



Medicine and Peace

by Joanna Santa Barbara

> Croat Med J. 2006;47:665-8

Foul Weather Ahead and We're Low on Gas

All health professionals subscribe to the merits of prevention in health care. We take it as a duty to identify health risks ahead and to act preventively. If our patient is traveling to the tropics, we give them antimalarials. Public health workers cooperate with epidemiologists to identify and monitor the development of avian influenza and urge appropriate preventive action, even though there is no certainty of when or if there will be a dangerous mutation. Some health professionals take on the duty to warn about the health effects of nuclear, chemical, and biological weapons, taking care to point out that there is no rational preventive action other than abolishing the weapons. Now, warnings are beginning to issue from the health profession about the health effects of human

impact on the biosphere and the closely associated health impact of oil scarcity in the age of post-peak oil. Peak oil refers to the point at which there will never again be as much oil extracted from the earth as there has been in the past – the halfway point in total oil extraction. Most analysts think we are approximately at that point now. While the amount of oil extracted diminishes, the demand for oil increases, leaving an increasing gap between supply and demand and increasing competition over available oil.

Ecosystem damage

John Last, prominent public health scholar, has been particularly eloquent in his warnings of the health effects of ecosystem damage (1). Human disruption

of previously balanced ecosystems may have resulted in the 30 or so dangerous pathogens that have emerged since 1970, including the viruses causing HIV/AIDS, Ebola-Marburg disease, Legionnaires disease, SARS, and avian influenza. Ozone layer depletion has already caused dramatic changes in skin cancer rates. By far the most severe impacts on human life will be caused by global warming. This is the result of our profligate burning of fossil fuels during the age of industrialization, causing megatonnes of carbon to shift from the inner earth into the atmosphere, causing a greenhouse effect, global warming, and climate change. Rising sea levels from glacial and ice sheet melting, and desertification of mid-continent areas may cause population movements which are highly likely to cause health dete-

rioration, and possibly violent conflict. Violent weather events can be expected to cause more disasters like Hurricane Katrina in the US.

Human population on the Earth has increased from 1.7 billion in 1900 to 6.4 billion in 2000, with further increases predicted. The wealthy are responsible for a disproportionate share of carbon production (they drive cars and heat and air-condition their large homes), ozone depletion, profligate water and timber usage, and other forms of ecosystem damage. This destruction to Earth's ecosystems is powered by very high use of fossil fuels, especially oil.

Peak oil

As noted above, oil will become more scarce. This will be partly compensated for by renewable forms of energy, but it is now predicted that no combination of renewables can ever replace the abundant energy of cheap oil (2). Since the global economy runs on oil, as scarcity begins to be felt, there may be serious disruption not only of financial systems, but of social and political systems.

The large-scale agriculture which enables 6.4 billion people to be fed is possible only because of fossil fuel, which powers the machinery, and provides fertilizers, herbicides, and pesticides. Since 1900, the world's cultivated area increased by only about

one third, but because of more than a fourfold increase of average yields, the total crop harvest rose almost sixfold. This gain has been due largely to a more than eighty-fold increase of external energy inputs, mostly fossil fuels, to crop cultivation (3). With fossil fuel scarcity, food production will diminish. People may starve. Some writers starkly predict a "die-off" (4). Food distribution and storage systems in industrialized countries are dependent on refrigeration, an energy-consuming function.

Water treatment and sanitation systems require large amounts of energy, and are essential infrastructure of public health, more and more relevant as humanity huddles ever more closely into huge cities. Health care itself is highly energy-dependent, or as Smil put it: "A hospital in a typical industrial city uses more energy per square foot of space than nearly any other kind of building" (3). Diagnostic equipment is energy-intensive. Patients depend on oil-powered transport to get them to their health-care facilities. Some readers will have practiced medicine in energy-scarce environments in low-income countries, and realize clearly the impact on health care of energy scarcity, although in this case it is caused by immediate poverty, rather than by global energy shortage.

