Conferência sobre o Impacto das Mudanças Climáticas na Saúde

The future of malaria prevention and control in an era of a changing climate

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INSTITUTO NACIONAL DE SAÚDE MOÇAMBIQUE

OBSERVATÓRIO NACIONAL DE SAÚDE

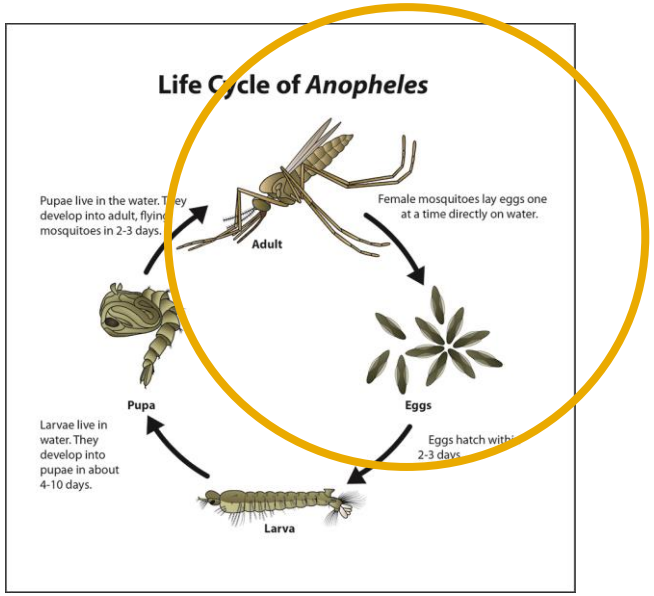
Outline

- How climate affects malaria
- How has climate changed in Mozambique
- How do we expect climate to change in the future?
- What do these expected changes mean for malaria control?
- What can we do about it?

How does climate affect malaria?

Primary

- **Precipitation**
  - Breeding sites



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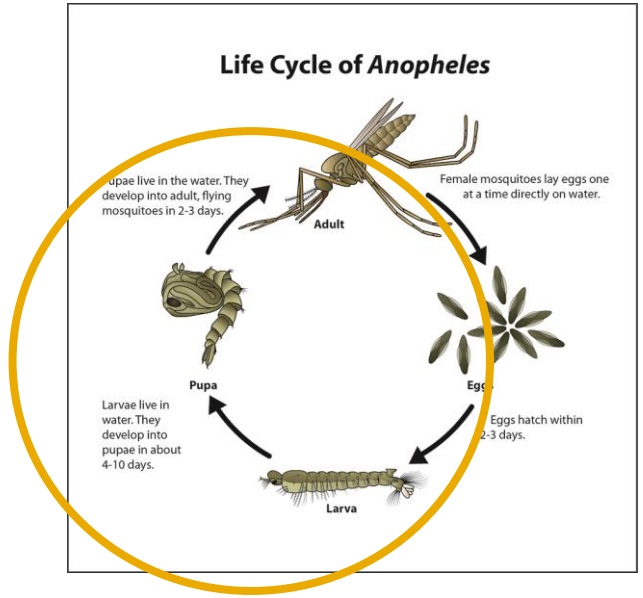
- **Temperature**
  - Vector development time
  - Parasite development time



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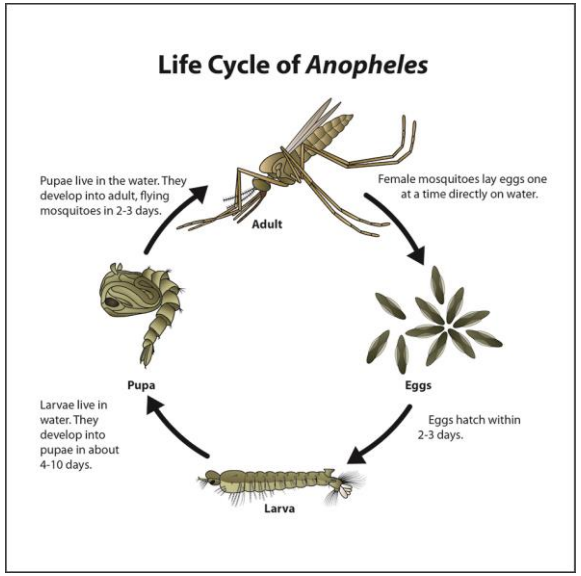
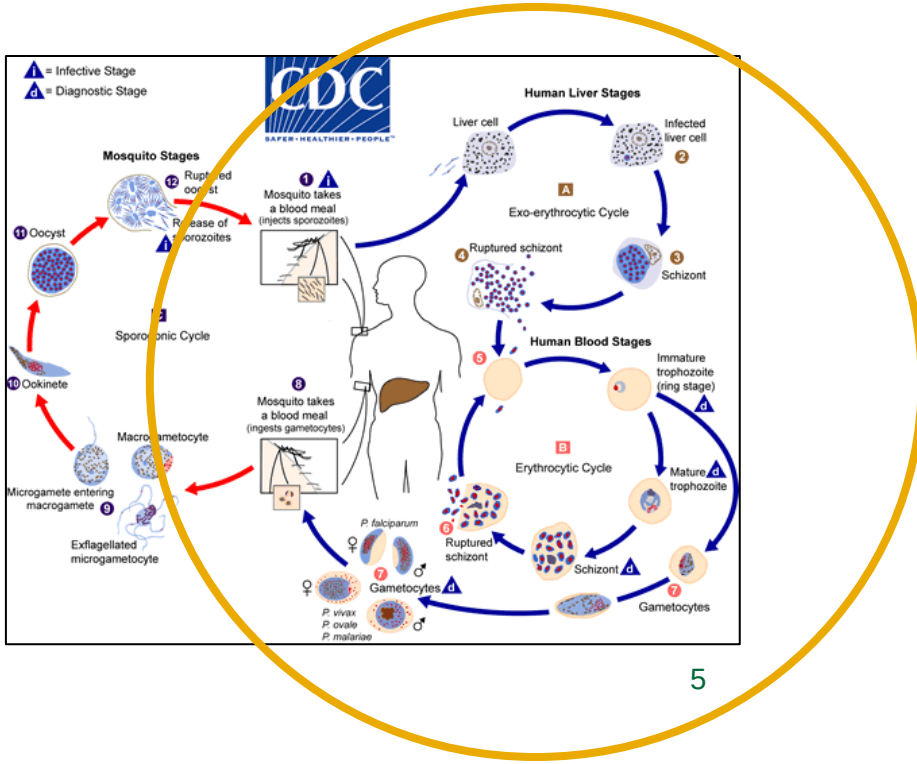
Secondary

