

2005 USAID Summer Seminar Series



July 26: The Public Health Consequences of Disasters

Presenters: Anne Ralte, PPC/P; Dr Eric Noji, Centers for Disease Control and Prevention

Materials: [Presentation](#); Notes (see below); Q&A (see below)

Synopsis

The impact of disasters on public health has received broader attention with increases in their occurrence and the number of people affected. The management of humanitarian assistance involves many more and different players, and disaster management is recognized as a significant priority of the public health system. Prevention, mitigation, and preparedness are part of the vocabulary of public health officials in national and international organizations. More importantly, these techniques are used to advance the cause of reducing mortality and morbidity from disasters. Although all disasters are unique, similarities exist among their health effects. Recognizing these common elements can ensure better management of limited resources.

Addressing these challenges, a second edition of the book, *Public Health Consequences of Disasters*, will be published later this year. Edited by Dr. Eric Noji, this book discusses aspects of public health and disaster response. A primer for humanitarian practitioners and policy makers, the book provides state-of-the-art knowledge, best practices, and recommendations. A panel will highlight those chapters of particular relevance to USAID with an overall summary of the state-of-the-art advances in technologies on disasters.

Notes

Anne Ralte, PPC/P and the Global Health Bureau sponsored this year's fourth USAID Summer Seminar, *The Public Health Consequences of Disasters*, presented by Eric Noji, M.D., M.P.H. Dr. Noji is a Senior Policy Advisor (Emergency Preparedness and Response) at the Centers for Disease Control and Prevention (CDC), Washington, D.C. He is an expert in disaster epidemiology and the author of the book, *The Public Health Consequences of Disasters* (Oxford University Press). The presentation summarized the development of disaster management and humanitarian assistance, focusing on epidemiological methods, accident prevention, and disaster mitigation. Dr. Noji provided case studies on natural disasters and technological accidents, and emerging public health challenges to show the evolution of disaster epidemiology.

Disaster epidemiologists have traditionally placed emphasis on assistance following natural disasters like famines and earthquakes. A significant moment in the development of disaster epidemiology was the 1960s Biafra famine, which was the first example of the CDC applying epidemiological methods to a humanitarian emergency. A fifty-person CDC team had been operating in Nigeria as part of a small-pox eradication program and following severe food shortages in the Biafra region, the team was mobilized for famine relief work. The CDC officers had to rapidly adapt many of their small-pox assessment techniques like sampling methods to the emergency famine assistance effort.

The 1976 Guatemalan Earthquake that killed 22,000 people and displaced one million persons was another significant moment in the evolution of disaster management. Epidemiological professors returned to the affected site months and years later to investigate the long term health effects of the earthquake. Information collected from the earthquake and other natural disasters produced greater interdisciplinary cooperation between health and other sectors to help prevent and mitigate the effects of future disasters. Dr. Noji noted that "disturbingly" many of the lessons learned from disaster response efforts from the 1970s and 1980s were not applied this year immediately following the South East Asian tsunami, and many past mistakes were repeated.

Two technological accidents involving nuclear power plants significantly impacted the evolution of disaster planning and administration. The 1979 Three Mile Island accident in the U.S. and the 1986 Chernobyl disaster in the former U.S.S.R. were significant for their long-term health effects decades

after the events. Three Mile Island was also a “sentinel event” that contributed to President Carter’s establishment of the Federal Emergency Management Agency (FEMA), which Dr. Noji compared to the creation of the Department of Homeland Security.

Since this early period the realities and challenges of disaster epidemiology have evolved and expanded significantly. The events of September 11, 2001 drastically increased awareness among disaster epidemiologists of the potential public health consequences of terrorism. Dr. Noji noted that the first edition of his book did not include any information on terrorism prevention or management, but one-fourth of the content for the second edition relates to “biological, chemical, radiological, nuclear, blast, or suicide terrorism.” Bioterrorism gained the attention of epidemiologists during the 1996 sarin gas attack on the Tokyo subway system, causing twelve deaths and injuring thousands. Today 25 percent of the CDC’s budget is spent on bioterrorism preparedness.

The public health menace of global pandemics has also reemerged with the spread of Severe Acute Respiratory Syndrome (SARS), avian influenza (Bird Flu) and most significantly, HIV/AIDS. With more than 40 million people infected worldwide, HIV/AIDS prevention and treatment have been top concerns for USAID, which has spent \$3.2 billion since 1986 on international HIV/AIDS programs. The transmission of all communicable diseases is facilitated by the effects of globalization, including increased human mobility.

