food nutrient packages distributed

Indicator Totals

Indicator 1 Name : Q1 food nutrient packages delivered	Type : actual
Label : 0122A	Unit : percent families
Date : 2012-03-15T00:00:00	
Total : 4.800	Observations : 8.000
Mean : 0.600	Median : 0.600
Variance : 0.046	Std Dev : 0.214
Q1 Total : 120000.000	Q1 Unit : families
Q1 Mean : 15000.000	Q1 Median : 15000.000
Q1 Variance : 28571428.571	Q1 Std Dev : 5345.225
Q2 Total : 200000.000	Q2 Unit : population families
Q2 Mean : 25000.000	Q2 Median : 25000.000
Q2 Variance : 0.000	Q2 Std Dev : 0.000

Description : This indicator measures the Q1 proportion of families with malnourished children that received the minimal number of food nutrient packages each week.

Output Series : 2013 Number of food nutrient packages distributed

The following Capital Budget Statistical analysis combines the Inputs, Components, Outputs, Outcomes, and Time Periods for 1 Capital Budget containing 2 Time Periods. A Labels aggregator was chosen for the aggregation and the base elements in both years contained the same Labels. The 2013 indicators are being included in the 2012 statistical analysis. If the Labels aggregator had not been chosen, the subsequent analysis would have been harder to interpret.

devtreks.cloudapp.net/hometreks/search/farmworkers/outcome/none/0

Aggregate Using: None **Labels** Types Groups

What If Tag: none

Description: v150a

Capital Investment Group : M and E 1 Malnutrition Projects

Capital Investment : Malnutrition Project 02

Indicator Totals

M and E Type: final

Time Period : 2012 Malnutrition Progress

Indicator Totals

Indicator 1

Indicator 1 Name : Q1 Population Food Secure Status	Type : actual
Label : TP123	Unit : proportion families
Date : 03/15/2012	
Total : 3.771	Observations : 8.000
Mean : 0.471	Median : 0.470
Variance : 0.045	Std Dev : 0.212
Q1 Total : 404000.000	Q1 Unit : families
Q1 Mean : 50500.000	Q1 Median : 50500.000
Q1 Variance : 563428571.429	Q1 Std Dev : 23736.650
Q2 Total : 846000.000	Q2 Unit : total families
Q2 Mean : 105750.000	Q2 Median : 107500.000
Q2 Variance : 14214285.714	Q2 Std Dev : 3770.184

Description : This indicator measures the Q1 proportion of families who are food secure

← → ↻ devtreks.cloudapp.net/hometreks/search/farmworkers/outcome/none/0

Outcome : 2012 Families no malnourished children

Indicator Totals

Indicator 1

Indicator 1 Name : Q1 families with no malnourishment	Type : actual
Label : OC123	Unit : proportion families
Date : 04/01/2012	
Total : 0.770	Observations : 8.000
Mean : 0.096	Median : 0.090
Variance : 0.002	Std Dev : 0.044
Q1 Total : 7700.000	Q1 Unit : families
Q1 Mean : 962.500	Q1 Median : 900.000
Q1 Variance : 191250.000	Q1 Std Dev : 437.321
Q2 Total : 80000.000	Q2 Unit : total families
Q2 Mean : 10000.000	Q2 Median : 10000.000
Q2 Variance : 0.000	Q2 Std Dev : 0.000

Description : This indicator measures the proportion of families who have no children suffering from malnutrition.

Output : 2012 Number of children examined for malnutrition, Project 01

Indicator Totals

Indicator 1

Indicator 1 Name : Q1 malnourished children examined	Type : actual
Label : 0123A	Unit : proportion children
Date : 03/15/2012	
Total : 1.909	Observations : 8.000
Mean : 0.239	Median : 0.120
Variance : 0.063	Std Dev : 0.252
Q1 Total : 192900.000	Q1 Unit : children
Q1 Mean : 24112.500	Q1 Median : 12350.000
Q1 Variance : 624989821.429	Q1 Std Dev : 24999.796
Q2 Total : 825000.000	Q2 Unit : children population
Q2 Mean : 103125.000	Q2 Median : 102500.000
Q2 Variance : 12053571.429	Q2 Std Dev : 3471.825

