Cardiovascular Diseases: Stroke Rheumatic Heart Disease
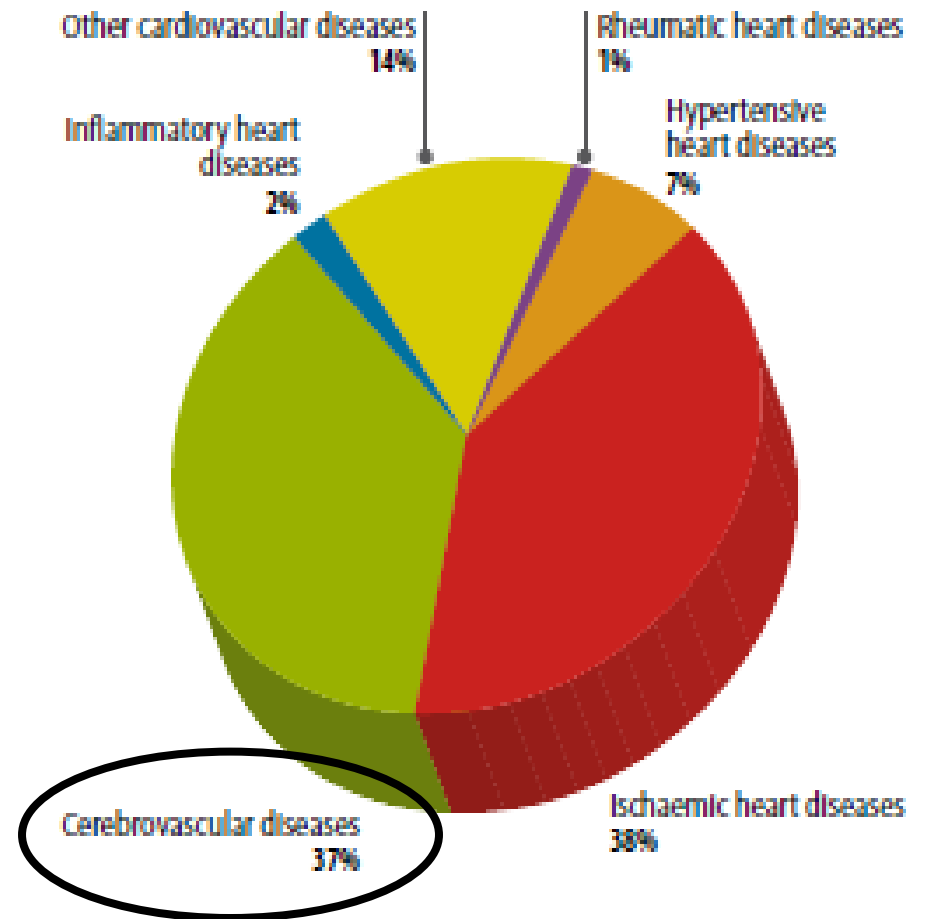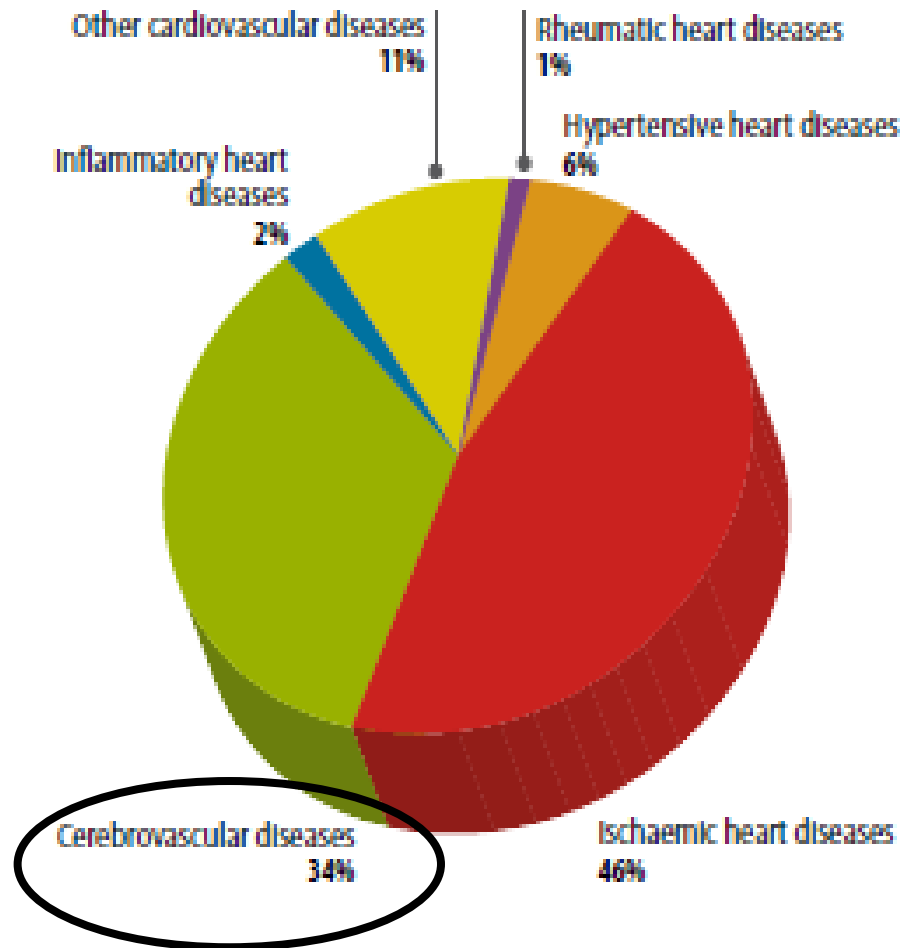