If energy scarcity develops without any regulation of mar-

kets, the richer and more militarily powerful countries will commandeer supplies, causing a rich-poor energy divide, paralleling and worsening the rich-poor income divide. If the horrifying prediction of "die-off" occurs, it will be among the poor in both high- and low-income countries. Within states, if there is no democratic regulation of markets, distribution of energy will not be according to social need. The military, a high energy-consuming sector, may demand priority in many states.

Several writers predict more wars over energy – to secure dwindling fossil fuel supplies for the most powerful nations, to control which other countries receive supplies (5,6) and to control the currency in which oil exchanges occur (7). We are now experiencing an agonizing war, initiated for this reason, in Iraq, and face the prospect of another one, for the same reason, in Iran. Further possibilities of energy wars include the US against China, China against Japan over disputed undersea oil-fields; civil wars within oil-producing countries over control of oil; civil wars in countries with serious political divisions, stimulated by financial strain.

All of these projections entail health effects, some direct, some mediated by war, some mediated by the structural violence of global economic systems. Projections of both climate change and peak oil effects suggest that

some effects may be slowly incremental, but that there may also be fast-developing shocks as interdependent systems, both ecological and economic, undergo critical shifts.

What is the role of health professionals?

Health professionals need to understand the data summarized above and to critically examine the projections. Then, before they sink into despair, they need to become aware of a range of solutions posed to counter these problems. Some of the solutions may even have beneficial health effects. The solutions, of course, call for advocacy action by health professionals, among others.

Solutions

One of the most attractive solutions is known as Contraction and Convergence (8). It addresses the need to reduce carbon emissions, to cut fossil fuel use in an organized manner, and to attend to the need for equity in this process, taking into account the negative impact of economic globalization, dividing high and low income countries. It may even have positive implications for limiting population growth. This proposal sets a limit to global carbon emissions, and then distributes "entitlements to emit" on a per capita population basis to the global re-

gions. The cap on emissions will steadily diminish until it reaches a sustainable level in terms of the biosphere's capacity to deal with carbon dioxide without a greenhouse effect. It will be set initially higher than the per capita emissions level of people in low-income countries and lower than the emissions level in high-income countries. The rich countries will need to contract their energy consumption, as well as to replace fossil fuel use with renewables. The "entitlements" are tradable on an open market. Money for emissions entitlements will flow towards low-income countries, assisting their development and achievement of Millennium Goals. There will be gradual economic convergence of rich and poor regions, as well as high incentives in both rich and poor regions to develop renewable energy sources. Since the per capita "entitlements" are set according to the population in a base year, there may also be incentive to reduce population to increase the per capita energy wealth in a region.

Robin Stott, British medical educator, has outlined ways that health professionals could contribute to Contraction and Convergence (C&C) (9). He suggests acting at both an advocacy and a personal and corporate implementation level. Public health professionals and other physicians can advocate for the adoption and promotion of C&C by health depart-

ments, medical associations, and governments at all levels. Health facilities should be built with energy efficiency and frugality in mind, together with awareness of public transport convenience of users, both patient and staff. Walking and bicycling to the facility should be encouraged and provided for. Locally grown organic food should be used, cutting energy use in food transport. Health professionals should modify their extensive use of air travel (very high carbon emissions) for intellectual exchange and leisure. Physicians should learn to "speak carbon" (10).

Contraction and Convergence has achieved acceptance by a wide range of institutions, including the European Parliament (9).

A different and detailed proposal for producing and consuming less oil is contained in the Oil Depletion (or Rimini) Protocol (11). In this arrangement, oil-producing countries decrease production proportionately to their current rates of production, and oil-consumers decrease consumption by the World Oil Depletion Rate (2-3% each year).

The Energy Futures Protocol (12) attends both to the needs to reduce carbon emissions and to make an orderly transition to a low-carbon future, but also to the need for economic equity. Sharing of alternative energy technology with developing

countries will be an important aspect of this, as will assigning priorities within each polity for the use of energy (health care should be higher priority than military or luxury uses, for example).