Component : 2012 Malnutrition Project 01 Food Delivery

Indicator Totals

Indicator 1

Indicator 1 Name : **Q1 Actual Food Delivered to Clinics** Type : actual
 Label : I122 Unit : dollars
 Date : 03/30/2013
 Total : 7652500.000 Observations : 4.000
 Mean : 1913125.000 Median : 1868750.000
 Variance : 652501562500.000 Std Dev : 807775.688
 Q1 Total : 12300.000 Q1 Unit : ton
 Q1 Mean : 3075.000 Q1 Median : 2850.000
 Q1 Variance : 1309166.667 Q1 Std Dev : 1144.188
 Q2 Total : 2450.000 Q2 Unit : dollars
 Q2 Mean : 612.500 Q2 Median : 625.000
 Q2 Variance : 3958.333 Q2 Std Dev : 62.915
Description : This indicator measures ..

Input : 2012 Food Package

Indicator Totals

Indicator 1

Indicator 1 Name : **Q1 Food Packages Purchased** Type : actual
 Label : I122 Unit : total package cost
 Date : 03/15/2012
 Total : 31262.000 Observations : 7.000
 Mean : 4466.000 Median : 3192.000
 Variance : 7364653.667 Std Dev : 2713.790
 Q1 Total : 20950.000 Q1 Unit : packages
 Q1 Mean : 2992.857 Q1 Median : 2100.000
 Q1 Variance : 3453690.476 Q1 Std Dev : 1858.411
 Q2 Total : 10.520 Q2 Unit : dollars
 Q2 Mean : 1.503 Q2 Median : 1.500
 Q2 Variance : 0.001 Q2 Std Dev : 0.030

2. Change 1 Analysis

This type of analysis uses indicators that support Change by Year and Change by Id calculations to measure total and percent changes in aggregated indicators.

Benchmark Total is the initial amount of the indicator being measured that has an Indicator Type property of Benchmark (regardless of the year).

Actual Total (or Q1, Q2) is a summation of all of the indicators that have an Indicator Type set to Actual for the same year except for the Benchmark.

Total Change (or Q1, Q2) is measured as Actual Total Year x – Actual Total Year $x - 1$ (with the first calculation subtracting zero).

Percent Total Change (or Q1, Q2) is measured (Total Change Year x / Actual Total Year $x - 1$) * 100.

Benchmark Percent Change (or Q1, Q2) is measured as ((Actual Total Year x – Benchmark Total) / Benchmark Total) * 100.

Average Cost is measured as Actual Total / Q1 Total (i.e. Total Cost / Total Quantity).

Marginal Cost is measured as Total Change / Q1 Change (i.e. Incremental Change in Total Cost / Incremental Change in Total Quantity).

Price Elasticity is measured as (($x_{\text{minus}1} \cdot \text{TotalQ1} - \text{current} \cdot \text{TotalQ1}$) / ($x_{\text{minus}1} \cdot \text{TotalQ1} + \text{current} \cdot \text{TotalQ1}$) / 2) / (($x_{\text{minus}1} \cdot \text{TotalQ2} - \text{current} \cdot \text{TotalQ2}$) / ($x_{\text{minus}1} \cdot \text{TotalQ2} + \text{current} \cdot \text{TotalQ2}$) / 2). Q1 is interpreted as a Quantity and Q2 is interpreted as a Price.

If any divisor is zero, the calculated number will be zero as well. Although the terms “Cost” and “Price” are used in these properties because those are common measurements for these types of numbers, the measurements are useful for numbers that are not prices or costs as well.