by:
Dr. NAVPREET
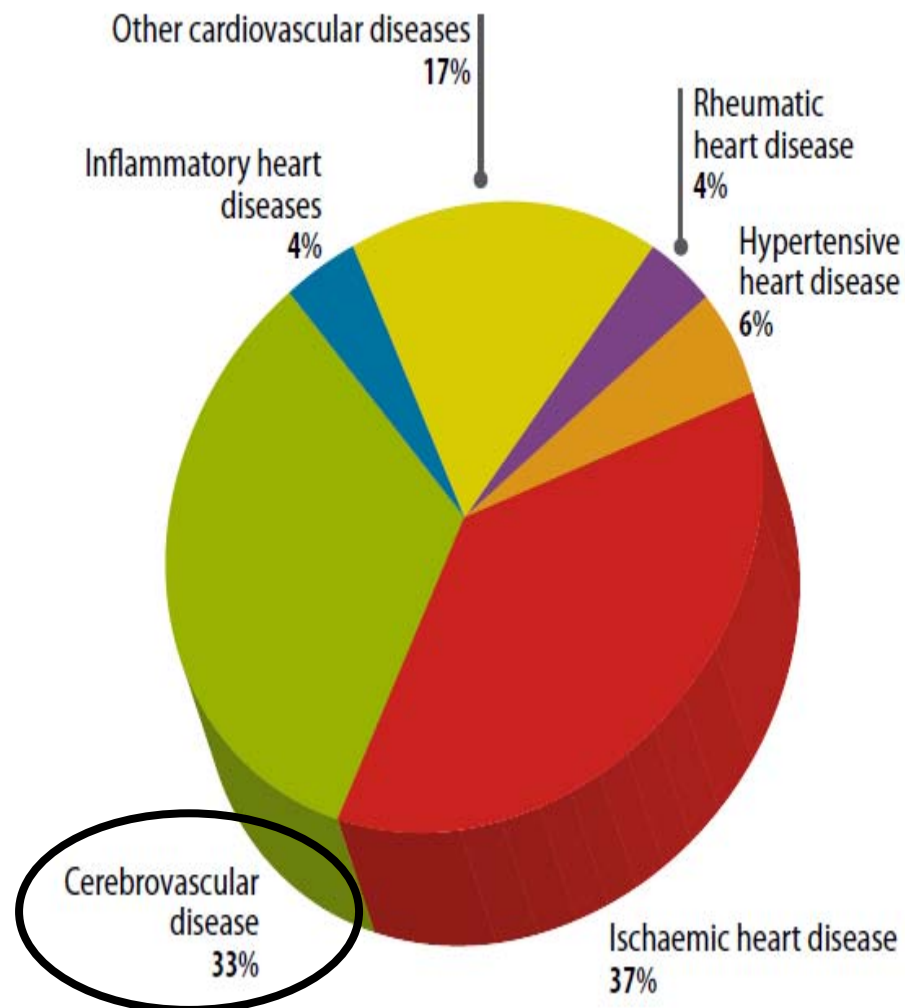Asstt Prof., Deptt. of Community Medicine
GMCH Chandigarh

