

# **Overview of Malaria Epidemiology in Ethiopia**

**Wakgari Deressa, PhD**  
**School of Public Health**  
**Addis Ababa University**

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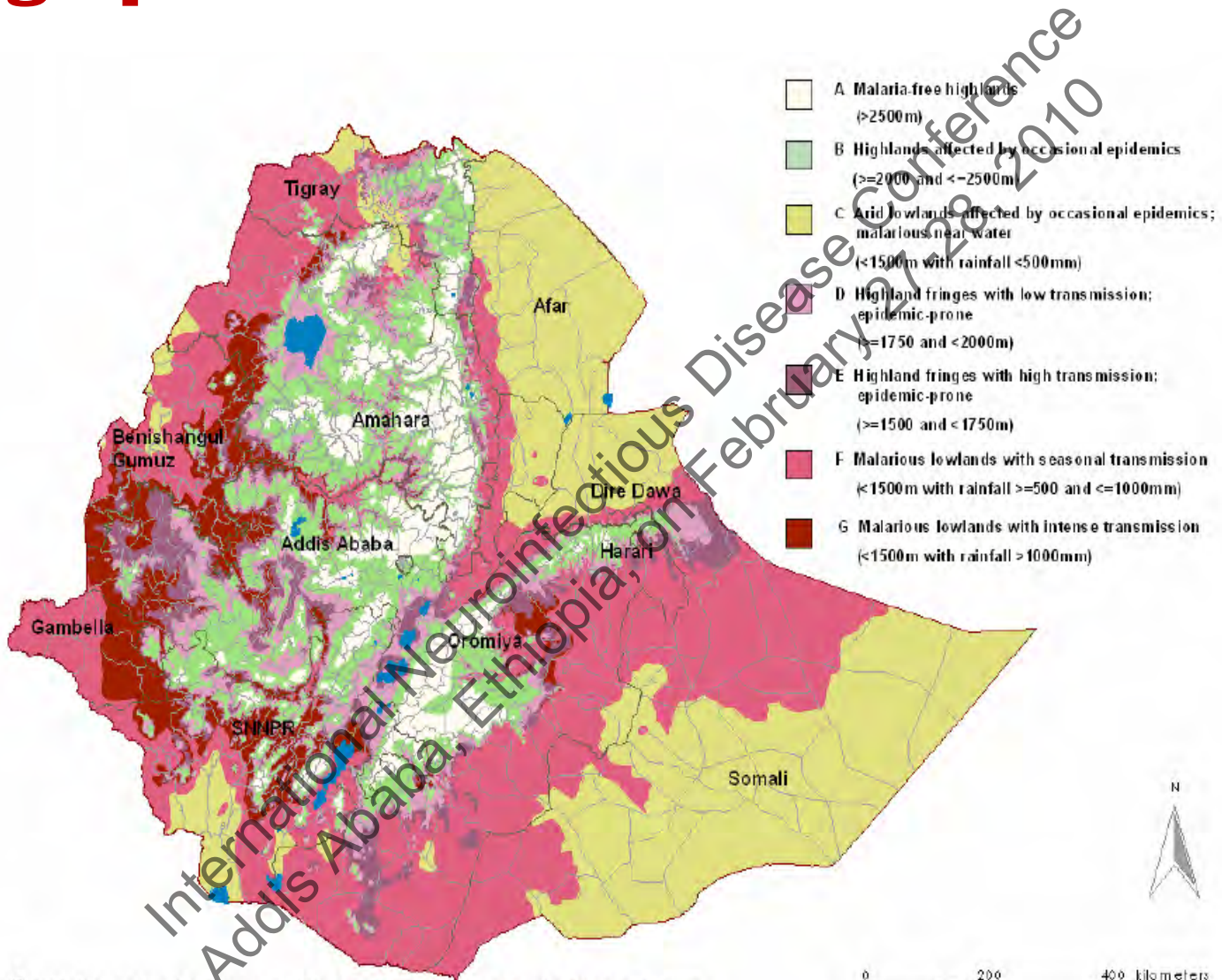
# Introduction

- **Malaria is one of the leading public health problems in Ethiopia**
- **75%** of the country is malarious (<2000m, with about **68%** of the population (**≈50 million**) at risk
- **Major impediment to socio-economic development, coincides with major planting and harvesting season**

