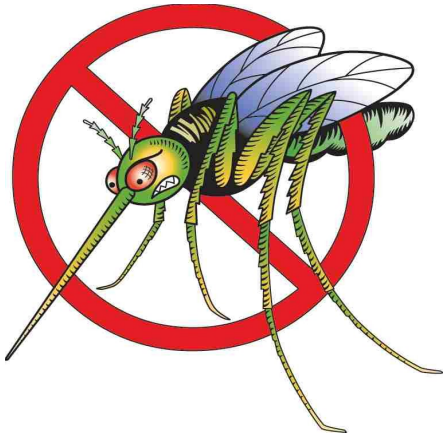
**TRANSPARENCY AND ACCOUNTABILITY NETWORK**



# IMMC

## INTEGRATED MOSQUITO AND MALARIA CONTROL

A comprehensive integrated mosquito and malaria control program to reduce the incidence of malaria, and other insect spread diseases.

## BUSINESS PLAN
## PORTFOLIO OF IMMC INTERVENTIONS
## MOSQUITO LARVA CONTROL

July 2006

DRAFT – FOR DISCUSSION ONLY

*For more information contact:*
*Peter Burgess*
*Tr-Ac-Net Inc. in New York*
*212 772 6918*
*peterbnyc@gmail.com*

# INTEGRATED MOSQUITO AND MALARIA CONTROL CONTEXT

***THIS DOCUMENT IS PART OF A SERIES THAT INCLUDES THE FOLLOWING:***

*EXECUTIVE SUMMARY – INTERNATIONAL*

*EXECUTIVE SUMMARY – LIBERIA*

*BUSINESS PLAN – INTEGRATED MOSQUITO AND MALARIA CONTROL*
*COMPRISING:*
*A ... BP for IMMC – INTRODUCTION SECTION*
*B ... BP for IMMC – THE MALARIA CRISIS*
*C ... BP for IMMC – HISTORY OF SUCCESSES*
*D ... BP for IMMC – MOSQUITOES AND MALARIA*
*E ... BP FOR IMMC – THE IMMC STRATEGY*
*F ... BP for IMMC – DATA AND MANAGEMENT INFORMATION*
*G ... BP for IMMC – PORTFOLIO OF IMMC INTERVENTIONS*
*GA – ENVIRONMENTAL MANAGEMENT*
*GB – INTERIOR RESIDUAL SPRAYING (IRS)*
*GC – EXTERIOR ADULTICIDE SRAYING*
*GD – MOSQUITO LARVA CONTROL*
*GE – INSECTICIDE TREATED NETS (ITN)*
*GF – MALARIA TREATMENT*
*H ... BP for IMMC – ORGANIZATION AND MANAGEMENT*

*APPENDICES*

*IMMC – ORGANIZATION AND MANAGEMENT*
*(An Excel workbook/spreadsheet)*
*IMMC – REFERENCES, ETC.*
*(An Excel workbook/spreadsheet)*
*CONTACTS, ETC.*
*(An Excel workbook/spreadsheet)*
*SIMULATION MODEL*
*(An Excel workbook/spreadsheet)*
*IMMC – BEHAVIOR OF COSTS*
*(An Excel workbook/spreadsheet)*
*IMMC – FINANCIAL PROJECTIONS – MACRO OVERVIEW*
*(An Excel workbook/spreadsheet)*
*IMMC – FINANCIAL PROJECTIONS – COUNTRY VERSION*
*(An Excel workbook/spreadsheet)*
*IMMC – FINANCIAL PROJECTIONS – DISTRICT VERSION*
*(An Excel workbook/spreadsheet)*

*SLIDE PRESENTATIONS*
*Components of IMMC (21 slides)*
*History of Malaria Eradication (24 slides)*
*Economics of Malaria (17 slides)*
*Organization of IMMC (24 slides)*

# Introduction

Progress in the reduction of the prevalence of malaria is only going to be achieved if there are adequate physical anti-mosquito and anti-malaria interventions. The interventions included an a comprehensive IMMC strategy include the following:

(1) neighborhood cleanup to reduce mosquito breeding places;

(2) interior residual spraying (IRS);

(3) ultra low volume (ULV) adulticide spraying to kill flying mosquitoes;

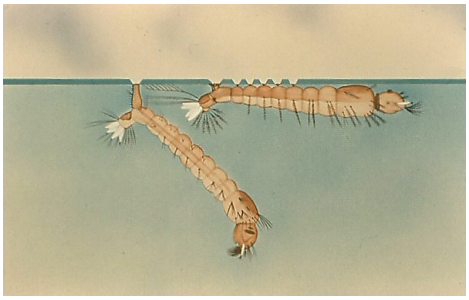
(4) larvaciding to kill larvae and stop mosquito recruitment into the population; and,

(5) personal use of insecticide treated bednets (ITN).

(6) medical treatment

# Larvaciding

Mosquito population control is best when mosquitoes are never recruited into the flying adult population. Mosquitoes lay eggs in stagnant water, and in a matter of days eggs become larvae, become pupae and then adult flying mosquitoes. The picture below shows what larvae look like, and how they attach themselves to the surface of the water. The examples hanging vertically are probably Culex larvae. The Anopheles larvae attaches itself horizontally to the surface of the water as shown in the right hand image.



Community level efforts to reduce mosquito breeding places is valuable. These can be organized through schools, churches, women's groups either as independent efforts or as part of a comprehensive set of activities. This is a useful part of a comprehensive effective program. Breeding places can also be treated with larvacides to kill the larvae before they grow into adult mosquitoes.

While there is a high natural mortality in the stages between egg and adult mosquito, natural mortality can be supplemented by larvacide control measures to stop all the recruitment from the water body. For larvaciding to be effective, there needs to be accurate and timely knowledge about the water bodies and the status of the mosquito larvae ... and interventions to control the larvae need to be scientifically suitable and timely.

The following are two typical larvaciding interventions:

Some bodies of water are difficult to access, and larvaciding can be done by air. In some places helicopters are used for very precise delivery of treatment.

The value of larvaciding has been demonstrated over and over again, but it requires a lot of organization. Precise data are needed, timely intervention and well trained staff. The success of larvaciding is determined in large part by the entomological data that is collected and the analysis of this data to design effective interventions.

The environment makes a big difference to the recruitment of mosquitoes into the population. The data shows man-made construction has a big role in creating the sort of environment that encourages mosquito breeding. Natural water is often associated with natural vegetation that seems to inhibit mosquito breeding. While the mechanism is not known, the idea that mosquito breeding varies spatially argues for precise information about the spatial entomological situation, and the precise interventions for each place.