- **Precipitation**
  - Access to care
  - Health care delivery





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- **Precipitation**
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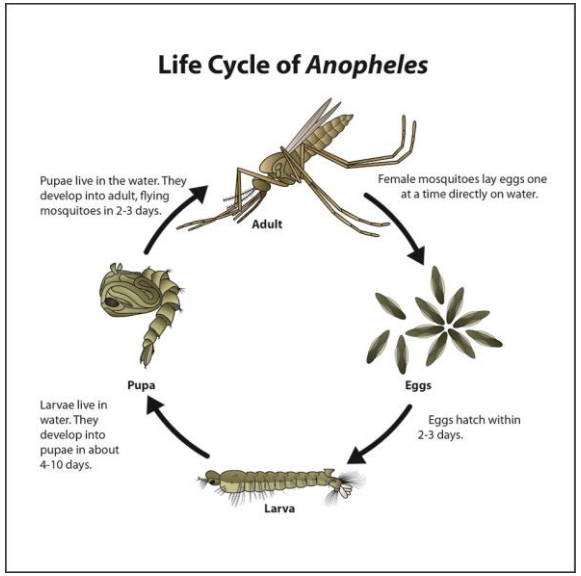
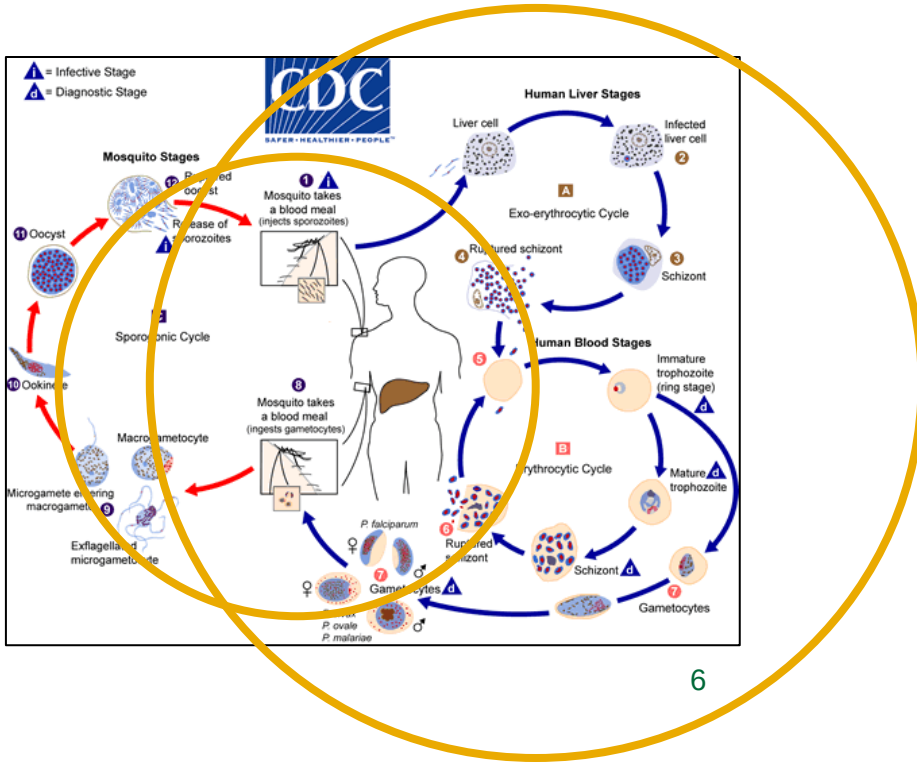
- **Temperature**
  - Vector development time
  - Parasite development time

