Integrating maps and models: projections on eliminating NTDs

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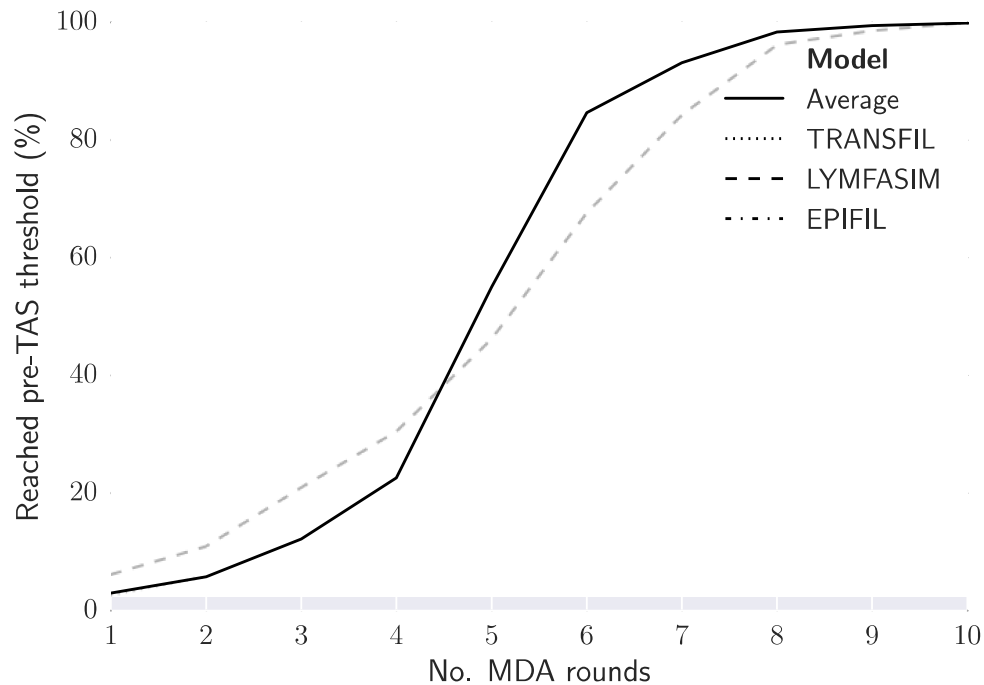
Erasmus MC: Wilma Stolk, Sake de Vlas

University of Notre Dame: Edwin Michael, Brajendra Singh, Morgan Smith

Imperial College London: Maria-Gloria Bazanez, Martin Wlaker

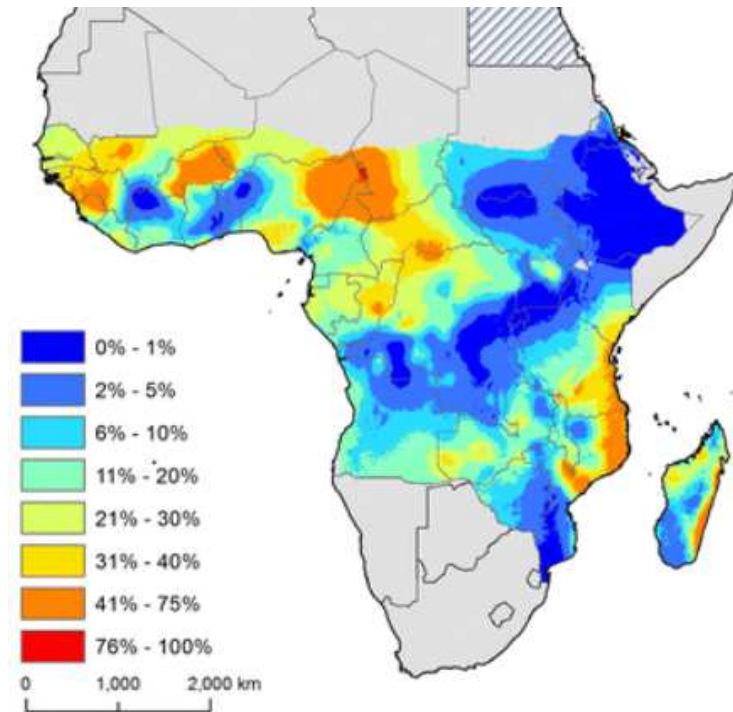London School of Hygiene and Tropical Medicine: **Rachel Pullan**, Jorge Cano