Stroke

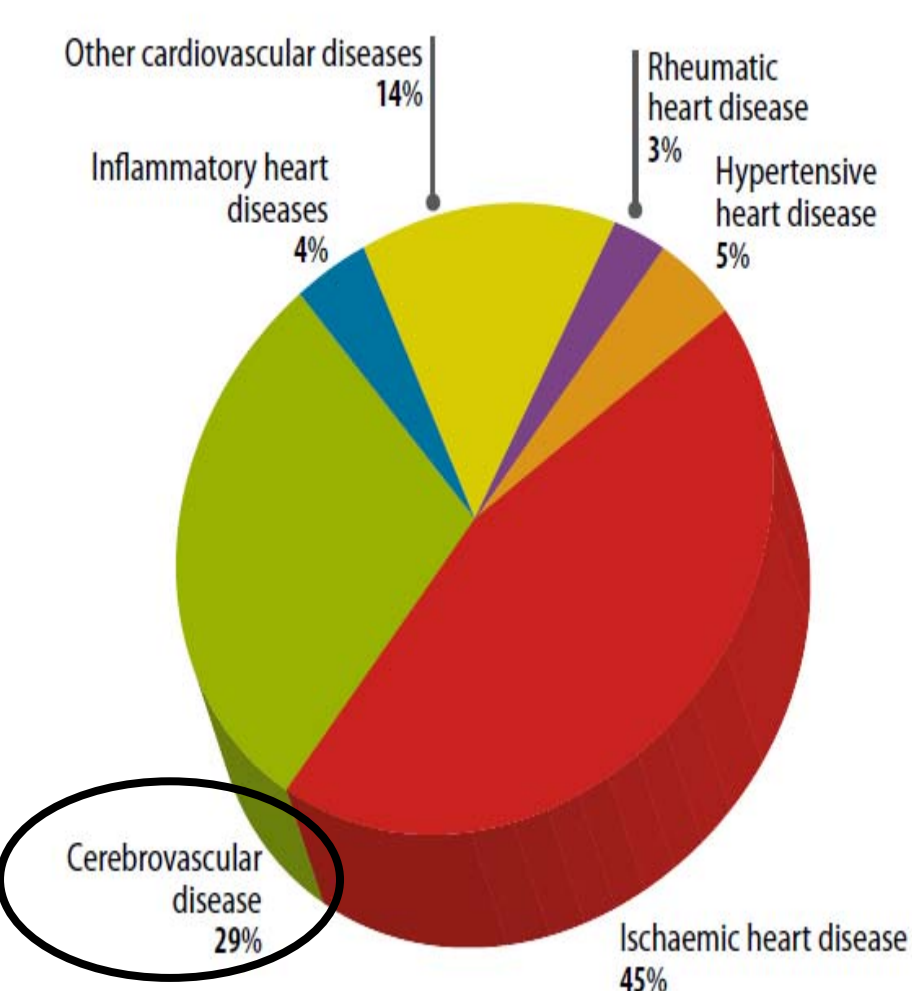- Rapidly developed clinical signs of focal (or global) disturbance of cerebral function; lasting more than 24 hours or leading to death, with no apparent causes other than vascular origin.

- Ischemic strokes
  - Atherosclerotic stenosis or occlusion
  - Cardio-embolism
  - Small vessels disease
  - Misc: CNS infections, hypercoagulable states etc.
- Hemorrhagic strokes
  - Subarachnoid hemorrhage
  - Intracerebral hemorrhage

Distribution of CVD deaths

Other cardiovascular diseases
11%

Rheumatic heart diseases
1%

Inflammatory heart diseases
2%

Hypertensive heart diseases
6%

Cerebrovascular diseases
34%

Ischaemic heart diseases
46%

Other cardiovascular diseases
14%

Rheumatic heart diseases
1%

Inflammatory heart diseases
2%

Hypertensive heart diseases
7%

Cerebrovascular diseases
37%

Ischaemic heart diseases
38%

Distribution of global CVD burden (DALYs)

Other cardiovascular diseases 14%
Inflammatory heart diseases 4%
Rheumatic heart disease 3%
Hypertensive heart disease 5%
Cerebrovascular disease 29%
Ischaemic heart disease 45%

Other cardiovascular diseases 17%
Inflammatory heart diseases 4%
Rheumatic heart disease 4%
Hypertensive heart disease 6%
Cerebrovascular disease 33%
Ischaemic heart disease 37%

Global distribution of Cerebrovascular Disease mortality rates (age standardized, per 100 000) in Males

Cerebrovascular disease mortality rate (per 100 000)

- 0–54
- 55–95
- 96–130
- 131–236
- Data not available
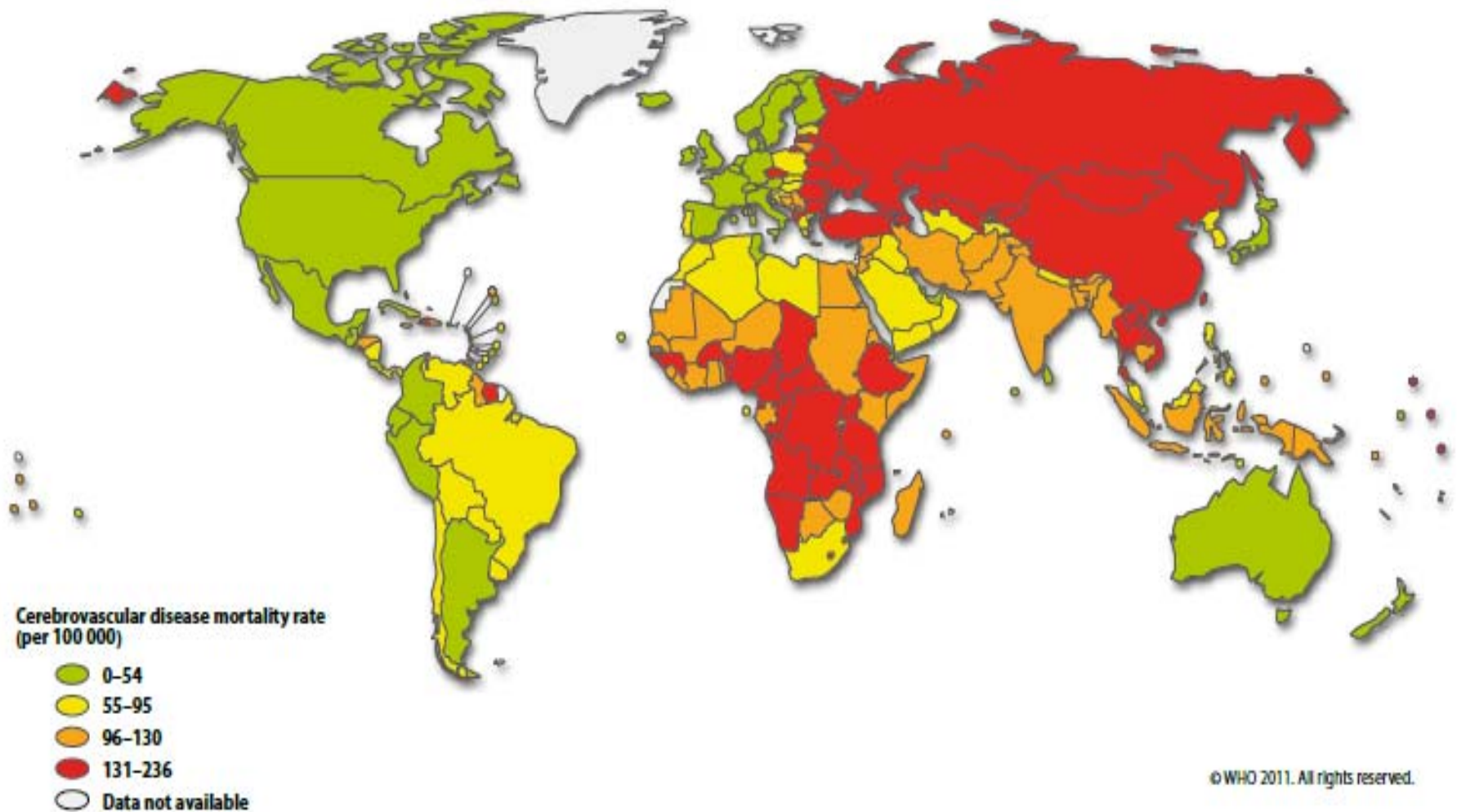
Global distribution of Cerebrovascular Disease mortality rates (age standardized, per 100 000) in Females

