

**EFFICIENCY MONITORING TOOL FOR HIV INTERVENTIONS
TARGETING FISHER- FOLK IN KISUMU COUNTY**

For

KENYA RED CROSS SOCIETY

JANE KANINA

W64/79874/2015

UNITID Fellowship Programme

Health Economics Track

**A PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE AWARD OF HIV FELLOWSHIP
(HEALTH ECONOMICS),
UNIVERSITY OF NAIROBI**

DECEMBER 2017

Declaration

This report is my original work and has not been submitted for award in any other University

Signature.....

Date.....

JANE KANINA

W64/79874/2015

This report has been submitted for examination with my approval as the supervisor

Signature.....

Date.....

Ms. JUDY ALUOCH OUMA

Project Summary

The efficiency guide on HIV interventions targeting the fisher folk comes against the backdrop of high and steady HIV prevalence rates in Kisumu County over the last decade. Efforts to contain the HIV epidemic must however take into account that resources are scarce. Scarcity of resources stresses the need to make choices on what health care should be provided, how it should be delivered and in what amounts. In order to maximize on the gains of spending on HIV interventions, implementers need accurate and timely information on the efficiency of different programs. By introducing DEA as a method of comparing efficiency of their different service delivery units, use of this guide will lead to improved efficiency of different interventions within the KRCS. Improved efficiency in the case of HIV interventions would further results to increased access to HIV services and further reduction in HIV prevalence. The project output is a technical efficiency guide for the fisher folk Program. The project goal is to provide a tool that can be used for decision making based on accurate levels of efficiency at KRCS. The main objectives are to prioritize indicators that can be used to measure efficiency of the fisher folk and to formulate and develop a guide that will measure efficiency of fisher folk HIV program as well as other HIV interventions within the KRCS.

List of Abbreviations and Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ARVs	Antiretroviral Drugs
GoK	Government of Kenya
HIV	Human Immunodeficiency Virus
KAIS	Kenya AIDS Indicator Survey
KNASP	Kenya National HIV/AIDS Strategic Plan
MoH	Ministry of Health
CEA	Cost-Effectiveness Analysis
PLHIV	People Living with HIV
NACC	National AIDS Control Council
BMU	Beach Management Unit
UNAIDS	United Nations Agency for International Development
UNGASS	United Nations General Assembly Special Session
IEC	Information-education-communication
DEA	Data Envelopment Analysis
DMU	Decision Making Unit
TE	Technical Efficiency
KRCS	Kenya Red Cross Society
VCT	Voluntary Counselling and Testing
SFA	Stochastic Frontier Analysis
ADA	Alcohol and Drug Abuse

Definition of terms

Allocative efficiency	Allocative efficiency of health interventions is providing the right intervention to the right people at the right way in the right place with a view of maximizing outcomes.
Behavioral Interventions	These are interventions geared to discouraging risky behavior and promote good behavior by addressing beliefs, attitudes, knowledge, and skills of the target population.
Biomedical Interventions	These are interventions that use medical approach to avert new HIV infections, reduce the rate of infecting others and minimize vulnerability to infection.
Cost	Total value of the resources used (inputs) to provide a service
Effectiveness	It is the extent to which an intervention achieves the desired results.
Technical Efficiency	Refers to the ability of a beach management unit to produce the maximum amount of output from a given level of inputs without compromising quality
Fisher folk	Refers to a group of people who are involved in catching, processing and trading of fish or people whose livelihoods depend on the fishing activities
HIV incidence	Estimated total number of new infections in a given time period
HIV prevalence	Percentage of people who are HIV positive.
Key populations	People who are thought to have higher risk of getting HIV compared to the general population.

TABLE OF CONTENTS

Declaration.....	i
Project Summary	ii
List of Abbreviations and Acronyms	iii
Definition of terms	iv
1. Introduction.....	1
1.1 The Kenya Red Cross Society Aphia Plus Western Kenya Fisher folk project	2
1.2 Kisumu County Profile.....	4
1.3 Project goal and objectives.....	4
1.3.1 Goal	4
1.3.2 Objectives.....	4
1.3.3 Deliverables	4
1.4 Justification/Significance.....	5
2. Methodology	6
2.1 Implementation Plan	6
2.2 Efficiency Analysis	7
2.2.1 Introduction to efficiency	7
2.2.2 Measurement of Efficiency of HIV interventions at KRCS	8
2.2.3 Data Envelopment analysis	8
3. Efficiency of the Fisher folk program	14
3.1 The Fisher folk program in brief.....	14
3.2 Quantitative Indicators.....	14
3.3 Qualitative Indicators	19
4. Conclusion, Recommendations and project impact.....	23
4.1 Conclusion	23
4.2 Recommendations.....	23
4.3 Projected Impact.....	24
4.4 Lessons Learnt	24
References.....	25
Appendix 1: Summary of the Fisher Folk Project Indicators.....	27
Appendix 2: Data Collection Tool for the Fisher Folk Project.....	28
Appendix 3: Qualitative Data Collection Tool	29
Appendix 4: Dunga Beach Management Unit.....	31
Appendix 5: Activity at the Beach	33

List of Tables

Table 1: HIV Statistics..... 4
Table 2: Inputs and Outputs for BMUs..... 15

1. Introduction

The Kenya aids strategic framework (KASF) identifies fishing communities as one of the vulnerable populations who disproportionately contributes to high number of HIV infections in Kenya. In this regard, KASF proposes the need to enhance targeted prevention of HIV infection among fishing communities as one of the key intervention areas. This is in line with the PEPFAR 3.0 strategy on controlling the HIV epidemic. The strategy emphasizes on investing in areas with high prevalence as well as key population so as to reduce new infections and create an ‘AIDS-free generation’.

