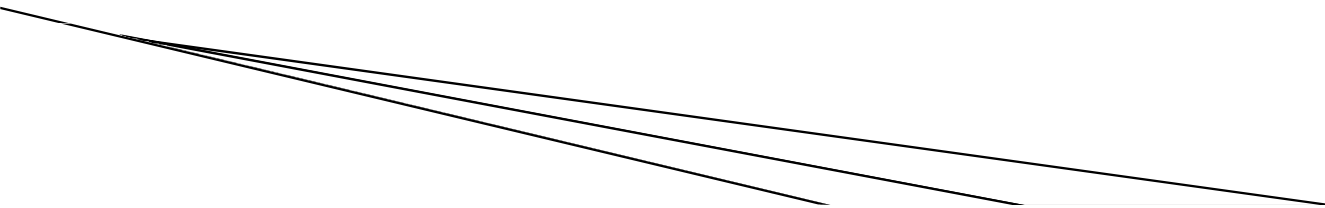


Human Salmonellosis

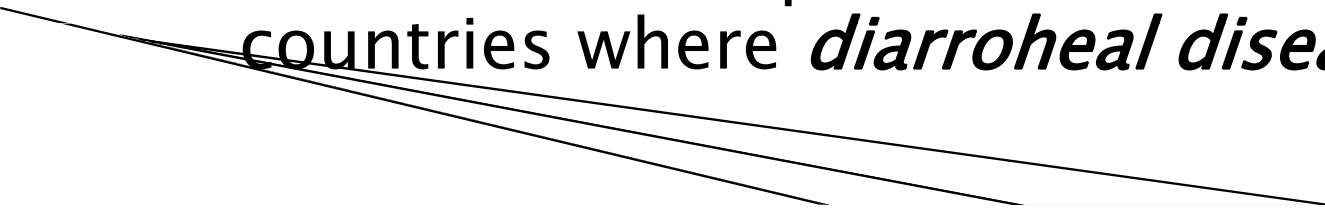
Dr. NAVEEN KRISHAN GOEL

Prof. & HEAD,
Department of Community Medicine
Govt. Medical College, Chandigarh

Introduction

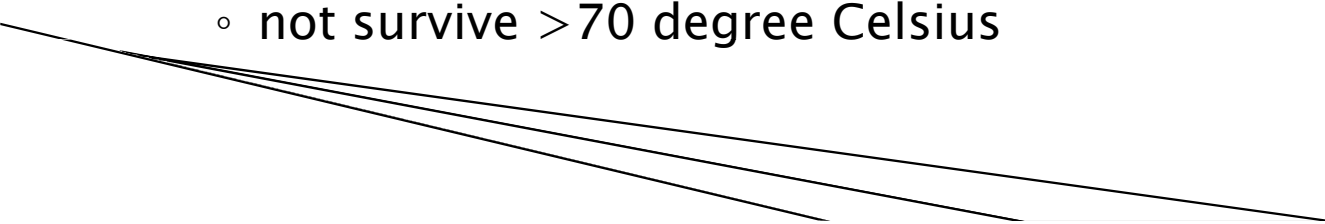
- ▶ “*Salmonellosis*” covers a complex group of food borne infections *affecting both man and animals*.
 - ▶ Causes *illness and even death* in humans as well as *economic losses* in animal and food industries.
- 

Magnitude of Problem

- ▶ Global problem
 - ▶ Represents *60–80% of all reported cases of foodborne diseases.*
 - ▶ *Tens of millions of human cases* occurring every year.
 - ▶ *Animal feeds containing antimicrobial ?* drugs that favour drug resistant salmonellae
 - ▶ Occur sporadically or in small outbreaks
 - ▶ Extent of the problem is not clear in developing countries where *diarroheal diseases are widespread.*
- 

Epidemiological determinants

Agent:

- ▶ Group of bacteria: comprise more than 25,000 serotypes.
 - Usually small number (about 10) *are endemic at any one time.*
 - ▶ Survive in many kinds of food.
 - *Resistant to* drying, salting, smoking and freezing *even for years.*
 - ▶ Sensitive to heat
 - not survive >70 degree Celsius
- 

▶ Three main groups:

1. Infect ***only man***

◦ e.g. *S. typhi*, *S. paratyphi A* and *C*

2. Host-adapted for ***particular species of animals***

◦ e.g. *S. cholera-suis* in swine, *S. Dublin* in cattle, *S. abortus equi* in horses.