Cerebrovascular disease mortality rate
(per 100 000)

- 9–44
- 45–83
- 84–128
- 129–293
- Data not available
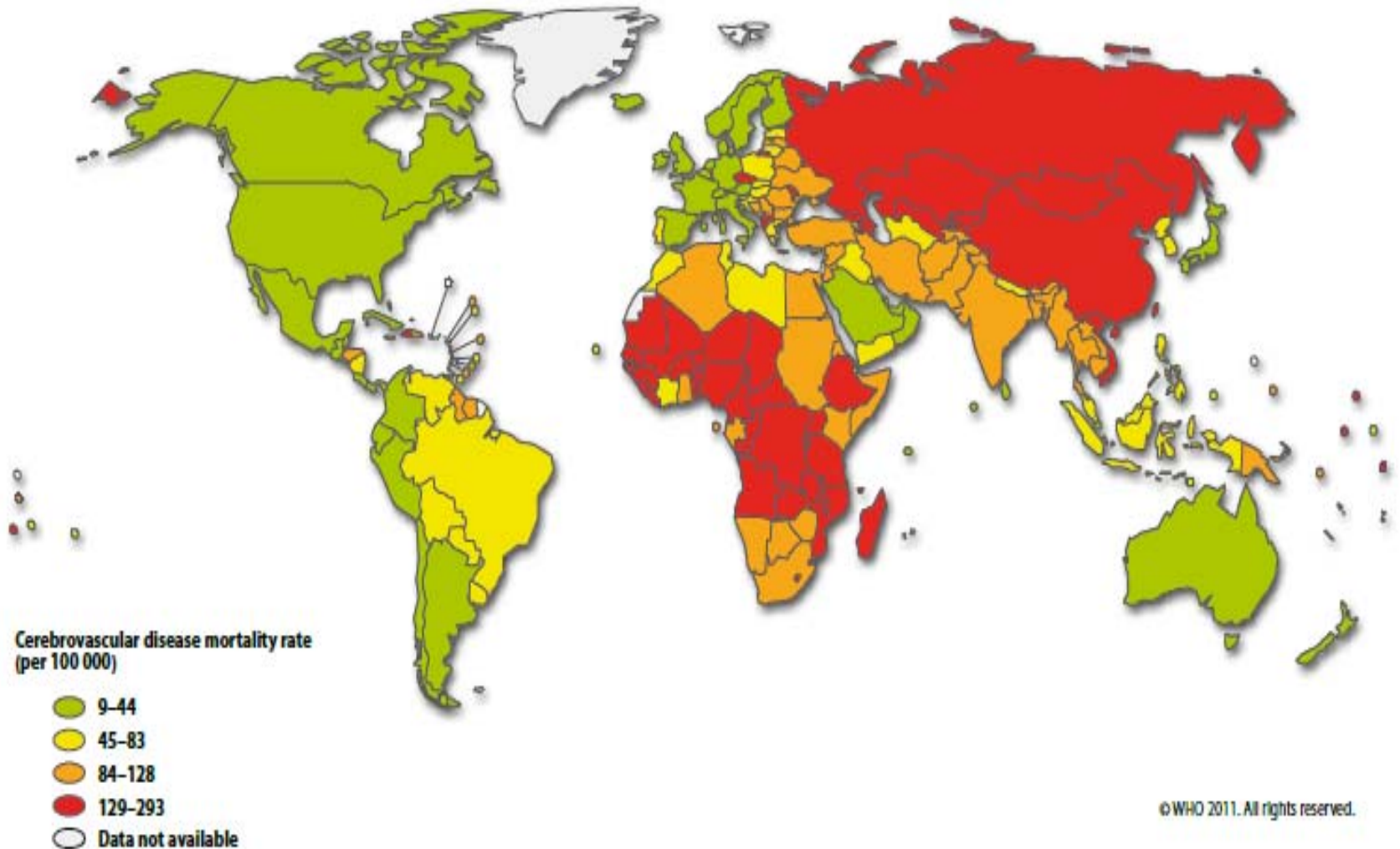
Risk Factors

