



Congressional Roundtable:

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

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NIEHS

National Institute of
Environmental Health Sciences

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



Temperature Rise ¹

Sea level Rise ²

Hydrologic Extremes

¹ 3°C by yr. 2100
² 40 cm " "
IPCC estimates

Urban Heat Island Effect

→ Heat Stress
Cardiorespiratory failure

Air Pollution & Aeroallergens

→ Respiratory diseases, e.g.,
COPD & Asthma

Vector-borne Diseases

Malaria
Dengue
Encephalitis
Hantavirus
Rift Valley Fever

Water-borne Diseases

Cholera
Cyclospora
Cryptosporidiosis
Campylobacter
Leptospirosis

Water resources & food supply

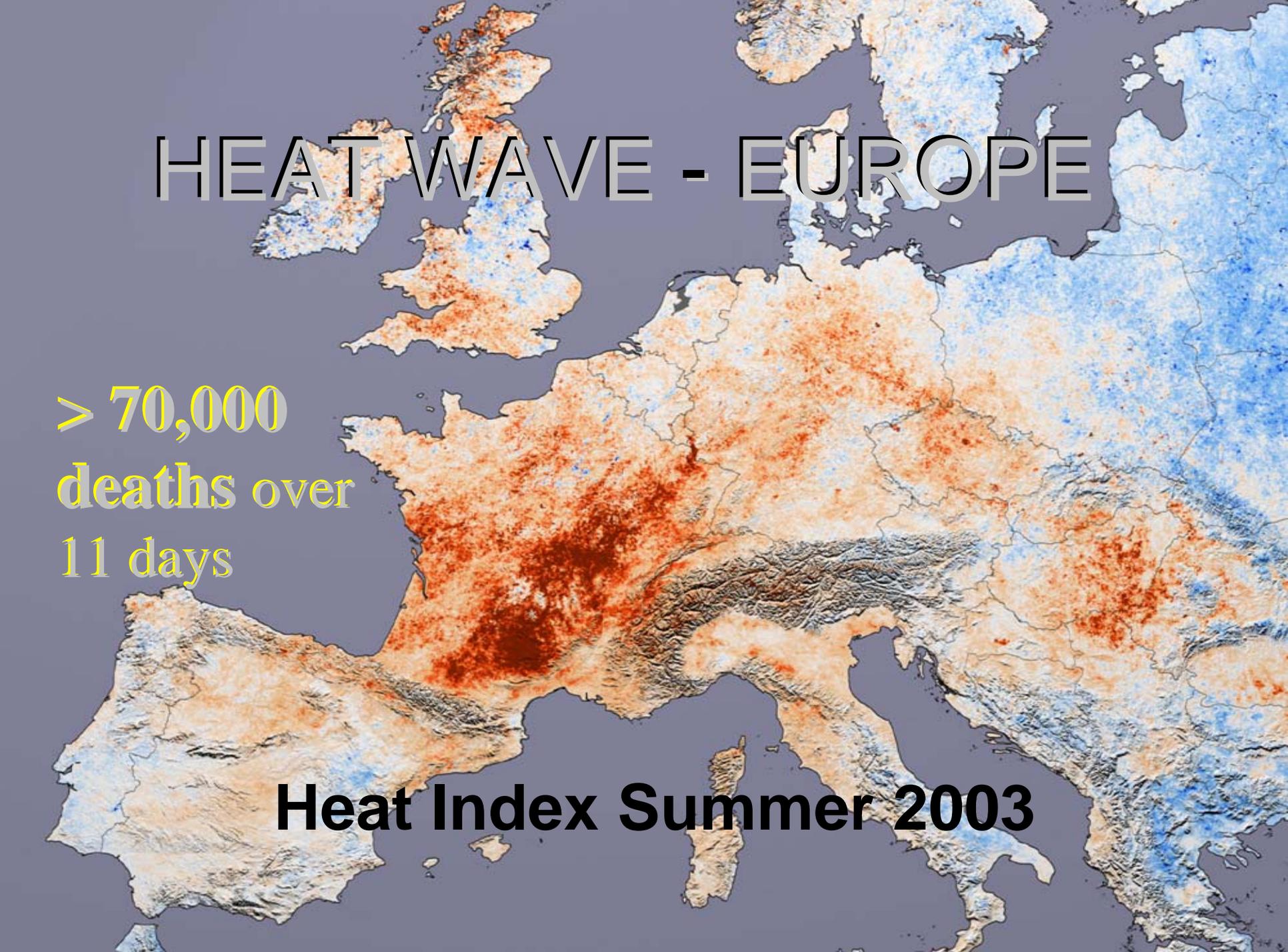
→ Malnutrition
Diarrhea
Toxic Red Tides

