Experiences in working with the health community

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Climate and endemic malaria

Epidemiological data is very poor in most parts of the world. In the absence of epidemiological data, climate data can be used to help model and map the distribution of disease.

Climate suitability for endemic malaria

- $= 18-32^\circ C + 80\text{mm} + \text{RH}>60\%$

Temporal information useful for developing seasonal disease calendars for control planning purposes
Combining Climate Datasets

Gauges are accurate, but have poor spatial coverage.

Satellites have good spatial coverage, but underestimate rainfall in the highlands.

High-quality observational datasets can be created by blending satellites with gauge data available only at National Meteorological Services.
Globally available datasets are often inappropriate for local analyses.
Climate and epidemic malaria

For epidemics we are less interested in the ‘normal’ – more interested in the ‘abnormal’ ....

Areas at risk of epidemic malaria

Rainfall Anomalies in Zones with Malaria Epidemic Potential January 21 - 31, 2006
Environmental monitoring can provide considerable advanced warning without the need for seasonal climate forecasts.

Evidence of impact of climate variability on specific outcome of interest (Thomson, et al. AJTMH. 2005)
Model Projections Compared to Recent Trends

PROJECTED % CHANGE IN RAINFALL (2080-2099 COMPARED TO 1980-1999)

OBSERVED % CHANGE IN RAINFALL (1999-2011 COMPARED TO 1979-1998)

What is the timescale of interest?
Climate trends

West Africa provides one of the most dramatic examples worldwide of climate variability that has been directly and quantitatively measured [Hulme, 2001].

**Changes in malaria**
- < endemicity (Faye et al 1995)
- > epidemicity (Mouchet et al 1996)

**Changes in meningitis**
- > epidemic frequency
- southward extension of ‘Meningitis Belt’ (Molesworth et al 2003)

!! Very important consideration when establishing baselines !!
Demands for evidence-based health policy

Before using climate information in routine decision making health policy advisors need:

• Evidence of the impact of climate variability on their specific outcome of interest, and

• Evidence that using climate information is a cost-effective means to improving health outcomes, and

• Evidence that the information can be practically useful within their decision frameworks.
Conclusions

• Information is needed more than data
• Sharing data is no substitute for collaborative research
• Monitoring is at least as important as forecasting
• Information is needed on a range of timescales, but mostly less than a few years maximum
• Climate impacts on health should not be over-simplified