NTD MODELLING CONSORTIUM

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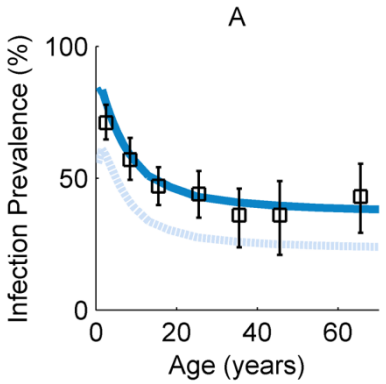
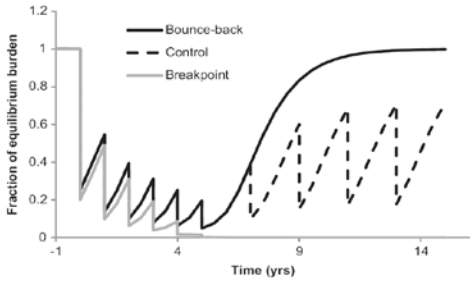
What is modelling?

- Use quantitative methods to
  - analyse infectious disease data
  - model transmission and interventions
- Powerful scientific and strategic tool
  - Synthesise knowledge
  - Rigororise our understanding of process
  - Encapsulate a range of biological and clinical insights
  - New way of looking at existing data
  - Understand indirect effects of interventions
  - Investigate ‘what-if’ scenarios
- Best done
  - Addressing real policy questions
  - In collaboration with stakeholders, epidemiologists, experts in the field





Central question

The consortium will address the epidemiological question:

Are we on target for the 2020 goals with the current strategies?

If not, what other strategies will be required where?

Grateful for support from:
Bill and Melinda Gates Foundation
Novartis Foundation
Children's Investment Fund Foundation

Modelling groups

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CHAGAS DISEASE Dobson, Princeton Lee, Johns Hopkins +Galvani, Yale	HAT Galvani, Yale Keeling, Warwick +Chitnis, Swiss TPH; +de Vlas Erasmus	LEPROSY de Vlas, Erasmus Medley, Warwick Porco, UCSF
LYMPH. FILARIASIS Hollingsworth, Warwick Michael, Notre Dame Stolk, Erasmus	ONCHOCERCIASIS Basanez, Imperial Stolk, Erasmus	SCHISTOSOMIASIS Anderson, Imperial King, CWRU +Galvani, Yale
SOIL-TRAN. HELMINTHS Anderson, Imperial de Vlas, Erasmus +Montressor, WHO	TRACHOMA Gambhir, Monash Lietman & Porco, UCSF	VISCERAL LEISH. de Vlas, Erasmus Medley, Warwick

Why all the diseases together? Cross-cutting

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Transmitted Helminths

istosomiasis

Trachoma

chocerciasis

Lymphatic Filariasis

Chagas

Human African Trypanosomiasis

Visceral Leishmaniasis

Leprosy

Mass Drug Administration

- Who to treat? How often to treat?
- How do we know where we are?
- When to stop?
- Dynamics of recrudescence ? Sampling?

Vector control

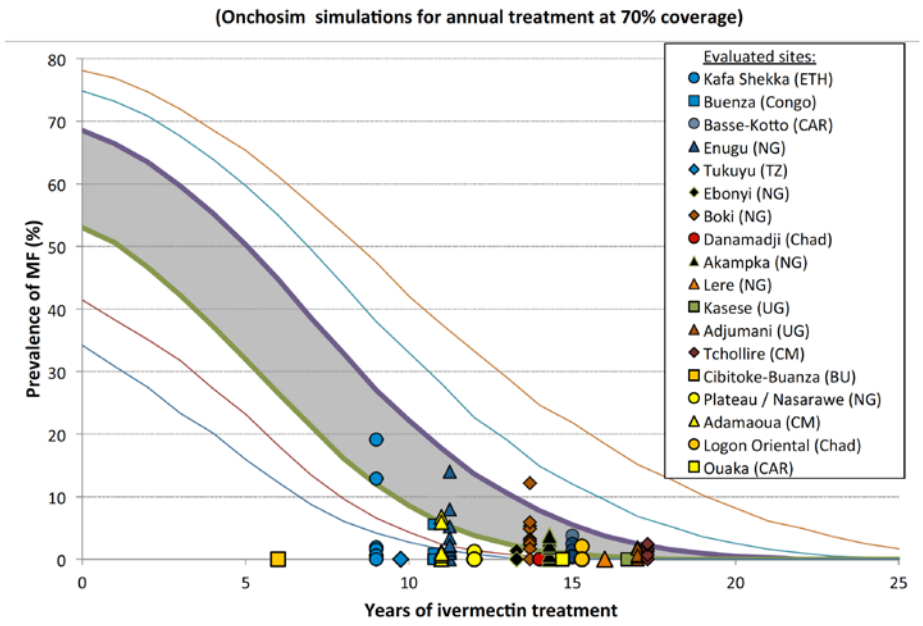
- Role of different vectors?
- Impact of interventions in different settings ?