3. ***No particular host preference*** and can infect both man and animals

◦ e.g. *S. typhimurium*, *S. enteritidis*.

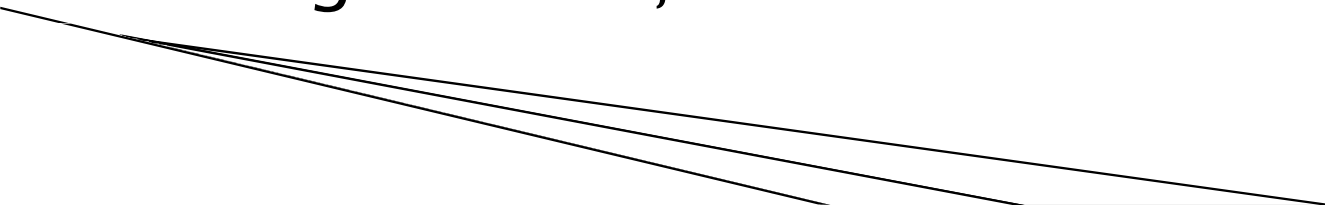
Reservoir:

- ▶ Main reservoir is the intestinal tract of man and animals.

Sources of infection:

- Foods
 - Animals
 - Environment
- 
- Three thin, parallel diagonal lines extending from the left side of the slide towards the bottom right.

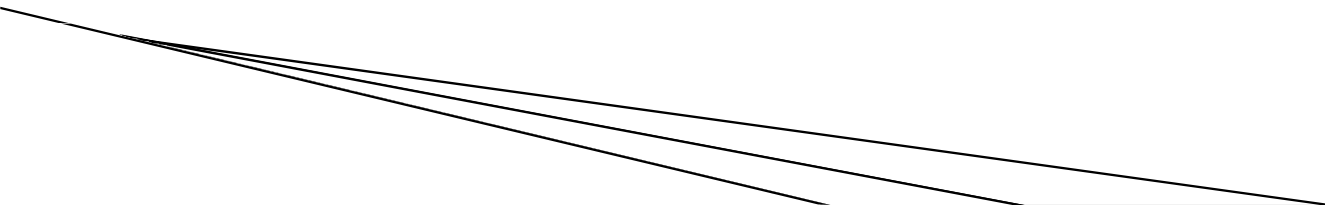
(i) Food:

- ▶ Meat and poultry:
 - *Primary source of salmonellosis*
 - *During slaughter, through shell cracks*
 - ▶ Produced or processed in contaminated environment (*chocolates, spices* etc.)
 - ▶ *Cross-contamination* of cooked foods from raw ingredients, kitchen utensils or surfaces
- 

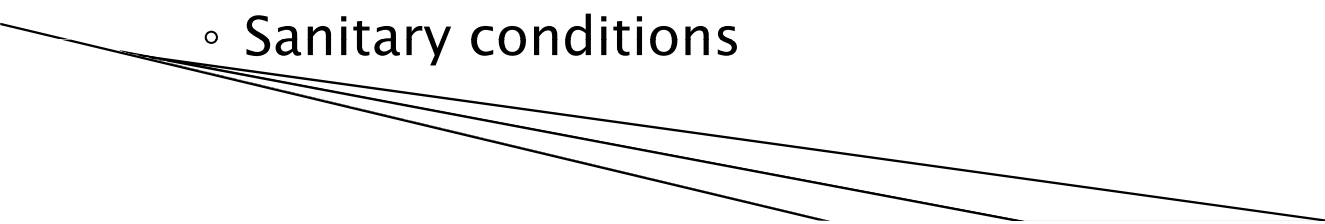
(ii) Animals:

- Hosts and principal vectors
- Bacilli in their tissues (meat), eggs or excreta
- *Carriers* occur among both man and animals

(iii) Environment:

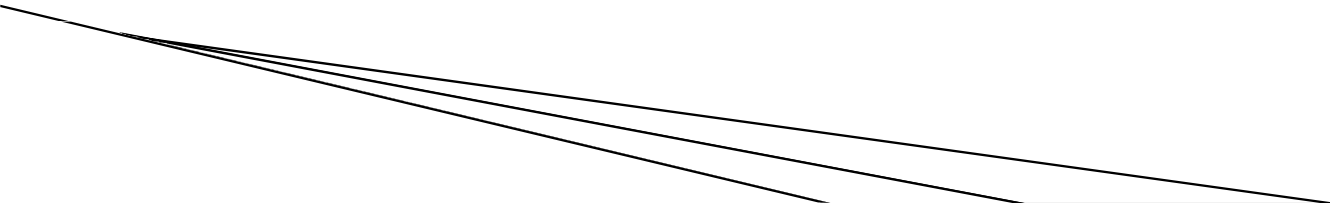
- Widely distributed
 - In *dust, water, manure, sewage, sludge, vegetables, birds, fish, rodents and other animals*
 - *Survive in soil for months*
- 

Mode of transmission

- ▶ Ingestion of contaminated food or drink
 - ▶ *Direct contact with domestic animals* e.g. dogs, pigeons, rats
 - ▶ Man to man transmission through *faecal-oral route*
 - ▶ *Facilitated by:*
 - Food handling methods
 - Local customs
 - Cooking and food habits
 - Food processing, storage and distribution
 - Sanitary conditions
- 
- Three thin, dark lines originate from the left side of the slide and extend diagonally towards the bottom right corner.

Incubation period

- 06 to 72 hours usually.



Clinical features

► May be manifest by one of three syndromes:

i. Gastroenteritis or salmonella enterocolitis:

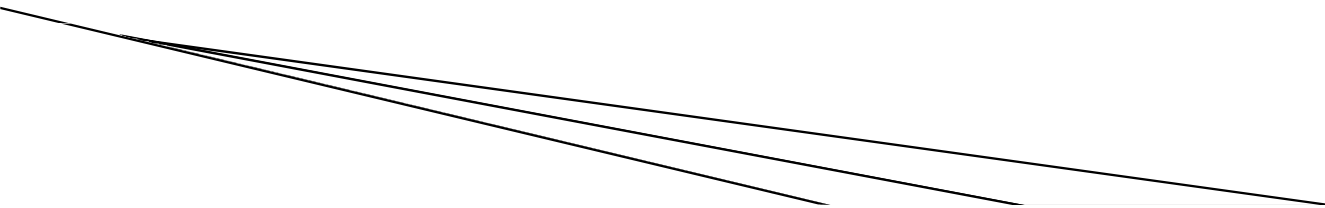
- Most common manifestation
- Nausea, vomiting, diarrhoea, fever, dehydration (in severe cases)
- Resolves in 2–3 days
- Stool culture are positive but Blood culture are negative
- Death is rare and occur in neonates, infants and elderly.

ii. Enteric fever.

iii. Septicemia with focal lesions:

- PUO, osteomyelitis, pyelonephritis, meningitis, endocarditis, cholecystitis.

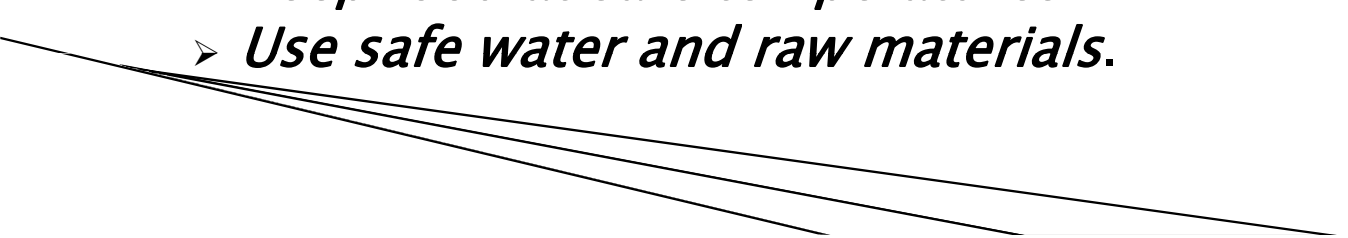
Prevention and Control

- ▶ *Immunization of farm animals* against salmonella
 - ▶ Use of *hygienic animal feed*
 - ▶ Ensuring *sanitary environment* for the animals
 - ▶ *Hygienic slaughtering and milking*
 - ▶ *Pasteurization*
 - ▶ Disposal of solid and liquid wastes
 - ▶ Cold storage facilities
 - ▶ Health education and training.
- 