Secondary

- **Precipitation**
  - Access to care
  - Health care delivery
  - Delivery/effectiveness of interventions





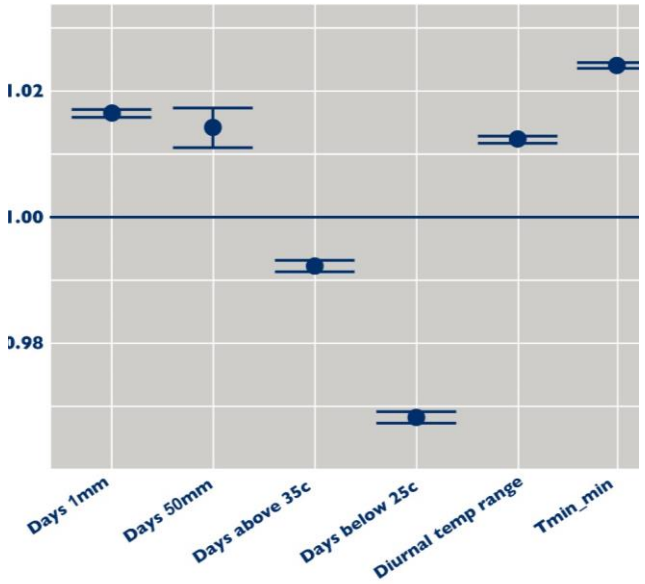
Relationships are not linear

Definitions and indicators matter

- Impact of precipitation consistent at the national level
- Effect of temperature varies depending on the indicator

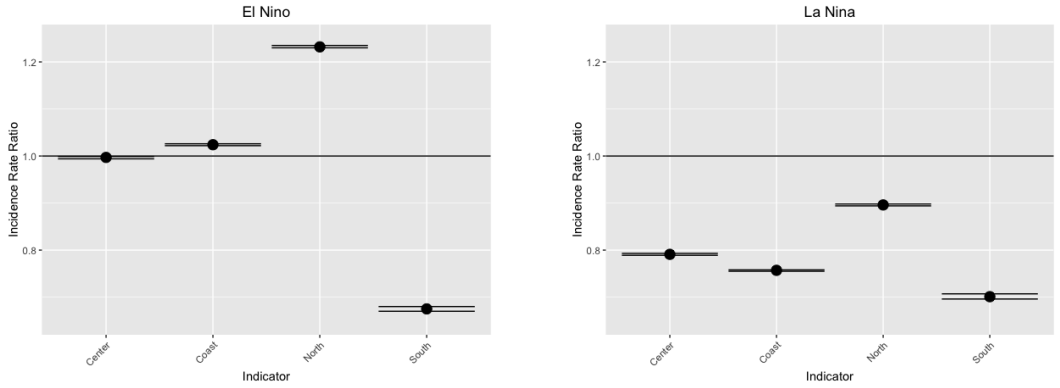
Regional climatology and environmental context matter

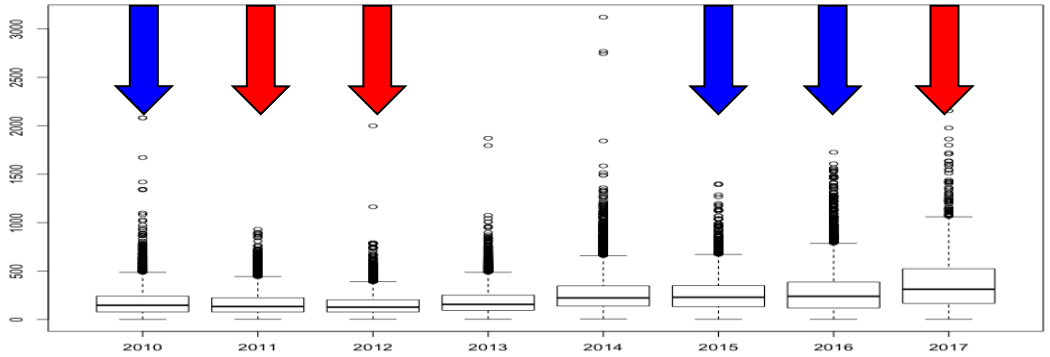
- Extreme precipitation events in the central and southern regions lead to more malaria, same events lead to less malaria in north and coastal regions