Kissling *et.al* (2005) noted that communities that engage in fishing are one of the high risk populations for HIV infections. This as a result of complex and widespread sexual network which is attributed to the high duration of time they spend away from home; fishermen and women are mostly youth between 15 to 35 years of age; access to cash income; widespread alcohol use; hyper masculinity of fishermen; availability of sex workers; and the high-risk nature of fishing making them risk-takers in the sexual arena among others (*ibid*).

However, resources to expand interventions to all the targeted populations remain scarce. Scarcity of resources implies that choices have to be made on what interventions should be provided, how they should be delivered and in what quantities. This means that not all potentially beneficial interventions can be funded and thus decision-makers should find ways of allocating the limited resources among different interventions. Inadequacy of resources amplifies the need to identify potential efficiency gains in HIV prevention with a view of ensuring value for money

This then calls for the need to establish efficiency of different interventions with a view of identifying the possible gains that can be made with the existing resources. According to Palmer and Torgenson (1999), technical efficiency is the ability of a unit to produce the highest attainable level of outputs from a given set of inputs; In the case of HIV prevention, technical efficiency may refer to the ability of an intervention to deliver a given amount of preventive services at the least unit cost. It implies the optimum inputs mix and the best use of such inputs. The focus is on delivering the highest HIV services for the least cost without compromising quality.

Studies on technical efficiency of HIV interventions have shown that significant improvements could be made with the available resources if programs are implemented more efficiently. An Indian study by Lepine *et al.*, (2015) showed that the Avahan NGOs could have used 43% less inputs to attain the equivalent level of outputs in their HIV prevention projects. Further, Zeng *et al.*, (2012) examined the level of technical efficiency of HIV/AIDS programs in low and middle income countries and revealed that outputs of the programs could be increased by 50 percent without making any variations to the inputs. Similar results were found in China by Cheng *et al.*, (2009) in evaluating the technical efficiency of Voluntary Counselling and Testing (VCT) services funded by the Global Fund. They concluded that reducing the inputs of VCT services by 2.17 times would result to the same level of outputs.

Such studies suggest that if efficiency is attained, then the maximum potential benefits of HIV interventions would be squeezed out of the available resources. To date however, little is known on the efficiency levels of HIV interventions programs by the KRCS. The question is whether the interventions could achieve more outputs with the existing resources or whether inputs could be reduced to achieve the same level outputs.

Given the sizeable amount of resources that go to HIV control and treatment, even small increases in efficiency can lead to resource savings or expansion of services to reach out to more people in the community. Further, focus on efficiency considers both benefits in terms of either outputs or outcomes and also the costs of interventions while ensuring the quality of services is not compromised.

This guide attempts to somewhat fill this gap by giving insights into the conceptual and methodological issues into measuring efficiency of HIV programs for the KRCS. By developing a framework for evaluating efficiency, the guide illustrates the need of collecting and using programme data such as data on outcomes, outputs and inputs for measuring efficiency of HIV services. Such analysis can lead to improved efficiency thus ensuring that obvious gains are made in the HIV spending.

1.1 The Kenya Red Cross Society Aphia Plus Western Kenya Fisher folk project

The Kenya Red Cross Society (KRCS) society is a humanitarian organization whose mission is to prevent and alleviate human suffering and save lives of the most vulnerable. The KRCS has

made significant contributions to successful national responses for HIV interventions and therefore contributing to fighting HIV and the burden of the same in Kenya.

The KRCS with support from APHIAplus Western Kenya Project is targeting HIV positive and negative men and women catching, processing and trading on fish in Kisumu County. The project targets the fisher folk from 12 BMUs with a comprehensive prevention package grounded in combination prevention approach (structural, behavioral and biomedical) and splash inside-out (SIO) as evidence based intervention (EBI). Appendix 4 and 5 shows images of activities at the beaches.



One of the 12 BMUs

The project aim is to create demand for health service uptake and promote healthy sexual behavior among the fisher folks. KRCS works with trained health activists reaching out to peers with repeat prevention messages; risk assessment; risk reduction; counselling focusing on alcohol and drug abuse, multiple concurrent partnerships; correct and consistent condom use messages; promotion of other safe sex practices and referrals for biomedical services.

1.2 Kisumu County Profile

Kisumu County is one of the 47 Counties in Kenya and is located at the shores of Lake Victoria. The total population as at 2014 was 1,059,053 people and is projected to grow to 1,145,749 by 2017. The main sources of income for the local population is from fishing activities and small scale farming.

The county ranks high both in HIV prevalence and incidence in the country. It is categorized as a high incidence cluster in which together with eight other counties contribute to 65 percent of all new infections in the Country. It is estimated that about 3200 people died of AIDS-related conditions in 2013. The women are more vulnerable to HIV than their male counterparts having recorded a HIV prevalence of 20.6 percent vis-à-vis 17.8 percent prevalence in men. This could be partly attributed to poverty which makes women to be victims of fishermen who demand for sexual favor. The County is also classified as hyper-endemic since it has HIV prevalence above 15 percent (GOK, 2014). Table 1.1 shows HIV statistics for Kisumu and the National statistics

Table 1: HIV Statistics

	KENYA	KISUMU COUNTY
Total population	41,792,563	1,059,053
HIV prevalence (%)	6.04	19.3
Number of PLHIV	1,599,451	134, 826
Number of new HIV infections	101,563	12,645
HIV incidence (%)	0.39	2.13
% contribution to national new HIV infections	100	12.5

Source: Kenya AIDS estimates, GOK (2014)

1.3 Project goal and objectives

1.3.1 Goal

To establish measures of efficiency for HIV interventions that will be useful for decision making at KRCS.

1.3.2 Objectives

- i) To prioritize indicators that can be used to measure efficiency of fisher folk interventions
- ii) Formulate and develop a guide that will measure efficiency of fisher folk HIV program

1.3.3 Deliverables

The overall output if this project is a guide for measuring efficiency of Fisher folk HIV interventions.