Why multiple groups?

- Scientific robustness
  - Investigate underlying assumptions
  - Parameter uncertainty
- To provide a coherent analysis for policy
  - Resolve differences in predictions or recommendations

- Consortium includes a mechanism for rigorous model comparison

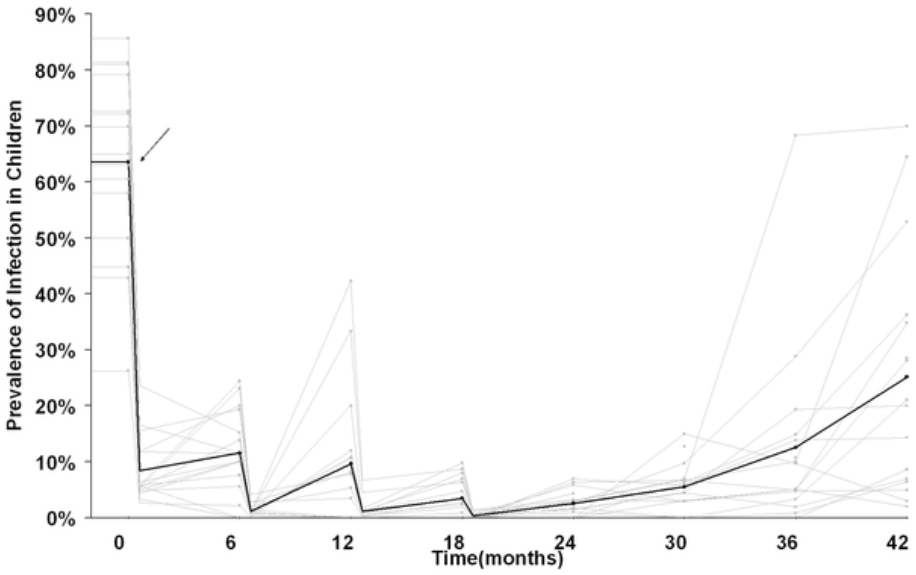
Predictions & data



- Predicted trends and expected duration of MDA for different settings for elimination
  - Useful for planning
- Alternative strategies?
  - When? Where?
  - Annual vs 6-monthly
- Importance of non-compliance?
- Seasonal treatment?

Presented by Hans Remme at APOC Consultative Meeting on Onchocerciasis Elimination, Ouagadougou, Burkina Faso, March 2013.

Heterogeneity in response



- What are main drivers?
  - Understanding of setting and programme
- What should we be measuring?
- How will we know if we eliminate?

Reduction and return of infectious trachoma in severely affected communities in Ethiopia Lakew T, House J, Hong KC, Yi E, Alemayehu W, Melese M, Zhou Z, Ray K, Chin S, Romero E, Keenan J, Whitcher JP, Gaynor BD, Lietman TM. PLoS Negl Trop Dis. 2009;3(2):e376.

Uncertainties

- What will be the impact of new treatments on transmission? (e.g. HAT, VL)
  - What combinations of interventions will get us to our goal?
- Indirect measures of worm burden
  - How should we interpret these?
  - Are additional studies needed?
- Relationship between infection and disease
  - Better diagnostics help us understand this dynamic, but pose new questions

Partnerships

- Modelling is a tool to be used as part of this effort
- Relies on good communication by both sides
- Relies on high quality, timely data
  - Individual data is incredibly valuable
  - Sharing data is the start of a conversation
  - New analyses add value to existing studies
- Opportunities for capacity building