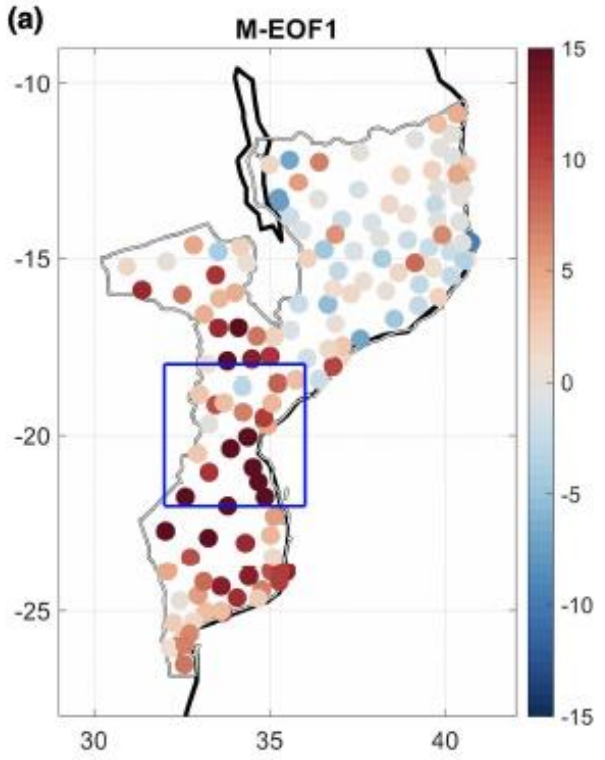


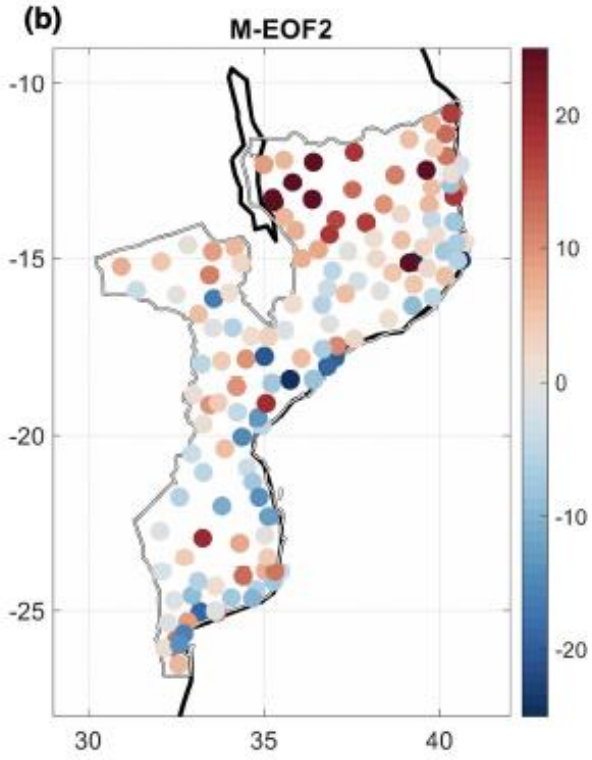
	Norte	Centro	Sul	Costeiro
Tmin min	**NA**	**1.02** (1.02,1.03)*	**1.03** (1.03,1.04)*	**1.01** (1.01,1.01)*
Days above 50mm	**0.21** (0.20,0.23)*	**1.13** (1.11,1.14)*	**1.31** (1.28,1.33)*	**0.89** (0.89,0.90)*
Days above 35ºC	**0.93** (0.93,0.94)*	**0.92** (0.92,0.92)*	**0.97** (0.96.0.98)*	**0.95** (0.94,0.95)*
Days below 25ºC	**0.90** (0.90,0.90)*	**0.94** (0.93,0.94)*	**0.93** (0.92,0.93)*	**1.01** (1.01,1.02)*
Diurnal temp range	**0.96** (0.95,0.96)*	**0.96** (0.95,0.96)*	**0.99** (0.99,0.99)*	**0.96** (0.96,0.96)*