The context of providing public health services to effected populations has also changed. Since the early 1990s, the number of humanitarian assistance operations in failed states has risen. Conditions for relief workers in many failed states are unsafe so coordination with military or peacekeeping forces has grown in importance. Dr. Noji described his own experience of needing to be escorted by Israeli soldiers to conduct relief work in the Gaza Strip and West Bank. This can be problematic since in many emergencies, “uniformed personnel are deemed the enemy by the same people that you are trying help,” said Dr. Noji.

The U.S.-led military invasion of Iraq presented unique challenges and opportunities for cooperation between medical experts and the military. In 2003, Dr. Noji served as Deputy Chief of the Medical and Public Health Unit for the U.S. Humanitarian Mission for Operation Iraqi Freedom. He contributed to the rapid determination of the medical and health needs of the Iraqi people. Some of the epidemiological lessons learned from Iraq include:

1. The Department of Defense (DOD) must utilize experienced professionals and allow dedicated international relief agencies to be responsible for their own humanitarian operations.
2. The capacity of DOD’s civil affairs units to provide an occupying power with the ability to restore essential basic services must be appreciated more and there should be a career track that reflects this.
3. DOD must achieve buy-ins from non-governmental organizations (NGOs) and international organizations (IOs) for crucial communication, transition, and exit strategies.

Public health professionals have also been forced to adapt to new domestic situations including the need to communicate better with the public. Dr. Noji noted that when he started his CDC career as an epidemic intelligence officer (EIS), he and the other employees did not receive any training on briefing the press or giving interviews. The need for this type of experience was exposed during the 2001 anthrax attacks in the U.S., and now all CDC EIS officers receive a minimum of three days of media relations training.

Dr. Noji also highlighted the need for standardization among government agencies, relief workers, and public health professionals in data collection and analysis. USAID; the Department of State’s Bureau of Population, Refugees and Migration; and the Canadian International Development Agency (CIDA), founded the Standardized Monitoring and Assessment of Relief and Transitions (SMART) Initiative to address the need to:

1. standardize methodologies for assessing needs based on nutritional status, mortality rate, and food security.
2. establish comprehensive, collaborative systems to ensure reliable data is used for decision making and reporting.

Improved strategic epidemic control planning will require the development of different country models. Epidemiological models of complex emergencies need to be specifically adapted to the needs of developing countries, developed countries, and chronic smoldering countries. Without specific models

tailored to the situation of each country type, health care access and availability suffer.

Dr. Noji then examined the potential future of disaster epidemiology. He identified seven trends that will increase the risk of disasters in the near future:

1. Increasing population density
2. Increased settlement in high-risks areas
3. Increased technological hazards and dependency
4. Increased terrorism: biological, chemical, nuclear
5. Aging population in industrialized countries
6. Emerging infectious diseases (example: AMR variant of hantavirus)
7. International travel (global village)

The higher risk of disasters requires that disaster prevention and management experts have increasingly sophisticated tools at their disposal. Dr. Noji noted how the use of handheld computing by relief workers and health professionals has increased the data collection rates from patients in the field, allowing for a more accurate and faster decision making process. Geographic information systems (GIS) are also powerful spatial analysis tools that can aid disaster assessment and assistance to an effected population. GIS during humanitarian disasters can be applied in “hazard, vulnerability, and risk assessments; rapid assessment and survey methods; disease distribution and outbreak investigations; planning and implementation of health information systems; data and program information; and program monitoring and evaluation.”

Dr. Noji concluded by noting that a significant amount of disaster epidemiological experience exists and has been compiled, but it must be studied and applied if disaster relief planners hope to avoid repeating past mistakes. An updated summary of state-of-the-art disaster prevention and response techniques can be expected in the second edition of Dr. Noji’s *The Public Health Consequences of Disasters* that will be published later this year.

Question and Answer Session

Recently, a local newspaper wrote that disaster preparedness plans seldom include the “average citizen.” What more can be done to help prepare the average citizen for a disaster?

Unfortunately, there is no designated federal agency that is responsible for public education [of disaster preparedness]. We [the Centers for Disease Control and Prevention] have a lot on our web site to prepare citizens for a heat wave, hurricane, cyclone, or pandemic flu, so in public health a lot available. The National Weather Service has a lot on what to do after a hurricane, tidal wave, or tornado, and the FEMA [Federal Emergency Management Agency] web site also has a lot on citizen safety guidelines. Good information is out there and available, but there is no “one-stop shopping” source.

