

# Global Warming and Malaria Update<sup>#</sup>

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*"Speculations on the potential impact of climate change on human health frequently focus on malaria. Predictions are common that in the coming decades, tens – even hundreds – of millions more cases will occur in regions where the disease is already present, and that transmission will extend to higher latitudes and altitudes."*

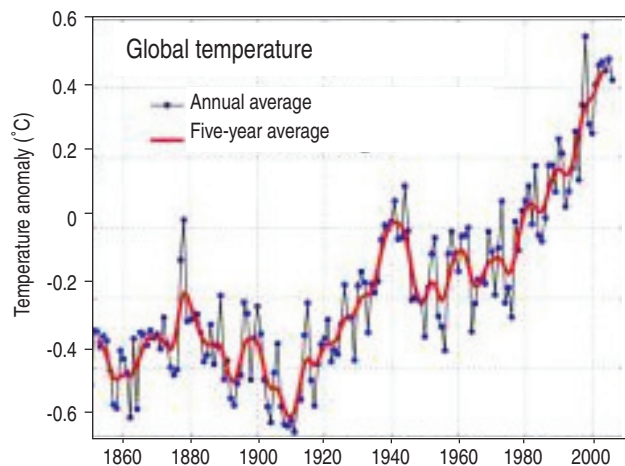
## Global Warming vs. Climate Change<sup>(2)</sup>

Over the past few decades, the term "global warming" had become a popular by-word virtually everywhere. Recently, several new terms have emerged, but one particular term "climate change" is strongly competing with the older term for prominence. There are reasons for preferring one term over the other.

For simplicity sake, "global warming" and "climate change" are just words with exact literal implications and inherent meanings. Their meanings are different. In current use, "global warming" refers to the phenomenon of the increased average temperature of the Earth's air and ocean near the surface since the mid-20<sup>th</sup> century and its projected continuation in accord with the first theory of global warming postulated in 1824, whereas the term "climate change" introduced in 1979 encompasses – beyond withering weather – changes in regional climate characteristics, including temperature, humidity, rainfall, wind,

and severe weather events.

Rising temperatures are causing polar ice to melt, rainfall levels to decline and sea levels to rise; climate disasters, such as droughts, floods and storms, are expected to worsen.



Global temperature land-ocean index, 1860-2000.

(Source: Hansen and others, 2006; and <www.columbia.edu>for 2007-2008; J Hlth Syst Res 2009;3:164.)

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**Global Warming and Malaria**<sup>(1,3,6)</sup>*Global warming increases malaria*<sup>(3,4)</sup>

Because the mosquitoes that carry the disease do not thrive in cooler climates, a link between the rise in incidence and climate change is suggested. Reviews of the evidence of links between climate change and human health suggest that a warmer climate could result in increases in mosquito-borne diseases like malaria in temperate climates and epidemics in upland areas. Owing to the fact that, within the range of survivable temperatures, warmer temperatures reduce the duration of the extrinsic cycle of malaria parasites in mosquito vectors, higher temperatures should result in higher rates of malaria transmission. Moreover, increases in rainfall, temperature and humidity will favor the spread of malaria-transmitting mosquitoes over a wider range and to higher altitudes. Mathematical-model estimations also suggest that malaria will worsen and its range will spread as the world gets warmer and more deaths will be attributable to malaria.

On the other hand, warming could dry out the pools in which the mosquitoes breed if temperatures continue to climb or current rainfall patterns change.

*Global warming unlikely to spread malaria*<sup>(3,5,6)</sup>

The widely held notion that warming global temperatures will lead to a future intensification of malaria and an expansion of its global range is at odds with the current evidence.<sup>(6)</sup> Of note, during the past decade, the number of malaria cases on the whole has not changed markedly. The complex natural history of malaria transmission involves interactions among humans, anopheline vectors, and malaria parasites. Many different factors influence those three primary components, including climatic, ecological,

environmental, socio-economic and human behavioral factors. Thus, malaria transmission may not simply be affected only by global warming; the relative importance of all the factors involved should be considered jointly. Worthy of note is the possibility that interventions could have a far more dramatic and positive effect on reducing the spread of malaria than any negative effects caused by climate change.

**Conclusion**

Future changes in climate may alter the prevalence and incidence of malaria, but obsessive emphasis on “global warming” as a dominant parameter is indefensible. The principal determinants are linked to ecological and social change, politics and economics. Nonetheless, disease surveillance systems must be closely monitored by epidemiologists if global warming persists. In the meantime, effective control campaigns are urgently required, irrespective of climate change, for a creative and organized search for new strategies based on new technologies.

**References**

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