Grant agreement no. 243964

QWeCI

Quantifying Weather and Climate Impacts on Health in Developing Countries

D5.4.a - Historical disease data contribution for WP1.1

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Lead contractor : UNIMA, ICTP
Coordinator of deliverable :
UNIMA, ICTP
Evolution of deliverable

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Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Counts of malaria related morbidity and mortality are compiled at each health centre (or health facility) on a national standardized form. The data is sent monthly to the District Health Offices (DHO). There are 28 districts in Malawi. At each DHO the data is compiled by an assistant statistician and sent to the Ministry of Health (MOH) on a quarterly basis. This data is recorded with the Health Management Information System (HMIS). Using data from this system the MOH produces an annual report (Health Management Information Bulletin). Most health centres reported the availability of data records of monthly statistics in paper form from 2002 onward. However, the data record is only considered reliable from 2004 onwards. During the November visit of ICTP and UNIMA to the partners in Malawi, an agreement with James Chirombo (Statistician at the HMIS - MOH) was made to provide the following data to QWeCI:

- Monthly malaria cases per district/health facility since 2004.
- Shape files for districts/health facilities.
- Blank copies of data collection forms.
- Data regarding bednet distribution/water supply and other malaria risk indicators.
- Demographic and socio-economic indicators from the Malawi National Statistical Office (http://www.nso.malawi.net/).
- List of all health facilities.
- Population data from 2008 census.

Figure 1 shows the spatial distribution of malaria incidence rates for Malawi, defined as the number of new malaria cases per 1000 population, in each of the 28 districts of Malawi for July 2008 to June 2009. This data was extracted from the Health Management Information Bulletin published in September 2009. Very high incidence rates are observed to the west of Lake Malawi and some districts to the South. Further malaria data for each district from January 2004 – December 2010 will be provided by the MOH to allow spatio-temporal variations in malaria rates to be investigated.

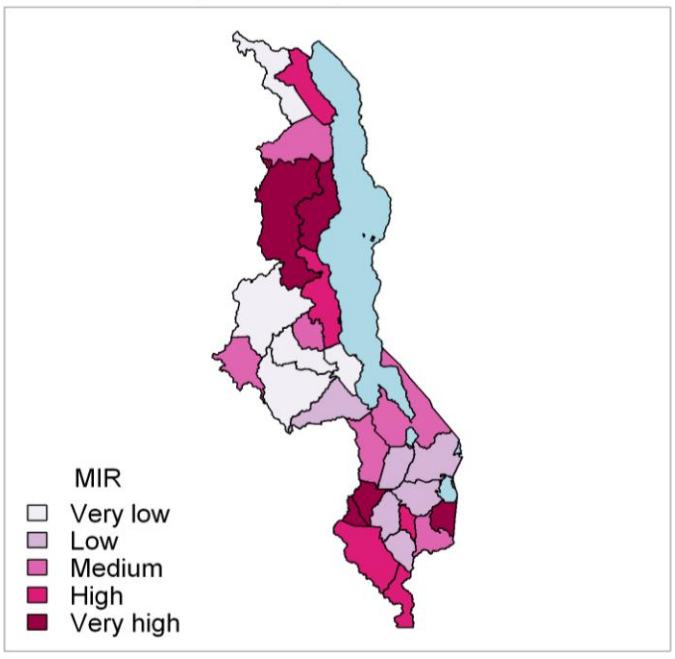

Figure 1 Malaria incidence rates (MIR) per 1000 population for the 28 districts of Malawi for the period July 2008 – June 2009.

An initial longer-term dataset has now been received for four sites of particular relevance for QWECI, where wireless network connections are being established. Figures 2 and 3 show time series of malaria cases for under five years and over 5 years respectively for the period January 2006 – December 2009.

The data confirms that malaria is year-round endemic in southern Malawi, complicating dynamic modelling efforts which will need to include population immunity. For both datasets there appears to be an upward trend in cases over the four year period and an annual cycle which peaks approximately in January. This follows the onset of the rainy season which typically occurs in November. Note that a greater number of malaria cases were reported in 2009 the over five age group compared to 2008. This difference is not apparent for the under five age group. It will be interesting to investigate if the general increase in cases during the peak malaria season over the data period is related to climate variation, population increases and/or differences in age stratification, or some other factor such as government intervention or confounding factors such as differences in reporting practices. Further concrete analysis of these issues will be possible when the enhanced dataset covering the period 2004-2005 is available in early 2011, and as data becomes available over the course of the project.

These figures also reveal how obtaining clinic/hospital level data is also important to reveal the spatial heterogeneity of malaria incidence. For example, Blantyre data shows a distinct peak at the height of the rainy season in January 2007 for both age groups in common with Mangochi and to a lesser extent Zomba, but Chikwawa, a mere 44 km to the south west of Blantyre, shows a much earlier peak in August-September 2006 and no increase in cases over the following rainy season. It will be interesting to investigate if the August 2006 peak corroborates with an isolated and localized dry season event, which tend to occur two or three times per season. If this is the case, malaria incidence in the following rainy season may have been suppressed by the ensuing increase in population immunity levels.

A further aspect that may be analysed is the contrast between the two age categories. While for most regions in these figures the incidence in the over and under 5 age bracket evolve in a similar fashion, there are some interesting exceptions that will require further investigation. One notable example is the January-February 2009 rainy season malaria maximum in the under 5 category at Mangochi, which is not reflected in the over 5 – adult statistics. Further investigation will be required to determine whether this is a data quality issue.