1.4 Justification/Significance

The rising costs of healthcare in Kenya poses a challenge to the Country's economic growth and development. Spending in health care is likely to rise further with the increasing burden of non-communicable diseases such as cancer and cardiovascular diseases. High costs of medical care may force deserving patients to forego health care when faced with other competing basic needs. This then calls for interventions that would prevent or delay occurrence of diseases including HIV and AIDS.

Fisher folk are known to engage in high risk behaviors that make them prone to HIV infections. KASF notes that there is a heightened HIV risk among the fishing communities in Kenya and calls for targeted interventions to address the same. The Kenya AIDS progress report shows that knowledge about HIV and condom use remains low among this population while majority engage in multiple and concurrent sexual relationships (GOK, 2014).

The Kenya HIV prevention roadmap target for zero new HIV infections by 2030 calls for diverse approaches to fighting the epidemic. The KAIS (2012) recommended that prevention strategies that have sustainable impact need to be implemented in Nyanza region in order to reduce the new infections. Besides being a hyper-endemic region with one of the highest number of PLHIV and a prevalence of 19.3 percent in 2013, data shows that most of the new infections are among persons aged 25-34 years and this is the age bracket for most of the fisher folk. Interventions for this group of people will need to be efficient in order to make the best of the existing resources.

2. Methodology

2.1 Implementation Plan

This guide will be used to analyze efficiency from a provider perspective. Efficiency analysis will guide decision makers on how to provide the highest attainable HIV services at the lowest possible cost. Such decisions would ensure a more sustainable HIV response that adds value in an already resource constrained environment. The guide involved a participatory and consultative process including:

Familiarization with fisher folk program

In order to prepare the efficiency tool, there was need to familiarize with the fisher folk program being implemented by the KRCS. This entailed literature review on the project documents so as to get a deep understanding of the project interventions, the target population and the type of data available that would be useful in efficiency analysis.

Interviews with key stakeholders

This was useful in getting an in-depth understanding of the project. The stakeholders included the project officers and the chairs of the BMUs. The interviews entailed an understanding of the study setting, what comprises of a BMU, the achievements of the fisher-folk project this far in terms of coverage, condoms distributed, successful referrals and any other information deemed important for the study.

Identification of indicators to be put in the tool

Health outcomes of an intervention such as reduction in HIV prevalence or the number of quality adjusted life years may only be measured imperfectly. This calls for the need to also measure direct and indirect outputs of interventions to serve as indicators for obtaining an operational definition of the term efficiency. In this context it was appropriate to have various indicators of HIV services and classify them according to the stages of production, using a scheme that may help to describe HIV services from an economic sense. Inputs were also broken down to fit the same. Appendix 1 show the summary of the indicators for the fisher folk project.

Development of the guide

This entailed collection of quantitative data that cover all the inputs and outputs of the interventions. Appendix 2 and 3 show the data collection tools that were used in developing the guide. Efficiency of HIV/AIDS intervention will be evaluated using direct inputs and outputs for each program. Outputs may include but not limited number of people that have received VCT services, number of condoms distributed, and numbers reached through campaigns. Inputs would be the total costs for the program such as salaries for staff, allowances for volunteers, laboratory costs, costs of printing IEC materials, and office expenses among others. The inputs and outputs will then be analyzed using DEA to get the efficiency scores of the interventions.

2.2 Efficiency Analysis

2.2.1 Introduction to efficiency

The theory of production in economics defines the maximum attainable level of outputs from a given level of inputs. Production function depicts production process that should be maximized so as to achieve the best possible level of output. Farrel (1957) defines efficiency as the ability of a decision making unit (DMU) maximum attainable level of outputs from a given level of inputs. Efficiency is the relationship between inputs into a production process and the results thereof. It's a measure of whether resource use is generating the best value for money. There are different types of efficiency in economics but the main ones are technical, allocative and productive (Palmer and Torgerson, 1999).

Technical efficiency is defined as the ability of a unit attain the maximum level of outputs from a given set of inputs; Productive efficiency which the highest attained level of outcomes for a given cost of production or cost minimization for a given level of outcome and; Allocative efficiency which captures productive efficiency but goes further look into the distribution of the outcomes among the target population.

The World Bank manual on efficiency analysis states that a HIV program would be deemed efficient if it provides each output at a unit cost that is most appropriate, World Bank (2012). It is therefore possible to compare different interventions in regard with respect to their levels of technical efficiency.

Simply put, technical efficiency is the output-input ratio with higher output per unit of input indicating greater efficiency. Optimum efficiency is reached when it's not possible to achieve more output at the existing level of inputs and technology. In service delivery however, it's not possible to determine what would be the optimum output given a certain level of inputs. Consequently, establishing absolute level of efficiency of a DMU is not possible but we can compare several units' output-to-input ratios and determine their relative efficiency.

2.2.2 Measurement of Efficiency of HIV interventions at KRCS

In order to analyze efficiency, information on inputs and output is needed. Technical efficiency gives amount of inputs that can be reduced without affecting the level of output. The efficiency score ranges between zero and one, with one representing fully efficient compared to the peers. The efficiency of each intervention will be measured from the data on inputs and outputs. The following steps are undertaken in measurement of efficiency:

1. Identifying the relevant variables to be put in the model
2. Formulation of an efficiency measure with the variables identified in step 1
3. Obtain the data to represent the variables
4. Calculate the efficiency score

2.2.3 Data Envelopment analysis

Data envelopment analysis was first suggested by Charnes, Cooper and Rhodes (1978) while building on Farrell's work on efficiency. DEA is a linear programming technique that measures relative efficiency of a firm thus comparing a firm's performance with the performance of other similar firms. It is used to estimate the production frontier function and thus measure efficiency at each service delivery point.

