Malaria

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435 Lecture Notes

Original Content | **Titles** | Additional Notes | **Important**

Objectives:

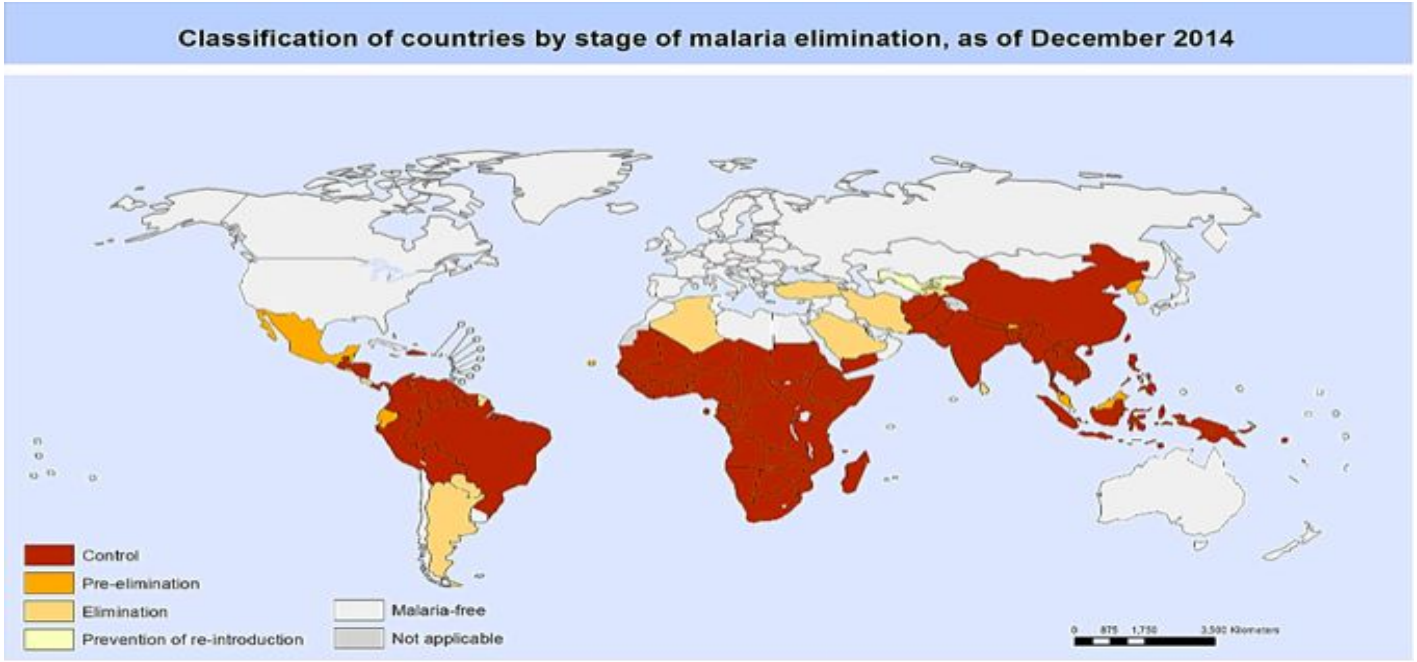
- Epidemiology of malaria
- Clinical picture
- Mode of transmission
- Risk factors
- Prevention and control

- Malaria is a life-threatening disease caused by **Plasmodium parasites** that are transmitted to people through the **bites of infected mosquitoes.**

