Why Model?

Current Challenges:

- Treatment controversies
- Limited real-world data
- Complex patient pathways
- Resource constraints

Modeling Benefits:

- Explore treatment strategies
- Clarify outcome measures
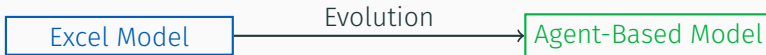- Predict resource needs
- Evidence-based decisions

Simple Approach (NHS England):

- Excel spreadsheet
- "Best guess" parameters
- Average patient behavior
- Quick but limited insights

Our Approach (Agent-Based):

- Individual patient simulation
- Build from known parameters
- Probabilistic events
- Rich, detailed insights

Excel Model → Evolution → Agent-Based Model

Model Comparison

Simple Models Assume:

- All patients start with same vision
- Perfect treatment adherence
- No appointment delays
- Uniform response to treatment

Why This Matters

- Captures NHS capacity constraints
- Models actual patient populations
- Predicts realistic outcomes
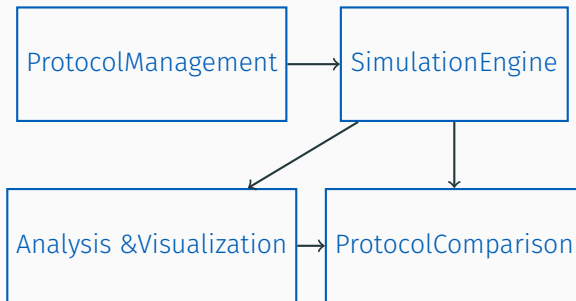- Enables better resource planning

Our Simulation Includes:

- Vision distribution at baseline
- Real discontinuation patterns
- Treatment gaps and delays
- Individual patient trajectories

Result: Evidence-based insights, not theoretical averages

Our Solution

Four Key Modules:

Next: Live demonstration of the application

[Switch to Screen Recording]

Demonstration includes:

- Loading treatment protocols
- Running 1000-patient simulation
- Exploring patient journeys
- Visualizing population outcomes
- Comparing different protocols

Key Insights

Model Reveals:

- Treatment pattern impacts
- Resource utilization peaks
- Patient outcome distributions
- Protocol efficiency metrics

Enables:

- Evidence-based protocols
- Capacity planning
- Cost-effectiveness analysis
- Commissioning decisions

Future Development
Cost calculator module in development for full economic analysis

Questions?

Contact:
your.email@nhs.net

Project Repository:
`https://github.com/lh/vegf-1`
Application:
`https://vegf-1.streamlit.app`

Acknowledgments:
HSMA Team | NHS England | Trust Leadership