- Non-modifiable risk factors
- Modifiable risk factors

Non-modifiable Risk Factors

- Age
- Sex
- Genetic factors
- Geography & Ethnicity

Age	RR every decade after 55yrs: 1.66 – 1.93
Sex	M:F = 1.15-1.3:1.0
Genetic factors	5x Prevalence in Monozygotic
Geography	Eastern European countries; US (Ischemic) while Japan & China (Hemorrhagic)
Ethnicity	African American > White

Modifiable Risk Factors

- Hypertension

- Diabetes

- Blood lipids

- Cardiovascular diseases

- Smoking

- Alcohol

- Physical activity

Hypertension	RR:1.5 – 3 RR with every 10 mmHg increase in Systolic BP: 1.7 – 1.9
Diabetes	RR: 1.4 – 2; Thromboembolic stroke
Blood Lipids	Complex; Inverse relationship between cholesterol & I/C hemorrhage; Modest association between raised serum cholesterol and thrombo-embolic stroke
Cardiovascular disease	RR: 1.7; Ischemic stroke.
Smoking	RR: 1.24 (Cerebral hemorrhage) – 2.53 (Ischemic stroke) – 4.85 (Sub arachnoid hemorrhage)
Alcohol	RR: 2-3; SAH
Physical activity	Reduce stroke risk

Prevention of Stroke

- **Primary Prevention**
- Secondary Prevention

Rheumatic Fever
Rheumatic Heart Disease

Rheumatic Fever/Rheumatic Heart Disease

- Rheumatic fever
  - a febrile disease affecting connective tissues particularly in the heart and joints
  - initiated by infection of the throat by group A beta haemolytic streptococci.
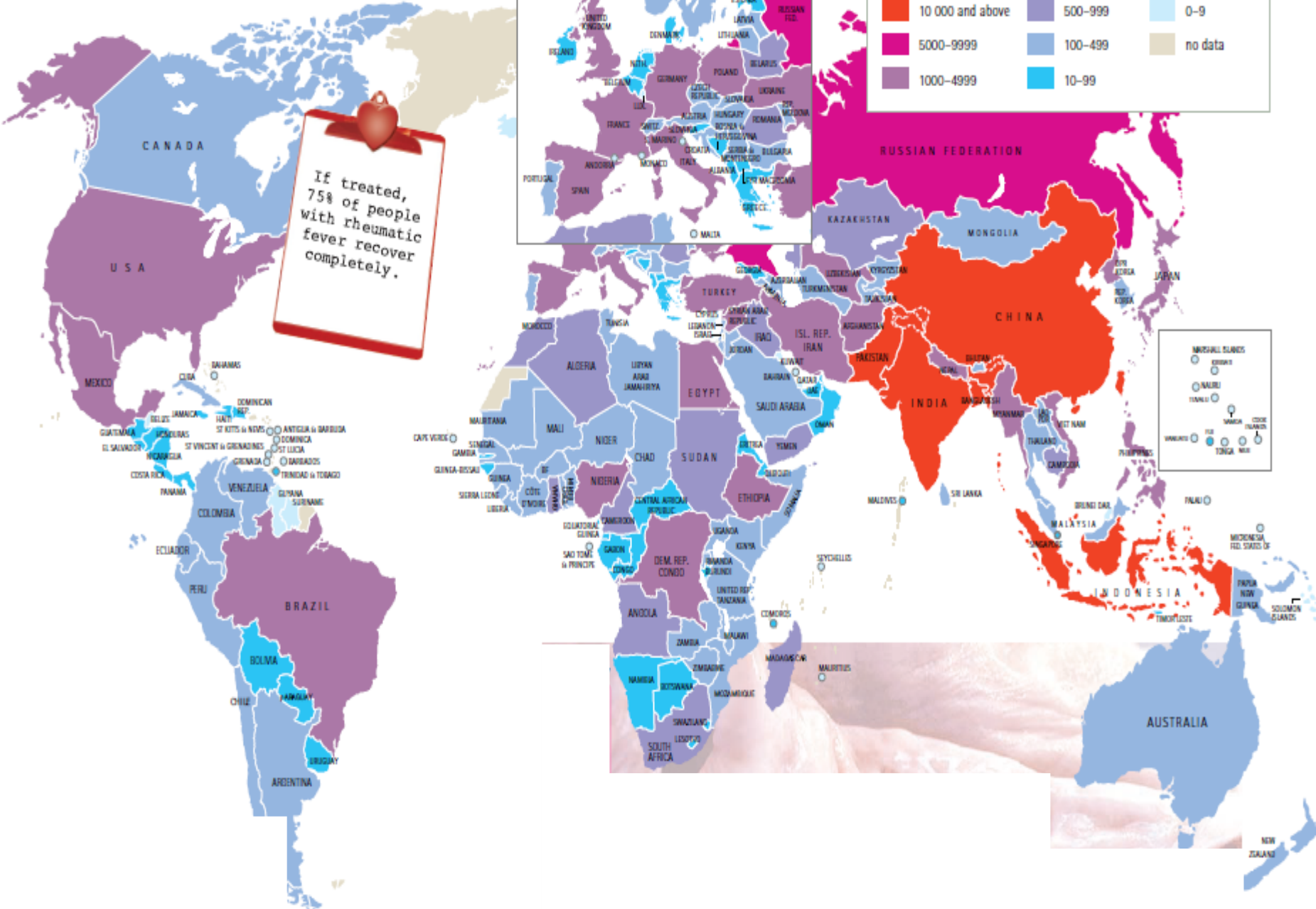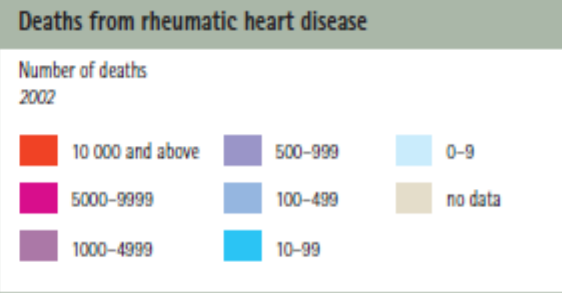- Rheumatic fever often leads to Rheumatic Heart Disease (RHD).