Lancaster University: Emanuelle Giorgi

Starting point... what tools do we already have?
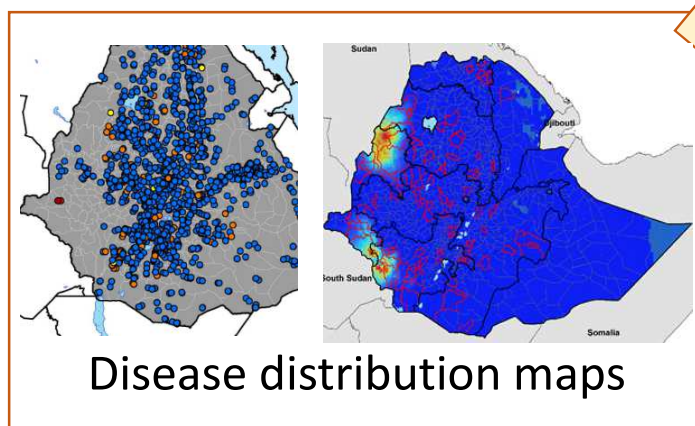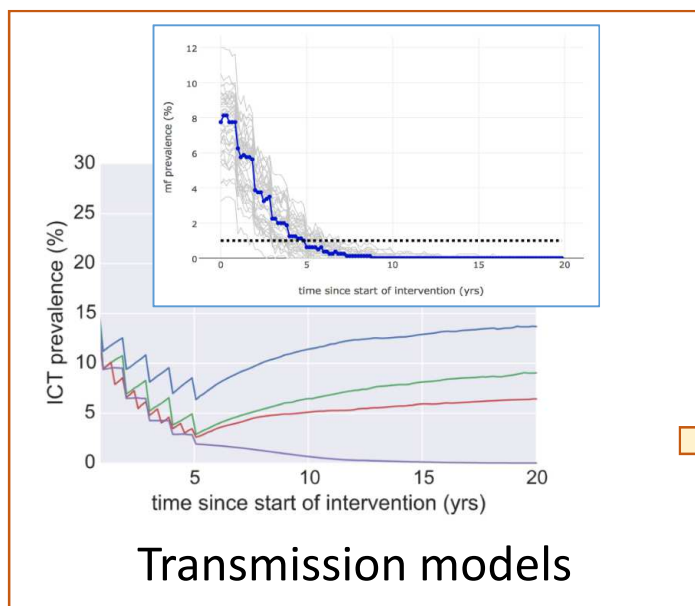

Dynamic transmission models:
- Several different models available
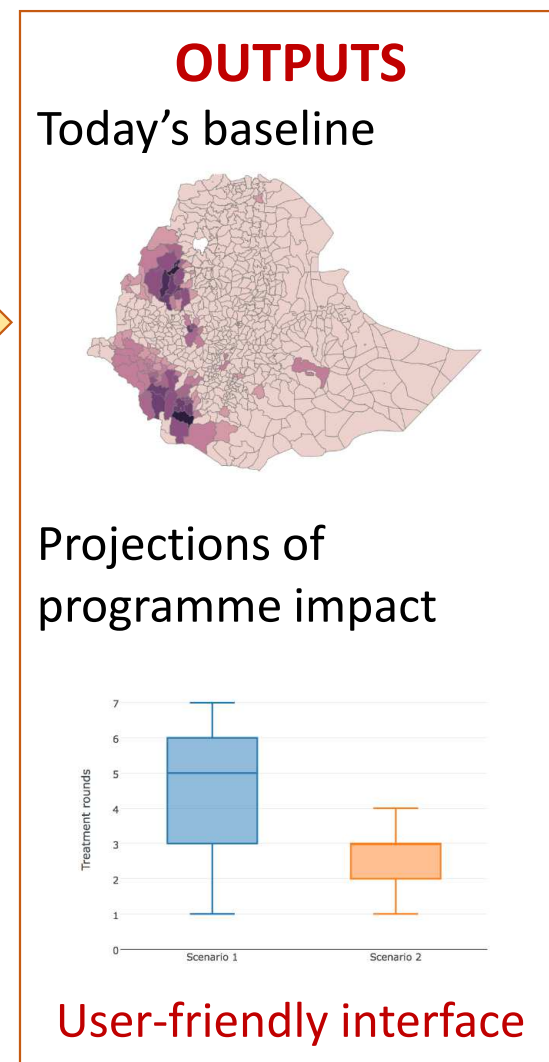- Each simulation is specific to a given community