Recommendations for the public and travellers

- ▶ Ensure food is *properly cooked and still hot* when served.
- ▶ Drink only *pasteurized or boiled milk*.
- ▶ *Avoid ice* unless it is made from safe water.
- ▶ When the *safety of drinking water is questionable*, boil it or if this is not possible, disinfect it with *a reliable, slow-release disinfectant agent* (usually available at pharmacies).
- ▶ Wash hands thoroughly and frequently using soap, in particular *after contact with pets or farm animals*, or after having been to the toilet.
- ▶ *Wash fruits and vegetables carefully*, particularly if they are eaten raw. If possible, *vegetables and fruits should be peeled*.

Recommendations for food handlers

- ▶ Both *professional and domestic food handlers should be vigilant* while preparing food and should observe hygienic rules of food preparation.
 - ▶ *Professional food handlers* who suffer from fever, diarrhoea, vomiting or visible infected skin lesions *should report* to their employer immediately.
 - ▶ The *WHO Five Keys to Safer Food* serve as the basis for educational programmes to train food handlers and educate consumers. They are especially important in preventing food poisoning. The Five Keys are:
 - *Keep clean.*
 - *Separate raw and cooked.*
 - *Cook thoroughly.*
 - *Keep food at safe temperatures.*
 - *Use safe water and raw materials.*
- 

Recommendations for producers of fruits and vegetables

- The WHO "Five keys to growing safer fruits and vegetables" is an educational manual for rural workers, including small farmers who grow fresh fruits and vegetables for themselves, their families and for sale in local market.
- It provides them with *key practices to prevent microbial contamination of fresh produces* during planting, growing, harvesting and storing.
- *The five keys practices are:*
 - Practice good *personal hygiene*.
 - *Protect fields* from animal faecal contamination.
 - *Use treated faecal waste*.
 - *Evaluate and manage* risks from irrigation water.
 - Keep harvest and storage *equipment clean and dry*.

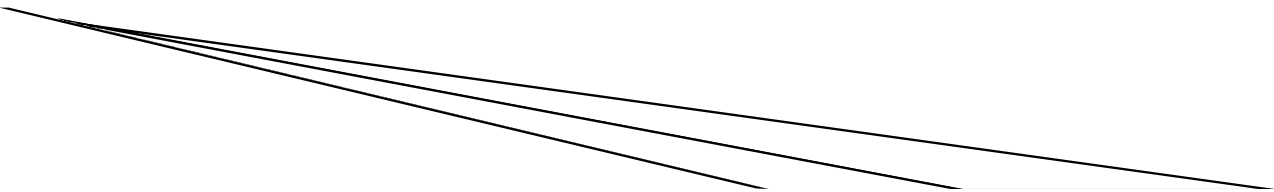
Taeniasis

Dr. NAVEEN KRISHAN GOEL

Prof. & HEAD, Department of Community Medicine
Govt. Medical College, Chandigarh

A decorative graphic consisting of two thin, black, wavy lines that originate from the left side of the slide and extend towards the right, creating a subtle, flowing background element.

Introduction

- ▶ Cestode infections
 - ▶ Parasites of importance:
 - *Taenia saginata*
 - *Taenia solium*
 - ▶ Cyclo-zoonoses:
 - require *more than one vertebrate host* (but no invertebrate host) to complete developmental cycles.
- 

Magnitude of problem

▶ *T. saginata*:

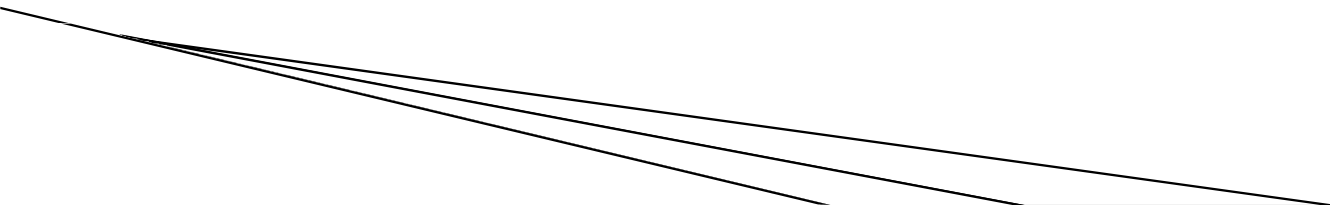
- *Highly endemic* (30 to 80%) in African countries, eastern Mediterranean countries, part of USSR
- *Moderate prevalence* in Europe, Indian subcontinent, Southern Asia, Japan.
- *Low endemic* (below 0.1%) in Australia, Canada and USA.