- RF and RHD remain significant causes of cardiovascular diseases in the world today.
- The most devastating effects are on children and young adults in their most productive years
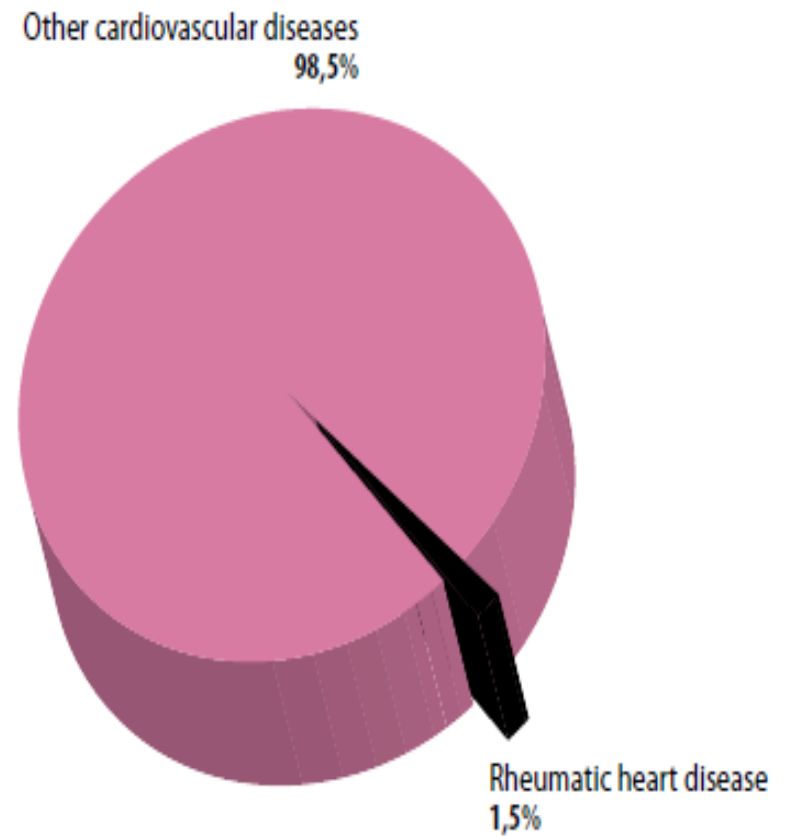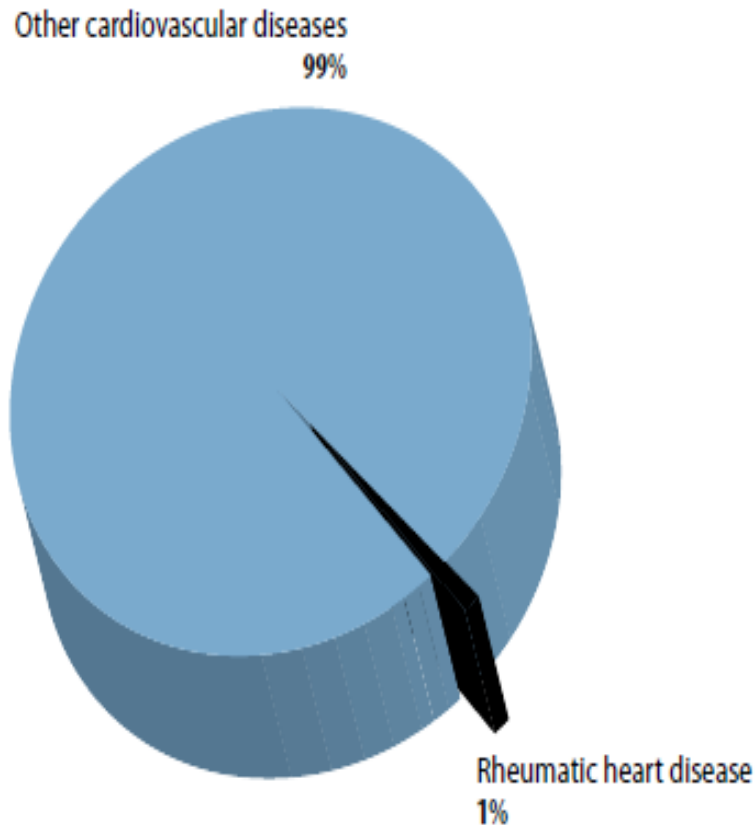
Magnitude of the Problem

