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Produced by the [IDS Health and Development Information](#) team in collaboration with [Eldis](#) and the [DFID Health Resource Centre](#)

## Climate change and infectious diseases

Health reporter, 8th April 2008

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- [Global climate change: implications for international public health policy](#)
- [Climate prediction of El Nino malaria epidemics in north-west Tanzania](#)
- [Effect of meteorological factors on clinical malaria risk among children: an assessment using village-based meteorological stations and community-based parasitological survey](#)
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## Feature: Climate change and infectious diseases

This year's world health day focuses on the need to protect health from the adverse effects of climate change. These effects are multiple and complex: extreme weather conditions such as heat waves, floods and droughts have direct health effects, and warmer temperatures disturb food production and ecosystems and are changing the spread and

incidence of insect-borne diseases.

There is some evidence to suggest that diseases transmitted by mosquitoes including malaria, dengue and yellow fever, are particularly sensitive to variations in climate. Increased rainfall and floods leads to more surface water which is used by mosquitoes as breeding pools, and warmer temperatures increases their biting rate, speeds up development of the parasites they carry and widens the geographical boundaries in which they can survive and reproduce.

However, the relationship between climate and mosquito populations is highly complex; for instance, higher rainfall can lead to reductions in populations if they wash away breeding pools. The spread of diseases such as malaria is also affected by human activities and their impact on the environment and local ecology, and the incidence of such diseases is determined by the ability of public health systems to provide timely treatment, care and effective prevention strategies.

Whilst it is important to take into account the possible effects that climate change can have on infectious diseases and to systematically collect data and evidence to accurately monitor changes in local conditions, interventions are needed to address the other causes of infectious diseases. These include: to prevent water from stagnating by ensuring adequate drainage and sanitation systems, and to ensure that all people, regardless of their wealth are able to access health services and to afford treatment.

### More information:

- Eldis Environment resource guide, section on climate change and health [www.eldis.org/go/topics/resource-guides/environment/climate-change/health](http://www.eldis.org/go/topics/resource-guides/environment/climate-change/health)
- World Health Day 2008: protecting health from climate change <http://www.who.int/world-health-day/en/index.html/>

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## Recommended readings on climate change and infectious diseases

### **1. Climate change futures: health, ecological and economic dimensions**

Authors: P.R. Epstein; E. Mills

Publisher: Center for Health and the Global Environment, Harvard Medical School, 2005

This paper documents a multi-dimensional assessment of climate change, with a particular focus on human health aspects alongside the ecological and economic impacts. The study also ties in the important concept of risk assessment, saying that the insurance industry will be both absorbing risk and, through its pricing and recommendations, helping business and society adapt to and reduce these new risks.

The Climate Change Futures study is comprised of three main elements: trends, case studies and scenarios, which detail and analyse current climate change related

consequences for human health, ecological systems and the global economy. The central premise is that climate change will affect the health of humans as well as the ecosystems and species on which we depend, and that these health impacts will have economic consequences. The case studies outline current effects of climate change with regard to infectious diseases such as malaria, Lyme disease and asthma; extreme weather events; and various ecosystems. Economic implications as well as possible near-future impacts are projected for each case. Furthermore, two climate scenarios are developed which examine how the possible impacts of climate change could impose severe strains on the financial sector.

The key points communicated by the report include:

- warming favours the spread of disease
- extreme weather events create conditions conducive to disease outbreaks
- climate change and infectious diseases threaten ecosystems, which provide us with essential resources and constitute our life-support systems
- some impacts of warming and greater weather volatility could occur suddenly and become widespread
- coastal human communities, coral reefs and forests are particularly vulnerable to warming and disease, especially as the return time between extremes shortens
- an increasingly unstable climate could shift and settle into a new equilibrium, allowing a measure of adaptation and the opportunity to rapidly reduce fossil fuel combustion and deforestation
- a well-funded, well-insured programme to develop and distribute a diverse suite of means to generate clean energy offers enormous business opportunities and may present the most secure means of restabilising the climate
- solutions to the emerging energy crisis must be thoroughly scrutinised as to their life cycle impacts on health and safety, environmental integrity, global security and the international economy

The editors hope that the report will not only help businesses avoid risks, but also identify opportunities and solutions. With early action and innovative policies, business can enhance the world's ability to adapt to change and help restabilise the climate.