▶ *T. solium*:

- Latin America, Africa, Asia including India.
- 

Hosts of infection

- ▶ Life cycles in two hosts:
 - Adult parasite lives in human small intestine.
 - Larval stage occurs in:
 - *cattle* (*T. saginata*, *C. bovis*) and
 - *pig* (*T. solium*, *C. cellulosae*)
- ▶ Mixed infestation of both parasites can occur.



Mode of transmission

i. Hetero-infection:

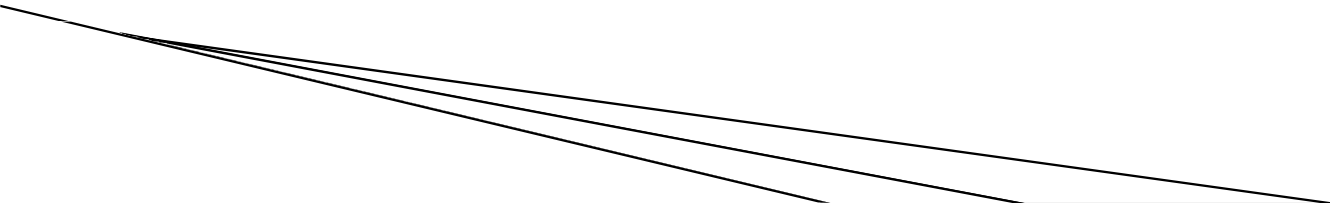
- Ingestion of infective cysticerci in *undercooked beef* (*T. saginata*) *or pork* (*T. solium*).
- Ingestion food, water or vegetables *contaminated with eggs*

ii. Auto-infection:

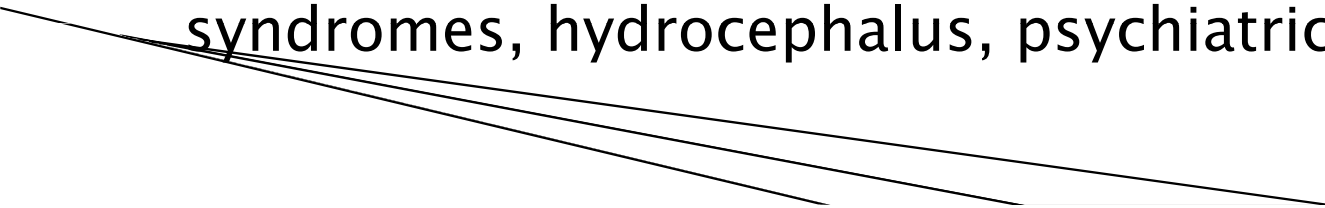
- Reinfection by the transport of eggs from the *bowel to the stomach by retro-peristalsis (rare)*

Incubation period

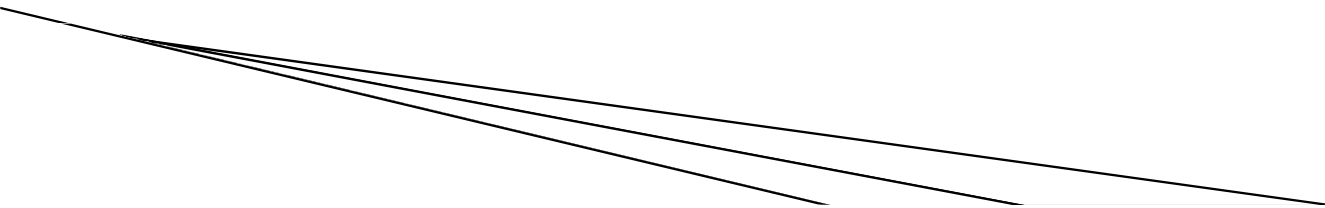
▸ 08 to 14 weeks.