Impacts of large scale oceanic patterns affect relationships







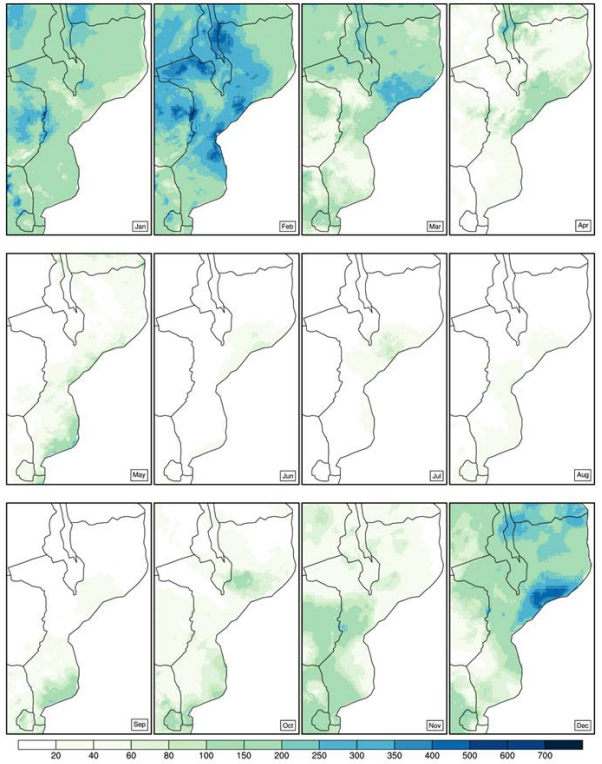


To predict impacts of future changes, first need to know what is normal

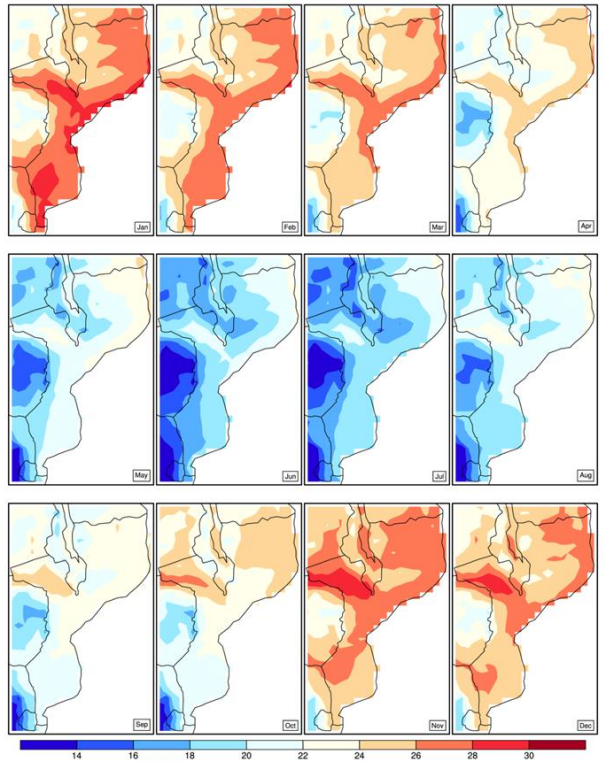
What is historical and current climatological profile?

Need to understand regional and temporal variation in:

- **Precipitation**
- **Temperature**
- **Seasonality**

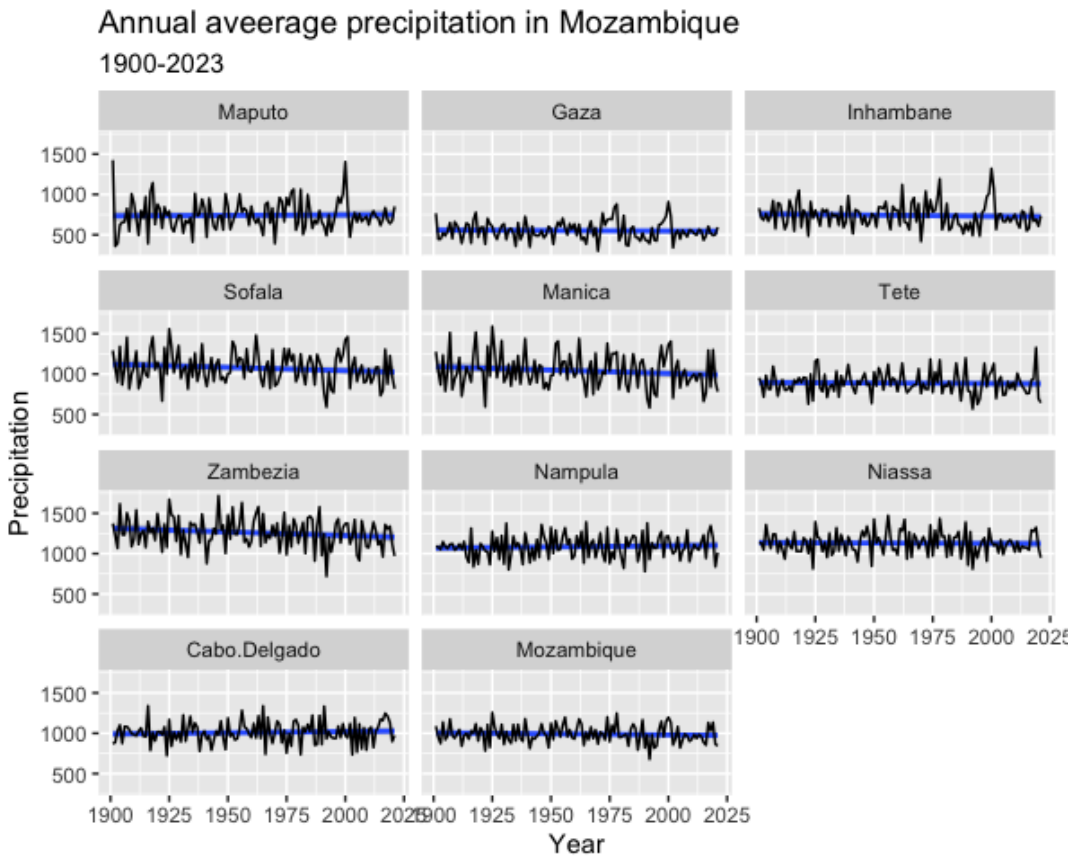


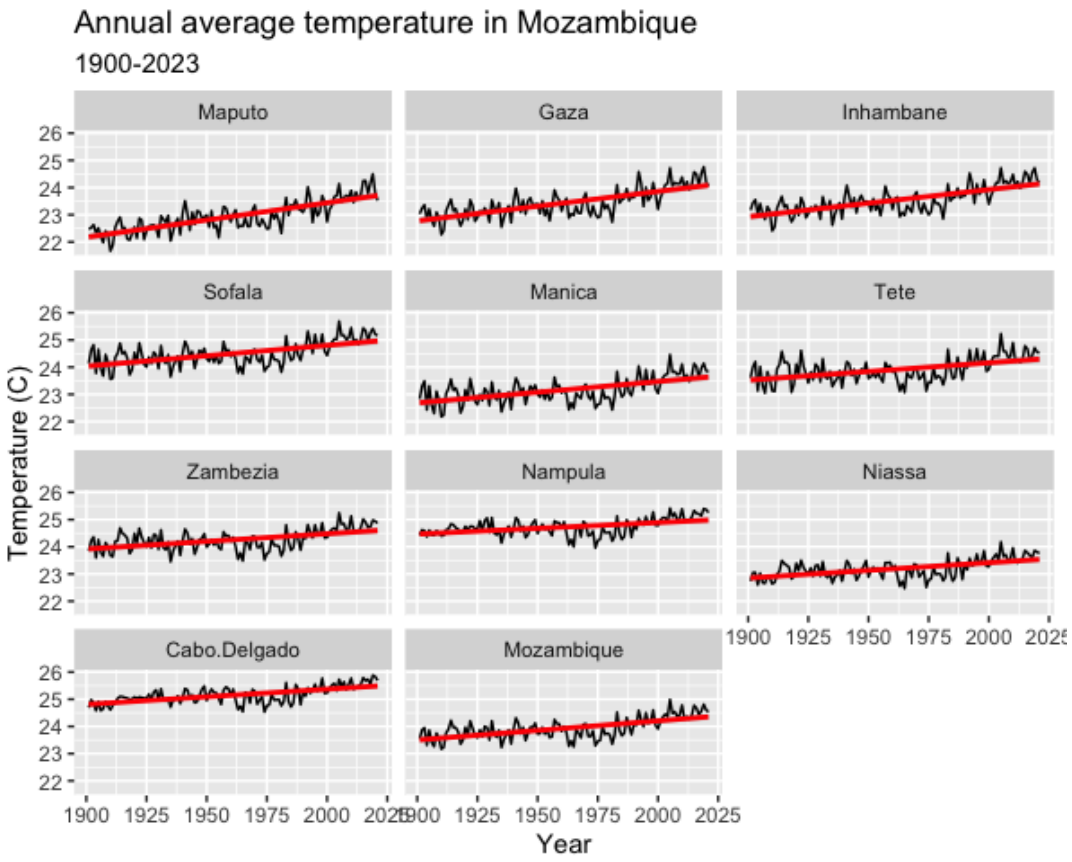
Ciclo sazonal de precipitação média mensal (mm) com base nos dados da CHIRPS. O mês do ano é indicado no canto inferior direito de cada painel.



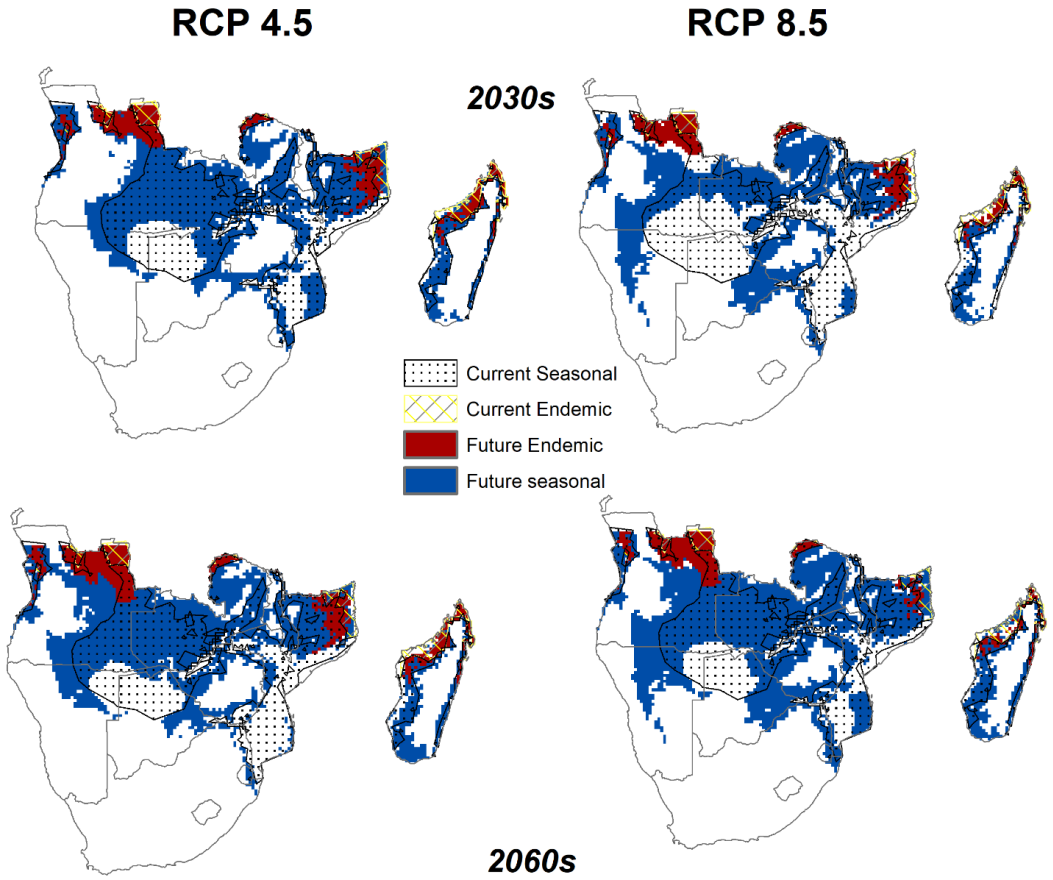
Ciclo sazonal de temperatura média mensal (°C) com base nos dados da CHIRPS. O mês do ano é indicado no canto inferior direito de cada painel.