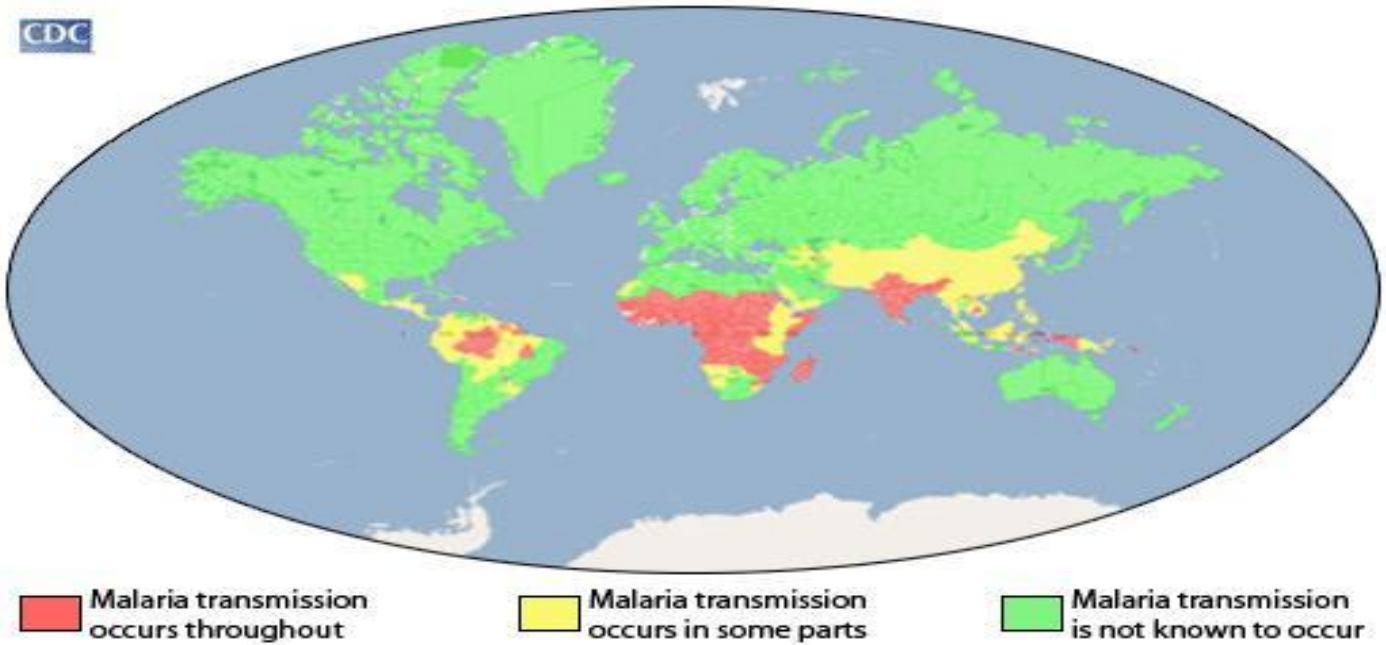
- Malaria is responsible for approximately 1-3 million deaths per year

Epidemiology

- Between 2000 and 2015, malaria **incidence** fell by 37% globally.
- During the same period, malaria **mortality** rates decreased worldwide by 60% among all age groups, and by 65% among children under 5.
- An estimated 6.2 million malaria deaths have been averted globally since 2000.
- In 2014, 13 countries reported zero cases of the disease and 6 countries reported fewer than 10 cases.



Control: malaria is endemic and needs to be controlled
Pre-elimination: near zero
Elimination: Don’t have malaria. E.g. saudi arabia
Eradication: worldwide elimination



An approximation of the parts of the world where malaria transmission occurs.