# Malaria Epidemiology

- **Bimodal type of transmission:**
  - **Major: Sep - Dec**, following the main rainy season from Jun to Aug
  - **Minor: Apr–May**, following a short rainy season from Feb to Mar
- **Major epidemics occur every 5-8 years, focal outbreaks are common**
- **Distribution varies from place to place depending on climate and altitude**

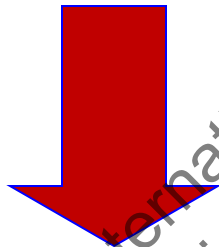
# Geographic Distribution of Malaria in Ethiopia



# Malaria in Ethiopia is Unstable

## Unstable malaria

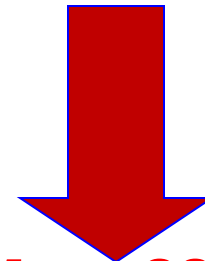
- **Seasonal**
- **Lack of immunity**
- **Epidemic common**
- **All age groups affected**



**Malaria in Ethiopia**

## Stable malaria

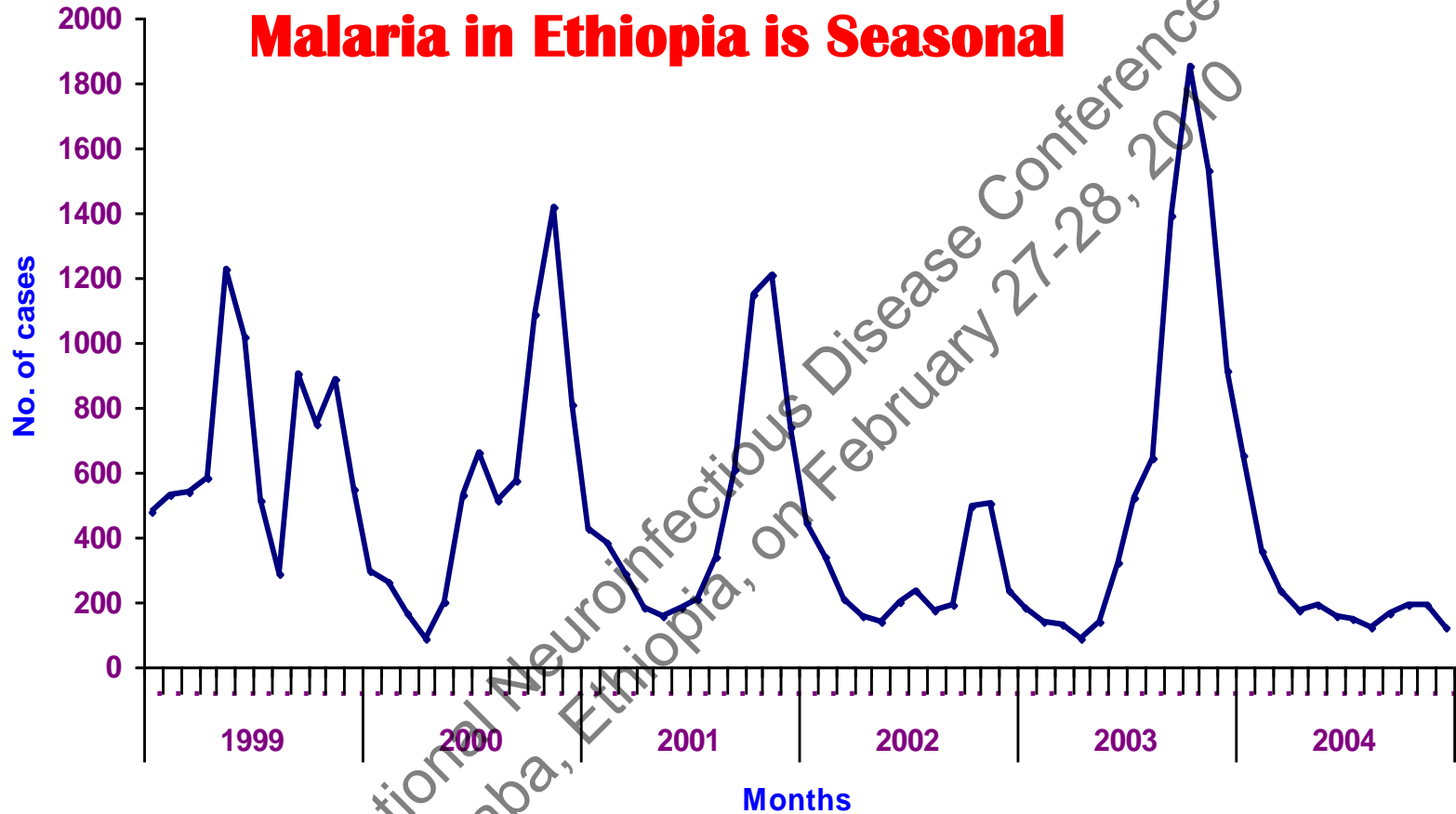
- **Intense, perennial**
- **High immunity**
- **Epidemic uncommon**
- **Children & pregnant women more affected**