- RF is the most common cause of heart disease in the 5-30 year age group throughout the world.

- Based on hospital data, RHD accounts for 12-65 percent of hospital admissions related to cardiovascular disease.

- RF and RHD continue to exert a significant burden on the health of low socioeconomic populations in LMICs despite the near disappearance of the disease in the developed world over the past century.

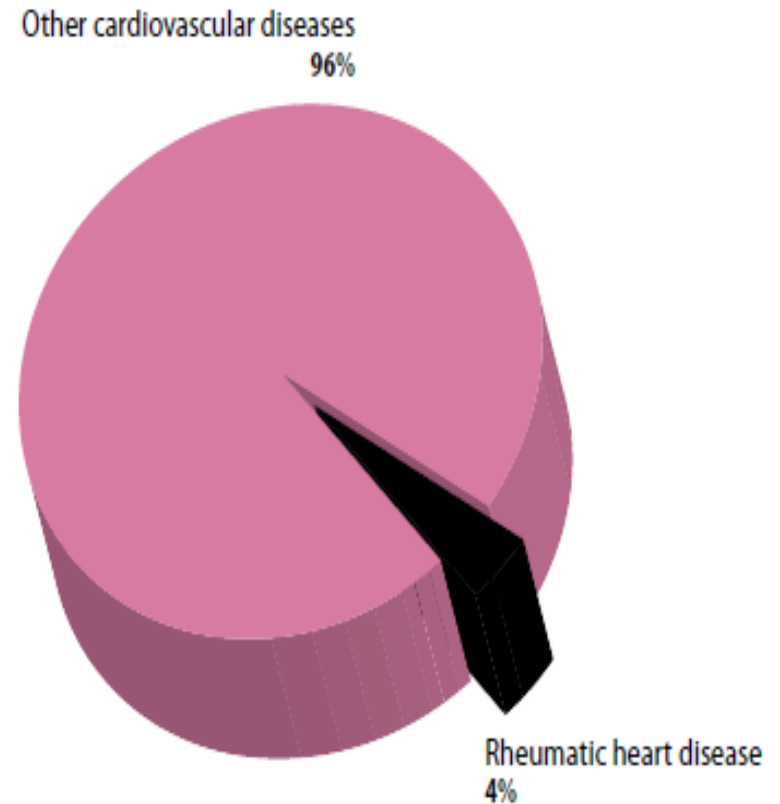# Rheumatic fever and rheumatic heart disease

If treated, 75% of people with rheumatic fever recover completely.

Deaths from rheumatic heart disease

Number of deaths
2002

- 10 000 and above
- 5000–9999
- 1000–4999
- 500–999
- 100–499
- 10–99
- 0–9
- no data

Proportion of global CVD deaths due to RHD, 2008

Other cardiovascular diseases
99%

Rheumatic heart disease
1%

Other cardiovascular diseases
98,5%

Rheumatic heart disease
1,5%

Proportion of global CVD burden (DALYs) due to RHD, 2008

Other cardiovascular diseases
97%

Rheumatic heart disease
3%

Other cardiovascular diseases
96%

Rheumatic heart disease
4%
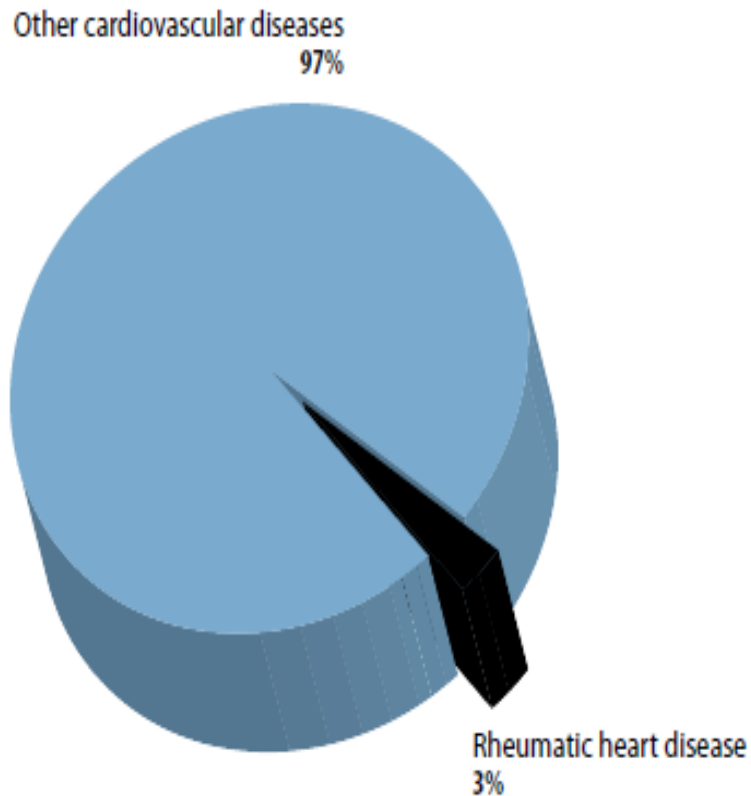
Epidemiological Factors

