Congressional Roundtable:

Addressing Climate Change Impacts on the World’s Poorest Communities and U.S. Foreign Policy

Sharon H. Hrynkow, Ph.D.
Associate Director
National Institute of Environmental Health Sciences
National Institutes of Health

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The mission of the National Institute of Environmental Health Sciences is to reduce the burden of human illness and disability by understanding how the environment influences the development and progression of human disease.
HEALTH EFFECTS OF CLIMATE CHANGE

CLIMATE CHANGE

Temperature Rise\textsuperscript{1}
Sea level Rise\textsuperscript{2}
Hydrologic Extremes

\begin{itemize}
\item Urban Heat Island Effect
\item Air Pollution & Aeroallergens
\item Vector-borne Diseases
\item Water-borne Diseases
\item Water resources & food supply
\item Mental Health & Environmental Refugees
\end{itemize}

\begin{itemize}
\item Heat Stress
Cardiorespiratory failure
\item Respiratory diseases, e.g.,
COPD & Asthma
\item Malaria
Dengue
Encephalitis
Hantavirus
Rift Valley Fever
\item Cholera
Cyclospora
Cryptosporidiosis
Campylobacter
Leptospirosis
\item Malnutrition
Diarrhea
Toxic Red Tides
\item Forced Migration
Overcrowding
Infectious diseases
Human Conflicts
\end{itemize}

Patz, 1998

\textsuperscript{1} 3\textdegree C by yr. 2100
\textsuperscript{2} 40 cm
IPCC estimates
HEAT WAVE - EUROPE

> 70,000 deaths over 11 days

Heat Index Summer 2003
Comparing the 2003 Heatwave to past summer climate

European heat wave of 2003, from Schär et al., 2004
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Sea level Rise \(^2\)
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2. Sea level Rise \(^2\): 40 cm
   IPCC estimates

Urban Heat Island Effect

Air Pollution & Aeroallergens

Heat Stress
Cardiorespiratory failure

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Water-borne Diseases

Mental Health & Environmental Refugees

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Diarrhea
Toxic Red Tides

Overcrowding
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Patz, 1998
Health Professionals and Scientists Warn of Spreading Infectious Diseases.

Global Warming's greatest threat may also be the smallest.
West Nile Virus Transmission Cycle in Old World

Mosquito vectors
Culex species

Avian reservoirs

Dead-end Hosts

Source: R.J. Novak
USGS, National Wildlife Health Center
New Findings: West Nile Virus

• “The strain of West Nile virus (WNV) that emerged for the first time in North America during the record hot July, 1999, requires warmer temperatures than other strains. The greatest WNV transmissions during the epidemic summers of 2002-2004 in the U.S. were linked to above-average temperatures.”

• W. Reisen et al. 2006 (UC Davis)
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Patz, 1998

\(^1\) IPCC estimates

\(^2\) ""
Vulnerable Groups Include:

- Children < 5 years old (88% burden – WHO)
- Coastal populations
- Urban groups, including poor, elderly, marginalized
- Those living in drought prone regions, subsistence farmers
- Those with weakened immune systems
- Indigenous groups
- Subsistence Farmers
- Socio-economic
- Underlying Chronic Condition
Opportunities for International Cooperation

• Strengthen science base to understand impacts, prevention
  ---- define, measure

• Train interdisciplinary leaders in science and health

• Work with partners on systems approach that incorporates health more fully into decisions on adaptation and mitigation strategies