Based on your research, what is the safest response during an earthquake?

The research that I did was during primarily the 1980s and 1990s. I grew up in Los Angeles, and we had a big earthquake in 1971 called the San Fernando Valley Earthquake. The citizen safety guidelines have not changed that much since then. The bottom line is that the proper response depends on building construction. In California, residential construction is basically wood frame and single-story. When those types of structures collapse most of the injuries are from what we call “non-structural elements” falling down, like bookcases, refrigerators, and chandeliers. So getting underneath a table might not be such a bad idea, and getting under a door frame also might not be such a bad idea. But, when you are in a collapsing multi-story concrete or brick building like they have in Armenia or Mexico City, I don’t care how strong your table is. In Turkey we found criminal violations by contractors and workers using cheap materials. Turkey has more stringent and better earthquake building codes than California, but they are frequently criminally violated. In those cases, it is clearly better to run outside. In California, the people who did run outside tended to suffer more injuries than those who did not because of falling architectural ornamentation. So the best response really depends on construction.



USAID
FROM THE AMERICAN PEOPLE

Session 4
Tuesday, July 26, 2005
9:00–11:00

Center for Association Leadership,
Concourse Level

The Public Health Consequences of Disasters

USAID Summer Seminar Series
Washington, D.C.
26 June 2005

Eric K. Noji, M.D., M.P.H.
Senior Policy Advisor for Emergency Readiness
Centers for Disease Control & Prevention
Washington, DC

Disasters and Emergencies



Natural Disasters



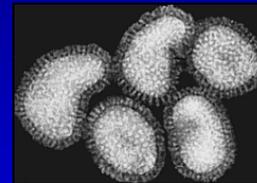
**Transportation
Disasters**



Terrorism



**Technological
Disasters**



Pandemics

Epidemiol Rev. 1981;3:140-62.

**Research issues and directions in the epidemiology
of health effects of disasters.**

Logue JN, Melick ME, Hansen H.

Epidemiol Rev. 1990;12:192-8.

**The epidemiology of health effects of disasters.
Review**

Lechat MF.

Myths and Realities in Disaster Situations

Myth: Foreign medical volunteers with any kind of medical background are needed.

Reality: The local population almost always covers immediate lifesaving needs. Only medical personnel with skills that are not available in the affected country may be needed.

Myth: Any kind of international assistance is needed, and it's needed now!

Reality: A hasty response that is not based on an impartial evaluation only contributes to the chaos. It is better to wait until genuine needs have been assessed.

Myth: Epidemics and plagues are inevitable after every disaster.

Reality: Epidemics do not spontaneously occur after a disaster and dead bodies will not lead to catastrophic outbreaks of exotic diseases. The key to preventing disease is to improve sanitary conditions and educate the public.

Myth: Disasters are random killers.

Reality: Disasters strike hardest at the most vulnerable group, the poor --especially women, children and the elderly.

Myth: Locating disaster victims in temporary settlements is the best

Reality: It should be the last alternative. Many agencies use funds normally spent for tents to purchase building materials, tools, and other construction-related support in the affected

THE
PUBLIC
HEALTH
CONSEQUENCES
OF
DISASTERS

EDITED BY ERIC K. NOJI

The Public Health Consequences of Disasters

Edited by Eric K. Noji

- Table of Contents

- **I. General Issues**

- 2. The Use of Epidemiologic Methods in Disasters, *Eric K. Noji*
- 4. Managing the Environmental Health Aspects of Disasters: Water, Human Excreta and Shelter, *Scott R. Lillibridge*
- 5. Communicable Diseases and Disease Control after Disasters, *Michael J. Toole*
- 6. Mental Health Consequences of Disasters, *Ellen Gerrity and Brian W. Flynn*

- **II. Geophysical Events**

- 8. Earthquakes, *Eric K. Noji*
- 9. Volcanoes, *Peter Baxter*

- **III. Weather-Related Problems**

- 10. Tropical Cyclones, *Josephine Malilay*
- 11. Tornadoes, *Scott R. Lillibridge*
- 14. Floods, *Josephine Malilay*

- **IV. Human-Generated Problems**

- 15. Famine, *Ray Yip*
- 17. Industrial Disasters, *Scott R. Lillibridge*
- 19. Nuclear-Reactor Incidents, *Robert C. Whitcomb and Michael Sage*
- 20. Complex Emergencies, *Michael J. Toole*

Biological Terrorism - A New Trend?