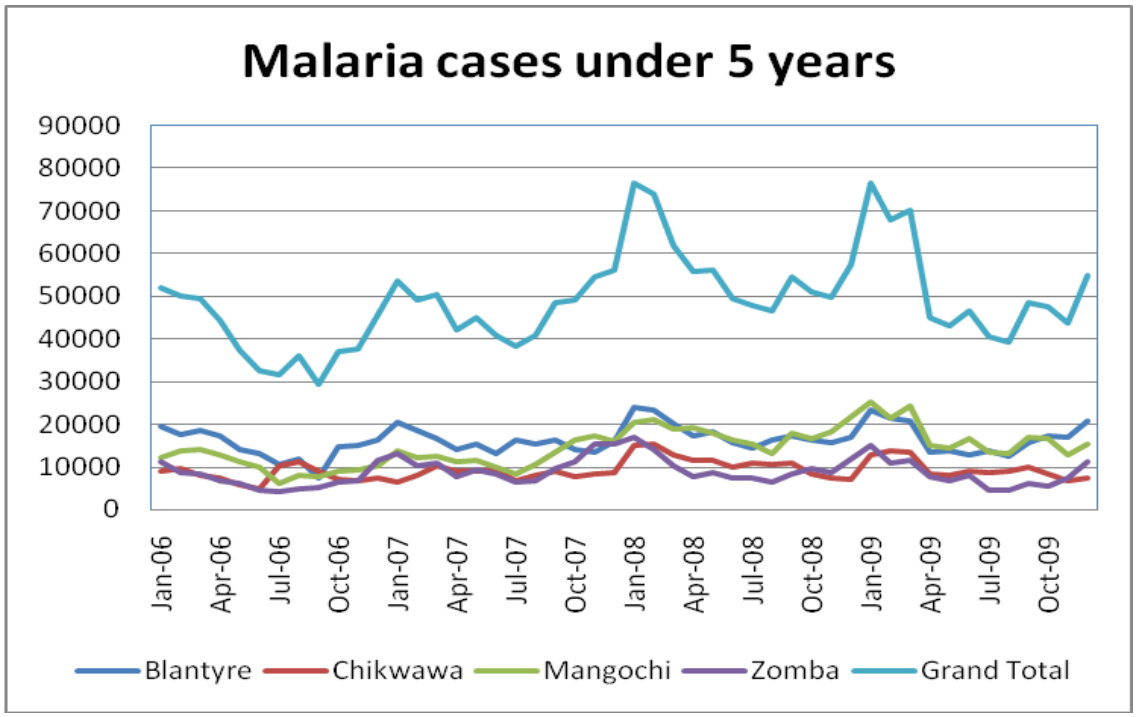

Figure 2: Monthly malaria cases for five districts from January 2006 – December 2009 for the under five age group.

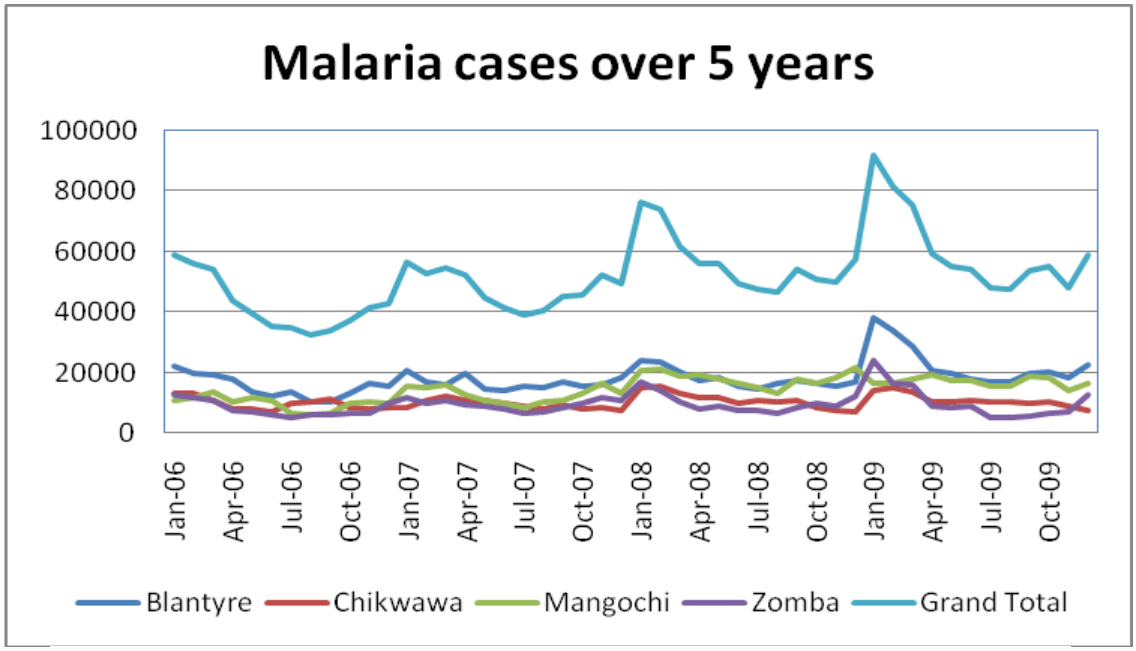

Figure 3 Monthly malaria cases for five districts from January 2006 – December 2009 for the over five age group.