**Many SSA**

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## Malaria in Ethiopia is Seasonal



**Trend of an epidemic malaria in Adami Tulu District. Microscopically confirmed malaria cases at Zeway MCL, 1999-2004.**

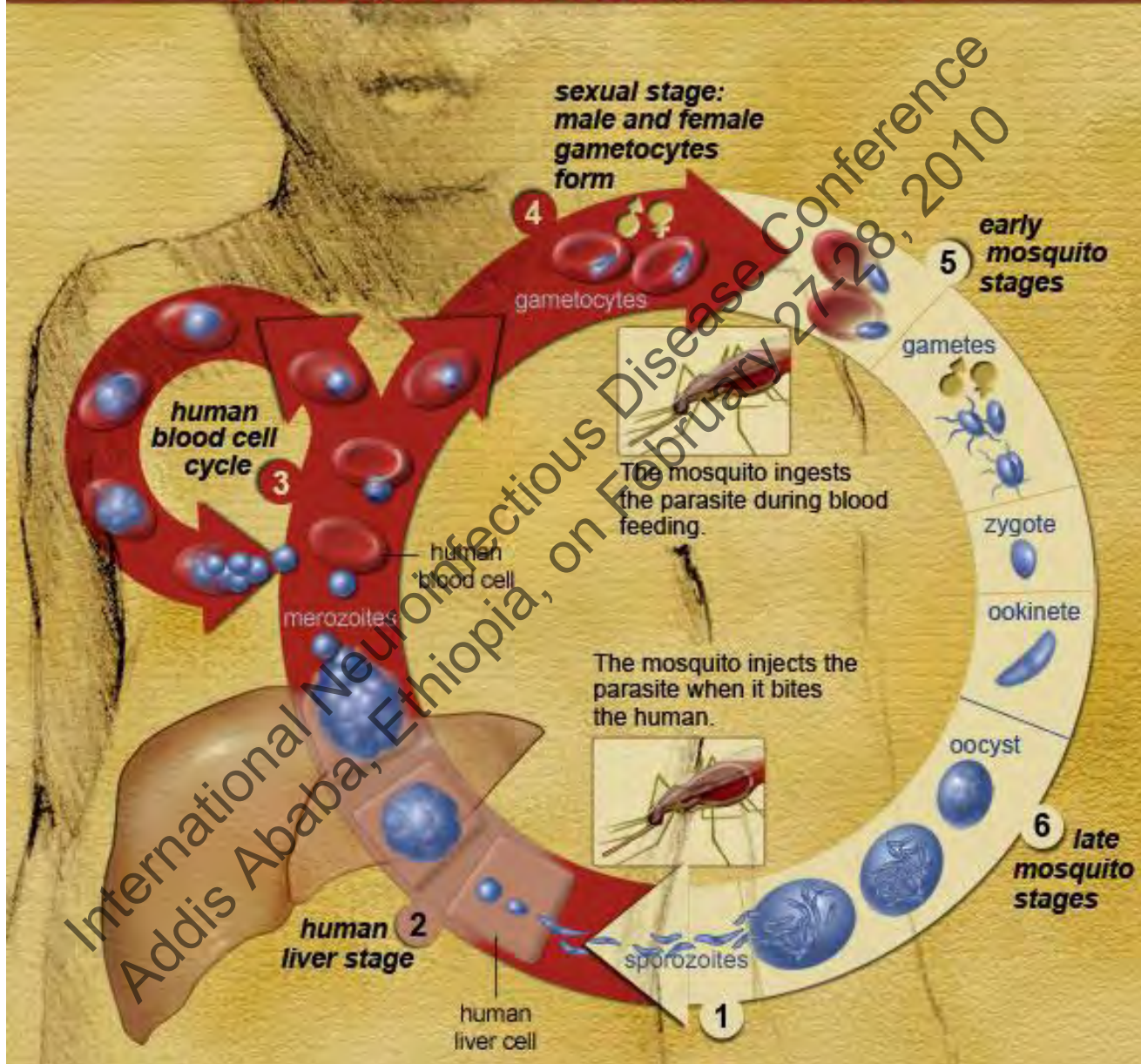
## • Major Malaria Parasites

- *P. falciparum* ( $\approx 60\%$ )
- *P. vivax* ( $\approx 40\%$ )
- *P. malariae* (rare)

## • Major Malaria Vectors

- *An. arabiensis* (family of *An. gambiae* complex)= primary vector
- *An. funestus*
- *An. pharensis*
- *An. nili*