The following image uses the same exact data as the Statistics 1 analysis but now analyzes annual indicator changes. The 2012 Output Series data is measuring changes between 2012 Benchmark and 2012 aggregated Actual Indicators. The 2013 *Output Series* data is measuring changes between the 2012 Benchmark and aggregated Actual Indicators and the 2013 aggregated Actual Indicators. Note that although up to four indicators are being aggregated in each series, properties such as name and description come from the first indicator only. Also note that the 2013 decreased Percent Total Change in the proportion of families receiving food nutrition packages could mean that malnutrition conditions are improving. The only way to know is to read the story that must accompany these analyses and that explains their content.

devtreks.cloudapp.net/hometreks/search/farmworkers/input/none/0/none

Indicator 1

Indicator 1 Name : **Q1 food nutrient packages delivered** Type : actual
 Label : 0122A Unit : proportion families
 Actual Total : 3.342 Date : 03/15/2012
 Benchmark Total : 0.200 Total Change : 3.342
 Percent Total Change : 0.000 Benchmark Percent Change : 1571.000
 Q1 Total : 336000.000 Q1 Unit : families
 Benchmark Q1 : 20000.000 Q1 Change : 336000.000
 Percent Q1 Change : 0.000 Benchmark Q1 Percent Change : 1580.000
 Q2 Total : 402000.000 Q2 Unit : population families
 Benchmark Q2 : 100000.000 Q2 Change : 402000.000
 Percent Q2 Change : 0.000 Benchmark Q2 Percent Change : 302.000
 Average Cost : 0.000 Marginal Cost : 0.000
 Price Elasticity : 1.000
Description : This indicator measures the Q1 proportion of families with malnourished children that received the minimal number of food nutrient packages each week.

Output Series : 2013 Number of food nutrient packages distributed

Indicator Totals

Indicator 1

Indicator 1 Name : **Q5 food nutrient packages delivered** Type : actual
 Label : 0122A Unit : proportion families
 Actual Total : 1.940 Date : 03/15/2013
 Benchmark Total : 0.200 Total Change : -1.402
 Percent Total Change : -41.951 Benchmark Percent Change : 870.000
 Q1 Total : 194000.000 Q1 Unit : families
 Benchmark Q1 : 20000.000 Q1 Change : -142000.000
 Percent Q1 Change : -42.262 Benchmark Q1 Percent Change : 870.000
 Q2 Total : 400000.000 Q2 Unit : population families
 Benchmark Q2 : 100000.000 Q2 Change : -2000.000
 Percent Q2 Change : -0.498 Benchmark Q2 Percent Change : 300.000
 Average Cost : 0.000 Marginal Cost : 0.000
 Price Elasticity : 107.438
Description : This indicator measures the Q5 proportion of families with malnourished children that

Operating Budget and Capital Budget analysis will display Input and Output elements as shown above (Q1 to Q4 in an aggregated 2012 element and Q5 to Q8 in an aggregated 2013 element). The following image shows that other elements, such as Outcome and Components, are displayed in the same element:

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Outcomes

Outcome : 2012 Families no malnourished children

Indicator Totals	
Indicator 1 Name : Q1 families with no malnourishment Label : OC123 Actual Total : 1.400 Benchmark Total : 0.100 Percent Total Change : 0.000 Q1 Total : 14000.000 Benchmark Q1 : 1000.000 Percent Q1 Change : 0.000 Q2 Total : 40000.000 Benchmark Q2 : 10000.000 Percent Q2 Change : 0.000 Description : This indicator measures the Q1 proportion of families who	Type : actual Unit : proportion families Date : 2012-03-15T00:00:00 Total Change : 1.400 Benchmark Percent Change : 1300.000 Q1 Unit : families Q1 Change : 14000.000 Benchmark Q1 Percent Change : 1300.000 Q2 Unit : total families Q2 Change : 40000.000 Benchmark Q2 Percent Change : 300.000
Indicator 1 Name : Q5 families with no malnourishment Label : OC123 Actual Total : 2.400 Benchmark Total : 0.100 Percent Total Change : 71.429 Q1 Total : 24000.000 Benchmark Q1 : 1000.000 Percent Q1 Change : 71.429 Q2 Total : 40000.000 Benchmark Q2 : 10000.000 Percent Q2 Change : 0.000 Description : This indicator measures the Q5 proportion of families who	Type : actual Unit : proportion families Date : 2013-03-15T00:00:00 Total Change : 1.000 Benchmark Percent Change : 2300.000 Q1 Unit : families Q1 Change : 10000.000 Benchmark Q1 Percent Change : 2300.000 Q2 Unit : total families Q2 Change : 0.000 Benchmark Q2 Percent Change : 300.000

