Emerging Infections

Public Awareness of Emerging Infections

Emerging And Re-emerging Infectious Agents
A. Viruses
   SARS (Severe acute respiratory syndrome)
   West Nile
   Influenza
   Eastern Equine Encephalitis
   Hantavirus
   Ebola
B. Bacteria and rickettsiae
   Plague
   E. coli 0157
   Rickettsial pox (Rocky Mountain spotted fever)
   Cholera
C. Protozoa
   Malaria
   Cryptosporidium parvum
   Trypanosomiasis (African)
   Leishmaniasis
**Medical Ecology Of Infectious Diseases**

Environmental Disturbance Leads To Emergence Or Establishment Of Infectious Agents

- Dam building
- Traditional Agriculture
- Urbanization
- De-forestation
- Irrigation
- Political unrest and open warfare
- Natural disasters and unusual weather patterns

**The Ecotone***

*The edge effect
The Earth At Night

I can see your house from here

The Ecotone And Infectious Diseases

**Viruses:**
- Rabies
- Yellow Fever
- Lassa Fever
- Ebola
- HIV
- Influenza

**Bacteria:**
- Cholera
- Lyme Disease

**Protozoa:**
- Malaria
- Trypanosomiasis

**Helminths:**
- Schistosomiasis

Environmental Disturbance Leads To Emergence Or Establishment Of Infectious Agents

**Dam building:**

There are currently over 800,000 dams throughout the world, with 75,000 within the USA.

Diseases (mostly tropical) associated with dams:

1. Schistosomiasis
2. Malaria
3. River blindness (Onchocerciasis)
Schistosomiasis In Africa

Schistosomiasis Was Prevalent Among Ancient Egyptians And Still Is Today

Lake Nasser and the Aswan high dam in Egypt
Japan is schistosome-free as of 1976.

The Three Gorges Dam Project in China will lead to a dramatic increase in the incidence of Schistosomiasis.
Environmental Disturbance Leads To Emergence Or Establishment Of Infectious Agents

**Irrigation:**

1. Schistosomiasis
2. Malaria*
3. Filariasis*

*Vector-borne diseases

Environmental Disturbance Leads To Emergence Or Establishment Of Infectious Agents

Traditional Agriculture:
Geohelminths - Hookworm, Ascaris, Trichuris

4 billion people harbor one or more species
Environmental Disturbance Leads To Emergence Or Establishment Of Infectious Agents

Urbanization: (encroachment into natural systems)
- Rabies
- Upper respiratory viruses
- Lyme Disease
- Arboviruses
- Ebola, Lassa, Hanta
- Plague

Urbanization: Atlanta 1983

Urbanization: Atlanta 1997
Lyme Disease Maintenance: Urbanization and Deforestation

Westchester County, NY

Environmental Disturbance Leads To Emergence Or Establishment Of Infectious Agents

De-forestation
Leishmaniasis
Trypanosomiasis
Environmental Disturbance Leads To Emergence Or Establishment Of Infectious Agents

Political unrest and warfare:
- Malaria
- African Tyrpanosomiasis
- Leishmaniasis
- Tuberculosis

Environmental Disturbance Leads To Emergence Or Establishment Of Infectious Agents

Natural disasters and unusual weather patterns:

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Plague In The USA