# Life Cycle of the Malaria Parasite

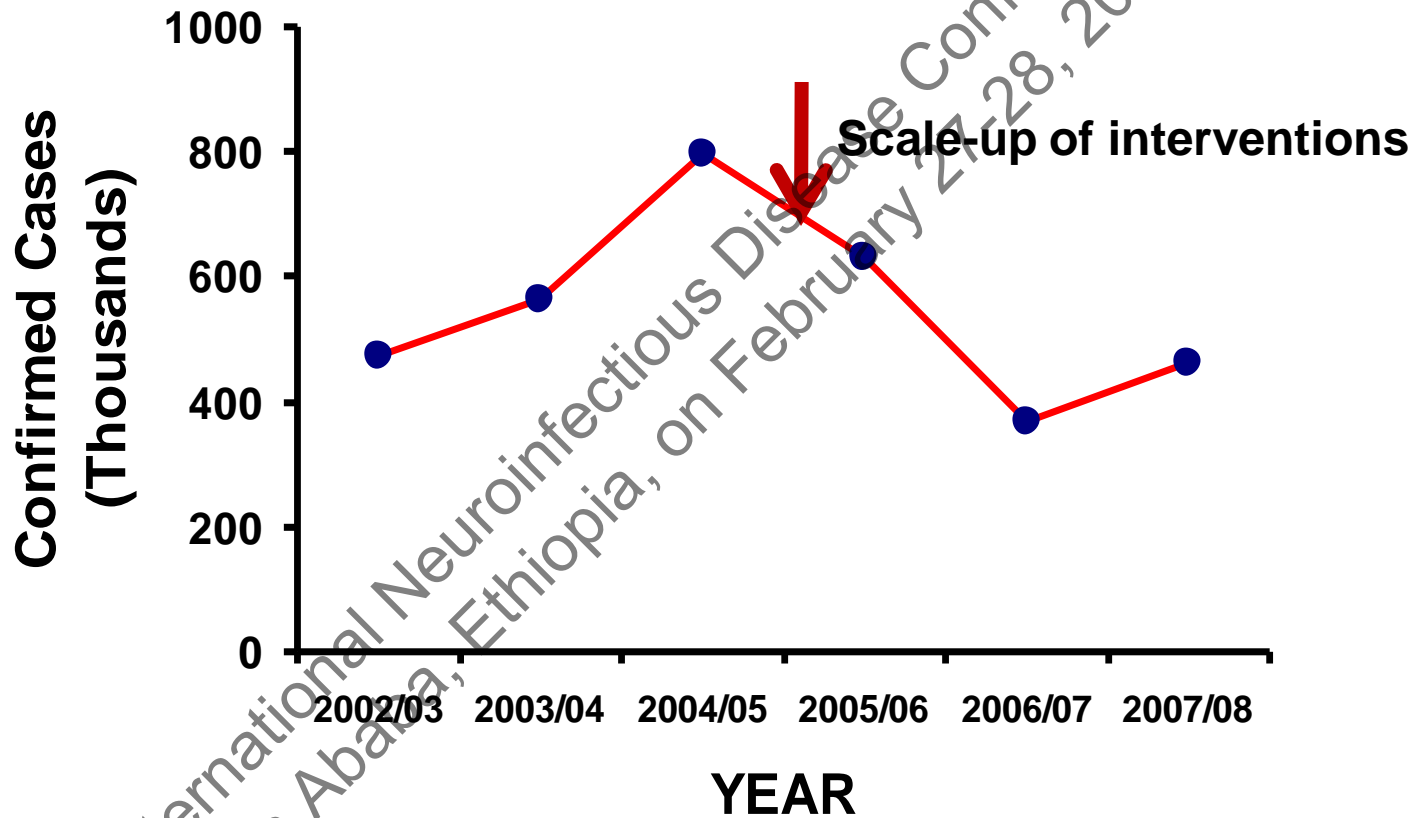




## **Malaria Burden in Ethiopia**

- **More than 600,000 confirmed and >9 million clinical cases each year**
- **Cause about 70,000 deaths each year**
- **Health and health related indicator (2005/06) of the FMOH:**