Mental Health & Environmental Refugees

→ Forced Migration
Overcrowding
Infectious diseases
Human Conflicts

Patz, 1998

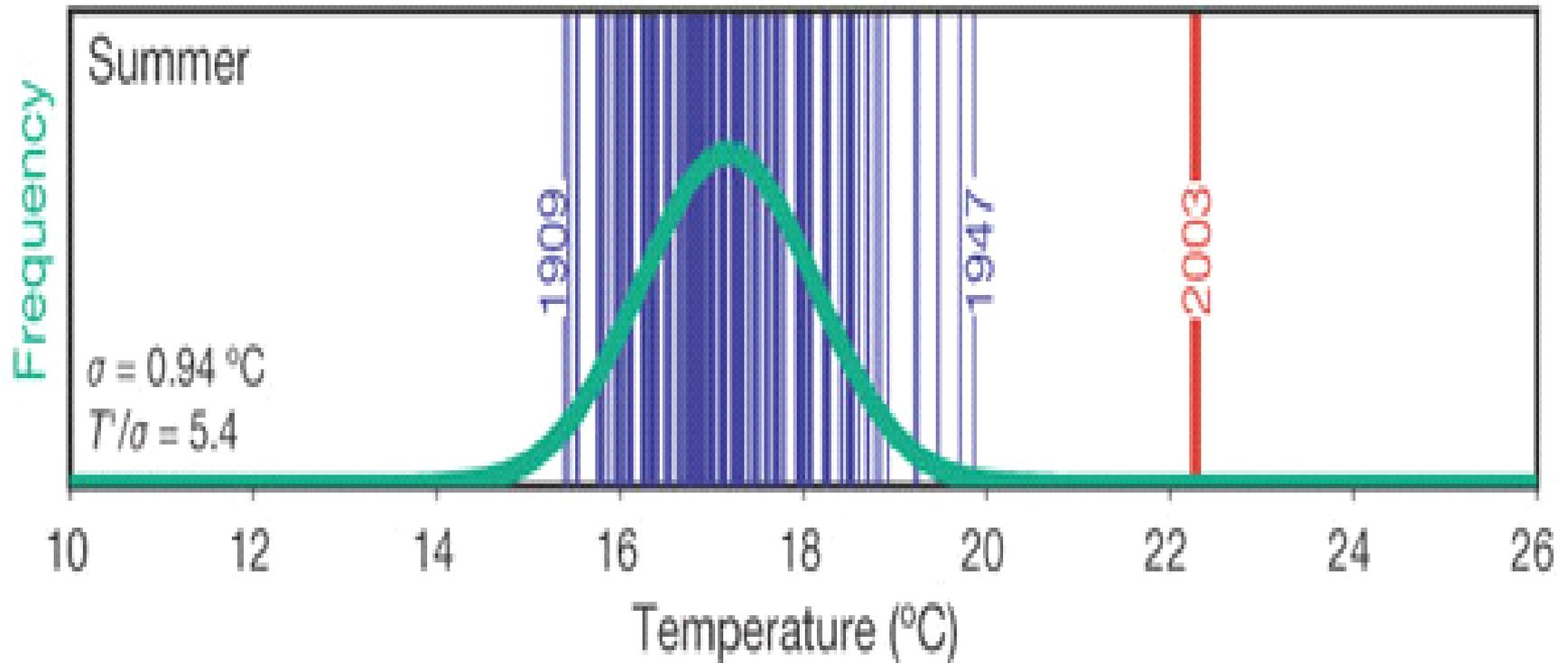
HEAT WAVE - EUROPE



> 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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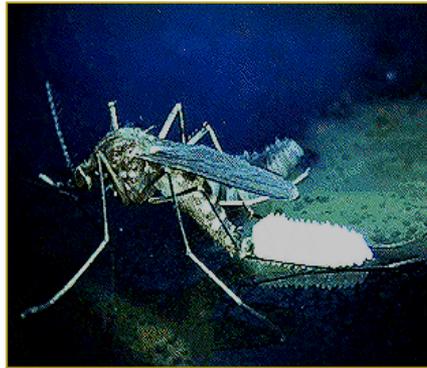
HEALTH PROFESSIONALS AND SCIENTISTS WARN OF SPREADING INFECTIOUS DISEASES.

Global Warming's **greatest** threat may also be the **smallest.**



West Nile Virus Transmission Cycle in Old World

Mosquito vectors
Culex species



VIRUS



Dead - end Hosts



VIRUS



VIRUS



Avian reservoirs



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.”**

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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**