Clinical features

- ▶ Vast majority of cases do *not lead to clinical manifestations*
 - ▶ Occasional abdominal discomfort, chronic indigestion, anorexia
 - ▶ Cysticercosis:
 - Most serious risk:
 - ***Neurocysticercosis:*** Epilepsy, intracranial hypertension syndromes, hydrocephalus, psychiatric diseases, death
- 

Prevention & Control

- *Treatment of infected person*
 - *Meat inspection*
 - *Health education* regarding hand washing and open field defecation.
 - *Adequate sewage treatment and disposal*, especially used for farming.
- 
- Three thin, parallel lines slanting downwards from left to right, located at the bottom of the slide.

‣ Treatment of infected person:

- *Praziquantel* (10 mg/kg stat dose) and *Niclosamide* (2 grams stat)
- *Surgical removal of cyst*
- Purgatives 2–3 hours after the drug in case of *T. solium*
- *Albendazole (10 mg/kg/day BD X 28 days)* and *Steroid for cysticercosis.*

Trachoma

Dr. NAVEEN KRISHAN GOEL

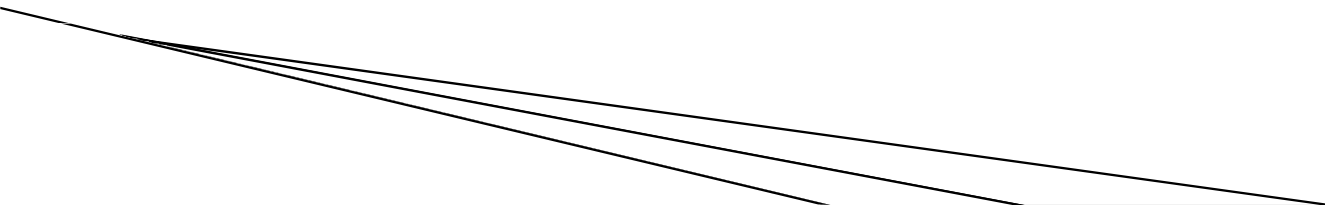
Prof. & HEAD,

Department of Community Medicine

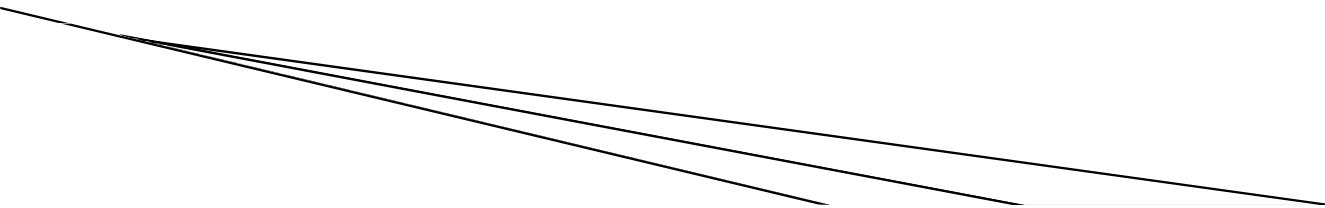
Govt. Medical College, Chandigarh



Introduction

- ▶ Trachoma – leading *infectious cause of blindness* in the world.
 - ▶ *Chlamydia trachomatis*, an *obligate intracellular bacterium* .
 - ▶ The infection–transmitted through contact with *eye and nose discharge of infected people*, particularly *young children* who are the *principal reservoir* of infection.
 - ▶ Also *spread by flies* which have been in contact with the eyes and noses of infected people
- 

Agent factors

- ▶ *Chlamydia trachomatis*, an obligate intracellular bacterium
 - ▶ ***Reservoir:***
 - Children with active disease,
 - chronically infected cases
 - ▶ ***Source of infection:***
 - Ocular & Nasal discharge, fomites.
- 