  - **18% of OPD cases (1<sup>st</sup>)**
  - **14% of admission (2<sup>nd</sup>)**
  - **9% of hospital deaths (2<sup>nd</sup>)**
- **Poor health information system**

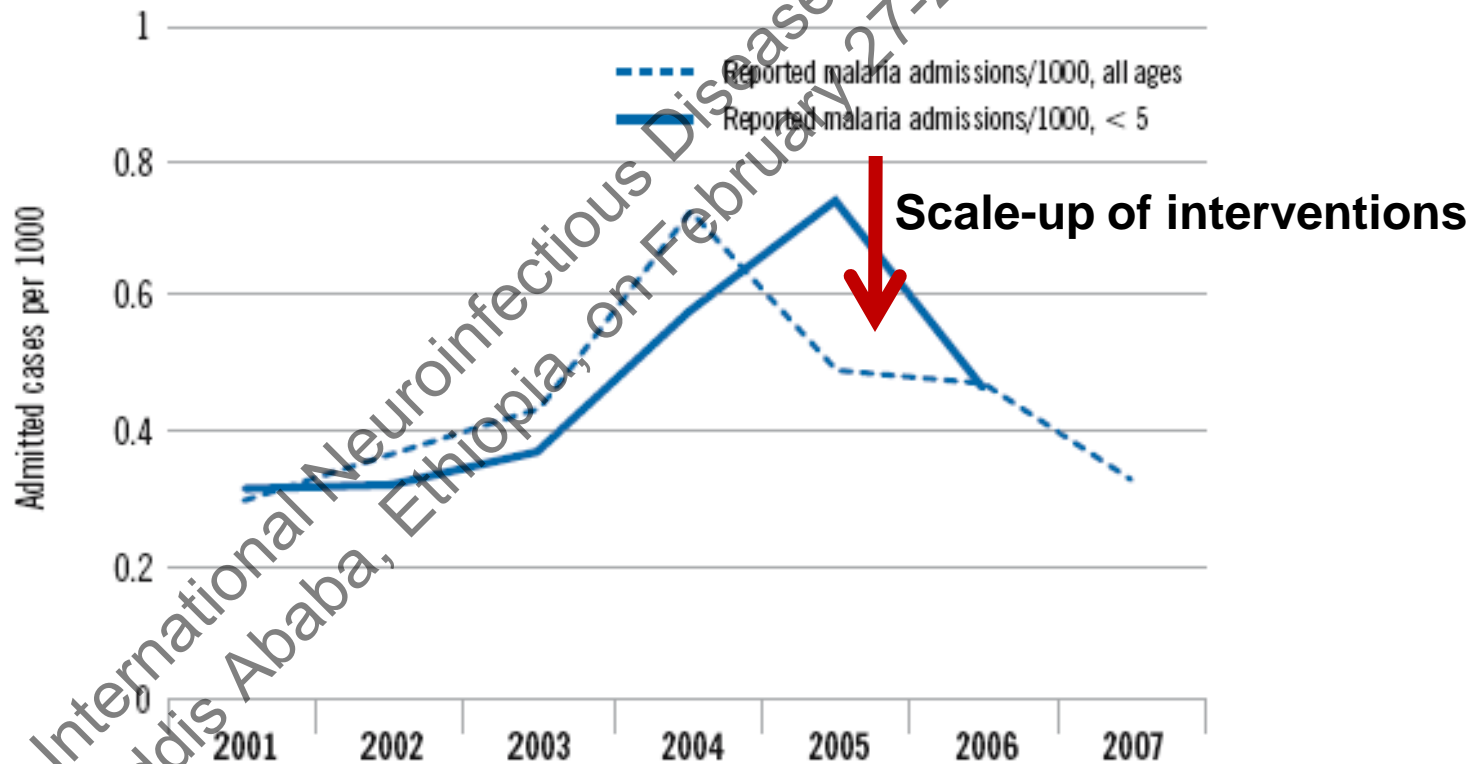
# Trends in Confirmed Cases of Malaria in Ethiopia (2003-2008)