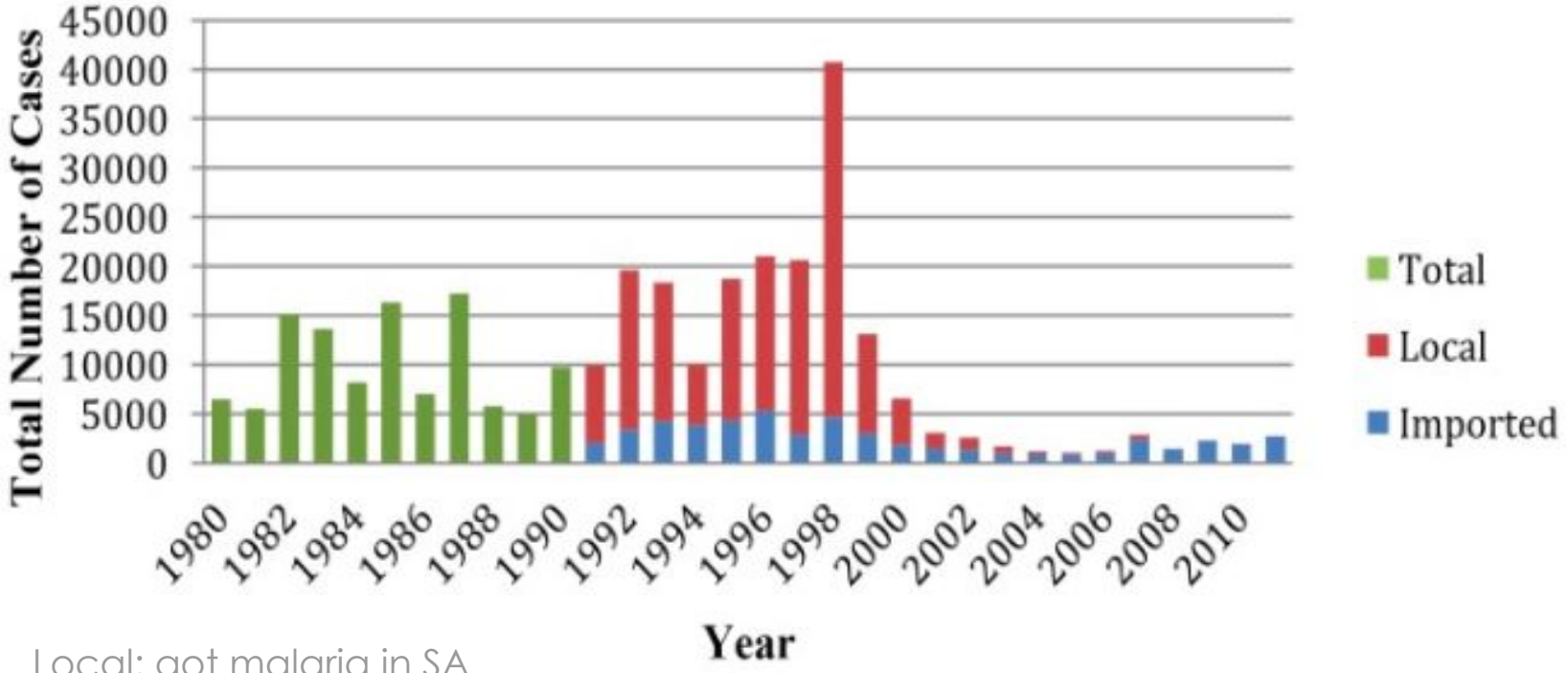
Malaria in Saudi Arabia

- Areas at the **southern region** are at risk of malaria transmission, specifically Asir and Jizan. The Dominant Malaria Species in Saudi Arabia is P. Falciparum.

  P. vivax not in saudi arabia

- Saudi Arabia achieved a decrease in malaria cases and case incidence rates of ≥75%.

Indigenous cases of malaria Saudi Arabia 2014 :



- Local: got malaria in SA
- Imported: came to SA with the disease

Total number of cases has decreased after the outbreak in 1998 due to effective control measures treatment and prevention)

Imported malaria in Saudi Arabia 1999-2010 :

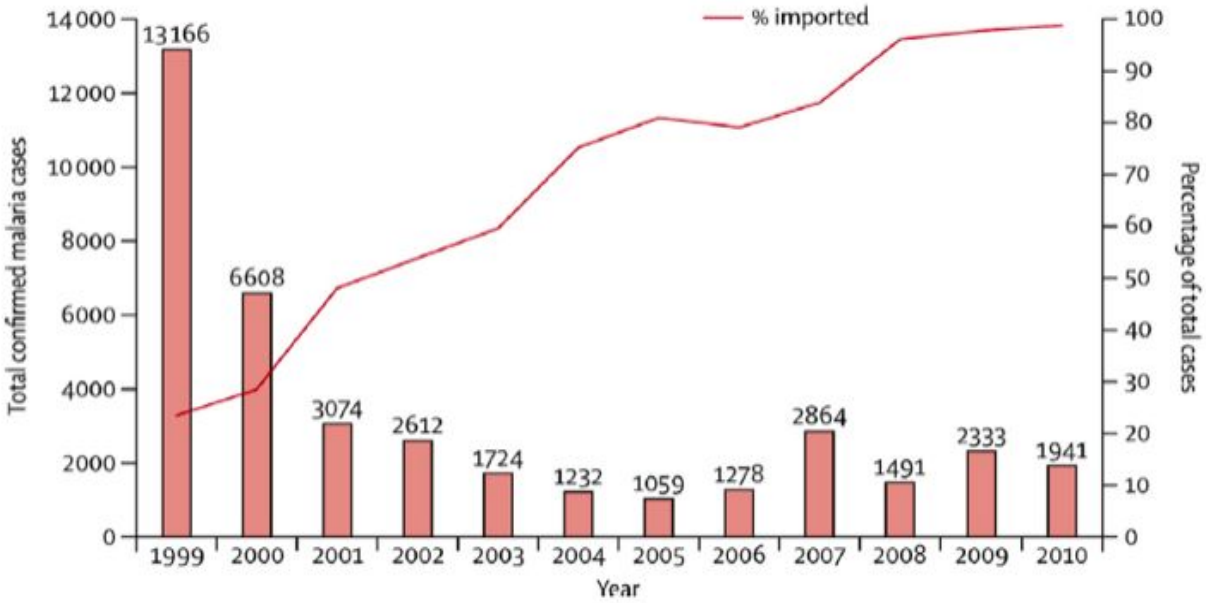


Fig. 1. Indigenous and imported malaria in Saudi Arabia, 1999–2010 (Cotter et al., 2013).

