Module 1 Part B
Introduction to targeted NTDs

Session 3.
Schistosomiasis (SCH)
Epidemiology and Control
Objective

• Remind district NTD programme managers of basic epidemiology and recommended interventions for diseases targeted with preventive chemotherapy:
  – Schistosomiasis
  – Control and elimination goals
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Map on Schistosomiasis distribution in Tanzania

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement. © WHO 2013. All rights reserved.

Data Source: World Health Organization
Map Production: Control of Neglected Tropical Diseases (NTD)
World Health Organization
Why is Schistosomiasis an important public health problem?
Pathology of *S. haematobium*

- Pathology is due to immune response to eggs (not to the adult worm)
- Egg deposition in genitourinary tract leads to:
  - Hematuria
  - Female genital schistosomiasis
  - Bladder calcifications
  - Bladder cancer
Pathology of *S. mansoni*

- Pathology is due to immune response to eggs (not to the adult worm)
- Egg deposition in the intestinal tract and tissues causes:
  - Intestinal pathology
  - Anemia
  - Weight loss
  - Hepatosplenic disease
Schistosome life cycle

1. Infective Stage
2. Diagnostic Stage

Sporocysts in snail (successive generations)

3. Miracidia penetrate snail tissue
4. Eggs hatch releasing miracidia
5. Cercariae released by snail into water and free-swimming
6. Penetrate skin
7. Cercariae lose tails during penetration and become schistosomulae
8. Circulation
9. Migrate to portal blood in liver and mature into adults
10. Paired adult worms migrate to:
   - mesenteric venules of bowel/rectum (laying eggs that circulate to the liver and shed in stools)
   - venous plexus of bladder

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Epidemiology & Transmission patterns

• Transmission can be quite focal and is facilitated by:
  • Poor sanitation
  • Human activities that bring people into contact with contaminated water
  • Environmental modifications affect vector’s ecosystem
Common features of Schistosomes

- Transmission linked to contaminated fresh water in rural areas
- Chronic diseases leading to long-term disability
- Affect adult productive capacity
- Increase the risks related to pregnancy (adverse outcomes)
- In children:
  - hinders normal growth
  - intellectual and
  - cognitive development
- Geographically confined:
  - although communicable, strictly linked to the environment
- Complex reproductive cycles
Where in the transmission cycle can we intervene to control Schistosomiasis?
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**Health Education**

**Safe Water Supply**

**Behavior Change**

**Sanitation**

**Snail Control:**
- Mollusccides
- Management of water scheme

**Schistosomiasis control**

**Drugs:** PZQ

**Snails**

**Cercaria**
- In water
- Penetrates in skin

**Human**
- Mature in intrahepatic portal blood

**Agents**
- S. m.
- S. j.
- S. h.

**Miracidium**

**Cyst**
- Penetrates into snail tissues

**Circulation**
Preventive & Control Measures

• Health information, education, communication (IEC) should be reinforced
• Improved sanitation and safe water supply are long-term measures linked with socio-economic development
• PC is the most common intervention, by treating people at risk with PZQ to prevent morbidity
• School health is a potential platform for integration with control of other diseases
Benefits of Treatment

- Reduce bladder and liver pathology
- Reduce anemia
- Improve growth and development of children
- Reduction of female genital schistosomiasis may reduce transmission of HIV
Target Groups

• School-aged children (5<15 years old)
• Women of childbearing age (15-39 years old)
• Special occupational groups:
  • Workers in water irrigation schemes
  • Fishermen
Praziquantel (PZQ) delivery

- Treatment dose: based on a height pole, weight can also be used
- Side effects are diminished by administering PZQ after food
- Can be safely combined with ALB as part of a de-worming programs
- PC intervention should be considered if prevalence is >10%
The dose pole:

Instead of using body weight (40 mg/kg) the number of PZQ tablets can be determined by height.
Feasibility of Elimination?

- Schistosomiasis has been eliminated in some settings
- Water, sanitation and behavior change facilitate elimination
- Focal vector control may be helpful
- Good surveillance, strong political will and commitment are needed
What do you think are the key messages from this session?
Key messages

• Transmission is by urine and fecal contamination of fresh water bodies and is facilitated by poor hygiene and sanitation

• High morbidity burden associated with Schistosomiasis and potential for severe complications

• PC targeted to high risk groups is the most common control strategy

• Main goal of PC is to avoid the severe consequences of chronic infections

• Elimination of Schistosomiasis is feasible in some countries

• Pregnant and lactating women can be included in PC with PZQ