



Environment and Health: Major Challenges for Physical Mental Health

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Abstract: *Environmental influences on human health are, par excellence, suited for the whole population approach to prevention and amelioration. Exposures tend to be shared across communities, often across whole populations. The health challenge is to attain and sustain a health-supporting physical, biological and social environment. The escalating impact of the global human population on the world's environment and its life-support systems poses additional, and mounting risks to human wellbeing and physical mental health. This unprecedented large-scale disruption to the natural environment reflects the combination of now-excessive (and 'growing') human numbers, energy-intensive economic activity, and increasing levels of wealth, consumption, and waste generation. Climate change, for example, already appears to be affecting health outcomes in some regions - including increasing exposures to more extreme weather events, an uptrend in annual deaths from heatwave conditions in some populations, shifts in the geography and seasonality of several infectious diseases, adverse mental health consequences in farming communities undergoing drying trends, and downturns in food yields and nutritional health in vulnerable populations.*

Key Words: Source language, Target language, equivalence, Metaphrase, Paraphrase, Imitation.

The physical environment is a major contributor to individual and community health but, what about the evidence for the effects of nature on health? Wilson has put forward a very strong argument about the health benefits of nature over two decades (Wilson, 1984, 2001). His 'biophilia hypothesis' i.e. 'the innately emotional affiliation of human beings to other living organisms' spawned research which suggested that our relationships with nature are a fundamental component of building and sustaining good health (Wilson, 1984).

The evidence about the influence of nature on the health and well-being of individuals and groups has emerged from a number of traditional disciplines, e.g. psychology and biology, and recent fields of research such as recreation and leisure, and wilderness therapy. The evidence tells us that the movement of humans from rural to urban environments across the globe within the last 200 years has facilitated their disengagement from the natural environment (Axelrod and Suedfeld, 1995).

We do not experience the range of natural environmental stimuli of our ancestors a built environment of concrete, cars, noise, high-rise housing, and pollution has replaced it. The

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protective factors of nature for health improvement and sustainability have been reduced by our diminishing regular contact with nature.

It doesn't require much effort to address this problem. A considerable body of research shows that viewing natural scenes has a positive health impact. For example, Ulrich (Ulrich, 1984), in a study, demonstrated that hospital patients who viewed natural scenes, e.g. trees and animals from their wards, recovered faster, spent less time in hospital, required fewer painkillers, and had fewer post-operative complications than those patients whose ward views consisted of other buildings and which were devoid of any appearance of plants and animals.

In prison, having a cell window with views of plants and animals, e.g. birds, lowered the number of sick calls of prisoners (Moore, 1981). A number of studies have demonstrated that office workers experienced lower job stress, higher job satisfaction, and fewer illnesses if they had views of nature than if they did not (Kaplan and Kaplan, 1989). Placing trees next to freeways and roads, and having roads pass through and by green areas, reduces driver stress as measured by blood pressure,



heart rate, and sympathetic nervous system changes (Parsons et al., 1998). In addition to physical health improvements, there is considerable evidence to suggest that psychological health is enhanced when a person views flora and fauna. Rohde and Kendle (Rohde and Kendle, 1994) conducted a comprehensive literature review into psychological reactions to nature. They concluded that viewing nature reduces anger and anxiety, sustains attention and interest, and enhances feelings of pleasure.

The above benefits occur by viewing nature. Being in nature also impacts health. Many studies have shown significant health gains for those in contact with nature. Some of these relate to assisting new immigrants to a country to cope with the transition of migration. Wong (Wong, 1997) reported benefits such as increased empowerment, feelings of integration, and willingness to participate. Exposure to nature was shown to reduce mental fatigue, irritability, and accidents, and improve problem-solving ability and concentration in people from urban areas who are located in a natural environment for a few days (Herzog et al., 1997).

This emerging recognition will become a central focus for social and economic policies, nationally and internationally, over the coming decade. Recognized risks to health are a potent political issue.

Indeed, governments and international agencies are increasingly concerned that our faltering progress towards improved global health, and the attainment of the UN's Millennium Development Goals, by 2015, will be jeopardized by this new, enlarged, dimension of environmental stress upon human populations. This situation presents an urgent new challenge to the public health research community to study these systemic threats to human health, quantify risks, and identify preventive strategies. The evolution of assessment of risks posed by global climate change is instructive. In 1991 the UN's Intergovernmental Panel on Climate Change (IPCC) published its first major scientific assessment. That report examined likely impacts on farmlands, fisheries, forests coastal

zones, energy systems, and other systems valued by human societies. Yet it contained little recognition that this unprecedented human-induced environmental change, occurring on at a global scale, posed serious risks to human health and survival. Indeed, this reflected the fact that, at that time, there had been scant research done on this relationship.

The five-yearly reports of the IPCC of 1996, 2001, and 2007, have given progressively increasing emphasis to the human health risks from climate change. The UN Environment Program released its Global Environmental Outlook 2007 ('GEO-4'). This report, written by over 400 scientists, assessed in detail the current state and future prospects of Earth's main environmental and ecological system.

