

# THE INTEGRATED MALARIA MANAGEMENT CONSORTIUM



# IMMC

## SCIENTIFIC DATA AND MANAGEMENT INFORMATION

### INTEGRATED MALARIA AND MOSQUITO CONTROL

#### **The Malaria Crisis in Africa.**

More than 3,000 children die every day from malaria. One every 30 seconds. More than 500 million people get malaria several times a year. The disease is debilitating and stunts economic progress.

Malaria is a parasitic disease of the blood passed from person to person through mosquito bites. It is no longer a serious health threat in wealthy countries, but malaria remains endemic in poor tropical areas. Malaria can be controlled, but it has gone unchecked in most of Africa.

The reasons are many, but lack of funds, poor allocation of available funds and poor execution of programs have all contributed to the crisis. The malaria parasite can be treated medically and the mosquito vector can be controlled. With growing availability of funding for malaria control, the challenge becomes how best to use scientific and management data to optimize malaria and mosquito control performance.

IMMC's comprehensive approach to malaria management uses an analytical framework of scientific data and management information to materially improve cost effectiveness. The main elements of information, medical science and vector control are described in the following pages.

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## THE IMMC MANAGEMENT DIMENSION

The management challenge is to make the best use of available resources. Recent progress in increasing the amount of resources committed to malaria control is very encouraging, but not of much value if the resources are used ineffectively.

Good management information answers the critical questions: (1) What is the cost? (2) What is being done for the money? (3) What measurable outputs are being achieved? and, (4) What is the value? (5) How can the work be done better?

Management information can be thought of as “the least amount of information that ensures that the right decisions are made”.

Decision making is complicated by the many different stakeholders, organizations and agendas that are involved, and the lack of a widely accepted set of metrics that can be applied to measure performance.

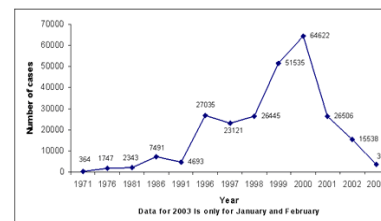
In the corporate world profit and value for the stockholder are simple concepts that are widely understood. The equivalent does not exist for the measurement of relief and development sector performance including the malaria health sub-sector.

However, there is no reason whatsoever why metrics that relate disbursement to results cannot become the norm. Nor is there any valid reason why decision making should not be linked to past performance and the capacity to perform.

The lack of internal information is an issue, but not difficult to improve. With internal information it becomes possible for staff to be held accountable for performance.

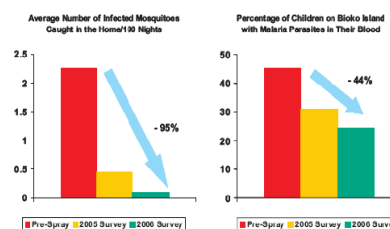
Transparency is the next phase where performance becomes visible to the external stakeholders including the public.

Accounting systems can easily analyze disbursements, but this needs to be related to results in order to measure performance.



In the following time series of malaria cases per year in Kwa Zulu Natal, the number increased dramatically when DDT use was discontinued, and then reduced when DDT was reintroduced.

Another example: the graphics below show progress on Bioko Island, Equatorial Guinea: (1) infected mosquitoes down 95% and (2) children with malaria parasites in their blood down 44%.



These are valuable metrics about results, and even more valuable when compared in a consistent way with the associated costs.

In order for management information to be of maximum value there must be a system of feedback and a framework for making decisions that improve performance.

A preliminary cost analysis study prepared by Tr-Ac-Net Inc. suggests that the use of better management information and optimized interventions can improve performance significantly ... maybe as much as an order of magnitude of improvement.

## MEDICAL SCIENCE

### Medical case management

Medical case management is getting more costly as malaria becomes resistant to low cost drug therapy. Better drugs can reduce the impact of malaria on society, but at a high cost. As long as there is ineffective vector control medical interventions are merely palliative and do not provide a durable solution.

Data from screening and diagnosis of malaria in the population helps to make the best use of resources for both medical and vector control activities. Data from screening is used: (1) to identify malaria cases needing treatment; and, (2) to measure the prevalence of malaria parasite in the human host.



There are constraints in almost every aspects of the health sector

1. Not enough government budget
2. Not enough clinics
3. Not enough staff
4. Not enough medications
5. Increasing resistance to low cost drugs
6. Cold chain not working
7. Salaries late
8. Multiple funding sources
9. Multiple implementing organizations
10. Incoherent priorities
11. Multiple actors and an ineffective coordination mechanism

Much more is known about malaria in the medical community than is used in practical situations to serve patients.

Training that is relevant to the beneficiary communities is required., from basic information to increase community awareness to nurses and doctors who treat patients.

The development of new drugs is essential because of increasing resistance to existing drugs. There is widespread resistance to drugs like chloroquine, and resistance to newer drugs is likely to develop.

In the short run, vaccine development delivers very little benefit. But it is important because there is a very real possibility that modern vector control and case management will become less and less effective. If this happens, a vaccine will be very very valuable.

Basic medical research is difficult to manage and optimize, but potentially very important, especially as vector systems evolve and what is best practice today becomes ineffective in the future.

**All sorts of constraints ... not enough resources ... AND people die!**



Optimizing performance means using not only medical interventions but also all possible vector control interventions.

# VECTOR CONTROL

## Long lasting insecticide impregnated bednets (LLITN)

Long lasting insecticide treated bednets (LLITN) reduce the impact of malaria on people who sleep under them, especially children.