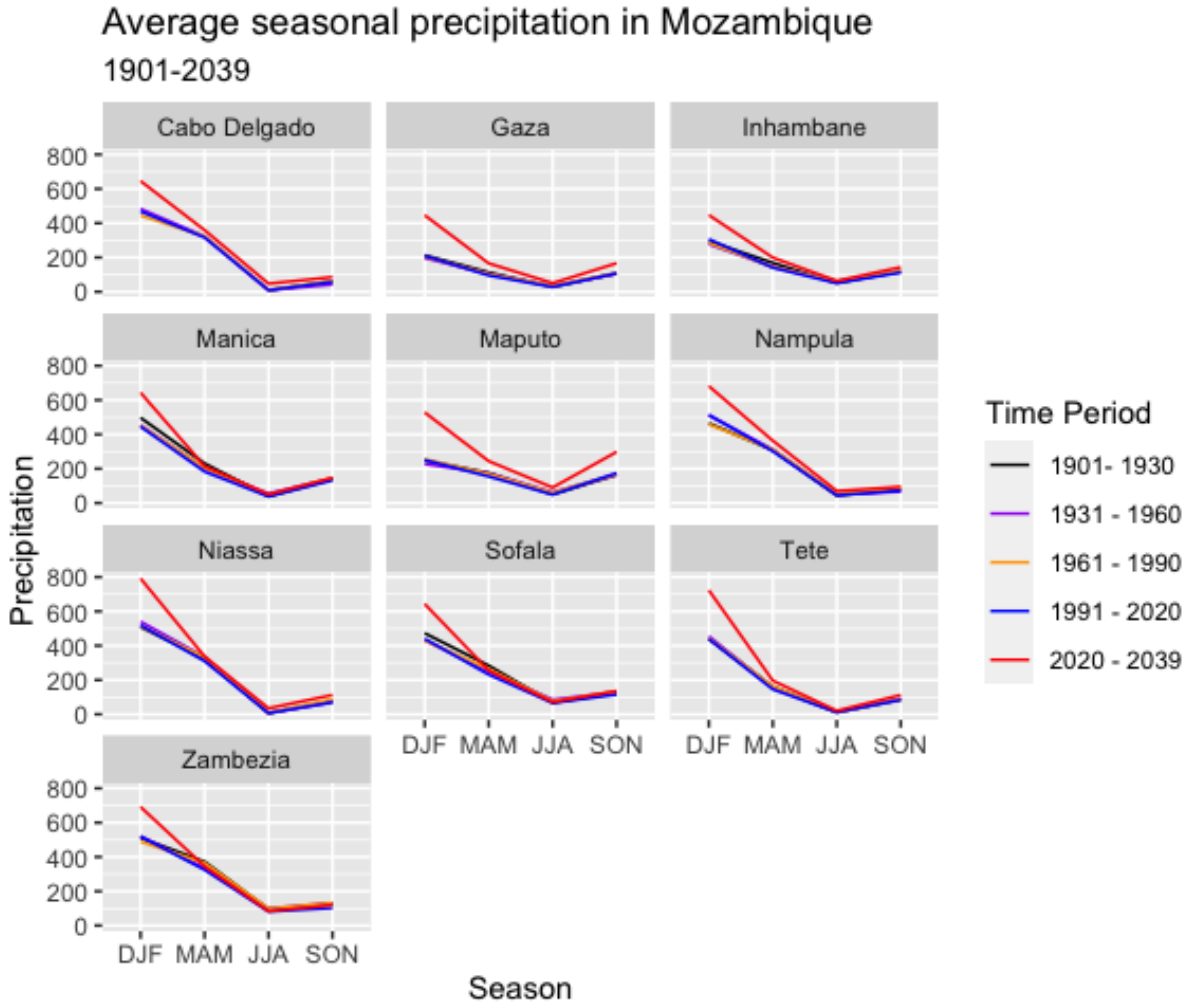
Historical profiles and predicted future changes





