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Malaria Decision Support System (MDSS)

Advanced tools for the continuous surveillance, monitoring and evaluation of malaria control programmes



IVCC
COMBATING INSECT
BORNE DISEASE

Monitoring, Evaluation and Continuous Surveillance

Monitoring and evaluation of malaria interventions and their impact on malaria burden are essential for understanding the progress, success and challenges that are faced in disease control. An effective system is essential for measuring performance of a control programme. Continuous surveillance capturing real time data allows for routine decisions and captures any programmatic issues in a timely fashion.

Good surveillance will produce a substantial volume of high quality data for the monitoring and evaluation of a programme to demonstrate the achievement of programme goals and impact. It also allows for:

- Identification of the depth and geographical extent of disease prevalence
- Quantifying and demonstrating success

- Planning interventions for maximum effectiveness
- Monitoring specific intervention effectiveness
- Promotion of good practice
- Reporting at all levels

This requires integration of data from a number of sources. The data required includes:

- Entomology
- Health information
- Epidemiology
- Infectivity
- Intervention coverage and usage





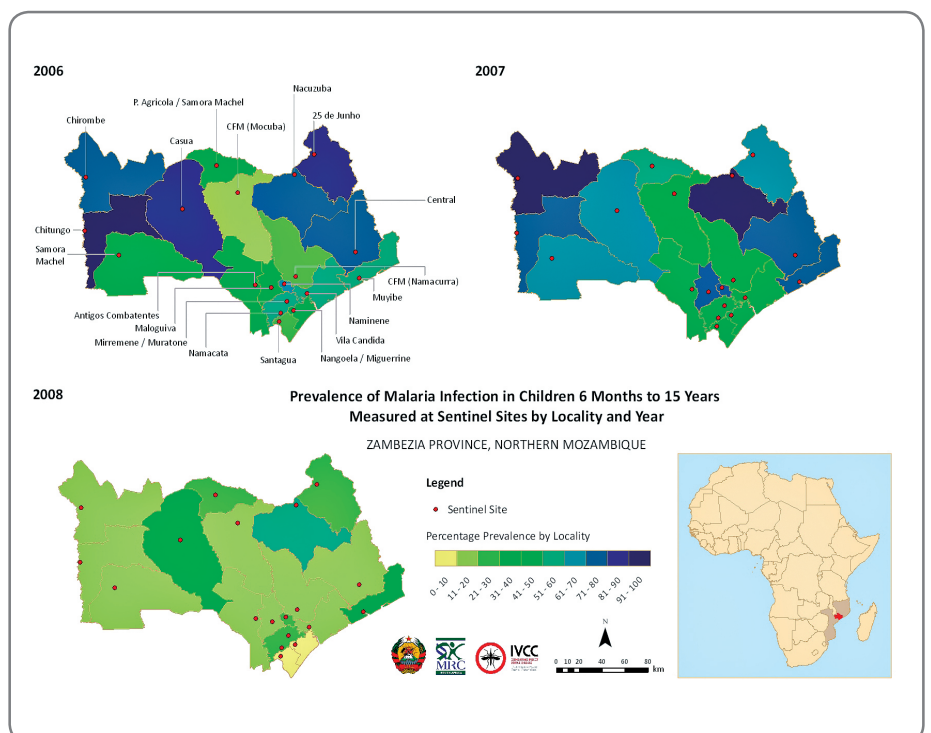
What is the Malaria Decision Support System?

The MDSS:

- integrates all continuous surveillance, monitoring and evaluation requirements of a malaria control programme
- combines best practices for data collection, storage, management and use
- includes advanced software that is user friendly, flexible and can be configured to individual programme needs
- empowers the user to extract data through intuitive dynamic and static queries
- includes automated tools supporting intervention planning, disease outbreak alerts and resource allocation
- allows the incorporation of data from other sources and historical data
- provides a simple tool that can generate customised reports for programme needs, donors and international oversight groups (such as RBM)
- assists with decision making at all levels

The MDSS incorporates:

- Case surveillance
- Entomological surveillance
- Intervention planning and monitoring
- Household surveys
- Stock control
- Data entry, import, export and storage
- Dynamic querying
- Automated alerts
- Data display, graphs, tables and mapping
- Report writing



Who benefits?

- **Field operators** will be able to manage their operations and resources to ensure the right interventions take place in the right locality at the right time.
- **District health managers** will be able to monitor disease levels, geographical spread and progression, and make informed decisions about interventions.
- **Central governments** will be able to maintain an accurate and up to date view of malaria in their country and direct policy and resources appropriately.
- **Funders, NGOs and international oversight groups (such as RBM)** will get accurate reporting tailored to their requirements that will aid policy and strategy development.