Population reduction is viewed by many as part of moving towards a sustainable relationship between humans and the Earth. It is projected that global population will plateau at about 10 billion people mid 21st century. It is quite clear that Earth cannot sustain this many people at Western standards of living; at 6.4 billion, we are already living on our natural capital, not the annual interest. Yet, it is extremely difficult to discuss this issue, even in circles dealing with issues of global health, causes of war, and the interface of ecology and economics (13). The estimated "carrying capacity" for humans on our one Earth depends at what level of technology and energy consumption they live – we might guess perhaps 3 billion at levels of sufficiency. To attain this, we would need a voluntary one-child policy based on a shared understanding of the global predicament and wish to avoid terrible consequences.

The Relocalization Movement experiments with establishing communities incorporating low fossil fuel use practices, such as their own or-

ganic gardens, shared transport, solar and wind energy generation, human-powered implements, and efficiently designed buildings (14).

Health benefits of responses to climate change and peak oil

Walking, cycling, and using human-powered implements are known to benefit the recognized health problems of civilization and urbanization – obesity, diabetes, and cardiovascular illness. Eating less animal products and more vegetable products may have similar benefits. Change in urban design from oil-dependent suburban isolation to more dense and interdependent community living may bring psychological benefits. Lower carbon emissions are likely to be accompanied by lower particulate emissions, with improvements in the quality of air and in rates of respiratory illness. Decreased car use would lower the very high mortality in almost all countries from road accidents.

Long-term thinking, beyond a few years ahead, is difficult for us. Denial, or the conviction that technology will take care of the entire problem, are common responses to these issues. We, who are responsible for our communities' health, have a duty to examine these issues and to take action.

References

- 1 Last J. Living in harmony with the earth and with each other: health workers preserving the ecosystem for a peaceful planet. In: Arya N, Santa Barbara J, editors. *Peace through health*. Bloomfield (NJ): Kumarian Press; Forthcoming 2007.
- 2 Heinberg R. *The party's over: oil, war and the fate of industrial societies*. Gabriola Island (Canada): New Society Publishers; 2003.
- 3 Smil V. *Feeding the world: a challenge for the 21st century*. Cambridge: The MIT Press; 2001.
- 4 Catton W. *Overshoot. The ecological basis of revolutionary change*. Urbana and Chicago: University of Illinois Press; 1980.
- 5 Klare M. *Blood and oil: the dangers and consequences of America's growing dependency on imported petroleum*. New York (NY): Henry Holt; 2004.
- 6 Klare M. *Resource wars: the new landscape of global conflict*. New York (NY): Henry Holt; 2001.
- 7 Clark WR. *Petrodollar warfare: oil, Iraq and the future of the American dollar*. Gabriola Island (Canada): New Society Publishers; 2005.
- 8 Global Commons Institute. *Contraction and convergence*. Available from: <http://www.gci.org.uk/briefings/ICE.pdf>. Accessed: June 27, 2006.
- 9 Stott R. Healthy response to climate change. *BMJ*. 2006;332:1385-90. [Medline:16763255](#)
- 10 Roberts I. When doctors learned to speak carbon. *BMJ*. 2006;332:497.
- 11 Association for peak oil. *The Rimini Protocol – an oil depletion protocol*. Available from: <http://www.peakoil.ie/protocol>. Accessed: June 27, 2006.
- 12 Santa-Barbara J. *The Energy Future Protocol*. Available from: <http://www.sustainablescale.org>. Accessed: July 5, 2006.
- 13 King M, Elliott C. To the point of farce: a Martian view of the Hardinian taboo – the silence that surrounds population control. *BMJ*. 1997;315:1441-3. [Medline:9418096](#)
- 14 Relocalization movement. Available from: <http://www.relocalize.net>. Accessed: June 27, 2006.