REPORT 3 OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH (I-08)
Global Climate Change and Human Health

SUMMARY

Objective. To review the current scientific information on climate change, discuss some predicted health effects facing various populations as a result of global climate change and modified weather patterns, and offer new policy recommendations for our American Medical Association.

Methods. Sentinel reports on climate, global climate change, and human health were relied on for the majority of this report, including the four Intergovernmental Panel on Climate Change (IPCC) assessment reports, and reports from the World Health Organization and the Environmental Protection Agency (EPA). Additional English-language articles were selected based on their relevance to enhancing the scientific understanding of global climate change and related health effects on humans, and to identify gaps in knowledge, including information on climate modeling. Lastly, the Web sites of several scientific authorities on global climate change and human health such as (but not limited to) the EPA, the National Aeronautics and Space Administration, and the IPCC were consulted for their specific content related to global climate change.

Results. Significant advances have occurred in the understanding of global climate change, and a large volume of published literature on this topic has appeared, particularly in the last half-century. The IPCC and other scientific researchers assert that warming of the climate system is unequivocal, and is evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level. Many health effects attributable to changes in the global climate system have been noted. These health effects are based on specific predicted climate-related events, including the effects of heat waves, climate events related to changes in water levels (either extreme flooding or droughts), and increases in infectious and/or vector-borne diseases. Additional modeling has been conducted to estimate more of the downstream health effects of global climate change, including changes in food yields and water supplies that could result in malnutrition and or dehydration.

Conclusions. Ongoing global climate change is now widely accepted by the majority of scientists, climatologists, and meteorologists, and human activity is accelerating this process. The extent of climate change will depend on many factors; most notably, changes in global greenhouse gas emissions. Anthropogenic contributions to global climate change exist, and the IPCC reports make a compelling case for linkage between these events. The effects of global climate change may be widespread, with impacts on ecosystems, land composition, sea levels, weather patterns, and ice coverage. The potential exists for devastating events with serious health implications, including extreme heat and cold events, flooding and droughts, increases in vectors carrying infectious diseases, and increases in air pollution. The health effects from these events should be of concern to the medical community and require action.

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RECOMMENDATIONS

The following statements by the Council on Science and Public Health were adopted by the AMA House of Delegates as directives and policies at the 2008 Interim Meeting.

Our American Medical Association (AMA):

1. Support the findings of the Intergovernmental Panel on Climate Change's fourth assessment report and concurs with the scientific consensus that the Earth is undergoing adverse global climate change and that anthropogenic contributions are significant. These climate changes will create conditions that affect public health, with disproportionate impacts on vulnerable populations, including children, the elderly, and the poor. (New HOD Policy)

2. Support educating the medical community on the potential adverse public health effects of global climate change and incorporating the health implications of climate change into the spectrum of medical education, including topics such as population displacement, heat waves and drought, flooding, infectious and vector-borne diseases, and potable water supplies. (New HOD Policy)

3. (a) Recognize the importance of physician involvement in policymaking at the state, national, and global level and supports efforts to search for novel, comprehensive approaches to mitigating climate change to protect the health of the public; and (b) recognize that whatever the etiology of global climate change, policymakers should work to reduce human contributions to such changes. (New HOD Policy)

4. Encourage physicians to assist in educating patients and the public on environmentally sustainable practices, and to serve as role models for promoting environmental sustainability. (Directive to Take Action)

5. Encourage physicians to work with local and state health departments to strengthen the public health infrastructure to ensure that the global health effects of climate change can be anticipated and responded to more efficiently, and that the AMA's Center for Public Health Preparedness and Disaster Response assist in this effort. (Directive to Take Action)

6. Support epidemiological, translational, clinical and basic science research necessary for evidence-based global climate change policy decisions related to health care and treatment. (New HOD Policy)

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Action of the AMA House of Delegates 2008 Interim Meeting: Council on Science and Public Health Report 3 Recommendations Adopted, and Remainder of Report Filed.