Host factors

- ▶ **Age:**

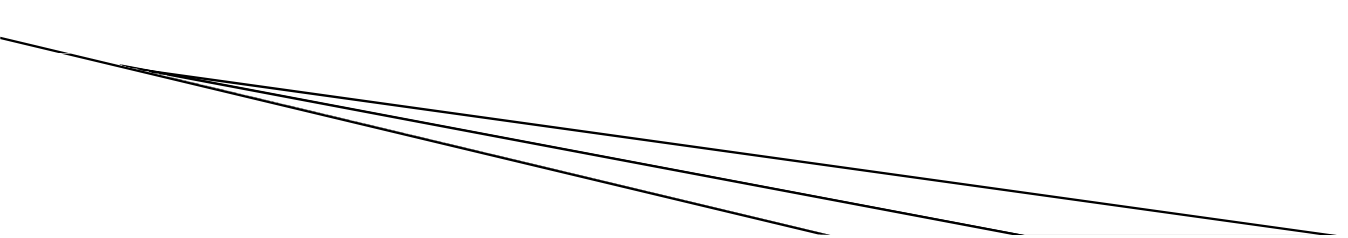
- 02–05 years age group

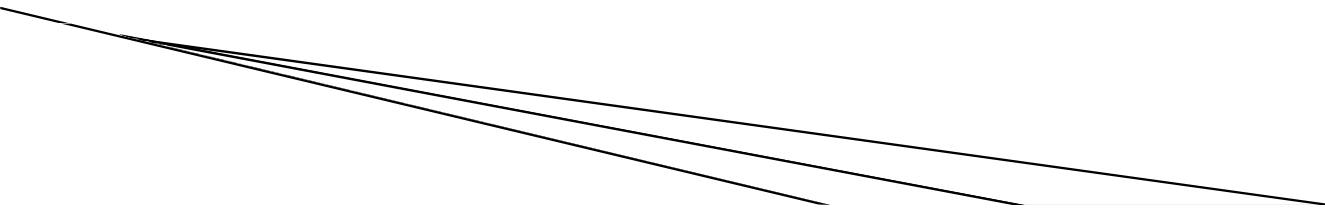
- ▶ ***Gender :***

- equal in younger age group but females > males in older age group.

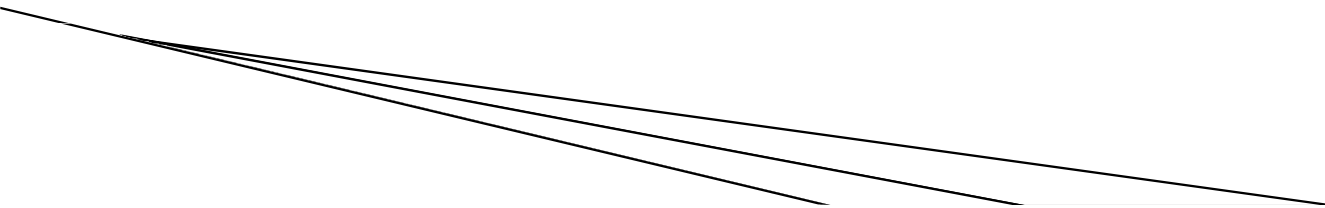
- ▶ ***Pre-disposing factors :***

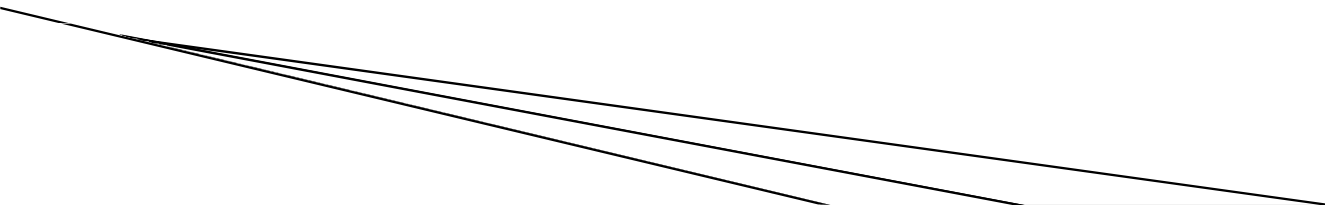
- *dust, smoke, kajal* application



- ▶ ***Environmental risk factors*** influencing the transmission of the disease include:
 - *Poor hygiene*
 - *Crowded households*
 - *Water shortage*
 - *Inadequate latrines and Sanitation facilities*
 - *Higher temperature and rainfall*
- 