- 1984: Oregon, *Salmonella*
- 1991: Minnesota, Ricin toxin
- 1994: Tokyo, Sarin and biological attacks
- 1995: Ohio. *Yersinia pestis*
- 1997: Washington DC, Anthrax hoax
- 1998: Nevada, nonlethal strain of *B. anthracis*
- 1999: Numerous Anthrax hoaxes



Probe aims at sale of deadly bacteria

By Lori Sharn
USA TODAY

Public Health Service officials are reviewing procedures for the sale of hazardous microbes, prompted by the arrest of an Ohio man charged with fraudulently obtaining three vials of bubonic plague bacteria.

On Monday, the person behind that concern — Larry Harris, 43, of Lancaster, Ohio, — entered an innocent plea to federal charges.

Currently, there are no laws against buying, growing or otherwise obtaining potentially deadly biological materials.

"Disease-causing microorganisms are prevalent and easy for anyone with limited technical knowledge to get their hands on," says University of Louisville microbiologist Ronald Atlas.

In knowledgeable hands, experts say the right microbe could kill thousands — a chilling fact in view of the April bombing in Oklahoma City and

“
We seem to be entering a period in which . . . there's a little more willingness to achieve maximum number of deaths possible.
”

— Kyle Olson, arms control expert

the deadly nerve gas attack on Tokyo's subway in March.

"We seem to be entering a period in which . . . there's a little more willingness to achieve maximum number of deaths possible," says Kyle Olson, executive vice president of the Chemical and Biological Arms Control Institute, a non-profit think tank in Alexandria, Va.

Military tests in the 1950s and 1960s showed that the spreading of dangerous organisms in the New York City subway and elsewhere could kill thousands of people.

"The tests were done to determine the vulnerability of

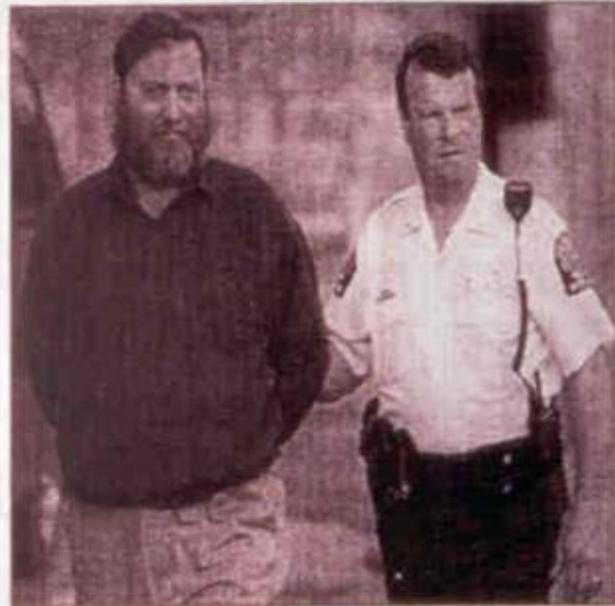
the American public to a biological attack," says Army spokesman Capt. Joseph Piek. "It's scary stuff."

Cases of biological terrorism within the USA have been rare:

▶ In 1984, followers of the Bhagwan Shree Rajneesh spread salmonella bacteria — purchased from a medical supply house — on restaurant salad bars in Wasco County, Ore.

More than 500 people got sick in a plot to win control of the county by making voters sick on election day.

▶ Two Minnesota tax protesters were convicted in February of possessing a biological

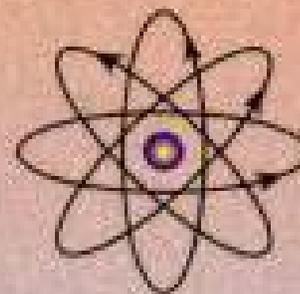


By Chris Russell, Columbus Dispatch

INNOCENT PLEA: Larry Harris, with police Lt. Don Regan, was charged with fraudulently obtaining the bubonic plague bacteria.

Police said Harris ordered one. The toxin made by the bacteria that causes botulism,

CHANGING THREAT



“A bioterrorism attack against Americans anywhere in the world is inevitable in the 21st century.”