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## APPENDIX 1.
## Relevant AMA Policies

**H-135.973 Stewardship of the Environment**

The AMA: (1) encourages physicians to be spokespersons for environmental stewardship, including the discussion of these issues when appropriate with patients; (2) encourages the medical community to cooperate in reducing or recycling waste; (3) encourages physicians and the rest of the medical community to dispose of its medical waste in a safe and properly prescribed manner; (4) supports enhancing the role of physicians and other scientists in environmental education; (5) endorses legislation such as the National Environmental Education Act to increase public understanding of environmental degradation and its prevention; (6) encourages research efforts at ascertaining the physiological and psychological effects of abrupt as well as chronic environmental changes; (7) encourages international exchange of information relating to environmental degradation and the adverse human health effects resulting from environmental degradation; (8) encourages and helps support physicians who participate actively in international planning and development conventions associated with improving the environment; (9) encourages educational programs for worldwide family planning and control of population growth; (10) encourages research and development programs for safer, more effective, and less expensive means of preventing unwanted pregnancy; (11) encourages programs to prevent or reduce the human and environmental health impact from global climate change and environmental degradation. (12) encourages economic development programs for all nations that will be sustainable and yet nondestructive to the environment; (13) encourages physicians and environmental scientists in the United States to continue to incorporate concerns for human health into current environmental research and public policy initiatives; (14) encourages physician educators in medical schools, residency programs, and continuing medical education sessions to devote more attention to environmental health issues; (15) will strengthen its liaison with appropriate environmental health agencies, including the National Institute of Environmental Health Sciences (NIEHS); (16) encourages expanded funding for environmental research by the federal government; and (17) encourages family planning through national and international support. (CSA Rep. G, I-89; Amended: CLRPD Rep. D, I-92; Amended: CSA Rep. 8, A-03; Reaffirmed in lieu of Res. 417, A-04)

**H-135.977 Global Climate Change - The "Greenhouse Effect"**

Our AMA: (1) endorses the need for additional research on atmospheric monitoring and climate simulation models as a means of reducing some of the present uncertainties in climate forecasting; (2) urges Congress to adopt a comprehensive, integrated natural resource and energy utilization policy that will promote more efficient fuel use and energy production; (3) endorses increased recognition of the importance of nuclear energy's role in the production of electricity; (4) encourages research and development programs for improving the utilization efficiency and reducing the pollution of fossil fuels; and (5) encourages humanitarian measures to limit the burgeoning increase in world population. (CSA Rep. E, A-89; Reaffirmed: Sunset Report, A-00)

**H-135.972 Environmental Preservation**

It is the policy of the AMA to support state society environmental activities by (1) acting as an information clearinghouse by providing state societies access to significant environmental information as it becomes available, including the dissemination of data regarding health risks received from the states; (2) identifying areas of concern and encouraging productive research designed to provide authoritative data regarding health risks of environmental pollutants; (3) encouraging continued and expanded efforts by the CSA to prepare focused environmental studies, where these studies can be decisive in the public consideration of such problems; (4) maintaining a global perspective on environmental problems; (5) considering preparation of public service announcements or other materials appropriate for public/patient education; and (6) encouraging state and component societies

that have not already done so to create environmental committees. (Res. 52, A-90; Reaffirmed: Sunset Report, I-00)

APPENDIX 2. Anticipated Health Effects of Global Climate Change

| Climate Change Event | Direct Health Effect | Additional Health/Systemic Consequences |
|---|---|---|
| Heat waves, increases in overall temperatures, Mild winters | Heat stress, heat illness<br>Excess cardiac deaths<br>Increases in vector-borne disease (malaria, dengue, Lyme disease) | Population disruption, international/societal conflicts, food and/or water scarcity, limited food diversity, contaminated water<br>Water and soil salinization, malnutrition, ecosystem and economic disruption |
| Extreme weather events (eg, cyclones, hurricanes) | Injuries, drowning, psychological stress | |
| Sea level rise | Injuries, drowning | |
| Droughts/floods/increased rainfall | Vector-borne disease (malaria, dengue, Lyme disease, leptospirosis, tularemia, viral hemorrhagic diseases)<br>Infectious diarrheal diseases such as cholera, E. coli, giardia, hepatitis A, shigella, and typhoid.<br>Psychological stress | |
| Decreased air quality | Respiratory disease, asthma, COPD, bronchitis, rhinitis | |

Adapted from Haines, 2006. (30)