Performance estimation is based on the efficiency of a unit in utilization of the existing resources to generate the optimal output and is thus the ratio of a unit's total output to inputs. Efficiency scores range from 0 to 1 with the most efficient unit scoring 1 while the technically inefficient units score a value of less than 1. Technical inefficiency means that a unit is producing less output per input or is using more inputs per output as compared to the other units on the production possibility frontier.

DEA is a commonly used approach in evaluating technical efficiency especially in situations where multiple factors of production are involved and multiple outputs are produced by a single firm. This approach could be used in the context of HIV programs by comparing the efficiency of different units offering interventions that have similar outputs.

Key steps of DEA procedure

1. Definition of the selection criteria for the decision-making Units (DMU)

DEA is used when estimating efficiency of similar units. Such units must meet some minimum conditions for them to be comparable, this include: they should implement similar work, operate under the same conditions and have similar inputs and outputs for measuring their performance.

2. The choice of units to be evaluated

This guide should be used for evaluating similar programs being conducted by different KRCS branches or similar programs being funded by KRCS to different implementing agencies. It can also be useful in evaluating the outputs at the BMU level within the same KRCS branch.

3. Selection of inputs and outputs

In selecting input and output items it is necessary to consider the nature and availability of the data, and the relationship between input and output items. This guide identifies a number of inputs and outputs that would be of help in achieving the overall goal of the fisher folk.

Outputs of the fisher folk can be classified into three categories as follows;

- 1. Increased demand for HIV prevention, care, treatment and support services-** This output for the fisher folk project will be measured by the number of peers reached both through one-on-one or small group sessions and by the number of small group and one-on-one sessions conducted.
- 2. Increased access to HIV prevention, care, treatment and support services –**This will be measured by the number of condoms distributed, number of outreaches conducted, number of individuals tested and the number of referrals made.
- 3. Enhanced advocacy against Stigma and Discrimination for HIV and services access and provision to fisher folks-** This will be measured using the Number of PLHIV reached with cPwP messages during the community prevention with the positives education sessions

On the input side, inputs that can be used to compute the level of efficiency for the interventions include:

1. Labor inputs which include number of staff in the program such as project officer, peer educators, program accountant and volunteers. Because data on personnel costs is easily obtainable, it can be used as opposed to the number of staff in the measurement of efficiency.
2. Capital costs such as buildings, equipment, furniture, vehicles and initial training
3. Other recurrent costs such as stationery, travel expenses, information education & communication costs, condom supplies and monitoring costs.

Costs can then be disaggregated by the activity and the type of input. Using the information recorded on field visits as well as time-sheets, it's possible to apportion personnel costs to different activities such as outreach, small group sessions and community mobilization. Any unpaid volunteer time should be valued based on time allocated to project activities and computed based on the agreed volunteer allowance rates or based on the allowances of staff doing the same type of work. In the event that the project has some donated goods, such goods should be valued using the current market prices.

2.2.4 What does Data Envelopment Analysis do?

DEA is a benchmarking method which works by comparing all the decision making units under analysis taking into account all the resources used and the outputs thereof. It then identifies the most efficient units (BMUs, KRCS branches) which are also referred to as best practice units and the inefficient units in which efficiency can be improved. This is achieved by creating an efficiency ratio between a unit's aggregated inputs and outputs weighted on the best practice performance in the peer group.

The questions KRCS can help answer with DEA include:

1. Can branches improve their performance with the existing resources? This is what is referred to as output maximization. It is useful for identifying benchmarks for inefficient units to the relatively efficient ones.

2. Can branches maintain their performance with fewer resources? This is input minimization. It helps identify the appropriate changes in budget allocation that will not negatively influence outputs.
3. Which are the most efficient branches in a group of the branches with similar projects? What makes them stand out?

These questions could also be answered in the case of different BMUs in instances where only one branch is implementing a project but at different sites. This is the case of the Fisher-folk in Kisumu County.

2.2.5 Data Analysis in DEAP Computer program

In computing relative efficiency scores for decision making units, DEA can either assume constant or variable returns to scale. Constant returns to scale approach assumes that increasing the level of inputs would result to a proportionate increase in the level of outputs. On the other hand, VRS assumes that increasing inputs would lead to a disproportionate increase in the level of outputs.

Estimating the efficiency frontier can either be input oriented or output oriented. Coelli et al., (1998), defined input-orientation as the approach where outputs are fixed and one explores the possibility of reducing inputs to achieve the same level of outputs. The output-oriented efficiency is concerned with increasing the level of outputs without varying the amount of inputs. However, both input and output orientations give similar results in production processes with constant returns to scale.

This guide proposes an output-oriented, variable returns to scale measure of technical efficiency. The choice of output orientation is on the assumption that KRCS has more control of the outputs of their interventions than their inputs because resources are allocated by the donor at the beginning of the project.

In some cases, reduction of inputs or increase in outputs is not enough to make a unit get to the same level of efficiency as the best practice unit. DEA analysis identifies slack variables which are useful in decision making. Slack is referred to as extra input or missing output that exists even after the change in inputs or outputs. Under output orientation, slack is the amount of inputs

that can be reduced while increasing outputs while input orientation identifies the amount of outputs that can be increased while reducing the inputs.

Evaluation of technical efficiency will be done using the DEAP Version 2.1 which is a free program written by Tim Coelli and is available at <http://www.uq.edu.au/economics/cepa/deap.php>. The program package includes the executable program; data files for four simple examples; and a 47-page user's guide (in pdf format).