Anthony Fauci, Director, NIAID

Clinical Infectious Diseases 2001;32:678

Major Disasters Humanitarian Crises, 1997-2005

- Kosovo refugee crisis
- Turkey earthquake
- E. Timor civil conflict
- Gujarat India Earthquake
- Bam, Iran Earthquake
- South Asia Tsunami

**IMPACTO
DE LOS
DESASTRES
EN LA
SALUD PUBLICA**

**EDITOR
ERIC K. NOJI**

ORGANIZACION PANAMERICANA DE LA SALUD



**Organización
Panamericana
de la Salud**



**Oficina Regional de la
Organización Mundial de la Salud**



OPS/OMS

SEPTEMBER 11, 2001

THE DAY THAT CHANGED AMERICA



Bioterrorism



DRAFT

**Lessons Learned from
Anthrax Incidents Late
2001**

Bad communication adds to crisis

- Mixed messages from multiple “experts”
- Late information “overcome by events”
- Over-reassuring messages
- No reality check on recommendations
- Myths, rumors, doomsayers not countered
- Poor performance by spokesperson/leader
- Public power struggles and confusion

Decision Making without Data

- Need to make decisions rapidly in the absence of data
- Access to subject matter experts was limited
- No “textbook” experience to guide response
- Understanding of “risk” evolved as outbreak unfolded
- **Need coherent, rapid process for addressing scientific issues in midst of crisis**

The Department of Homeland Security Was Established By Public Law and Executive Order on 24 January, 2003

**Thomas Joseph Ridge
was Sworn-In as the first
Secretary of Homeland
Security by the
President and the Vice
President during a
Ceremony at the White
House**



The Cross Hall, January 24, 2003

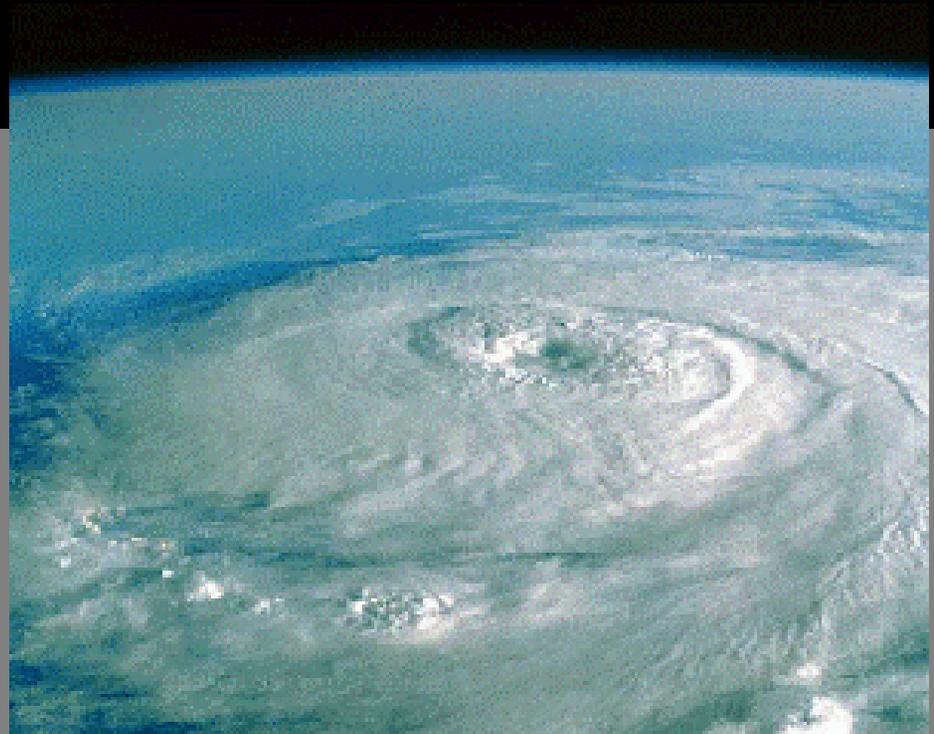


The Sphere Project



Humanitarian
Charter
and Minimum
Standards in
Disaster Response

U.S. Military Medicine in International Humanitarian Assistance



Military Assistance in Complex Emergencies: What Have We Learned Since the Kurdish Relief Effort?

CAPT. Trueman W. Sharp, MD, MPH;¹ LT. COL. John M. Wightman, MD, MA;² Michael J. Davis, PA-C;³ CDR. Sterling S. Sherman, MD, MPH;⁴ Frederick M. Burkle Jr., MD, MPH⁵

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Abstract

After the success of relief efforts to the displaced Kurdish population in northern Iraq following the Gulf War, many in the US military and the international relief community saw military forces as critical partners in the response to future complex emergencies (CEs). However, successes in subsequent military involvement in Somalia, Rwanda, the former Yugoslavia, and other CEs proved more elusive and raised many difficult issues. A review of these operations reinforces some basic lessons that must be heeded if the use of military forces in humanitarian relief is to be successful. Each CE is unique, thus, each military mission must be clearly defined and articulated. Armed forces struggle to provide both security and humanitarian relief, particularly when aggressive peace enforcement is required. Significant political and public support is necessary for military involvement and success. Military forces cannot execute humanitarian assistance missions on an ad hoc basis, but must continue to develop doctrine, policy and procedures in this area and adequately train, supply, and equip the units that will be involved in humanitarian relief. Militaries not only must cooperate and coordinate extensively with each other, but also with the governmental and non-governmental humanitarian relief organizations that will be engaged for the long term.