Output : 2012 Number of children examined for malnutrition, Project 01

Indicator Totals	
Indicator 1 Name : Q1 malnourished children examined Label : 0123A Actual Total : 0.200 Benchmark Total : 0.010 Percent Total Change : 0.000 Q1 Total : 2000.000 Benchmark Q1 : 100.000 Percent Q1 Change : 0.000 Q2 Total : 40000.000	Type : actual Unit : percent children Date : 2012-03-15T00:00:00 Total Change : 0.200 Benchmark Percent Change : 1900.000 Q1 Unit : children Q1 Change : 2000.000 Benchmark Q1 Percent Change : 1900.000 Q2 Unit : children population

The following Input Change by Id Analysis carries out legitimate Marginal Cost Analysis because the Q1 and Q2 indicator properties were entered using a standard Quantity (Q1) and Price (Q2) relation (refer to the M&E 1 reference for further details about this type of analysis).

devtreks.cloudapp.net/hometreks/search/farmworkers/input/none/0/no

Percent Q2 Change : 20.000 Benchmark Q2 Percent Change : 0.000
 Average Cost : 1810.824 Marginal Cost : 49145.672
 Price Elasticity : 0.000
Description : Q1 measures the number of cancers detected, Q2 measures the diagnosis price per cancer detected, Weight is a general multiplier, and Total measures the totals costs per treatment.

Indicator 4

Indicator 1 Name : **4 Test Marg Cost Cancers Detected** Type : actual
 Label : I130A Unit : total cost
 Actual Total : 148116.934 Date : 06/23/1975
 Benchmark Total : 0.000 Total Change : 17918.688
 Percent Total Change : 13.763 Benchmark Percent Change : 0.000
 Q1 Total : 71.939 Q1 Unit : cancers detected
 Benchmark Q1 : 0.000 Q1 Change : 0.039
 Percent Q1 Change : 0.054 Benchmark Q1 Percent Change : 0.000
 Q2 Total : 7.000 Q2 Unit : price per cancer detected
 Benchmark Q2 : 0.000 Q2 Change : 1.000
 Percent Q2 Change : 16.667 Benchmark Q2 Percent Change : 0.000
 Average Cost : 2058.924 Marginal Cost : 459453.538
 Price Elasticity : 0.000
Description : Q1 measures the number of cancers detected, Q2 measures the diagnosis price per cancer detected, Weight is a general multiplier, and Total measures the totals costs per treatment.

Indicator 5

Indicator 1 Name : **5 Test Marg Cost Cancers Detected** Type : actual
 Label : I130A Unit : total cost
 Actual Total : 163141.435 Date : 06/23/1975
 Benchmark Total : 0.000 Total Change : 15024.501
 Percent Total Change : 10.144 Benchmark Percent Change : 0.000
 Q1 Total : 71.942 Q1 Unit : cancers detected
 Benchmark Q1 : 0.000 Q1 Change : 0.003
 Percent Q1 Change : 0.004 Benchmark Q1 Percent Change : 0.000
 Q2 Total : 8.000 Q2 Unit : price per cancer detected
 Benchmark Q2 : 0.000 Q2 Change : 1.000
 Percent Q2 Change : 14.286 Benchmark Q2 Percent Change : 0.000
 Average Cost : 2267.680 Marginal Cost : 5008167.000
 Price Elasticity : 0.000
Description : Q1 measures the number of cancers detected, Q2 measures the diagnosis

3. Progress 1 Analysis

This type of analysis uses indicators that support Progress calculations to measure the actual progress achieved for Full Target and Partial Target indicators. Actual indicators must have a date that is less than the corresponding partial target date, and greater than or equal to a previous partial target date. The properties in this analysis include:

Actual Total is a summation of all of the indicators within a partial period that have an Indicator Type property of Actual.

Benchmark Total is the initial amount of the indicator being measured (using a Benchmark option for the Indicator Type property).

Benchmark Percent equals $\text{Actual Total} / \text{Benchmark Total}$.

Partial Target Total is the partial target amount of the indicator being measured for a partial target period.