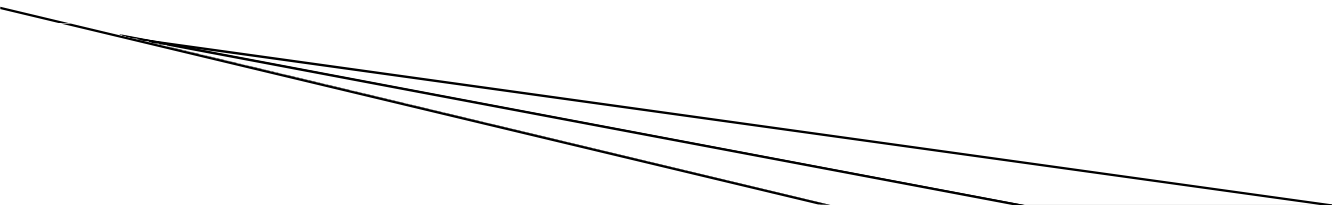
Clinical characteristics

- ▶ *Trachomatous follicular inflammation –(TFI)*
 - ▶ *Trachomatous trichiasis (TT)*
 - ▶ *Corneal opacity (CO).*
 - ▶ *Trachomatous intense inflammation –(TII)*
 - ▶ *Trachomatous conjunctival scarring (TCS)*
- 

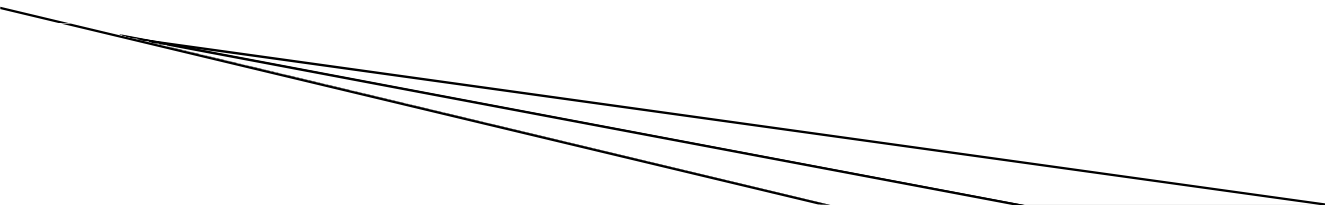
- ▶ The prevalence of TFI in children aged 01–09 years is the ***key index*** for determining whether ***an area needs intervention with the A, F and E components of SAFE.***
 - ▶ The prevalence of TT determines the ***probable need for surgical services.***
 - ▶ The prevalence of CO is a (rough) measure of the ***burden of blindness and visual impairment due to trachoma.***
- 

Distribution

- ▶ Responsible for the *visual impairment of about 1.8 million people, of whom 0.5 million are irreversibly blind.*
 - This represents about 1.4% of the global total of blind individuals.
- ▶ Overall, Africa remains *the most affected continent and the one with the most intensive control efforts.*

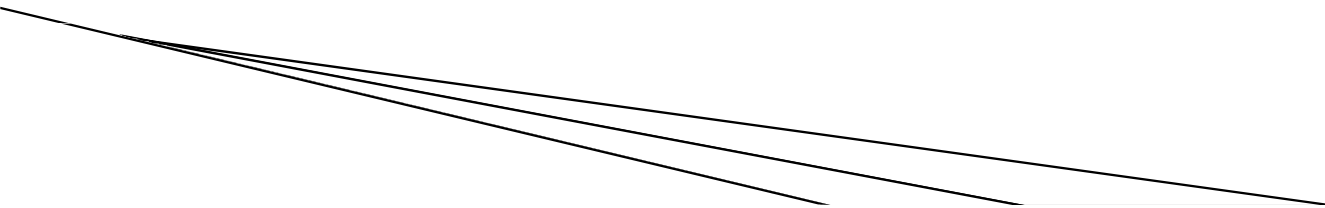


Prevention and Control

- ▶ *Assessment* of the problem
 - ▶ *Chemotherapy:*
 - Mass treatment vs. Selective treatment
 - Tetracyclines, erythromycin
 - ▶ **SAFE**
 - ▶ *Surveillance*
 - ▶ Health education
- 

Prevention & Control

▶ ***WHO–recommended SAFE strategy:***

- Surgery to treat the blinding stage of the disease (trachomatous trichiasis),
 - ***Antibiotics to treat infection*** (tetracycline eye ointment or Azithromycin single oral dose),
 - Facial cleanliness, and
 - ***Environmental improvement***, particularly ***improving access to water and sanitation.***
- 

▶ *Thank*

