Modeling Treatment Strategies

Objective

Prevent emergence and spread of resistance

Strategies

- Treatment policy (combinations, MFTs
- Financing policy (AMFm)
- Regulatory/health system policy (diagnostics, improved prescribing)
- Innovation policy (investing in new classes)

Treatment Policy

- Single first-line treatment for entire country or region

- Choice is determined by best available drug at lowest price

- Resistance rarely considered (unless it has already emerged)

Current Situation

- Adopt single first-line treatment
- Sequential combinations
- Alternative approaches
  - Cycling antibiotics (in US hospitals)
  - Mosaic application of pesticides (agriculture)
  - Refuge strategies (for prevention of resistance in Bt crops)

Multiple First-line Treatments

- Work like combinations at population level
- Delay emergence AND spread of resistance
- Lessons from agriculture
- Need recognition in national policy
  - Different ACTs for pediatric and adult formulations
  - Different ACTs in public and private sector
  - Different ACTs in different regions

Questions for this session

- What is the value added of multiple-first treatments

- At what scale should such a strategy be implemented to be useful

- What are the key biological parameters at work?

What's next for resistance modeling?

- Modeling so far has been on strategies using existing drugs
- Future models can help inform the kinds of new drugs we will need
- Spatial models of resistance emergence and spread
- Models for guiding antimalarial financing strategies through AMFm (through relative prices)