

EMERGING AND RE-EMERGING INFECTIONS

What are emerging/re-emerging infections .

In 1991, a committee appointed by Institute of Medicine, USA, defined them as follows :

EMERGENCE : Spread of new agent
recognition of a previously unrecognised infection.

RE-EMERGENCE : Reappearance of previously known infection after a
period of decline

Is there a general phenomem of 'emerging infections' today? Or are we
witnessing a 'resurgence' of infectious diseases.

We would like to define 'resurgence' as follows :

'Resurgence' is an exacerbation of an already prevalent infection.

Background paper
For Southern mfc meetings
or CHC on 6/4/97

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HISTORY OF THE IDEA OF EMERGENCE/RE-EMERGENCE OF INFECTIOUS DISEASES

- 1880-1920 - Sanitary legislation, safe handling of food and water, environmental sanitation were instituted in many countries. These were followed by control of diseases due to faeco-oral or vector borne transmission, wherever these measures have been adopted.
- 1936 - Discovery of antibiotics
- 1955-1960 - Polio vaccination and eradication of polio from Europe and America.
Small pox vaccination and eradication of small pox.
- 1960's - Discovery of MRSA (Methicillin resistant S. Aureus)
- Control of infectious diseases in most market economies
Increase in life expectancy, shift of morbidity to degenerative diseases.
- General perception that infectious diseases had been conquered, accompanied by a decrease in funding of infectious disease research.
- Increasing environmental consciousness and of its relations to health.
- 1981 - Discovery of HIV/AIDS.
- 1980's - Spread of HIV pandemic world-wide
Description of a host of new pathogens related to HIV.
Appearance of several multidrug resistant pathogens (Pneumococcus, Enterococcus, TB).
Increasing concern about emerging infections among scientific community.
- 1989 - Conference on emerging infectious diseases
Rockefeller University, National Institute of Allergy & Infectious diseases, Fogarty International Centre.
- 1991 - 18 month study by committee appointed by Institute of Medicine, USA.
(Emerging microbial threats, to public health in USA)
- April 1994 - WHO meeting of International Experts to consider global strategy to deal with new, emerging and re-emerging infections.
- 1994 - Supposed outbreak of 'Plague' in India affecting 876 people.
- 1995 - 'Emerging Infectious Diseases', a new quarterly was published by National Center for Infectious Diseases, and CDC, Atlanta.
- 1995 - Outbreak of Ebola Virus in Zaire with 315 deaths.
- 1997 - Theme for World Health Day "Emerging Infections".

DISTRIBUTION OF DALY's LOSS BY CAUSE AND DEMOGRAPHIC REGION 1990

	WORLD	INDIAN	CHINA	SUB-SAHARAN AFRICA	ESTABLISHED MARKET ECONOMIES
Population (millions)	5267	850	1134	510	798
Communicable diseases	45.8	50.5	25.3	71.3	9.7
TB	3.4	3.7	2.9	4.7	0.7
STD & HIV	3.8	2.7	1.7	8.8	3.4
Diarrhea	7.3	9.6	2.1	10.4	0.3
Vaccine preventable childhood infection	5.0	6.7	0.9	9.6	0.1
Malaria	2.6	0.3	+	10.8	+
Worm infections	1.8	0.9	3.4	1.8	+
Respiratory infections	9.0	10.9	6.4	10.8	2.6

+ = less than 0.1

DALYs = disability - adjusted life years

RESURGENCE OF INFECTIOUS DISEASE IN INDIA (BACTERIA)

INFECTION	RESURGENCE	EPIDEMIOLOGICAL INFORMATION	REASONS FOR RESURGENCE
Plague	Re-emergence	2 out breaks in August-October 1994 with 876 cases of presumptive plague (after a period of 26 years) Only 3 proven cases based on histopathology. Data on outbreak not convincing.	- Dismantling of plague surveillance units among rodents. - Poor environmental sanitation - Poor lab and epidemiological support
* Melioidosis	New agent ?Unrecognised problem	Handful of cases reported from two centres 1991-1996 Extent of problem not known.	
* Anthrax	?Resurgence ?Unrecognised problem	Increase in number of cases from 1970's	- Poor veterinary care of animals - Poor lab support. - Handling and ingestion of dead animals
* Leptospirosis	? Resurgence ? Unrecognised problem	Outbreaks of Leptospirosis Since 1980's in Tamilnadu, Kerala and Andamans. Leptospirosis wide spread among animals.	- Poor lab support hence extent of problem cannot be defined.
V.Cholera 0139	Old agent New strain	8th pandemic of cholera starting in South India in 1992 spreading all over India and the whole world.	Poor environmental sanitation and lack of safe drinking water.
Multi-drug Resistant typhoid	New strain	Wide spread of this organism since 1990's.	Overuse of Chloramycetin
MRSA (Methicillin Resistant Staphylococcus Aureus)	New strain	Widely prevalent in many hospitals in India since 1990's.	Over use of Penicillins in hospitals. Lack of infection control and handwashing.
Multi-drug Resistant M-Tuberculosis	New strain	Extent of problem not defined but likely to be large	Irregular therapy

* Inadequate epidemiological data to state the extent of the problem.