The DEAP version 2.1 Involves the following files:

1. The executable file- DEAP.EXE
2. The START UP file-DEAP.000
3. A data file- (example fisher.dta)
4. An Instruction file- (fisher.ins)
5. An output file- (fisher.out)

DEAP executes the instructions in the instruction file and produces outputs that are stored in the output file which can be viewed using a text editor such as Word. There are simple batch files within the program which one edits to suit their analysis. More information on the analysis is on the user manual.

It's of importance to note that an efficiency score of 1 does not imply that there is no room for improvement in such DMUs. It only indicates that the said unit is the most efficient when compare to its peers. It's therefore an indicator of relative efficiency as opposed to absolute efficiency.

2.2.6 Strengths and weaknesses of DEA

The main advantages of using DEA over other methods of measuring efficiency are:

1. Its ability to handle numerous inputs and outputs
2. There is no need to specify a model relating inputs to outputs
3. The comparison is against peer units
4. Inputs and outputs can be in different units

However, the methodology has a few weaknesses such as:

1. It does not measure absolute efficiency, only gives relative efficiency
2. It's not possible to conduct statistical tests on the results
3. Measurement error due to its inability to capture random noise thus regarding any deviation from the frontier as inefficiency.

2.2.7 Focus for the guide

The focus of this guide is on the Kisumu fisher folk project. The data available at the time of preparing the guide was the number of peer educators, number of project staff and number of condom outlets as inputs while outputs were the number reached through one on one session, number reached through small group discussions, number of condoms distributed and completed referrals.

3. Efficiency of the Fisher folk program

3.1 The Fisher folk program in brief

The Fisher folk uses evidence based approach using peer educators who are also referred to as health activists. The program is divided into the following:

1. Splash inside out
2. Communication prevention with the positives
3. Condoms distribution and advocacy
4. Mobilization for outreaches

The peer educators are part of the fisher folk and their names are given by the BMUs thus they are very acceptable to the community. As health activists, they are not really trained but are taken through refreshers once a year. It is estimated that the total population within this beaches is about 21,000 but the target for the Fisher folk is 8,000. On average, the peers reach about 2000 fisher folk monthly.

As at 2016, the project had 65 peer educators who are paid volunteer allowance. The office staff is composed of a project manager based at the HQ, project officer, assistant project officer and the lead peer educator. The office staff offer support supervision. They also conduct monthly sessions with the educators and get to know the challenges they are experiencing.

The peer educators also demonstrate on proper and safe use of condoms during those sessions. Condom dispensers are also placed at the walls of the BMU offices where the team meets every day. Any referrals are made to the government facilities.

3.2 Quantitative Indicators

The data collected on the specified inputs and outputs should then be analyzed using the DEA methodology as explained in this guide to evaluate the efficiency of each intervention. An example is using hypothetical data in Table 2

Table 2: Data on inputs and outputs for BMUs

BMU	No. reached through one on one sessions	No. reached through small group discussions	No. of peer educators
1	336	357	7
2	437	403	9
3	495	517	7
4	609	465	6
5	791	702	5
6	1441	873	7
7	777	1052	6
8	469	411	8
9	347	410	6
10	622	671	9
11	322	357	8
12	464	488	7

The files in the DEAP are explained as follows;

1. The executable file- DEAP.EXE

This file comes with the software and needs no alteration.

2. The START UP file-DEAP.000

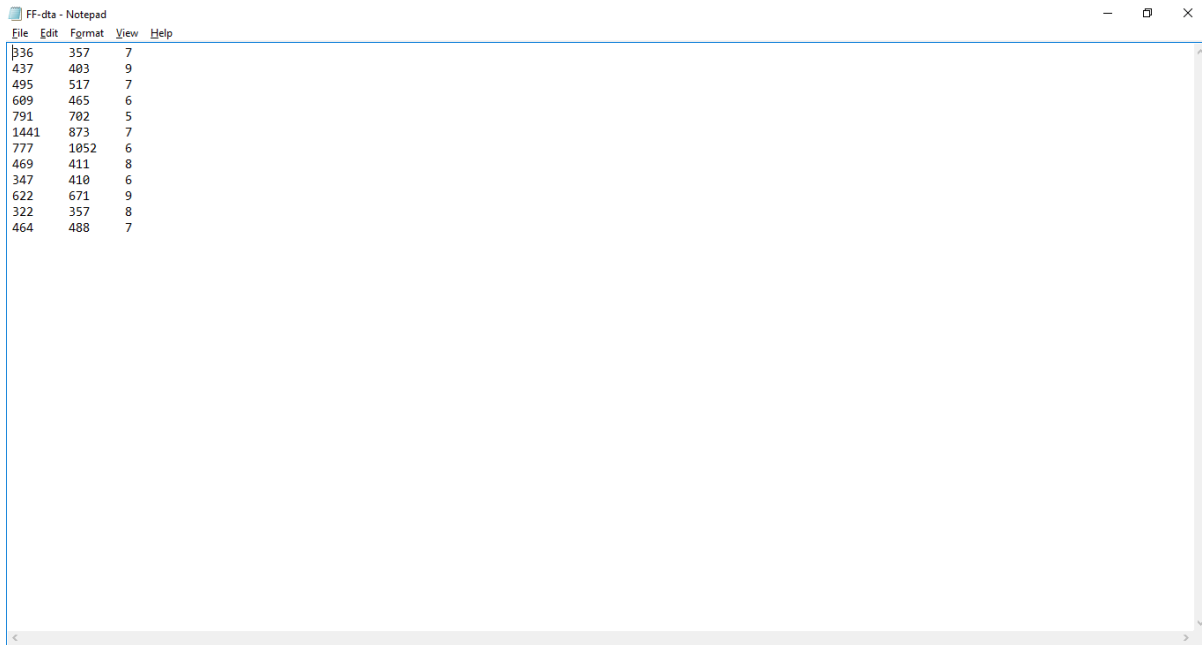
This file is also supplied with the software. Once you open it, prompts you to key the instruction file name which is used to solve the DEA problem. The file stores parameter values which the user may alter or not depending on the need.

```
C:\Users\HP\Desktop\KAREN WKSHOP\DEAP-xp\1\DEAP.EXE
DEAP Version 2.1
*****
A Data Envelopment Analysis (DEA) Program
by Tim Coelli
Centre for Efficiency and Productivity Analysis
University of Queensland
Brisbane, QLD 4072
Australia.
Email: t.coelli@economics.uq.edu.au
Web: http://www.uq.edu.au/economics/cepa

Enter instruction file name:
```