Available online at: [www.eldis.org/go/topics/resource-guides/health&id=20972&type=Document](http://www.eldis.org/go/topics/resource-guides/health&id=20972&type=Document)

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## **2. Global climate change: implications for international public health policy**

Authors: D. Campbell-Lendrum; C. Corvalan; M. Neira

Publisher: Bulletin of the World Health Organization : the International Journal of Public Health, 2007

This article considers the health impacts of climate change and discusses policies and interventions to address these effects. Many of the most important global killers including malaria and diarrhoea are highly sensitive to climatic conditions, yet a comprehensive

strategy to support a public health response is lacking. The paper discusses preventative environmental health interventions including scaling up water and sanitation services and providing point-of-use disinfection; and examines integrated measures that address the root causes of vulnerability to natural disasters. Post flooding health effects can be reduced by adequately planned and funded health-sector responses, including interventions to control outbreaks of vector-borne and water-related diseases.

The paper concludes that climate change strains existing weak points in health protection systems and calls for reconsideration of public health priorities. The most effective priorities are likely to be strengthening of the key functions of environmental management, surveillance and response to safeguard health from natural disasters and changes in infectious disease patterns, and a more pro-active approach to ensure that development decisions serve the ultimate goal of improving human health. [adapted from author]

Available online at: [www.eldis.org/go/topics/resource-guides/health&id=24402&type=Document](http://www.eldis.org/go/topics/resource-guides/health&id=24402&type=Document)

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### **3. Climate prediction of El Nino malaria epidemics in north-west Tanzania**

Authors: A. E. Jones; U. Uddenfeldt Wort; A. P. Morse

Publisher: Malaria Journal, BioMed Central, 2007

This paper, published in the Malaria Journal examines the relationship between climate and malaria incidence in Kagera in northwest Tanzania, with the aim of determining whether seasonal weather forecasts may assist in predicting malaria epidemics. The study uses malaria and climatic data collected during two annual malaria seasons over a period of ten years from 1990. It finds that malaria incidence is positively correlated with rainfall during the first season (October-March). For the second season (April-September) high malaria incidence was associated with increased rainfall, but also with high maximum temperature during the first rainy season.

The paper also finds that 1998 malaria epidemic was associated with excessive rainfall along with above average maximum temperatures, caused by the El Nino effect. Despite this, the underlying relationship between rainfall and malaria in this location is too complicated to be revealed by this type of analysis. The authors conclude that there is potential for a seasonal forecasting system in the development of a malaria early warning system in Kagera region. This research also points towards the need for downscaled rainfall forecasts to become available, particularly in regions of known predictability such as East Africa.

Available online at: [www.eldis.org/go/topics/resource-guides/health&id=36291&type=Document](http://www.eldis.org/go/topics/resource-guides/health&id=36291&type=Document)

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#### **4. Effect of meteorological factors on clinical malaria risk among children: an assessment using village-based meteorological stations and community-based parasitological survey**

Authors: Y. Ye; V. R. Louis; S. Simboro; R. Sauerborn

Publisher: BMC Public Health, 2007

This paper, published in BMC public health, examines the effects of meteorological factors (temperature, relative humidity and rainfall) on the incidence of clinical malaria. It uses data collected from over 670 children in urban and rural areas of Burkina Faso. The paper finds that all of the meteorological factors investigated affect the incidence of malaria among children under five, and that mean temperature alone is the strongest predictor of clinical malaria. The relationship with clinical malaria is bell-shaped such that the risk was lowest at low and high temperatures. This is also observed in other regions including the highlands region in sub-Saharan Africa.

The paper concludes that meteorological conditions have a significant influence on clinical malaria rates. They do this by modifying local mosquito microhabitats and patterns of transmission. A systematic measurement of local temperature through ground stations and integration of such data in the routine health information system could support assessment of malaria transmission risk at the district level of well-targeted control efforts.

Available online at: [www.eldis.org/go/topics/resource-guides/health&id=36294&type=Document](http://www.eldis.org/go/topics/resource-guides/health&id=36294&type=Document)

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#### **5. Using climate to predict infectious diseases epidemics**

Authors: K. Kuhn; D. Campbell-Lendrum; A. Haines; J. Cox

Publisher: Climate Change and Health, World Health Organization , 2005

This World Health Organization document evaluates the potential of climate-based disease early warning as a means of improving preparedness for, and response to, epidemics. The authors develop a conceptual framework for constructing and evaluating a climate-based early warning system (EWS). The report highlights that many of the most important infectious diseases, and particularly those transmitted by insects, are highly sensitive to climate variations. However, the published literature includes no full descriptions of climate-based EWS being used to influence disease control decisions. This is partly because affordable and accessible data and analytical tools have only recently become widespread and as of yet, there is no common consensus on good practice in building predictive models.

