



Photo: Hydas World Health

Improving malaria diagnosis in Equatorial Guinea

The threat of malaria to economic development is compounded by the lack of adequate quality assurance programmes for laboratory technicians, especially those in outlying facilities serving rural areas. Equatorial Guinea is creating a National Malaria Slide Archive to be used for training and certification of microscopists, and which will provide the foundation of such a programme.

Malaria is a serious threat to human health and economic development throughout the rural tropics, and nowhere more so than on Bioko Island in Equatorial Guinea in Central Africa, where it is a leading source of morbidity

and mortality. The National Malaria Control Programme (NMCP) is fighting malaria using vector control, improved malaria diagnostics and treatment, comprehensive community education, robust monitoring and evaluation, and substantial investment in human resources and institutional capacity building. The implementation of these integrated strategies has had significant impact on malaria-attributable disease in Equatorial Guinea – most notably, all-cause mortality in children under five was reduced by 65 percent in just the first four years of the effort (2004–2008). The NMCP activities are supported by the Bioko Island Malaria Control Project (BIMCP, funded by a private-public consortium consisting

of the Marathon Oil Company, Noble Energy, SK of Korea, the national

Map of Equatorial Guinea with Bioko Island



Robert Jordan
Hydas World Health
Hummelstown, PA, USA
robert.jordan@hydaskworldhealth.org

Miguel Torrez
Medical Care Development
International, Silver Spring, MD, USA

Maximo Mico
Ministry of Health and Social Welfare,
Government of Equatorial Guinea



Applying cover-slips to make the slides permanent.

scopes are often inadequate (if present at all) or poorly maintained, and there is no reliable way to train, supervise and systematically measure the performance of laboratory technicians. Thus the NMCP/BIMCP, working with the technical support of Medical Care Development International and Hydas World Health (two US-based non-profit associations), is developing a comprehensive quality assurance programme for malaria diagnostics. Two distinguishing features of this approach are the use of a National Malaria Slide Archive for training, supervision and evaluation, and a delivery strategy based on outreach rather than on centralisation.

Photo: Hydas World Health

oil and gas companies of Equatorial Guinea, Sonagas, GEPetrol, and the Government of Equatorial Guinea).

The provision of effective treatment based on quality diagnosis is a particularly vital part of the programme as there are many other illnesses with symptoms similar to those of malaria, and because at least three different malaria parasite species are present on the island. Treatment based solely on symptoms (which is quite common) or treatment directed at the wrong species will be ineffective and will both waste resources and encourage

the development of resistance to the medications.

■ Microscopy still the “gold standard”

Currently, available rapid diagnostic tests do not distinguish adequately among all malaria species and do not indicate the levels of parasites in the blood. Thus diagnosis ultimately depends, as it has for well over a century, on light microscopy. It is here that weaknesses in the country’s health care systems are most evident – micro-

There has never been an internationally recognised system to standardise the production and use of malaria blood slides for training laboratory technicians – existing collections of malaria slides vary considerably in quality, and their diagnoses are often of questionable validity. The work in Equatorial Guinea is the first attempt to address this problem of standardisation and quality at national level, and is based on preliminary work completed by Hydas World Health for the United States National Institutes of Health in 2005. In this system, up to 200 identical slides are prepared from a single sample of a patient’s blood. Examples

Zusammenfassung

Die Malariadiagnostik hängt immer noch stark von lichtmikroskopischen Analysen ab und leidet in vielen Entwicklungsländern, vor allem in kleinen peripheren Gesundheitszentren für ländliche Gebiete, unter mangelhaften Qualitätssicherungsprogrammen. Für Äquatorial-Guinea wird derzeit an einem dezentralen Trainings- und Zertifizierungsprogramm zur Qualitätssicherung für Laborkräfte gearbeitet, das den Einsatz genormter Blutprobenträger in der Malariadiagnostik beinhaltet. Dieses natio-

nale Malariaprobendarchiv ist ein absolutes Novum und wird von der Weltgesundheitsorganisation WHO als beispielhaft auch für andere Länder betrachtet.

Resumen

El diagnóstico de la malaria (paludismo) sigue dependiendo en gran medida de la microscopía luminosa, y en muchos países en desarrollo dicho diagnóstico se ve dificultado por la debilidad de los programas de aseguramiento de la calidad. Este problema aqueja sobre todo a las pequeñas

instalaciones de salud periféricas, como las que se ubican en las áreas rurales. En Guinea Ecuatorial se viene desarrollando un sistema de capacitación y certificación en aseguramiento de la calidad para técnicos en microscopía de la malaria, que utiliza juegos estandarizados de láminas para análisis de sangre. Este Archivo Nacional de Láminas para Malaria es una novedad a nivel mundial y ha llamado la atención de la Organización Mundial de la Salud como modelo a seguir para esfuerzos similares en otros países.

are then sent to six or more experts from around the world for their confirmatory diagnoses – only when all these experts agree is a series of slides added to the national archive. All aspects of slide preparation are being taught to local personnel so that the programme can continue after the cessation of external support in 2014.

The ability to use sets of slides of known diagnosis is of particular utility in an outreach-based programme such as that being developed for Equatorial Guinea. Rather than having technicians be required to come to a main teaching centre periodically, the trainer/supervisor goes to the peripheral health facilities, bringing the slides, which can then be used to examine the technicians' performance in their own workplaces, to reinforce training, and for certification. In addition, some of the slides can be left on site for use as study or reference material. In this sense, the archive functions much as a library,

Part of the National Malaria Slide Archive, a library of reference and training slides for hospital microscopists.



Photo: Hydros World Health

with material checked out for use as the need arises.

■ International interest

The programme in Equatorial Guinea has attracted wide attention. The World Health Organization has recently published guidelines for training and certifying malaria microscopists at several levels of responsibility, but has recognised that all such programmes ultimately depend on the availability of slides of known diagnosis, including all species at all levels of parasitaemia, as well as on the availability of known negative slides. The effort in Equatorial Guinea is demonstrating that it is possible to produce a high quality archival malaria slide collection at country level in Africa – a collection containing numerous identical replica slides of known diagnosis which can be reconfigured into teaching and certification sets compliant with WHO standards. The resulting improvement in malaria diagnosis, with the consequent improvement in treatment outcomes, is expected to significantly enhance the quality of medical care in Equatorial Guinea, and nowhere more so than in its peripheral rural health facilities.

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Advisory council:

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Editor in chief:

Silvia Richter
s.richter@dlg.org
Phone: +49-30-39848857

Editorial staff:

Angelika Wilcke, a.wilcke@dlg.org
Ines Buck, i.buck@dlg.org

Editorial office:

DLG-Verlags-GmbH
Eschborner Landstraße 122
60489 Frankfurt, Germany

Translated by:

Christopher Hay
Tazir International Services

Distribution, advertising:

DLG-Verlags-GmbH
Viola Hilz
Eschborner Landstraße 122
60489 Frankfurt, Germany
v.hilz@dlg.org

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97080 Würzburg
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