3. A data file- (example fisher.dta)

Data should be keyed in text format The order is also important as one ought to start with outputs and then inputs. The program requires a separate column for each output and input being used for evaluation. The file should only contain numbers and should not have any column headings. Data in Table 2 will appear as follows in the DEA data file



The image shows a Notepad window titled "FF-dta - Notepad" with a menu bar containing "File", "Edit", "Format", "View", and "Help". The main text area contains a table with three columns of data. The first column contains numerical values, the second column contains numerical values, and the third column contains numerical values. The data is as follows:

336	357	7
437	403	9
495	517	7
609	465	6
791	702	5
1441	873	7
777	1052	6
469	411	8
347	410	6
622	671	9
322	357	8
464	488	7

4. An Instruction file- (fisher.ins)

This is a text file that has instructions on the DEA problem that is being solved. It has details on the name of the data file, number of firms, number of inputs, number of outputs and the orientation among others. The simplest way to make the instruction file while using DEAP is to overwrite the ones supplied with the program as examples and then edit them to suit your data. The Instruction file for Table 2 data is as follows;


```

FF-ins - Notepad
File Edit Format View Help
FF-dta.txt          DATA FILE NAME
ff-out.txt          OUTPUT FILE NAME
12                 NUMBER OF FIRMS
1                  NUMBER OF TIME PERIODS
2                  NUMBER OF OUTPUTS
1                  NUMBER OF INPUTS
1                  0=INPUT AND 1=OUTPUT ORIENTATED
0                  0=CRS AND 1=VRS
3                  0=DEA(MULTI-STAGE), 1=COST-DEA, 2=MALMQUIST-DEA, 3=DEA(1-STAGE), 4=DEA(2-STAGE)

```

5. An output file- (fisher.out)

DEAP requires that you create an output file where results will be posted after the instructions have been executed. The output file for the fisher folk data after is as indicated

```

FF-output - Notepad
File Edit Format View Help
|Results from DEAP Version 2.1
Instruction file = ff-ins.txt
Data file       = FF-dta.txt

Output orientated DEA
Scale assumption: CRS
Single-stage DEA - residual slacks presented

EFFICIENCY SUMMARY:

firm   te
1   0.317
2   0.295
3   0.462
4   0.554
5   0.939
6   1.000
7   1.000
8   0.346
9   0.408
10  0.461
11  0.273
12  0.435

mean  0.541

SUMMARY OF OUTPUT SLACKS:

firm output:      1      2
1              0.000  0.000
2              0.000  0.000

```

The output file can be exported into excel for easy manipulation of data.

The efficiency scores in the fisher folk data are such that BMU 6 and 7 are the efficient ones compared to their peers having scored 1. The mean efficiency score for all BMUs in the sample is 54 percent. This indicates that BMUs can improve on their outputs without altering the current levels of inputs. BMU 6 and 7 appear as the peers for the other 10 BMUs meaning that they can benchmark to see how best to improve on their performance.

3.3 Qualitative Indicators

In order to capture the essence of HIV prevention programs, there is need to apply qualitative evaluation methods. This is because qualitative data can help evaluators to tap into the experiences of their target populations; enable the provider to tackle sensitive issues and thus get an insider view of their programs. The idea is to supplement statistical data with qualitative aspect of how the program touches the lives of the participants. Such information would help the evaluator to know the value the target population place on their experience in a particular program as well as what they think should be done to make it better. It is argued that Participants' perceptions are important because their perceived reality is reality thus when combined with quantitative data, they give a more complete picture of the prevention programs being evaluated.

This guide recommends that as part of the evaluation and in addition to collecting quantitative data, the monitoring and evaluation team should consider posing questions in the Appendices to the peer educators and the target population from time to time.



Meeting with peer Educators

During the field work, a number of questions were posed to the staff on the ground. A summary of some of their responses are listed here:

Asked what keeps the peer educators going, the peer educators had the following:

1. Understand the community well since they are part of the fisher folk
2. They speak the same language
3. Have an integrated understanding of the project
4. The desire to see change within their community
5. The level of acceptance and trust from the community is high
6. The Monetary aspect in terms of the allowance

The main challenges highlighted by the educators are as follows

1. Time- Since the fisher folk community is generally busy; getting hold of them to sit and listen to the educators has remained a key challenge to the implementation of the project.

2. Weather- During the wet and rainy season, accessibility to the beaches is a key challenge. The peer educators felt that the KRCS should provide them with umbrellas, raincoats and



gumboots to use during the wet season.

Meeting with peer Educators

3. Migrating nature of the fisher-folk- This makes follow-up hard since the fishermen keep changing beaches and thus tracing them to complete the sessions of SIO becomes a challenge.
4. Shortage of commodities such as female condoms as well as the removal of implants where the patients are required to pay at the facilities
5. The issue of acceptance where once they have convinced people to be tested and they turn out to be reactive, they become violent to the peer educators
6. The target population expects the peer educators to approach them with goodies such as foodstuff and blankets since they view KRCS as a humanitarian organization. This makes some of them not listen to the educators as they feel they have nothing to offer. The same

challenge is seen with VMCC since the target population expects an allowance during the healing process

7. The peer educators feel that they need some basic training on counseling to especially deal with the cases of denial. The issue of refresher courses was also raised since they felt that KRCS has not been doing enough.
8. The allowance paid to the peer educators is not adequate and is less than any other NGO in the region. They therefore feel not well motivated since it also does not take into account your deliverables. They are also not given communication allowance yet they have to follow up on some clients.
9. Some of the facilities are very far from the beach and require transport. The peer educators are at times forced to give the clients' money since they are willing to be tested but have no means of reaching the facility.
10. The peer educators have no means of identification making it risky for them. The t-shirts have not been given to everyone and the name-tags.

