Forecasting Engine for Epidemic Response Planning

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Epidemic response requires simultaneous planning for multiple transmission scenarios while the pathogen's characteristics are still being determined. Decisions about containment measures, resource allocation, and public communication must be made before the epidemiological picture is complete. Current planning tools generate point forecasts that decision-makers either follow or ignore. The forecasting engine maintains parallel transmission scenarios as governed planning branches, enabling public health agents to evaluate intervention strategies against multiple scenarios and promote containment measures based on accumulating epidemiological evidence rather than single-model predictions.

The scenario management gap in epidemic planning

Early in an epidemic, critical parameters are uncertain: transmission rate, incubation period, severity distribution, and the effectiveness of various interventions. Public health agencies must plan responses despite this uncertainty. Different parameter combinations produce dramatically different outbreak trajectories, requiring different intervention strategies.

Current epidemic planning tools generate forecasts based on estimated parameters and produce single-trajectory projections. Decision-makers receive a forecast and must decide whether to trust it. If the forecast changes next week as new data arrives, the response must pivot. This reactive cycle produces the oscillation between insufficient response and overreaction that characterized many epidemic responses historically.

Effective epidemic planning requires maintaining multiple scenarios simultaneously: a mild scenario where limited intervention suffices, a moderate scenario requiring targeted containment, and a severe scenario requiring broad public health measures. The response plan should prepare for all scenarios while deploying resources proportional to the evidence supporting each one.

Transmission scenarios as planning branches

The forecasting engine maintains each transmission scenario as a planning branch with its own intervention strategy, resource allocation plan, and public communication approach. The mild scenario branch plans for enhanced surveillance and voluntary measures. The moderate branch plans for targeted quarantine, healthcare surge capacity, and school closures. The severe branch plans for broad community measures, emergency healthcare expansion, and essential services continuity.

As epidemiological data accumulates, the evidence for each scenario is updated. Case counts, hospitalization rates, and transmission patterns provide data points that shift the probability weight among scenarios. The planning agent tracks which scenarios are gaining or losing evidentiary support and adjusts the readiness level of each branch accordingly.

Intervention measures that are common across scenarios can be promoted early with high confidence. Enhanced surveillance is appropriate under all scenarios, so it is promoted immediately. Measures that are scenario-specific, such as school closures or travel restrictions, remain contained until the evidence supports the scenario that requires them.

Evidence-gated intervention promotion

The containment boundary prevents premature commitment to interventions that may not be warranted. A public health agent under political pressure to act decisively can demonstrate through the planning graph that the evidence does not yet support the severe scenario's interventions while showing that preparations for those interventions are being maintained in containment.

Each intervention has defined promotion criteria: what epidemiological evidence would justify its deployment. These criteria are established in advance and documented in the planning graph. When the criteria are met, the intervention is promoted to execution with a structural record of the evidence that triggered promotion. When the criteria are not met, the intervention remains contained regardless of political or public pressure.

This evidence-gated approach provides decision-makers with a defensible framework. Interventions are deployed when the evidence supports them and withheld when it does not. The decision record shows the criteria, the evidence, and the timing of each promotion. Post-epidemic review can evaluate whether the evidence thresholds were appropriate without conflating the planning discipline with the eventual outcomes.

Multi-jurisdiction coordination

Epidemics do not respect jurisdictional boundaries. The executive graph aggregates planning across jurisdictional agents, identifying coordination opportunities and conflicts. When one jurisdiction plans to implement travel restrictions that affect an adjacent jurisdiction's containment strategy, the executive aggregation detects the interaction.

For public health agencies, the forecasting engine provides the planning infrastructure that epidemic response has long needed: structured multi-scenario management with evidence-based intervention gating. The planning agent maintains preparedness across all plausible scenarios while committing resources only when the evidence warrants action. The result is more measured, defensible, and effective epidemic response based on structural planning discipline rather than reactive decision-making under pressure.

Forecasting Engine All 21 steps →

Plan before you act. Contain speculation. Promote only what passes.

Primary Technical Disclosure
○ Forecasting and Executive Graphs in Autonomous Cognitive Systems
Secondary Technical
○ Planning Graphs as First-Class Cognitive Structures○ Containment Layer and Delusion Boundary○ Branch Classification System○ Personality Field as Structural Modifier○ Executive Engine Multi-Agent Graph Aggregation○ Branch Dormancy and Deferred Promotion○ Proactive Speculative Maintenance (Dream State)○ Planning Graph Archival for Cognitive Forensics○ Cross-Agent Planning Graph Visibility○ Slope-Constrained Speculative Simulation○ Structural Separation From Verified Memory○ Forecasting Engine Architecture○ Forecasting Execution Cycle○ Emotional Modulation of Planning○ Executive Graph Conflict Resolution○ Planning Graph Delegation and Forking○ Temporal Anchoring and Lifecycle Management○ Forecasting as Coordination Primitive○ Forecasting-Modulated Discovery Traversal○ Forecasting as Confidence Input○ Integrity-Constrained Forecasting○ Forecasting for Training Curriculum○ Biological Signal to Forecasting Coupling○ Substrate-Agnostic Forecasting Deployment
Applications (General)
○ Surgical Robot Planning Through Governed Speculative Branches○ Defense Tactical Planning With Contained Speculation○ Forecasting Engine for Logistics Planning○ Forecasting Engine for Disaster Response Planning○ Forecasting Engine for Financial Portfolio Planning○ Forecasting Engine for Construction Project Planning● Forecasting Engine for Epidemic Response Planning○ Forecasting Engine for Space Mission Planning
Applications (Specific)
○ da Vinci Plans Trajectories, Not Consequences○ Anduril's Lattice Plans Missions Without Speculative Containment○ Boston Dynamics Plans Motion, Not Missions○ Shield AI's Hivemind Cannot Contain Its Own Speculation○ MuJoCo Simulates Physics Without Planning Governance○ NVIDIA Isaac

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- nick@qu3ry.net
- 72 28 14 36 01

Invented by Nick Clark | Founding Investors: Devin Wilkie