Partial Target Percent equals $\text{Actual Total} / \text{Partial Target Total}$.

Full Target Total is the full target amount of the indicator being measured.

Full Target Percent equals $\text{Actual Total} / \text{Full Target Total}$.

If any divisor is zero, the calculated number will be zero as well.

The following *Progress / Outcome Analysis* displays the progress achieved for two M&E element indicators over two quarterly periods:

Outcome : Consumption of Nutritious Meals	
Indicator Totals	
Indicator 1 Name : Q1 Partial Target Percent Population Eating Healthy Label : OC120 Actual Total : 25.00 Benchmark Total : 20.00 Partial Target Total : 20.00 Partial Target Percent : 125.00 Full Target Total : 75.00 Description : The Q1 partial target percentage of the targeted population engaged in targeted eating meals that meet food nutrition target is 20%,	Type : partialtarget Actual Unit : percent eating healthy Actual Date : 2013-06-10T00:00:00 Benchmark Percent : 125.00 Partial Target Date : 2013-06-12T00:00:00 Full Target Percent : 33.33
Indicator 2 Name : Q2 Partial Target Percent Population Eating Healthy Label : OC120 Actual Total : 45.00 Benchmark Total : 20.00 Partial Target Total : 40.00 Partial Target Percent : 112.50 Full Target Total : 75.00 Description : The Q2 partial target percentage of the targeted population engaged in targeted eating meals that meet food nutrition target is 40%,	Type : partialtarget Actual Unit : percent eating healthy Actual Date : 2013-09-10T00:00:00 Benchmark Percent : 225.00 Partial Target Date : 2013-09-12T00:00:00 Full Target Percent : 60.00
Output : 2013 Nutrition Training Workshops	
Indicator Totals	
Indicator 1 Name : Q1 Partial Target Passing Nutrition Grades Label : O121 Actual Total : 20.00 Benchmark Total : 15.00 Partial Target Total : 25.00 Partial Target Percent : 80.00 Full Target Total : 70.00 Description : Quarter 1's partial target for	Type : partialtarget Actual Unit : percent passing score Actual Date : 2013-06-10T00:00:00 Benchmark Percent : 133.33 Partial Target Date : 2013-06-12T00:00:00 Full Target Percent : 28.57

The following Operating Budget Progress Analysis examines the progress achieved for 2 quarters in 2 Time Periods:

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Budget Group									
M and E 1 Malnutrition Projects									
Budget									
Malnutrition 1 Project 01									
Monitoring and Evaluation Type: final									
Time Period Indicator Totals									
2013, Malnutrition Improvement Progress									
Type	Actual Total	Actual Date	Benchmark Total	Benchmark Percent	Partial Target Date	Partial Target Total	Partial Target Percent	Full Target Total	Full Target Percent
Q1 Partial Target Nutrition-Related Health Improvements									
T120 percent									
partialtarget	27.000	03/30/2013	20.000	135.000	04/01/2013	35.000	77.143	75.000	36.000
The Q1 partial target percentage of the targeted population who do not experience food nutrition-related health problems is 35%.									
Q2 Partial Target Nutrition-Related Health Improvements									
T120 percent									
partialtarget	43.000	06/30/2013	20.000	215.000	07/01/2013	50.000	86.000	75.000	57.333
The Q2 partial target percentage of the targeted population who do not experience food nutrition-related health problems is 50%.									
Outcomes									
Outcome									
Consumption of Nutritious Meals									
Type	Actual Total	Actual Date	Benchmark Total	Benchmark Percent	Partial Target Date	Partial Target Total	Partial Target Percent	Full Target Total	Full Target Percent
Q1 Partial Target Percent Population Eating Healthy									
OC120 percent eating healthy									
partialtarget	25.000	06/10/2013	20.000	125.000	06/12/2013	20.000	125.000	75.000	33.333

4. **Other Analyses:** Future references will include additional types of analyses.

H. M&E Analysis and Economic Analysis

Although M&E Analyses can be completed independently of their encompassing economic evaluation numbers, we recommend that both M&E analyses and economic analyses (refer to the General Analyzers section of DevTreks’ home page) be used together. The *Performance*

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Analysis 1 reference demonstrates how to use various Performance Measures, such as Incremental Cost Effectiveness Ratio and Cost per Unit Indicator, to support decisions that combine monitoring and evaluation data with benefit and cost data.