Source: Health Indicators (FMOH)

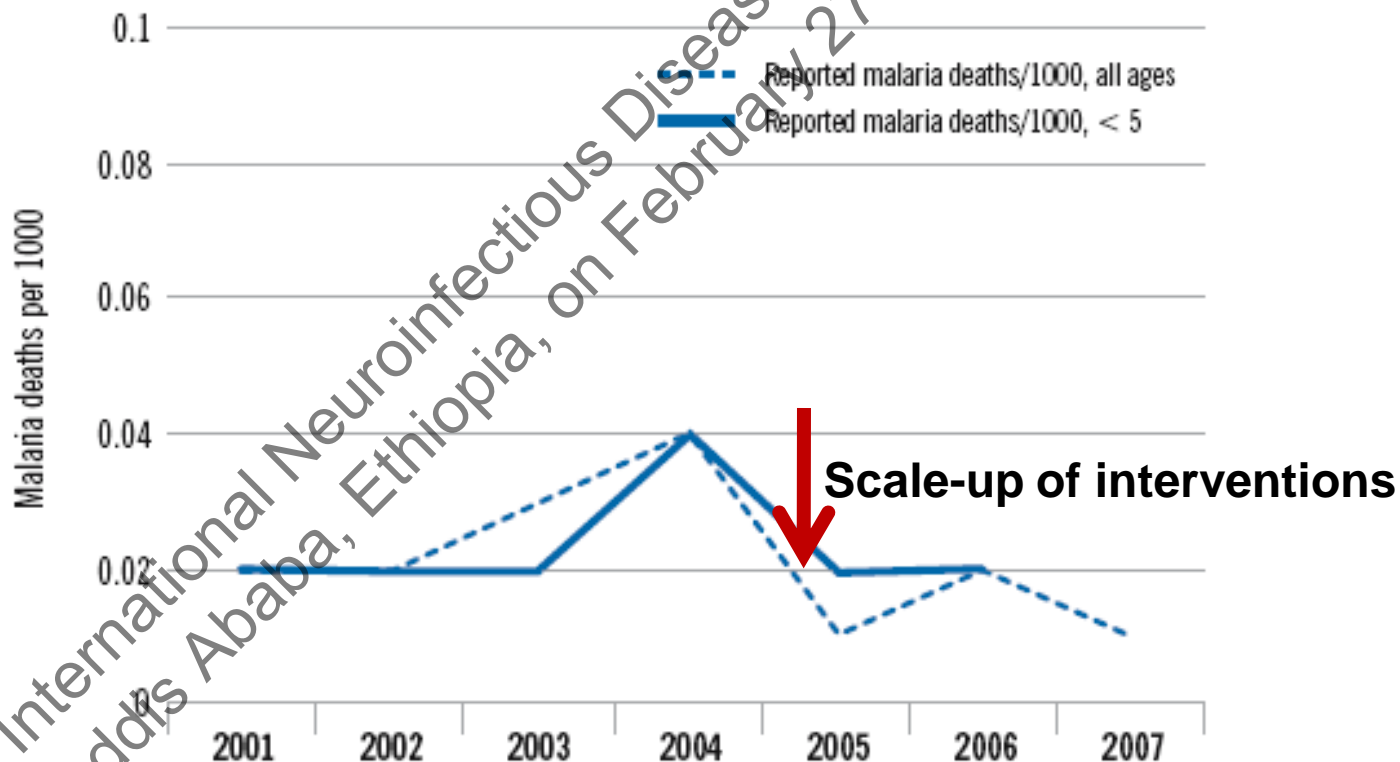
# Trends in Malaria Admissions in Ethiopia