High resolution maps of disease distribution:
- Geostatistics enables prediction in unmapped areas
- Large amounts of new data for many countries

Applying dynamic transmission models in a real world context

Transmission models

Disease distribution maps

Intervention history

Future intervention plans

Computational and statistical framework

OUTPUTS

Today's baseline

Projections of programme impact

User-friendly interface

A working example: LF in Ethiopia


```
┌─────────────┐
│  5 effective│
│   rounds    │
└─────────────┘
       │
       ▼
┌─────────────┐
│   Pre-TAS   │
└─────────────┘
  PASS     FAIL
   │         │
   ▼         ▼
┌──────┐  ┌──────────┐
│ TAS  │─►│ 2 further│
└──────┘  │  rounds  │
   │ FAIL └──────────┘
   │           │
 PASS          ▼
   │      ┌──────────┐
   │      │  Pre-TAS │
   │      └──────────┘
   │           │
   │         PASS
   ▼           ▼
┌──────┐  ┌──────────┐
│ Stop │◄─│   TAS    │
└──────┘  └──────────┘
     PASS
```
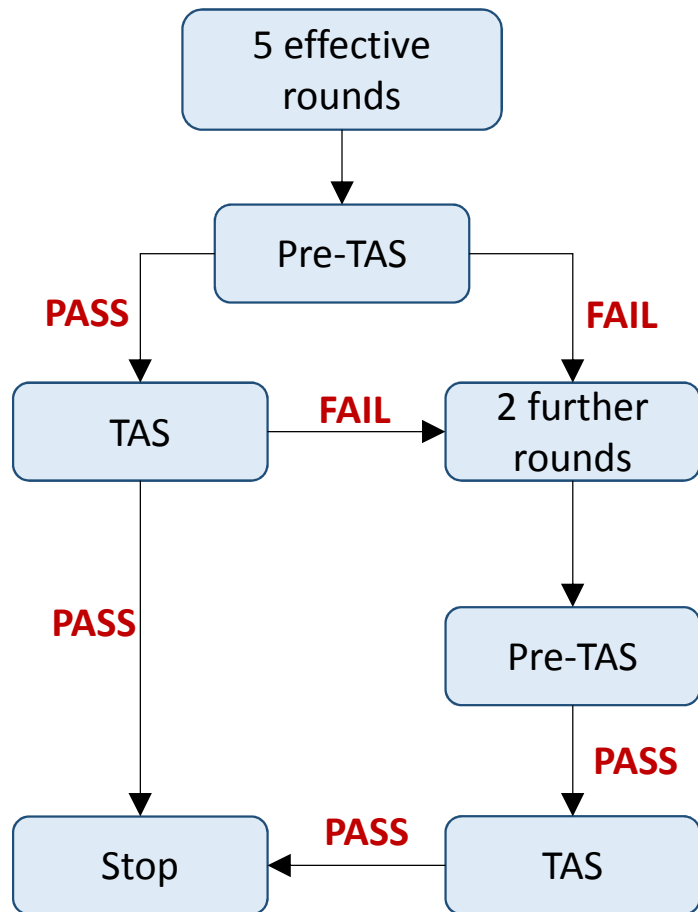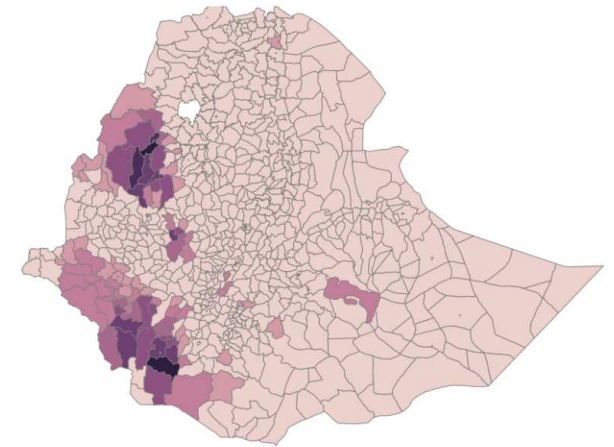
For a given implementation unit:

- What is the probability of reaching low prevalence after 5 rounds?

- What is expected impact of twice yearly treatment?

- How important are coverage and systematic non-adherence