I. Comparative Analysis

DevTreks supports basic M&E comparative analysis. Each indicator being compared in an analysis must have the Indicator.Alternative option set to an appropriate option (one, two, three, four, or five). The exact same type of Analyses explained in previous sections will be carried out, but, before running the analysis, the Indicators will be subdivided further by the Alternative. This generation of analyses displays the results of each Alternative but does not carry out any mathematical operations between the Alternatives. Even though the math carried out in comparative analysis is simple (addition, subtraction, multiplication, or division), the amount of data generated can make interpretation difficult. A good strategy is to always include a summary story with each analysis.

The comparative analyses supported in DevTreks include:

1. Statistics 1 Comparative Analysis

The following image displays the results of running a comparative analysis for a *Statistics 1 Analysis*. The analysis compares three alternatives, each consisting of 8 indicators that have been aggregated from two different Output Series (2012 and 2013).

Indicator 1 Name : Altern one : Q1 malnourished children examined	Type : actual
Label : 0123A	Unit : percent children
Date : 2012-03-15T00:00:00	
Total : 0.600	Observations : 8.000
Mean : 0.075	Median : 0.075
Variance : 0.001	Std Dev : 0.027
Q1 Total : 6000.000	Q1 Unit : children
Q1 Mean : 750.000	Q1 Median : 750.000
Q1 Variance : 71428.571	Q1 Std Dev : 267.261
Q2 Total : 80000.000	Q2 Unit : children population
Q2 Mean : 10000.000	Q2 Median : 10000.000
Q2 Variance : 0.000	Q2 Std Dev : 0.000
Description : This indicator measures the Q1 proportion of malnourished children examined during the malnutrition improvement program.	

Output Series : 2012 Number of children examined for malnutrition, Project 02

Indicator Totals	
Indicator 1 Name : Altern two : Q1 malnourished children examined	Type : actual
Label : 0123A	Unit : percent children
Date : 2012-03-15T00:00:00	
Total : 0.800	Observations : 8.000
Mean : 0.100	Median : 0.100
Variance : 0.001	Std Dev : 0.027
Q1 Total : 8000.000	Q1 Unit : children
Q1 Mean : 1000.000	Q1 Median : 1000.000
Q1 Variance : 71428.571	Q1 Std Dev : 267.261
Q2 Total : 80000.000	Q2 Unit : children population
Q2 Mean : 10000.000	Q2 Median : 10000.000
Q2 Variance : 0.000	Q2 Std Dev : 0.000
Description : This indicator measures the Q1 proportion of malnourished children examined during the malnutrition improvement program.	

Output Series : 2012 Number of children examined for malnutrition, Project 03

Indicator Totals	
Indicator 1 Name : Altern three : Q1 malnourished children examined	Type : actual
Label : 0123A	Unit : percent children
Date : 2012-03-15T00:00:00	

2. Change 1 Comparative Analysis

The following image displays the same data as found in the comparative *Statistics 1 Comparative Analysis*, but an *Annual Change 1 Analysis* has been run. The analysis compares three alternatives over two years, each consisting of 4 indicators found in separate Output Series (2012 and 2013). The 2012 Output Series are measuring changes between a 2012 Benchmark Indicator and aggregated 2012 Actual Indicators. The 2013 Output Series are measuring changes between their related 2012 Output Series Alternative and 2013 aggregated Actual Indicators.

Output Series : 2012 Number of children examined for malnutrition, Project 03

Indicator Totals

Indicator 1 Name : Altern three : Q1 malnourished children examined	Type : actual
Label : 0123A	Unit : percent children
Actual Total : 0.400	Date : 2012-03-15T00:00:00
Benchmark Total : 0.100	Total Change : 0.400
Percent Total Change : 0.000	Benchmark Percent Change : 300.000
Q1 Total : 4000.000	Q1 Unit : children
Benchmark Q1 : 1000.000	Q1 Change : 4000.000
Percent Q1 Change : 0.000	Benchmark Q1 Percent Change : 300.000
Q2 Total : 40000.000	Q2 Unit : children population
Benchmark Q2 : 10000.000	Q2 Change : 40000.000
Percent Q2 Change : 0.000	Benchmark Q2 Percent Change : 300.000

Description : This indicator measures the Q1 proportion of malnourished children examined during the malnutrition improvement program.