Reported malaria admissions, per 1000



# Trends in Malaria Deaths in Ethiopia

Reported malaria deaths, per 1000



# Main Reasons for Reduction in Malaria in Ethiopia: Is there a conclusive evidence?

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- **There is no argument about:**
    - **Large-scale up of interventions (LLINs & ACT)**
    - **Reduction in morbidity and mortality**
- 

- **Can the interventions be sustainable?**
  - **Can the reduction in burden sustainable?**
    - **At least 4-5 more years ?**
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# **Technical Strategic Approaches for Malaria Prevention and Control**

- 1. Early diagnosis and effective treatment***
- 2. Vector control (LLINs and IRS)***
- 3. Epidemic prevention and control***
- 4. Intermittent Presumptive Treatment (IPT)***
  - Not adopted***
  - Treatment and prevention (LLINs)***

# ***1. Early Diagnosis and Effective Treatment***

- **Drugs**

- **ACTs (CoArtem, AL), Chloroquine, Quinine**
- **7 million ACTs in 2006 and 4 million ACTs in 2007**

- **Diagnostic tools**

- **Microscopy, RDT, clinical diagnosis**

- **Treatment sites**

- **Health facility including health posts**
- **Community-based**
- **Home management**

# Currently Recommended Antimalarial Drugs

- *P. falciparum* ————— CoArtem (AL)
- *P. vivax* ————— Chloroquine (CQ)
- Clinical malaria — AL + CQ
- Second-line ————— Quinine
- SCM ————— Quinine



# Therapeutic Efficacy of Antimalarial Drugs in Ethiopia

- **1950s** – ***Chloroquine 1<sup>st</sup> introduced***
- **1986** – **1<sup>st</sup> report on emergence of CQ resistant *P. falciparum***
- **1998** – **SP replaced CQ for the treatment of *P. falciparum***
- **2004** – **ACTs (artemether-lumefantrine) (Coartem™) replaced SP for treatment of *P. falciparum***