- **Agent Factors:**

➢ Rheumatic Fever (RF) and Rheumatic Heart Disease (RHD) are nonsuppurative complications of Group A streptococcal pharyngitis due to a delayed immune response.

➢ All strains of Group A streptococci are not implicated in causation of Rheumatic Fever but the serotype which has attracted the most attention in M type 5.

- **Host Factors :**
  - (a) Age- Rheumatic Fever is commonly a disease of childhood and adolescent age group (5-15 years).
  - (b) Sex-Affects both sexes equally.
- **Environmental Factors :**
  - low socio-economic status
  - overcrowding and
  - poor ventilation/housing conditions.

Environmental and Health-system determinants

Determinants	Effects	Impact on RF and RHD burden
Socioeconomic and Environmental factors: -poverty, -undernutrition, -overcrowding, -poor housing.	-Rapid spread of group A streptococcal strains. -Difficulties in accessing health care.	-Higher incidence of acute streptococcal-pharyngitis and suppurative complications. -Higher incidence of acute RF. -Higher rates of recurrent attacks.

Determinants	Effects	Impact on RF and RHD burden
Health-system related factors: -shortage of resources for health care; -inadequate expertise of health-care providers. -low-level awareness of the disease in the community.	-Inadequate diagnosis and treatment of streptococcal pharyngitis. -Misdiagnosis or late diagnosis of acute RF. -Inadequate secondary prophylaxis and/or non-compliance with secondary prophylaxis.	-Higher incidence of acute RF and its recurrence. -Patients unaware of the first RF episode. -More severe evolution of disease. -Untimely initiation or lack of secondary prophylaxis. -Higher rates of recurrent attacks with more frequent and severe heart valve involvement, and higher rates of repeated hospital admissions and expensive surgical interventions.

Clinical Features

Major manifestations	•Carditis •Polyarthritis •Chorea •Erythema marginatum •Subcutaneous nodules
Minor manifestations	•Fever, polyarthralgia •Lab: elevated acute phase reactants (erythrocyte sedimentation rate or leukocyte count).
Supporting evidence of a preceding streptococcal infection	•Prolonged P-R interval •Elevated or rising antistreptolysin-O or other streptococcal antibody OR •A positive throat culture OR •Rapid antigen test for group A streptococci OR •Recent scarlet fever

Jones Criteria

Primary episode of RF	Two major or One major and two minor manifestations *plus* evidence of a preceding group A streptococcal infection
Recurrent attack of RF in a patient without established rheumatic heart disease	Two major or One major and two minor manifestations *plus.* evidence of a preceding group A streptococcal infection.
Recurrent attack of RF in a patient with established rheumatic heart disease	Two minor manifestations *plus* evidence of a preceding group A Streptococcal infection

Prevention of Rheumatic Fever and Rheumatic Heart Disease

- Primary prevention
- Secondary prevention

Primary Prevention

- The adequate antibiotic therapy* of group A streptococcal Upper Respiratory Tract (URT) infections to prevent an initial attack of acute RF.

- Approach is theoretically simple, but it may not be practically feasible.

  – In order to prevent a single case of RHD, several thousand cases of streptococcal throat infection will need to be identified and treated.

*Inj. Benzathine Peniclline 12 lacs IU IM AST

- A more practical and viable approach is to concentrate on "high risk" group such as school children and to treat a sore throat with penicillin empirically even without the throat swab culture.

Secondary prevention

- The continuous administration of specific antibiotics to patients with a previous attack of RF, or a well-documented Rheumatic Heart Disease (RHD).

- The purpose is to prevent colonization or infection of the Upper Respiratory Tract (URT) with group A beta-hemolytic streptococci and the development of recurrent attacks of RF.

- Secondary prophylaxis is mandatory for all patients, who have had an attack of RF, whether or not they have residual rheumatic valvular heart disease.

Other measures for the prevention/control of RF/RHD

- Improving living conditions,

- Breaking the poverty-disease-poverty cycle.

- Improvements in socio-economic conditions (particularly better housing).

- It is not always feasible to implement broad-based primary prevention programs in most developing countries.

- A provision for the prompt diagnosis and effective therapy of streptococcal pharyngitis should be integrated into the existing healthcare facilities

THANKS