The report concludes that climate information can be used to improve epidemic prediction, and therefore has the potential to improve disease control. It is important to maintain and strengthen disease surveillance systems for monitoring the incidence of epidemic diseases and to clarify definitions of terminology and methods for assessing

predictive accuracy.

Available online at: [www.eldis.org/go/topics/resource-guides/health&id=36298&type=Document](http://www.eldis.org/go/topics/resource-guides/health&id=36298&type=Document)

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## Latest additions from the Health resource guide

### **1. Socioeconomic inequality in malnutrition in developing countries**

Authors: E. Van de Poel; A. R. Hosseinpoor; N. Speybroeck

Publisher: Bulletin of the World Health Organization : the International Journal of Public Health, 2008

This study, published in the Bulletin of the World Health Organization, reports on socioeconomic inequality in childhood malnutrition in developing countries, with the intention of providing evidence for an association between socioeconomic inequality and the average level of malnutrition. The paper uses measures of stunting and wasting as an indicator of malnutrition, and household assets and living conditions as indicators of socioeconomic status. It finds that in almost all countries investigated, stunting and wasting disproportionately affected the poor. However, socioeconomic inequality in wasting was limited and was not significant in about one third of countries. It also finds no clear association between average stunting and socioeconomic inequality.

The paper concludes that socioeconomic inequality in childhood malnutrition exists throughout the developing world and is not related to the average malnutrition rate. Failure to tackle this inequality is a cause of social injustice. Moreover, reducing the overall rate of malnutrition does not necessarily lead to a reduction in inequality. Policies should therefore, take into account the distribution of childhood malnutrition across all socioeconomic groups.

Available online at: [www.eldis.org/go/topics/resource-guides/health&id=36296&type=Document](http://www.eldis.org/go/topics/resource-guides/health&id=36296&type=Document)

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### **2. Global tuberculosis control - surveillance, planning, financing**

Publisher: World Health Organization , 2008

This World Health Organization report on global tuberculosis (TB) control compiles data from over 200 countries to monitor the scale and direction of TB epidemics, implementation and the impact of the Stop TB Strategy. The paper finds that there were an estimated 9.2 million new cases and 1.7 million deaths from TB in 2006 including 0.2 million deaths among people infected with HIV. Whilst there has been progress in HIV testing among TB patients, implementation of interventions to reduce the burden of TB in HIV-positive people is far below the targets set in the Global plan in 2006.

The paper concludes that overall, there are several signs that global progress in TB

control is slowing and that there are parts of the world where much more needs to be done to achieve the global targets that have been set. The percentage of estimated cases being detected in directly observed treatment short-course (DOTS) programmes in the African region remains low, and budgets stagnated between 2007 and 2008 in all but five of the 22 high burden countries. The report recommends that renewed effort to increase the rate of progress in global TB control in line with the expectations of the Global Plan, backed up by intensified resource mobilisation from domestic and international donors, is required.

Available online at: [www.eldis.org/go/topics/resource-guides/health&id=36085&type=Document](http://www.eldis.org/go/topics/resource-guides/health&id=36085&type=Document)

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### **3. Iraq: no let up in the humanitarian crisis**

Publisher: International Committee of the Red Cross , 2008

This report, by the International Committee of the Red Cross (ICRC), details the findings and observations made by ICRC personnel during their contacts with staff in hospitals, health care centres and water and sanitation facilities. It shows that five years after the war began, many Iraqis do not have access to the most basic health care; there is a lack of qualified staff and many hospitals and health-care facilities lack drugs and other essential items.

The Iraqi health-care system is now in worse shape than ever and many lives have been lost because prompt and appropriate medical care is not available. The report concludes that renewed effort is required to address the everyday needs of Iraqis and that every person should have regular access to health care, electricity, clean water and sanitation. There needs to be a renewed effort not only to maintain and upgrade medical facilities but also to develop the skills and capacity of medical staff. Those involved in the conflict and those who can influence them must do everything possible to ensure that civilians, medical staff and medical facilities are not harmed.

Available online at: [www.eldis.org/go/topics/resource-guides/health&id=36199&type=Document](http://www.eldis.org/go/topics/resource-guides/health&id=36199&type=Document)

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### **4. Family planning policies and their impacts on the poor: Peru's experience**

Authors: J. N. Gribble; S. Sharma; E. P. Menotti

Publisher: Alan Guttmacher Institute, 2007

This paper examines the policies that Peru's Ministry of Health has developed and implemented to promote access to family planning for all, and how these policies have affected contraceptive use and access to services in particular amongst poor people. The paper finds that poor people are particularly vulnerable to unanticipated policy outcomes: providing universal coverage which, although conceptualised as a strategy to reach the

poor, ended up serving a considerable proportion of people who can afford to pay for care and restricted access among those people who can least afford it.