Output Series : 2013 Number of children examined for malnutrition, Project 01

Indicator Totals

Indicator 1 Name : Altern one : Q5 malnourished children examined	Type : actual
Label : 0123A	Unit : percent children
Actual Total : 0.400	Date : 2013-03-15T00:00:00
Benchmark Total : 0.010	Total Change : 0.200
Percent Total Change : 100.000	Benchmark Percent Change : 3900.000
Q1 Total : 4000.000	Q1 Unit : children
Benchmark Q1 : 100.000	Q1 Change : 2000.000
Percent Q1 Change : 100.000	Benchmark Q1 Percent Change : 3900.000
Q2 Total : 40000.000	Q2 Unit : children population
Benchmark Q2 : 10000.000	Q2 Change : 0.000
Percent Q2 Change : 0.000	Benchmark Q2 Percent Change : 300.000

Description : This indicator measures the Q5 proportion of malnourished children examined during the malnutrition improvement program.

Output Series : 2013 Number of children examined for malnutrition, Project 02

Indicator Totals

3. Progress 1 Comparative Analysis

A future update of this reference will include a sample data set demonstrating the use of this analysis.

J. Sample Data Sets

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This section demonstrates how a data set for an M&E analysis might be structured. The data set uses a *Progress 1* analysis. Examples of *Statistical*, *Annual Change*, and *Marginal Cost* analyses can be found in nearby M&E elements (i.e. a Project 02 Malnourishment Capital Budget is a sibling of the Malnutrition Project 1 Capital Budget URI below).

Data

This section contains links to sample data sets that display the results of running these M&E analyzers. Keep in mind that these data sets were structured and used to test the analyzers. The data is fictitious and no weight should be assigned to the absolute numbers –pay attention to the aggregation techniques only. Many of these data sets were not all upgraded to their latest version on the cloud site. As testing takes place on some elements, changes are made to indicators to further test an analysis (i.e. Change by Alt). Those changes may not be reflected in analyses that were run before the changes were made (i.e. Totals). The data can be examined at the following URIs (1*):

- **Input Service URI**

<https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M and E Malnutrition Inputs/2651/none/>

- **Output Service URI**

<https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M and E Malnutrition Outputs/2656/none/>

- **Operation Service URI**

<https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M and E Malnutrition Operations/2654/none/>

- **Component Service URI**

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[https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M and E Malnutrition Components/2650/none/](https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M%20and%20E%20Malnutrition%20Components/2650/none/)

- **Outcome Service URI**

[https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M and E Malnutrition Outcomes/2655/none/](https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M%20and%20E%20Malnutrition%20Outcomes/2655/none/)

- **Operating Budget Service URI**

[https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M and E Malnutrition Op Budgets/2653/none/](https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M%20and%20E%20Malnutrition%20Op%20Budgets/2653/none/)

- **Capital Budget Service URI**

[https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M and E Malnutrition Investments/2652/none/](https://www.devtreks.org/hometreks/select/farmworkers/servicebase/M%20and%20E%20Malnutrition%20Investments/2652/none/)

WBS Examples

The following WBS is an example of how to classify Inputs:

Type: T120. Food Nutrition

Group: IG120. M and E Malnutrition Education Group

Input: I120. 2013 Nutrition Training Manual Development

Input Series: I120. 2013 Nutrition Training Manual Development

Indicator 1: I120. Training Material Development Labor

Input: I121. 2013 Nutrition Training Workshop

Input Series: I121. 2013 Nutrition Training Workshop

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Indicator 1: I121. Training Labor

The following WBS is an example of how to classify Outputs:

Type: T120. Food Nutrition

Group: 0G120. M and E Nutrition Training and Practice

Output: O121. 2013 Nutrition Training Workshops

Output Series: O121. 2013 Nutrition Training Workshops

Indicator 1: O121. Passing Nutrition Grades

Output: O120. 2013 Nutritious Meals Consumed

Output Series: O120. 2013 Nutritious Meals Consumed

Indicator 1: O120. Daily Nutrition Target Days per Month

The following WBS is an example of how to classify Operations or Components:

Type: T120. Food Nutrition

Group: OPG120. M and E Malnutrition Training

Operation 1: OP121. 2013 Conduct Training Workshops

Indicator 1: OP121. Workshops Held

Input 1: I121. 2013 Nutrition Training Workshop

Indicator 1: I121. Training Labor

Operation 2: OP120. 2013 Develop Nutrient Training Materials

Indicator 1: OP120. Training Materials Completed

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Input 1: I120 2013 Nutrition Training Manual Development

Indicator 1: I120. Training Material Development Labor

The following WBS is an example of how to classify Outcomes:

Type: T120. Food Nutrition

Group: OCG120. Nutrition Education and Practices

Outcome 1: OC120. Consumption of Nutritious Meals

Indicator 1: OC120. Percent Population Eating Healthy

Output 1: O121. 2013 Nutrition Training Workshops

Indicator 1: O121. Passing Nutrition Grades

Output 2: O120. 2013 Nutritious Meals Consumed

Indicator 1: O120. Daily Nutrition Target Days per Month

The following WBS is an example of how to classify Operating or Capital Budgets:

Type: T120. Food Nutrition

Group: BG120. M and E Malnutrition Projects

Budget 1: B120. Malnutrition Project 1. The goal of this project is to reduce malnutrition in a targeted population. Children in the targeted population suffer from malnutrition.

Time Period 1: TP120. 2013 Malnutrition Improvement Progress

Indicator 1: TP120. Nutrition-Related Health Improvements

Indicator 2: 120A. Female Children

Indicator 3: 120B. Male Children

Outcome 1: OC120. Consumption of Nutritious Meals

Indicator 1: OC120. Percent Population Eating Healthy

Output 1: O121. 2013 Nutrition Training Workshops

Indicator 1: O121. Passing Nutrition Grades

Output 2: O120. 2013 Nutritious Meals Consumed

Indicator 1: O120. Daily Nutrition Target Days per Month

Operation 1: OP121. 2013 Conduct Training Workshops

Indicator 1: OP121. Workshops Held

Input 1: I121. 2013 Nutrition Training Workshop

Indicator 1: I121. Training Labor

Operation 2: OP120. 2013 Develop Nutrient Training Materials

Indicator 1: OP120. Training Materials Completed

Input 1: I120 2013 Nutrition Training Manual Development

Indicator 1: I120. Training Material Development Labor

Summary

Clubs using DevTreks can carry out the basic monitoring and evaluation of projects, programs, and technologies. Clubs can solicit help with projects that are struggling and share structured knowledge explaining success and failure. Networks can build knowledge banks that explain why projects, programs, and technologies succeed or fail and pass that knowledge down to future

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generations. The result may be more effective social improvement programs and people who improve their lives and livelihoods.

Footnotes

1. DevTreks focuses on software development, not content development. We don't run calculations for every URI in a data set, just enough to carry out software tests. The monitoring and evaluation numbers generated by these analyzers were tested within the limitations of existing data sets. Those data sets have limited M&E data, but were successfully tested using Version 1.5.0's 88 M&E 1 and 2 calculators and analyzers. They'll continue to be tested using new data sets and combinations of base elements, prices, amounts, dates, amortization periods, and multipliers. We recommend running all analyses using the Full, rather than Mobile, view. The Full view generates html faster than the Mobile view. Once the Full view has been saved, click on the Mobile view to save that view.

References

References can be found in the *Monitoring and Evaluation 1: Food Nutrition* reference.

References Note

We try to use references that are open access or that do not charge fees.

Improvements, Errors, and New Features

Please notify DevTreks (devtrekkers@gmail.com) if you find errors or can recommend improvements.

Video tutorials explaining this reference can be found at:

<https://www.devtreks.org/commontreks/preview/commons/resourcepack/M and E Analysis 1/518/none/>