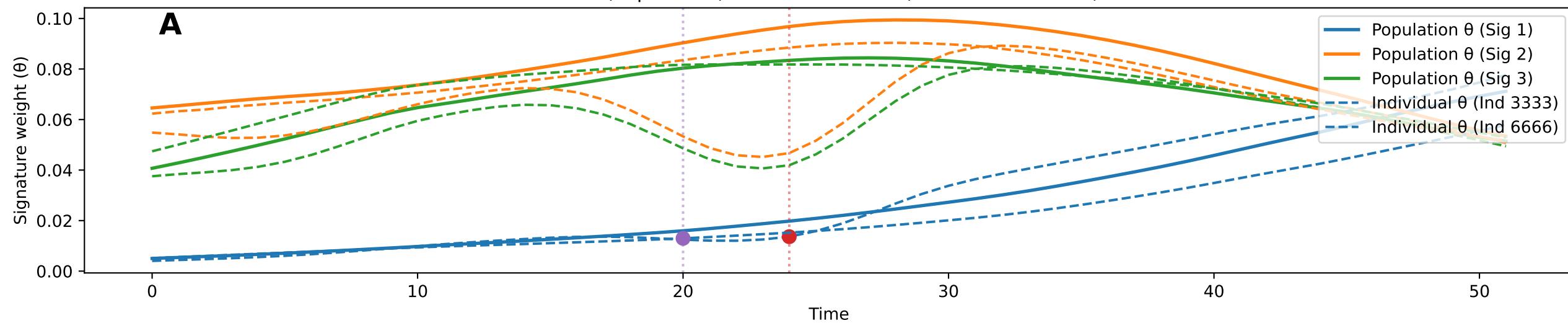


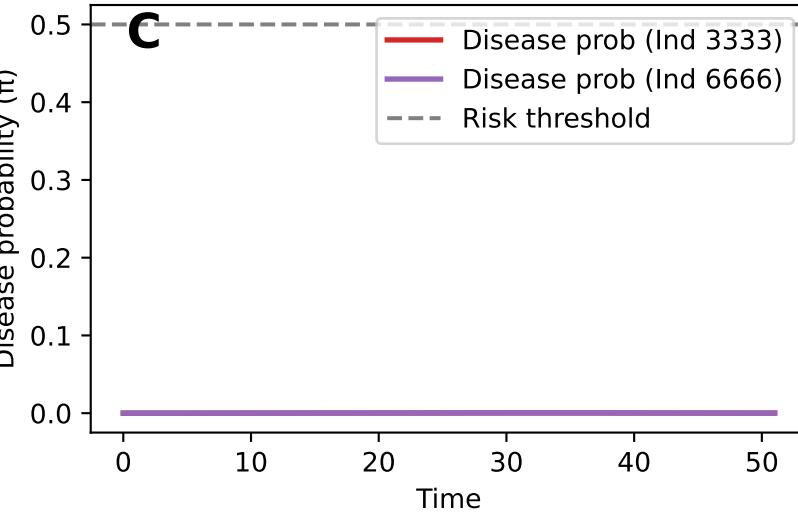
ATM (Population) vs ALADYNOLLI (Individual+Events)

**B**

$$\begin{aligned} \lambda_{i,k} &\sim GP(r_k + \Gamma_k^T g_i, K_\lambda) \\ \theta_{i,k,t} &= \frac{\exp(\lambda_{i,k,t})}{\sum \exp(\lambda_{i,k,t})} \\ \pi_{i,d,t} &= k \sum_k \theta_{i,k,t} \cdot \text{Sigmoid}(\phi_{k,d,t}) \\ Y_{i,d,t} &\sim \text{Bernoulli}(\pi_{i,d,t}) \end{aligned}$$

Individual-specific latent variables with GP dynamics  
Signature weights vary over time for each individual  
Disease-specific probabilities computed from signature mixtures  
Actual disease events modeled as Bernoulli outcomes

Individual disease probabilities (Disease 0)

Signature-Disease Associations ( $\psi$  Parameters)