Increasing service availability and providing free contraceptives through the Ministry of Health increased contraceptive use for all women in the short-term, but likely reduced the role of the commercial sector and shifted some wealthier clients towards using public sector services. The paper concludes that these problems highlight the need for well-designed policies and significant thought about both implementation and short- and long-term consequences. Moreover, as the experience of Peru demonstrates, policy makers should monitor and evaluate how policies are being implemented and be willing to make adjustments when it is clear that the policy is not achieving its desired outcomes.

Available online at: [www.eldis.org/go/topics/resource-guides/health&id=36197&type=Document](http://www.eldis.org/go/topics/resource-guides/health&id=36197&type=Document)

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### **5. Intimate partner violence against women in rural Vietnam - different socio-demographic factors are associated with different forms of violence: need for new intervention guidelines?**

Authors: N. D. Vung; P. O. Ostergren; G. Krantz

Publisher: BMC Public Health, 2008

This population-based study published in BMC public health, investigates the different forms, magnitude and risk factors of men's violence against women in intimate relationships in a rural part of northern Vietnam and whether a difference in risk factors affected the different forms of violence. The paper finds that the lifetime prevalence of physical violence was 31 per cent and sexual violence was 33 per cent. In most cases the violence was severe and recurring. Women and men's low educational level, low household income and the husband having more than one wife/partner were risk factors for physical and sexual violence.

The pattern of factors associated with psychological abuse alone was however different: husband's low professional status and women's intermediate level of education appeared as risk factors. The paper concludes that men's violence against women in intimate relationships is common in rural Vietnam. There is an obvious need for preventative and treatment activities. Given the different characteristics affecting psychological abuse from sexual/physical violence, it might be that also different strategies are needed to reduce and prevent this violence.

Available online at: [www.eldis.org/go/topics/resource-guides/health&id=36198&type=Document](http://www.eldis.org/go/topics/resource-guides/health&id=36198&type=Document)

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## Announcements

### **Online discussion forum: Virtual global community of practice on health worker migration, by the Health Worker Migration Policy Initiative**

Join the Virtual Global Community of Practice to discuss: "How can we best address the challenges raised by health worker migration? What are our shared responsibilities as individuals, countries and as a global community to develop the Code of Practice?"

The Health Worker Migration Policy Initiative is keen for all individuals, professionals, policy and programme managers and interest groups from around the world to participate and enrich the policy dialogue addressing the issue of Health Worker Migration. This worldwide virtual discussion will contribute and assist in the development of a Global Code of Practice for Health Worker Migration.

More information: [www.eldis.org/go/topics/resource-guides/health/health-events-and-announcements&id=36086&type=Item](http://www.eldis.org/go/topics/resource-guides/health/health-events-and-announcements&id=36086&type=Item)

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### **Event: International Training Course on Programming for HIV/AIDS and Reproductive Health of Young People in South and South East Asia**

The broad objective of this programme is to strengthen management capabilities for programming for HIV/AIDS and reproductive health of young people including adolescents. This course will impart state-of-the-art knowledge and skills to the participants for designing and delivering efficient, equitable and financially sustainable HIV/AIDS and SRH interventions for young people including adolescents.

By the end of this course participants will be able: To identify and prioritize HIV/AIDS and SRH issues, concerns and vulnerabilities within their regions and countries. To design operational plans for addressing the HIV/AIDS and SRH needs of young people including adolescents, in their regions and countries. To develop programme management skills for implementing evidence- based strategies, monitoring and evaluation of the programme.

More information: [www.eldis.org/go/topics/resource-guides/health/health-events-and-announcements&id=35303&type=Item](http://www.eldis.org/go/topics/resource-guides/health/health-events-and-announcements&id=35303&type=Item)

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The IDS Health and Development Information team promotes health and equity in developing countries through the provision of high quality, accessible information to policymakers and practitioners. IDS Health and Development Information currently has three flagship products:

- Health Resource Guide - <http://www.eldis.org/health/index.htm>
- Health Systems Resource Guide - <http://www.eldis.org/healthsystems/index.htm>
- HIV and AIDS Resource Guide - <http://www.eldis.org/go/topics/resource-guides/hiv-and-aids>

The HRC provides access to technical assistance and information for the Department for International Development (DFID UK), and its partners, in support of pro-poor health policies as well as health systems, service delivery and public health topics and programmes.

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Eldis is funded by DFID, Sida, SDC and NORAD, and hosted by the Institute of Development Studies, Sussex, UK.

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