Responses to such questions would help in improving the overall efficiency of the programs as views from the people on the ground would go a long way in tailoring the solutions to inefficiency and give the programs a more humane approach.

4. Conclusion, Recommendations and project impact

4.1 Conclusion

Mounting pressures on healthcare resources couple with a complicated epidemic that is not only incurable but also devastating to those infected and affected lie behind the need to improve efficiency in interventions. It must not be lost that the amounts of resources spent in HIV are substantial and are likely to supplant other health spending thus efficiency gains would go a long way in expansion of services.

DEA is useful method for evaluating relative efficiency scores in cases with numerous inputs and outputs. DEA provides efficiency scores and does not require application of common weights to the inputs and outputs. Further, DEA identifies peer units as well as the targets for inefficiency units.

This guide draws attention to the efficiency of the fisher-folk program. It however lays the foundation of efficiency analysis of any other programs and would be very useful in comparing similar interventions in different localities. Understanding KRCS performance in delivery of HIV/AIDS interventions will be useful in formulating strategies for resource allocation to fight the HIV epidemic. Qualitative evaluation is further useful in cementing the quantitative data as it helps capture the realities on the ground.

4.2 Recommendations

During the interviews with the participants, it was clear that one of their main challenges was time since the fisher folk are busy doing their business. To address this challenge, Peer educators have been encouraged to be flexible and match the timings of the fisher folk as opposed to having a fixed time. The peer educators however feel that they might need to go to the beaches very early which is too much on their end. This is likely to impact on the efficiency of the program if not well addressed.

The challenge of the migrating nature of the fisher folk seems to be a huge one since being a vulnerable population; they hardly use the same mobile lines and are reluctant to give their ID numbers. This may therefore affect the efficiency and thus the need to see how best to address it.

To solve the issue of distance to the facility, the peer educators suggested that there should be more outreaches at the beaches. Further, the outreaches should be integrated to help solve the

issue of stigma as this encourages many people to attend and there is no fear since a number of activities are being conducted. The issue of sports day within the beaches was also raised as it would help bring more people

In conclusion, KRCS should consider reviewing the allowances for the peer educators and also ensure availability of condoms. One of the peer educators said '*volunteers need motivation., you just can't follow a call blindly*'. The peer educators also felt that clients who complete all the sessions should be acknowledged by issuing of certificates to motivate other members to participate. Refresher courses should also be done more frequently as well as exchange visits to enhance efficiency.

A more effective communication strategy is needed for improved efficiency. The fishing community needs to understand that HIV is just as dangerous as waves in the lake. Since the peer educators rely on creating awareness, it needs to be done in a way that the fisher folk will understand. Further, the issue of ADA seems to be a big challenge that may require a different strategy. The peer educators are of the opinion that beach managers and boat owners needs some training on ADA and HIV so that they can also pass the message to the fisher folk.

4.3 Projected Impact

By introducing DEA as a method of comparing efficiency of their different service delivery units, use of this guide will lead to improved efficiency of different interventions within the KRCS. Improved efficiency in the case of HIV interventions would further results to increased access to HIV services and further reduction in HIV prevalence.

4.4 Lessons Learnt

In conducting efficiency analysis, it's important to combine quantitative and qualitative methods to get a complete picture of the project. It is argued that participants' perceptions are important because their perceived reality is reality. They therefore give the story behind the numbers. Though the focus of this guide is on efficiency of service delivery, it's important to acknowledge that efficiency of a program should be understood in a wider context that include effectiveness, political and socio-economic variables among others.

References

- Charnes, A., Cooper, W. & Rhodes, E. (1978). *Measuring the efficiency of decision making units*. European Journal of Operational Research 2(6), 429-444.
- Cheng G, Qian Z, Hu J, (2009). *Longitudinal analysis of technical efficiency of voluntary counseling and testing of HIV in China*. J Peking Univ. 41(2):135.
- Coelli, T., Rao, P.D.S., O'Donnell, C. and Battese, G.E. (1998). *An introduction to efficiency and productivity analysis*. Second edition. New York: Springer Science.
- Farrel, M.J. (1957). *The measurement of productive efficiency*. Journal of Royal Statistics Society 120(3):253-290
- Government of Kenya (2009), Kenya HIV prevention response and modes of transmission analysis
- Government of Kenya (2014), Kenya Health Policy, 2014-2030, Ministry of Health.
- Government of Kenya (2015), Kenya Aids Strategic Framework, 2014/15-2018/19. Ministry of Health
- Holtgrave, D. R., Qualls, N. L. , Curran, J. W. , Valdiserri, R. O. , Guinan, M. , Parra, W. C. (1995). An Overview of the Effectiveness and Efficiency of HIV Prevention Programs. (2), 134 -146.
- Joint United Nations Programme on HIV/AIDS: Global report: UNAIDS report on the global AIDS epidemic. Geneva: Joint United Nations Programme on HIV/AIDS; 2013
- Kenya National Bureau of Statistics (KNBS) & ICF Macro. (2010). Kenya Demographic Health Survey 2008-09. Calverton, Maryland: KNBS and ICF macro.
- Kenya National Bureau of Statistics (KNBS) and ICF Macro (2010), Kenya Demographic and Health Survey 2008-09, Calverton, Maryland.
- Kissling, E., Allison, E.H., Seeley, J.A., Russell, S., Bachmann, M., Musgrave, S.D., Heck, S., (2005). *Fisher folk are among those most at risk to HIV: a cross-country comparison of estimated prevalence and numbers infected among groups at risk*. AIDS 19: 1939-1946
- Lepine A, Vassall A, Chandrashekar S, (2015). *The determinants of technical efficiency of a large scale HIV prevention project: application of the DEA double bootstrap using panel data from the Indian Avahan*. Cost effectiveness and resource allocation. 13:5
- Palmer S and Torgerson DJ (1999), *Definitions of Efficiency*. BMJ April 24; 318(7191): p. 1136.
- UNAIDS, The Kenya AIDs epidemic Update, 2012.
- UNAIDS. (2013). UNAIDS Global Report. Geneva: UNAIDS.
- World Bank (2012), Repositioning AIDS: The World Bank's Approach to Improved Efficiency and Effectiveness Using HIV Program Science Principles. Available at