The software

The MDSS bespoke data management software works as a modular, integrated system. It covers all the major components that are required for a malaria control programme and caters for all the different areas of expertise required to combat the vector-borne disease.

The MDSS has both import and export functionality. This allows the import of data from other sources including health information systems and archived data sets. The export function allows data to be extracted from the MDSS into other systems.

Entomology

MDSS records insecticide resistance, insecticide resistance mechanisms, vector mosquito abundance and infectivity data as well as efficacy of insecticides on treated surfaces. The entomology team is then able to analyse species variation over space and time, and to recommend insecticides based on their effectiveness in a local context taking account of both insecticide resistance levels in the vector population and resistance mechanisms.

Entomology information can also be used to monitor the impact of the control programme on mosquito populations and transmission risk.

Intervention Planning

MDSS can assist the planning of interventions especially interventions based on insecticides, e.g. Indoor Residual Spraying (IRS) or Insecticide Treated Net (ITN) distribution. This takes into consideration data from case surveillance, household surveys and entomology modules.

The planning function assists in developing the structure of spray teams according to area and time limitations and helps managers predict the resources and insecticide quantities required to accomplish their targets.

Intervention

MDSS tracks intervention activities and compares them to set targets. The flexible reporting and writing capability of the MDSS assists in highlighting delays against national plans, poor performance of teams or individuals, and inconsistency of application rates, comparing coverage rates against recommended standards and much more.

MDSS has a comprehensive intervention tracking module that can be used to monitor the delivery of ITNs at facility and community level distribution, as well as monitoring other interventions such as intermittent preventative treatment (IPT).

Case surveillance

MDSS allows for tracking of both individual and aggregated malaria cases. The MDSS can track cases in real-time and compare them to several user defined thresholds. Cases can be tracked at different scales from clinic to countrywide. MDSS will notify users and managers if a threshold has been reached to trigger corrective measures by the national programme. The planning of these measures can be assisted by the MDSS Intervention Planning module as well as the stock monitoring system to ensure that adequate stock for correct patient management and interventions are available.

Flexibility and sustainability of MDSS

Outbreak Alerts

The case surveillance module allows for real time tracking of individual malaria cases. This combined with automated calculations of thresholds and alerts creates a powerful disease outbreak tool. This module is an essential component for any malaria elimination programme.

Household Surveys

Many countries now complete comprehensive malaria indicator surveys on a regular basis, as well as routine household surveys that can help managers to make informed decisions on malaria control interventions. The MDSS caters for this and will allow countries to record data including parasite rates, anaemia, household surveys, intervention use and child mortality, and to create constructive queries to assist in decision making.

Querying data

A number of dynamic query tools exist in the MDSS that allows the user to interpret data in formats tailored to their needs. Data can be visualised in map, graph, table and custom report formats.

GIS

MDSS has a strong GIS component, this helps users visualise data geographically. The system users can create their own enquiries, define their own mapping criteria and view the results in customisable thematic maps. At the click of a button users can see disease hot spots, intervention progress and coverage, vector distribution and prevalence data, and combine data queries to overlay intervention and impact data.



Because MDSS is an integrated system, the data entered in any of the modules is easily available to the other modules. This allows users with different module expertise to benefit from the integration of information across multiple disciplines. The system comes with pre-defined queries and reports, but any competent user can also create their own. The flexibility of the system is only confined by the imagination of the user.

MDSS has been designed to cater for the needs of any country and any transmission intensity from highly endemic malaria transmission to supporting efforts for malaria elimination. It is completely configurable, making its implementation and the installation of upgrades very simple.

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Other features

MDSS software caters for all of the following:

- MDSS will allow administrators to customise their own specific geographic model within the system.
- MDSS will assist administrators in eliminating incompatibilities in geographic names between legacy systems and the names known to MDSS.
- MDSS allows administrators to configure specific lists to suit their country's needs.
- MDSS allows any screen to be configured to show or hide fields that are relevant to a control programme's unique situation.
- MDSS allows any text on the standard screens or menus.
- MDSS allows the import of archived data from legacy systems without the need to customise pre-defined interface specifications.
- MDSS is not limited to pre-defined reports. A report writer allows the creation of customised enquiries within the system and the creation of reports in any language.
- MDSS is language independent, not only by country, but by user. Any user can set their preferred language.
- MDSS allows the administrator to define the control programme's own malaria season or even epi week.

The IVCC

The IVCC is a Product Development Partnership developing vector control products and information systems, bringing together expertise and technical resources with an initial award of \$50.7 million from the Bill & Melinda Gates Foundation.

The IVCC is a not for profit company registered as a charity in the UK. The strategy and scope of the IVCC is directed by its Executive Committee under governance of the Board of Trustees who represent a wide range of expertise as well as other stakeholders in the field.

Further information

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