Malaria in Saudi Arabia

- Malaria outbreak in 1998.
- Since then, only a few cases were reported
- In 2012 , only 82 cases of malaria were reported..
- The proportion of imported malaria has increased from 23% to 99% of **total detected cases.**

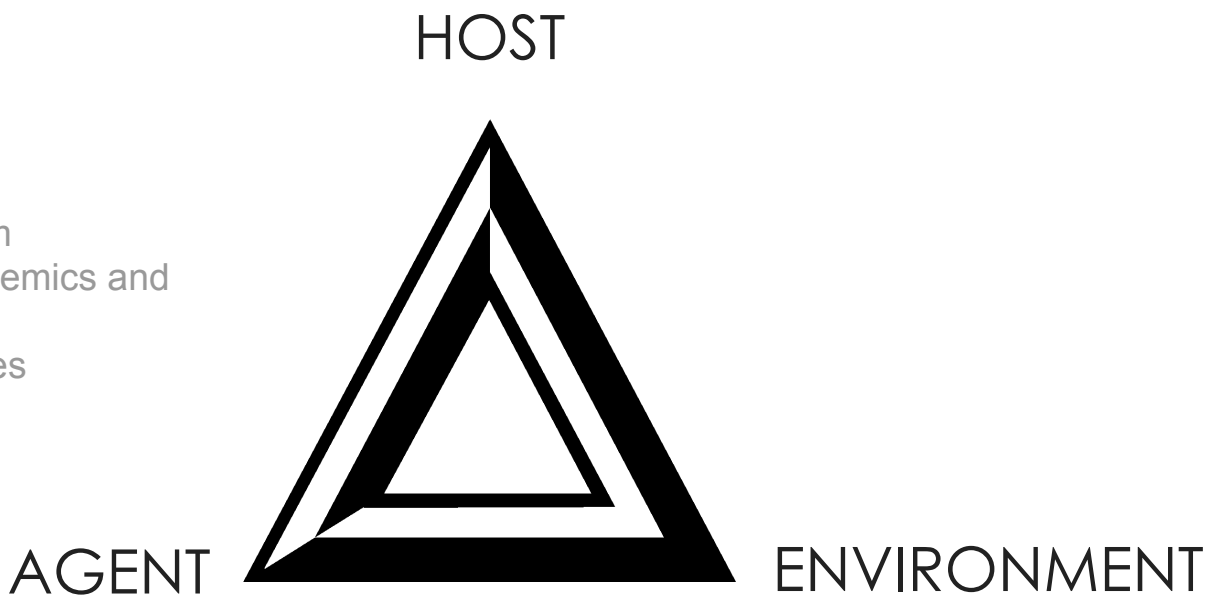
  i.e. now there is almost no local cases, mostly imported

- **Imported malaria:** via asymptomatic travelers from malaria endemic areas, sustains a threat for possible resurgence of local transmission:

  Workers, immigrants, pilgrims.

Analytical Epidemiology Triad:

- Host = human
- Agent = P. falciform
- Environment = endemics and overcrowding
- Vector = mosquitoes



Plasmodium Parasites:

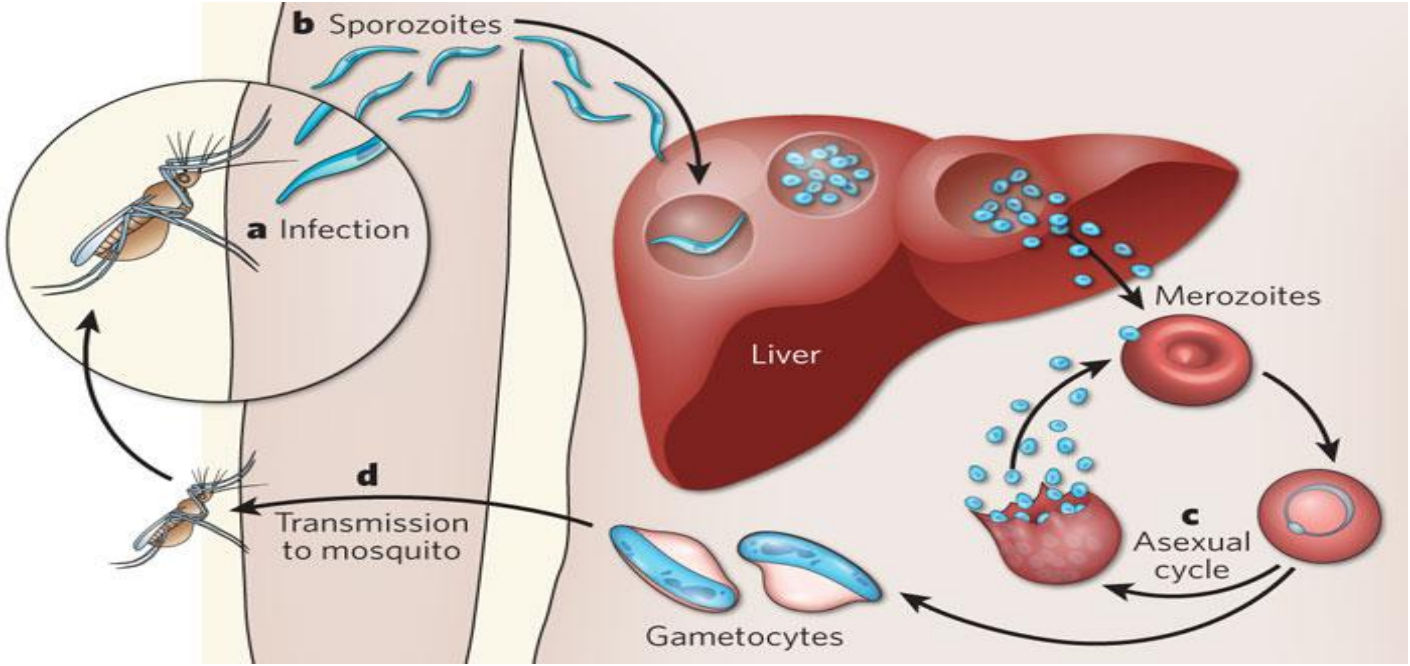
- The parasites are spread to people through **the bites of infected female Anopheles mosquitoes (vector)**.
- **Five** parasite species that cause malaria in humans
- **P. falciparum (in SA) and P. vivax** pose the greatest threat.

So transmission is mainly by vector

Other modes of transmission:

- From mother to unborn child (vertical transmission)
- Blood transfusion or needle pricks

Plasmodium Parasites transmission and lifecycle:



We won’t be asked about the life cycle

Symptoms

Early symptoms		Severe illness
Fever Headache Chills	**If not treated early** **(within 24 hours)** **might progress to**	Severe anemia Respiratory distress Cerebral malaria Multiorgan failure

Risk factors:

Host factors: decreased immunity or no previous exposure

The most vulnerable are persons with **no or little immunity against the disease** in areas with high transmission (such as Africa south of the Sahara).

- **Young children**, who have not yet developed partial immunity to malaria
- **Pregnant women**, whose immunity is decreased by pregnancy.
- **Travelers or migrants** coming from areas with little or no malaria transmission, who lack immunity. i.e. never been exposed = no partial immunity

Immunity against malaria (protection)

- **Genetic Factors:** Biologic characteristics present from birth can protect against certain types of malaria: (having the **sickle cell trait**)
- **Acquired Immunity:** newborns in endemic areas will be protected during the first few months by maternal antibodies.
- **Repeated attacks of malaria:** will have partial immunity

Control:

The main way to reduce malaria transmission at a community is **vector control**

- Insecticide-treated mosquito nets (ITNs)

شبكة منقعة بمبيد حشرات

- Indoor spraying with residual insecticides
- Antimalarial medications
- Vaccination

Insecticide-treated mosquito nets (ITNs)

- For **all at-risk persons**
- Provision of **free LLINs** (Long lasting insecticidal nets)
- **Everyone sleeps under a LLIN every night.**

لأن نشاط البعوضة أكثر شيء في الليل

Indoor spraying with residual insecticides

- **At least 80%** of houses in targeted areas are sprayed. If 80% is clear, the rest 20% will then be also protected
- Protection depends on type of insecticide.

Antimalarial medications (chemotherapy)

- To travelers
- Pregnant women
- Infants in endemic areas
- Seasonal chemoprevention

  يعطى لكل الناس وقت الموسم

Vaccine

- **Still under trial**

Prevention And Control Of malaria in KSA

Mainly vector control + نظام حصن

The current elimination strategy in Saudi Arabia focuses mainly on:

1. Targeting **high risk areas** for sustained preventative measures such as (Long lasting insecticide treated nets, Indoor residual spraying)
2. **Management of infection** through rapid confirmed diagnosis and treatment.
3. Individual case follow up and reactive **surveillance** with appropriate treatment and vector control.
4. Active case detection **at borders** with screening and treatment (reduces imported transmission).

References:

- http://www.who.int/mediacentre/factsheets/fs094/en/.
- **http://www.cdc.gov/malaria/about/biology/human_factors.html**