The report explicitly concluded that social stability and human wellbeing, health, and survival are now at increasing risk from climate change and other systemic environmental changes. The report documented worrying negative trends in the world's fertile soils, freshwater supplies, coastal and reef ecosystems, fish stocks, concentrations of human-activated nitrogen (mostly from nitrogenous fertilizers and fossil fuel combustion), ocean acidity, numbers and stocks of species, and the global climate. All these changes, directly or indirectly, pose risks to population health.

Overloading Earth's vital capacity: systemic risks to population health- A similar general conclusion was reached by the comprehensive scientific review carried out during 2001-2005 by the international Millennium Ecosystem Assessment (MA). That assessment concluded that Approximately two-thirds of the world's ecosystems have been significantly damaged by human actions in recent decades.

Continuation of this trend will seriously impair the flow of Nature's 'goods and services to human societies, comprising: (i) provisioning (e.g. foods, freshwater flows), (ii) regulating (e.g. flood control, and the range and activity of infectious agents), (iii) supporting (e.g. generation of hydropower and geothermal power), and (iv)



enriching local cultures (diverse examples include: seasonal festivals, animal migratory events, and totemic species).

The contemporary pressures on the world's fish stocks provide a good example of how systemic changes can jeopardize human health. Fish consumption accounts for a high proportion of animal protein in the world's diet, especially in many developing-country coastal communities. However, since the mid-1980s the total global wild fish catch has been declining and fish prices have been rising. This decline in the seas' harvest reflects the well-known over-fishing of many of the world's major fisheries, along with the consequences of other recent changes to the ocean environment.

The GEO-4 report estimates that commercial pressures on the world's major fisheries have resulted in more than 1400 stocks being fished, of which 240 stocks had 'crashed' by the year 2000. Meanwhile, in addition to this over-exploitation by industrialized fishing fleets, other environmental stresses are emerging. As the oceans warm and as various coastal and other currents begin to change and shift, so some fish populations have begun to move. Further, the oceans are now undergoing gradual acidification as more carbon dioxide is absorbed from the atmosphere (to form carbonic acid). The acidification seriously endangers the calcification processes (formation of chalky structures) that are integral to the tiny creatures at the bottom of the marine food web - coral, zooplankton, copepods, crustaceans, and shellfish. This now precarious situation of the world's fisheries illustrates the complex systemic way in which human pressures on the natural environment can combine to pose major threats to components of Earth's life-support systems, and hence to human health.

Climate change and human health: local risks and global significance- There is now general acceptance that human-generated greenhouse gases are changing the world's climate, and that this process of change will inevitably continue over many coming decades. The IPCC's Fourth Assessment Report concluded that most of the warming since

1950 is due to human actions. The risks to human health from climate change are part of a wider constellation of risks to climate-sensitive physical systems (e.g. ice-sheets and river flows), biological processes and rhythms, ecological relationships, and social-economic conditions.

Changes in climatic conditions will have many health effects, via stresses on human biology, environmentally mediated exposure (infectious diseases, food yields, etc.), and the physical risks of injury.

These effects will occur via direct and indirect pathways and across different timescales. The latest IPCC report concluded that the world's mid-latitude regions are likely to experience long-term drying, as rainfall systems are displaced towards the poles. Any such longer-term shifts in rainfall zones over coming decades will have disruptive effects on agriculture and on regional food yields and, in some populations, nutritional health. The Millennium Development Goal of reducing childhood stunting will thus be further impeded. Recent modeling of climate change impacts on regional food yields, especially cereal grains, indicates, with fair consistency, that South Asia is likely to experience the greatest downturns in yields over coming decades.

Livelihoods from fisheries, farming, and forestry are at risk in many vulnerable regions of the world. The impacts of climate change on food yields and livelihoods will therefore also affect mental health and health-related behaviors. The indirect impacts on health are well illustrated by the consequences of the recent warming of the Arctic region, which is occurring more rapidly than for the world at large. The resultant loss of ice (both sea-ice and permafrost) has begun to disturb traditional living, hunting, and eating patterns in the Inuit communities of northern Canada. This has caused a decline in physical activity and a greater reliance on imported energy-dense processed foods, resulting in a much greater probability of adverse health consequences, especially obesity, cardiovascular disease, and the occurrence of diabetes.



Climate Change and Health- The first task is specified health outcomes to variations in climatic conditions. Then, second, there is, already, a need to seek evidence of ongoing changes in health risks and outcomes due to climate change - a complex task that is subject to all the usual difficulties of multivariate influences and causal attribution. Third, by forging new collaborations with climate scientists and mathematical modelers, health researchers must estimate how future scenarios of climate change are likely to affect health risks and changes in burdens of disease. Finally, of course, there are very important new research tasks relating to the prevention of adverse health outcomes.

For climate change, this can be encapsulated as a twofold task: avoiding future unmanageable risks and, in the interim, managing unavoidable risks. In health promotion, we need to be more familiar with the evidence and, in many cases, more proactive in making sure our natural environments are protected. The health benefits are considerable. Physical, mental, and spiritual healths are all enriched when we engage with nature. It is a challenge for us to make sure it happens.

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