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Global warming and mosquito-borne disease in USA

SIR—In your June 8 editorial[1] you raise the issue of the impact of global warming on health. Speculations on the effect of global warming in the USA frequently include discussion of mosquito-borne diseases such as malaria, yellowfever, and dengue.[2] Some have suggested that rising temperatures will expand the geographical range of vector mosquitoes, increase their rate of development, and reduce the extrinsic incubation time of their pathogens. The implication is that both the mosquitoes and the diseases will emerge from the tropics and give rise to epidemics in the USA. Such predictions ignore the complex dynamics of mosquito-borne infections: climate and weather are important variables, but other factors are of equal or greater importance.

Several efficient malaria vectors are indigenous to North America, and are common in many areas. The disease was once endemic and widespread in the USA (figure). In 1934, the year after systematic reporting began, 125 556 cases were recorded.[3] Transmission was also recorded in Canada. When it was founded in 1946, the main function of the Centers for Disease Control and Prevention (CDC) was malaria control, and it was based in Atlanta because the city was in a malarious region. The disease was finally eradicated from the USA in the 1950s. *Aedes (Stegomyia) aegypti* (L), the principal urban vector of yellowfever and dengue, is also common throughout the southern USA. From the 17th century onwards, frequent epidemics of yellowfever killed tens of thousands of people as far north as New York. In a single year (1878), there were 100 000 cases and 20 000 deaths. Dengue fever was also common, eight major pandemics occurring between 1827 and 1946.[4] In 1922, dengue spread east from Texas (500 000 cases) through Louisiana, Georgia, and Florida, and then south into the Caribbean islands. Savannah, Georgia, reported 30 000 cases, 28% of which had haemorrhagic manifestations.

Summer temperatures in the USA were clearly conducive to the transmission of these diseases. Indeed, in the southern states they are higher than in many tropical countries. So why did epidemic transmission cease? The principal factor was probably a change in living conditions. Even in the poorest US communities, most people now live and work in air-conditioned buildings, or are at least protected by insect screens. In addition, the spacing of houses and other buildings has increased because modern urban areas have evolved around the motor vehicle. As a result, population density is much lower than in the past, a major impediment to transmission. Events such as the dengue pandemic that affected the Caribbean, Central America, and Mexico in 1995 support this explanation. 74 000 cases were reported from the region (Pan-American Health Organisation, unpublished data), including 4479 from Tamaulipas state, on the Texas border. Of these, 2361 were from Reynosa, a city contiguous with Hidalgo, Texas, but only seven autochthonous cases were reported in the entire state of Texas.[5] Thus, unless living conditions are drastically changed, global warming is unlikely to give rise to major epidemics of tropical mosquito-borne disease in the USA.

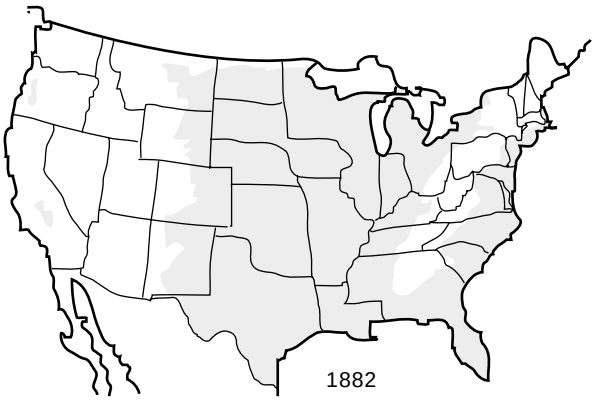

Figure: **Areas of the USA where malaria was thought to be endemic in 1882[3]**
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Isotretinoin and azathioprine: a synergy that makes hair curl?

SIR—Acne is common after organ transplantation.[1] Steroids are usually blamed but recently cyclosporin has also been reported to be associated with severe acne.[2] Systemic treatment with antibiotics may interact with cyclosporin metabolism and absorption. Severe acne responds to isotretinoin. Transplant physicians have been reluctant to prescribe this drug because of concern about enhancing rejection, although several cases have now been reported on the use of isotretinoin with no deleterious effects on the grafts.[2]

A rare side-effect of isotretinoin is curling hair.[3] We report three simultaneous pancreas-kidney (SPK) transplant recipients, who developed curling hair after isotretinoin therapy. The first patient is a 49-year-old man who was put on isotretinoin 100 mg/day 13 months after transplantation because of severe acne which did not respond to topical therapy. 2 months later he developed extremely curly hair (figure). The second patient was a 46-year-old man who started 60 mg isotretinoin 12 months after transplantation, and developed curls in his hair after 60 days. The third patient started isotretinoin 60 mg/day 13 months after transplantation and developed curling hairs 3 months later. All patients had an improvement in their acne and no deleterious effects on pancreas and kidney graft function were seen. Cyclosporin dosage had to be increased in two patients, based on trough levels. Concurrent medication was prednisone (10 mg/day), cyclosporin (Neoral), and azathioprine. Furthermore, nifedipine (2/3 patients), sodium bicarbonate (3/3), omeprazole (1/3), distigmine bromide (1/3), atenolol (1/3), hydrochlorothiazide (1/3), and enalapril