RESURGENCE OF INFECTIOUS DISEASES IN INDIA (VIRUSES)

INFECTION	EMERGENCE/RESURGENCE	EPIDEMIOLOGICAL INFORMATION	REASONS FOR RESURGENCE
HIV	New Agent	First case detected in 1985 Presently number of cases estimated to be 1.75 - 3 millions Projection of 5-6 millions by 2000 A.D.	Low role of women in society Widespread sex industry Inadequate blood donor screening Inadequate governmental response Poor education IV Drug use.
Denque	Resurgence	Outbreaks known for one century Since 1960's-DHF/DSS seen Since last 10 years increasing Frequency and magnitude of epidemics Rural outbreaks	Increasing urbanisation Poor environmental sanitation Inadequate lab. facilities for diagnosis and knowledge about treatment. Soread of vector to rural areas (Ae. aegypti)
* Japanese B Encephalitis		Extent of problem not defined	
* Hepatitis B Hepatitis E Hepatitis C	Hepatitis E & C previously unrecognised infections	Hepatitis B- major public health problem Hepatitis E - Commonest cause of epidemic epidemic and sporadic hepatitis	Hepatitis E Poor environmental, sanitation Hepatitis B Inadequate blood supply Professional blood bank/donors Inadequate blood screening.

* Inadequate epidemiological data to state the extent of the problem.

RESURGENCE OF INFECTIOUS DISEASES IN INDIA (PROTOZOA/NEMATODES)

INFECTION	RESURGENCE	EPIDEMIOLOGICAL INFORMATION	REASONS FOR RESURGENCE
Kalaazar	Resurgence	Steady increase in no. of cases/deaths from late 1970's Spread to non-endemic areas (1977 - No. of cases 18,742 1992 - No. of cases 75,523)	Withdrawal of DDT spray under NMEP. Buildup of sandfly population Inadequate public attention Scarcity of funds for diagnosis, treatment and control. Lack of monitoring system.
Lymphatic filariasis	Resurgence	Enormous increase in cases over over last 4 decades Microfilaria rates 10-22% Disease rate 5-18 % Mosquito infection rates 10-30%	Increased urbanisation Mosquitogenic condition Improper water drainage Limitations of control programme Non-availability of drugs and anti-filarial measures
Malaria	Resurgence	Steady increases of cases in 1990's Increased P. Falciparum rate Drug resistance Epidemic and focal outbreaks Increase in urban Malaria	Urbanisation Environmental degradation Population movements Drug resistance Lack of residual spraying Lack of availability of drugs and adequate diagnostic facilities.

FACTORS RESULTING IN RESURGENCE OF INFECTIOUS DISEASES

1. URBANISATION:
 - Increased population density
 - Poor sanitation
 - Poor quality of housing, water food and healthcare

2. ENVIRONMENTAL/ECOLOGICAL CHANGES

Deforestation
Man-made reservoirs of water
Global warming
Changes in animal populations
and animal movements
Agriculture

3. ECONOMIC FACTORS

North - South Inequalities
Low income - decreased access to shelter, food, water, clothing
health care

Economic factors leading to urbanisation
Decreased governmental expenditure on health.

4. POLITICAL FACTORS:

'World Bank' Control of developing governments health policy.
'Panic reaction' to politically sensitive diseases
'Cover up' of diseases for political reasons
Low government expenditure on health and social sector.

5. PUBLIC HEALTH SYSTEM :

Inadequacies in hospital and public health apparatus

6. EPIDEMIOLOGY AND MICROBIOLOGY SERVICES

Absence of surveillance apparatus and microbiology services to
reliably diagnose common and uncommon infections.

7. ANTIBIOTIC PRESCRIBING PRACTICES:

Irrational and overuse of antibiotics

8. NATURAL AND MAN-MADE DISASTERS :

Earthquakes, tidal waves, war and civil strike.

9. POPULATION MOVEMENTS :

Travel
Migration
Tourism

10. HUMAN BEHAVIOUR :

IV drug use
Sexual practices