GLOBAL WARMING AND POVERTY RELATED SKIN DISEASES

ABSTRACT

During the past century, global surface temperatures have increased 0.6°C per century (1.1°F per century); this trend is today 3 times higher than 1976. Human activity, particularly the burning of fossil fuels, has very likely (90% probability) driven this rise by greatly increasing atmospheric concentrations of carbon dioxide (CO2) and other greenhouse gases (GHGs).

Climate warming may have significant impacts on human health.

Van der Leun and de Gruijl have estimated that the long-term temperature increases by 2°C, as a consequence of climate change, may raise the carcinogenic effectiveness of solar UV by 10%.

The most definitive evidence exists for Non Melanoma Skin Cancer (NMSC) being linked to chronic, repeated exposure to mid-range UVR (UV-B: 290-320 nm) and therefore being likely to increase because of the ozone depletion. Individuals greatly differ in susceptibility, first of all for genetic reasons, but the major determinant of the occurrence of skin cancer is the quantity and the quality of sunlight exposure.

There is weaker evidence of the role of UVR exposure in the development of Melanoma (MM). There is considerable evidence that sunlight exposure plays a role, but the mechanism is certainly different from the one operating in NMSC. Although it is much more difficult to estimate numerical effects, epidemiological studies in the United States suggest that for a 1% reduction in ozone, MM might increase by 0.6%.

Climate warming may also have significant effects on the distribution and seasonality of vector-borne diseases (i.e. malaria, dengue, leishmaniasis, tick-borne diseases). Cardenas et al reported the impact of the El Nino Southern Oscillation climatic fluctuations during 1985-2002 with regard to the occurrence of leishmaniasis in Colombia, showing that cases of leishmaniasis increased during El Nino and decreased during La Nina phases.

Global warming and climate change may alter the frequency, timing, intensity, and duration of extreme weather events.

These weather events, such as extreme precipitations and severe storms, cause hundreds of deaths and injuries in the USA every year.

In 2005, following the occurrence of Hurricane Katrina and subsequent flooding, the Centers for Disease Control and Prevention (CDC) reported wound infections with methicillin-resistant Staphylococcus aureus (MRSA), Vibrio vulnificus, and Vibrio parahaemolyticus in evacuees of Hurricane Katrina, and tinea corporis, folliculitis, miliaria, and arthropod bites amongst rescued workers. These skin infections were provoked by the prolonged flooding and the exposure to contaminated water. Hiransuthikul et al related that 515 (66.3%) tsunami survivors with traumatic wounds were diagnosed to have skin and soft-tissue infections. The most common isolated organisms were Aeromonas species. Multidrug resistant bacteria, polymicrobial infections, and infections with uncommon pathogens, such as Burkholderia pseudomallei, Cladophialophora bantiana, and Mycobacterium abscessus, were also reported, as the result of exposure to contaminated freshwater due to flooding.

In recent decades, the emergence and the resurgence of various infectious diseases has been linked in part to regional climatic changes. New infectious agents have also been encountered because of increasingly disruptive patterns of land use.

Some populations and geographic regions will be particularly vulnerable to the impacts of global change. Climatic changes will tend to increase various health problems in countries affected by poverty, malnutrition, lack of water, consequences of extreme weather events, inequality, and social-economic differences among the population.

There is a complex nexus between population pressure, poverty and environmental degradation, entailing various mutually reinforcing processes. If the present environmental trends persist, leading to changes in environmental climatic conditions and ecological relationships, adverse health consequences will become more evident in vulnerable populations, especially those in low-income tropical countries.

Africa is one of the most helpless continents to climate change.

Climate change and variability are likely to impose additional pressures on water availability, water accessibility and water demand in Africa.

About 25% of Africa’s population (about 200 million people) currently experience high water stress. The population at risk of increased water stress in Africa is estimated to be between 75-250 million and 350-600
million people by the 2020s and 2050s respectively. In many African countries and regions agricultural production and food security are likely to be severely compromised by climate change. Diarrhoeal disease is common in developing countries and reflects the overcrowding and the difficulties with sanitation and hygiene. In Ethiopia global warming, without offsetting precipitation increases, provoke a negative impacts on subsistence agriculture. Furthermore, recent ecological changes in rural settlement areas have exacerbated malaria by increasing the mosquito-friendly period in the fringes of the Ethiopian highlands; this is due to the combined effect of rising temperatures and the creation of moist surfaces rainwater harvesting (RWH) ponds that remain after the summer rain season. A lack of water availability and sanitation services in rural area of Ethiopia might explain the hyperendemic burden of active trachoma. Our experience in Tigray, northern Ethiopia, points out that lack of water, sanitation and hygiene lead to skin diseases, the most frequent causes of morbidity in Ethiopia. Being the sixth most frequent cause of outpatient visits nationwide to health facilities, it shows its high prevalence in the general population. Since January 2005 we have been performed at the Italian Dermatological Centre (IDC) in Mekelle (Tigray) more than 40,000 visits. The Dermatological Centre has a wide catchment area and it is the referral point for complex dermatological cases from all peripheral health units of Tigray region. The region covers 54 572 km2 and has an estimated population of 4 215 944, mostly (83%) living in rural areas. Malaria, pneumonia, acute upper respiratory infections, diarrhoeal diseases, skin infections and HIV/AIDS are among the leading diseases seen in health facilities. Tigray is the northernmost region of Ethiopia, a country located in the horn of Africa that has more than 77 million inhabitants. Ranking 99 out of 103 countries on the UNDP Human Poverty Index, Ethiopia remains one of Africa’s poorest countries, with close to 80% of the population living on less than US$2 per day and over 50% living more than 10 km from the nearest health facility. Since the most common and readily treatable skin diseases are related to household crowding and lack of hygiene, they are esteemed to be important contributors to the ‘disease profile of poverty’ and, in general, to the health inequalities. Cost-effective interventions are available to reduce the burden of skin disease. The control of skin disease should be considered a public health priority and included in strategies for health-sector development and poverty reduction. The experience in Tigray indicates that training non specialized health workers significantly improves their skill in managing common skin diseases and in referring complicated cases. This shows that skin diseases can be treated in a cost-effective way in peripheral health units such as health centres if a support is provided by a specialist centre for training, supervision and referral. Skin disease control should be an important component of the strategy for Ethiopian poverty eradication. In fact, poverty is the major risk factor for poor health and the pathway leading from poverty to poor health includes lack of access to decent housing, sanitation and clean water, all risk factors related to skin diseases. In turn, not only are the main risk causes associated with skin diseases — household overcrowding and lack of hygiene — related to low socio-economic status and poverty, but also skin diseases bring about heavy financial burdens within households, creating a vicious cycle of poverty and ill health. Overall, our data suggest that significant progress could be made in reducing the burden of skin disease by focusing on the small group of conditions, particularly infections, that account for the bulk of the community case load and for which cost-effective interventions are available. Furthermore, through a simple skin examination early detection (or referral for confirmation) is possible of systemic diseases such as HIV/AIDS, leprosy and onchocerciasis, whose first signs tend to appear as skin problems. The control of skin problems by means of simple public-health measures is a realistic approach to alleviating a common source of ill health. For all these reasons, it is very important to slow the environmental change processes taking the protective and adaptive capacities of populations of the different countries into account.
REFERENCES