Sharp TW, Wightman JM, Davis MJ, Sherman SS, Burkle FM:

Lessons and Controversies: planning and executing immediate relief in the aftermath of the war in Iraq

FREDERICK M BURKLE, JR, BRADLEY A WOODRUFF & ERIC K NOJI

ABSTRACT The international community since the end of the Cold War has failed to agree on a satisfactory solution as to how it should respond to protect vulnerable populations at risk from internal state wars and human rights abuse. Western powers frustrated by this have increasingly resorted to intervention on the basis of 'right to intervene'. This paper argues that what is required is for the international community to exercise 'a right to protect' through the UN. Meanwhile the USA since 9/11 has gone down the route of unilateral intervention on the basis of 'self-defence' and in the case of Iraq has extended this concept by placing humanitarian as well as military operations under the single command of the Defense Department. The paper demonstrates how this led to the exclusion of expertise from planning, co-ordination and professional support in the field of humanitarian work. The operational lessons learned are ~~discussed and the conclusion is reached that to avoid the problems experienced in Iraq, military and humanitarian operations should as far as possible be separated, leaving the leadership of relief to the dedicated international agencies~~ Iraq, military and humanitarian operations should as far as possible be separated, leaving the leadership of relief to the dedicated international agencies

The Immediate Future

2003 – 2010

**A Revolution in biotechnology,
genomics and proteomics that will
affect all human beings**

Increasing disaster risk

- ✓ Increasing population density
- ✓ Increased settlement in high-risks areas
- ✓ Increased technological hazards and dependency
- ✓ Increased terrorism: biological, chemical, nuclear?
- ✓ Aging population in industrialized countries
- ✓ Emerging infectious diseases (AMR)
- ✓ International travel (global village)

- Increasing Global Travel
- Rapid access to large populations
- Poor global security & awareness
...create the potential for simultaneous creation of large numbers of casualties





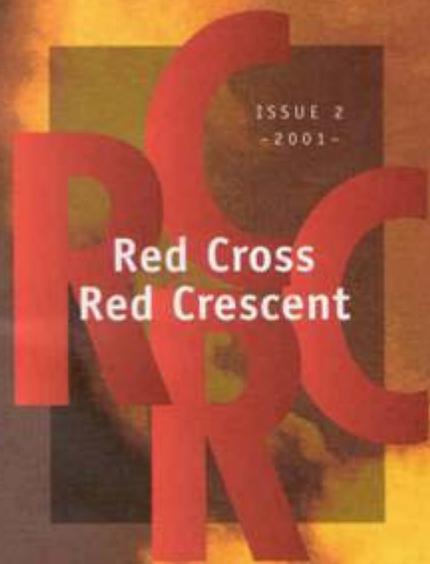
Terrorist Bombings



Chronic Smoldering Complex Emergencies

SUDAN:

- ***Chronic war since 1955***
- ***Children grow up chronically malnourished***
- ***Know only a culture of violence***
- ***Little access to healthcare and education***
- ***Only expatriate healthcare***
- ***Reproductive health considered a luxury***



ISSUE 2
- 2001 -

Red Cross
Red Crescent

www.redcross.int

- ◆ Surviving the violence in Guinea
- ◆ Families in the line of fire
- ◆ A diary from India's earthquake zone
- ◆ Helping remote regions in Afghanistan

An illustration depicting global warming. The background is a bright, hazy yellow-orange sky. In the foreground, several industrial smokestacks are visible, emitting thick plumes of white smoke that rise into the air. The overall scene conveys a sense of environmental impact and climate change.

Global
warming

Professional Stove-Piping



Natural Disasters



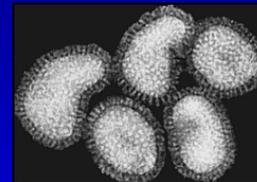
**Transportation
Disasters**



Terrorism



**Technological
Disasters**



Pandemics

Thank You