Predicted changes in seasonality



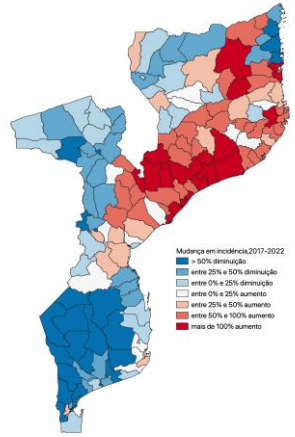


Climate change will affect what malaria interventions we do, when we do them, and where we do them

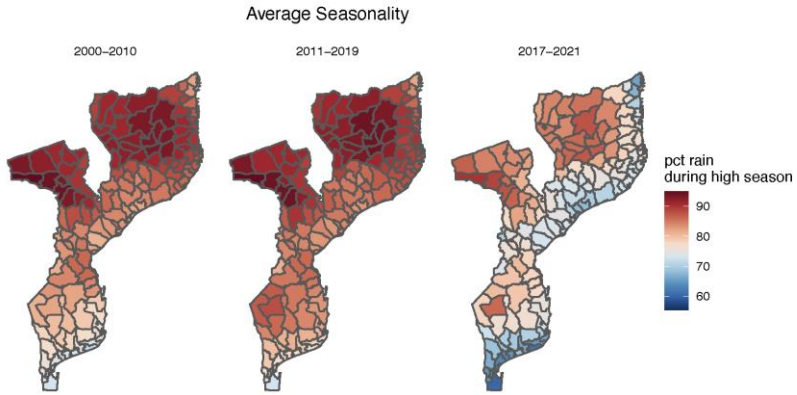
Potential changes and the interventions they will affect:

- **More frequent extreme weather events**
  - Expanded/enhanced community-based interventions
  - Environmental management
- **Onset, duration, intensity of rainy seasons**
  - Seasonal malaria chemoprevention (SMC)
  - Indoor residual spraying (IRS)
- **Shifting burden of transmission intensity**
  - IRS
  - Mass drug administration (MDA)
  - Test and treat
- **Population movement**
  - SMC
  - MDA
  - Test and treat
  - Expanded/enhanced community-based interventions
  - Larvaciding

IRS: traditionally focused on high-burden areas



SMC: should only be implemented in areas with >60% rainfall in 4 consecutive months



Conclusions and recommendations

Lot of uncertainty about predictions, but:

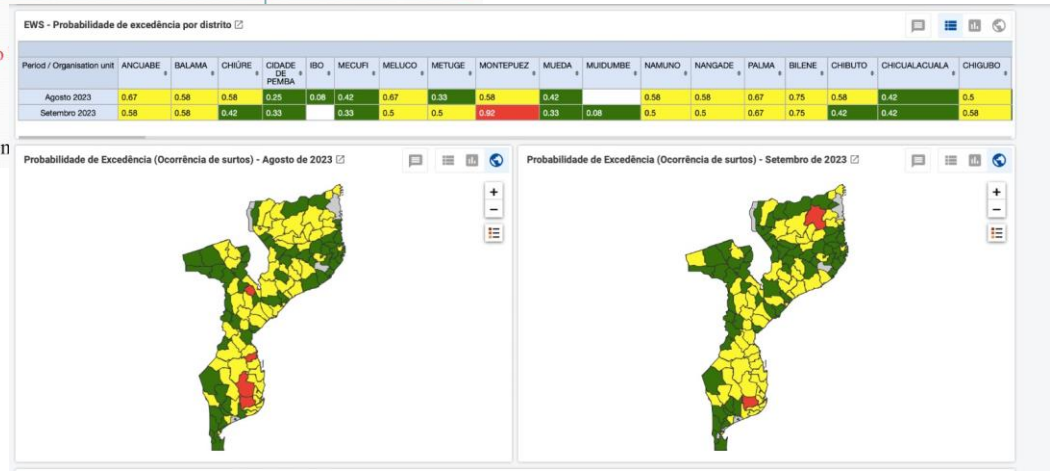
- **Temperature will increase**
- **Precipitation will likely be more variable**
- **Seasonality likely to change and be more unpredictable**
- **Burden likely to shift accordingly**
- **More frequent and intense cyclones will significantly affect all of the above**

Given uncertainty, more data is necessary

- **Changes in seasonality**
- **Continued longitudinal analysis of burden patterns**
- **Exploration of relationship between transmission and climate/weather**

Key priorities moving forward

- **Early warning systems**
- **Country climate profiles for climate-sensitive diseases**
- **Routinely updated relationships between key climatic and disease indicators**



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