https://www.aids2014.org/Web/WebContent/File/e2_Presentations/Day1/4PoliciesandInitatives/Gorgens_World Bank's Approach to Improved E2.pdf

Zeng W, Shepard D, Chilingerian J, Avila-Figueroa C (2012). *How much can we gain from improved efficiency? An examination of performance of national HIV/AIDS programs and its determinants in low- and middle-income countries*. BMC Health Serv Res. 12(1):74.

Appendix 1: Summary of the Fisher Folk Project Indicators

1	Increase demand for HIV prevention, care, treatment and support services	
1.1	Number of peers reached in the reporting quarter	Total number of peers met by the project team at least once through one on one sessions in the reporting quarter.
1.2	Number of peers reached in the reporting quarter	Total number of peers met by the project team at least once through small group sessions in the reporting quarter.
2	Increase access to HIV prevention, care, treatment and support services	
2.1	Number of individuals who received a condom (Male/Female) directly from the program/project during the reporting quarter	Total number of people who received a condom (male of female) directly from a peer educator, outreach staff, or a KPs-friendly health facility, Drop-in-Centres) during the reporting quarter
2.2	Number of condoms distributed through condom outlets during the reporting quarter	Total number of free condoms distributed indirectly to the peers through channels other than outreach staff (e.g. through condom dispensers, unmanned/ manned condom outlets etc.) during the reporting quarter
2.3	Number of health outreaches conducted in the reporting quarter	Total number of health outreaches organised for the fisher folk in the reporting quarter.
2.4	Number of clients who utilized the health outreaches in the reporting quarter	Total number of individuals who attended and made use of health outreaches in the reporting quarter.
2.5	Number of individuals counselled and tested for HIV during the reporting Quarter	Total number of individuals counselled and tested for HIV during the reporting Quarter
2.6	Number of clients tested HIV positive in the reporting period	Total number of clients tested HIV positive in the reporting period
2.7	Number of MARPs counselled and tested for HIV during the reporting Quarter	Total number of most at risk populations (MARPs) who tested HIV positive during the reporting Quarter
2.8	Number of PLHIV reached with cPwP messages	Total number of PLHIV who were reached by peer educators (community prevention with positives) with health information on comprehensive minimum package on cPwP
	Inputs	
3.1	Number of project staff	Total number of staff working in the project in the reporting period
3.2	Number of Active Peer Educators	Individuals that have been hired or volunteered and trained to provide the services in the reporting quarter

Appendix 2: Data Collection Tool for the Fisher Folk Project

KRCS efficiency of fisher folk project (2015-2016)										
	Inputs					Outputs				
Month	Number of peer educators (allowances)	Number of sessions conducted	Number of office staff (salaries)	Recurrent Inputs and services costs	Number of condom outlets	No. reached through one on one sessions	No. reached through small group discussions	Number of condoms distributed	Number of condoms distributed (Outlets)	Completed referrals
Jan										
Feb										
Mar										
Apr										
May										
June										
July										
Aug										
Sep										
Oct										

Appendix 3: Qualitative Data Collection Tool
KENYA REDCROSS SOCIETY FISHER FOLK PROJECT
Focus Group Discussion and Key Informants Guide

This set of questions are meant to gather qualitative information on the efficiency of the programme. The first set will be administered to peer educators while the second set is meant for the target audience.

Peer Educator Questions

1. What are main activities for this program? Do the main activities address the gaps, concerns, attitudes and needs of the target audience towards HIV/AIDS? If not, what is missing, or what does not match these needs?
2. Are you able to reach the targeted number of audience? What in your opinion would enable you to reach more people with the available resources? What should be done differently?
3. What are the challenges that you face in carrying out the interventions? What solutions do you propose for these challenges?
4. What reasons do you feel would hinder the target audience from utilizing your services? How should the same be addressed?
5. What type of training, tools, and resources do you need to effectively provide services to the target audience? Are the same availed to you?
6. What factors are associated with your effective job performance and continuity?
7. What are your general recommendations that would you help improve this program?

Target Audience

1. What do you perceive as your most important needs with regard to HIV/AIDS? Do the activities conducted by educators address your needs? If not, what do you think can be done to address them?
2. What time are the sessions conducted? Is it convenient for you or can this hinder your participation?
3. What are your opinions on the location of the condom outlets? Is it suitable for you? Are there other locations you would prefer the same to be situated?
4. Do the peer educators offer a good environment for you to interact and share your views? How suitable are the educators in terms of their expertise and knowledge about HIV/AIDS? What do you think they can do differently to make the environment friendlier?

5. What factors may hinder your participation or that of your colleagues in the fisher folk initiatives?
6. What are your general recommendations that would you help improve this program?

Appendix 4: Dunga Beach Management Unit





Appendix 5: Activity at the Beach