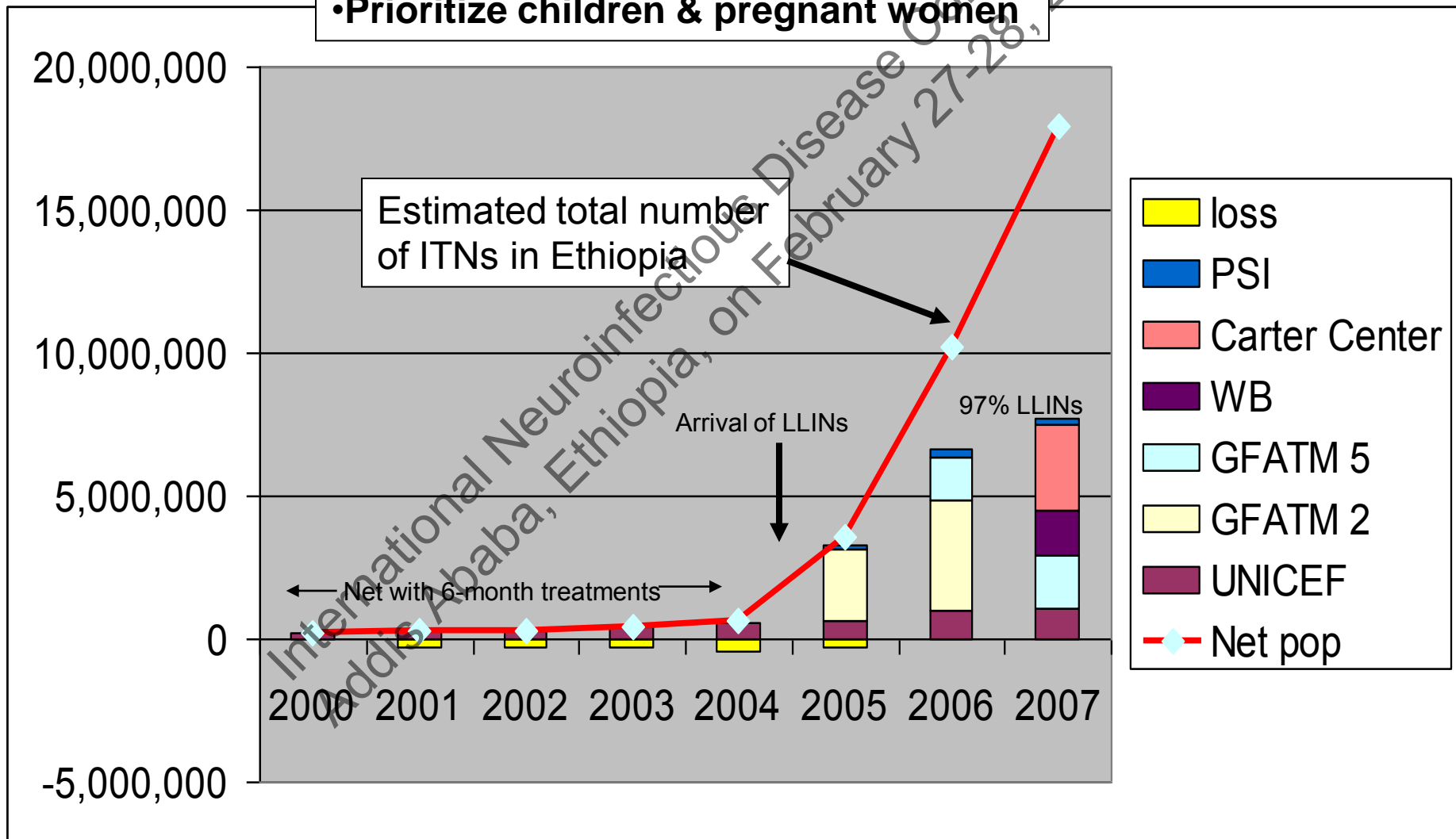
## ***2. Vector Control***

- **Insecticide treated mosquito net (LLIN)**
- **Indoor residual spraying (IRS)**
- **Environmental management**
- **Etc**

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# ITN/LLIN scaling-up in Ethiopia

- Target 100% net coverage, 2007
- 2 ITNs per malaria affected household
- Prioritize children & pregnant women



# Major Challenges in LLINs Implementation

- **Low utilization rate**
- **Lack of sustainable mechanism for replacement for torn or worn out nets**
- **Almost all LLINs distributed in 2005-2007 are now worn-out**
  - **Average life-span about 3-4 years**
  - **All nets distributed in 2005 should be replaced in 2009, and so on**
- **Sustainable LLINs replacement strategy is needed**

# **Indoor Residual Spraying (IRS)**

- **The most widely used chemical method, during national MEP**
- **Applied in epidemic prone areas (<2000m)**
- **DDT and Deltamethrin (insecticide of choice)**
- **IRS conducted in 20% of households below 2000m (MIS 2007)**
- **Mosquitoes should be susceptible and rest indoor**

# Major Challenges in IRS Implementation

- **Lack of well-trained technicians**
- **Lack of trained sprayers and supervisors**
- **Lack of adequate field equipment**
- **Poor geographic reconnaissance**
- **Poor logistic and financial availability**
- **Low level of community acceptability**
- **High resistance to insecticide of choice (DDT)**

### ***3. Epidemic Prevention and Control***

- **Malaria epidemics usually occur at 5-8 years intervals**
- **1958** – the worst malaria epidemic with about **3 million cases** and **153,000 deaths**
- **Since then, 1-2 epidemics have been occurring per decade:**
  - **1980/81, 1987/88, 1994/95, 1998/99, 2003/04.**
- **Recently highly localized outbreaks**

# ***Challenges in Epidemic Control***

- **Poor early warning system**
- **Poor epidemic preparedness and response capacity**
- **Poor early detection systems**
- **Early warning/early detection system should be improved through operational research?**

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**Thank You!**

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