## Larvaciding.

Kills larva. Reduces recruitment into the adult mosquito population.



Larvaciding is a valuable tool in reducing the population of mosquitoes.

## Ultra low volume (ULV) insecticide spraying.

ULV can be a powerful tool in rapidly reducing the EIR and accelerating benefits from an integrated program for malaria and mosquito control.



## Interior Residual Spraying (IRS)

Interior residual spraying (IRS) is very effective but takes a time to organize and costs are substantial.



Recent policy changes allows the use of DDT again after a long time ban. DDT is both a low cost and effective, especially with respect to its repellent effect.

## Community clean up

Clean up helps to reduce the number of potential breeding places for mosquitoes.

It can be low cost when trained volunteers and local workers do the clean-up.



## Infrastructure modification

Structural modification can be useful where community infrastructure facilitates the breeding of mosquitoes as in irrigated farming and drainage schemes.

## Cost effectiveness

Vector control is expensive to start, and reduces in cost over time when done using good scientific data. Integrated programs have much lower long term costs.

# MORE ON SCIENTIFIC DATA AND MANAGEMENT INFORMATION

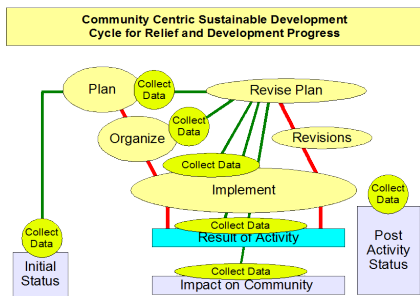
## Data collection and analysis

Field teams collect data for analysis. And scientists do analysis to identify species and the state of infection with malaria.



## Feedback

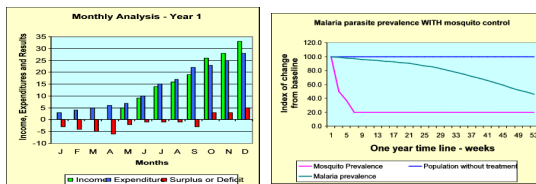
Measurement facilitates analysis, feedback, continuous improvement and optimization.



The schematic shows how data are needed at every stage and how there is feedback to make improvements all the time.

## Presenting management information ... time series

Time series help to make data clear:

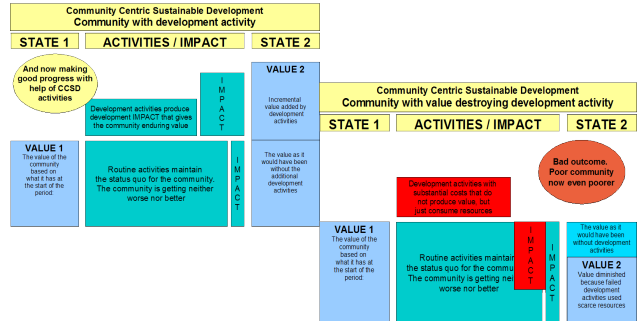


## ICT

The potential to use ICT to optimize malaria and mosquito control performance is amazing ... and it is time to do it.

## Metrics about community

Metrics about activities in a community show performance in the most meaningful way: These graphics show the difference between value created by development activities that are value creating compared activities that are value destroying.

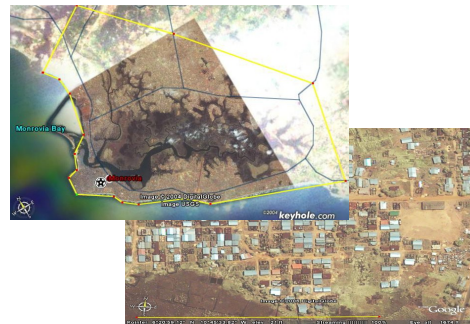


Conceptually this is similar to balance sheet accounting that is the norm for corporate accounting applied to the community.

## Geographic or spatial data

Spatial information is a powerful aid to good planning. The following images show:

(1) a large area of marshland within an urban area; and (2) an area of town with individual houses.



Together with other data, it is possible to target interventions and plan for minimum cost and maximum performance.

## ABOUT IMMC

### Organization

IMMC is registered in the USA as a not-for-profit corporation in the State of Vermont. The Ecologia Foundation serves as the fiscal agent for IRS tax exempt status.

### Some Key People

The founding members of the organization and the current leadership includes the following:

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IMMC has an active program to expand its network of cooperating organizations.

### Some Cooperating Organizations

The key people associated with IMMC are also associated with organizations with interest and expertise in areas important to IMMC including:

- University of Illinois;
- National Center for Super-Computing Applications;
- ADAPCO; and
- The Transparency and Accountability Network (Tr-Ac-Net);

Other cooperating academic institutions in the USA include the Universities of Alabama, Illinois, Florida, Oklahoma, and California-Riverside and Harvard University.

IMMC benefits from the expertise of mosquito control districts from California, Louisiana, Florida, Texas in the USA as well as Darwin, Australia.

Cooperating academic and research institutions in Africa include the Universities of Nairobi (Kenya) and Makerere (Uganda) and the International Center for Insect Physiology and Ecology (ICIPE) in Kenya.

IMMC is cooperating with local community organizations in Africa including NGOs with a focus on health, faith based organizations and telecenter networks.

IMMC is also working with organizations of diaspora Africans such as LIHEDE (Liberian History, Education and Development Inc.) in the USA and Liberia, and friends of Africa such as CORE (Congress for Racial Equality) in the USA and Uganda.

