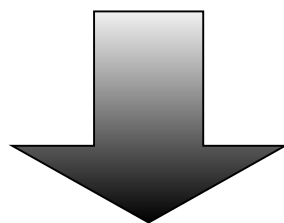


sequence database
(NCBI, GISAID)



Infer dependencies
across mutations
and genomic
variations

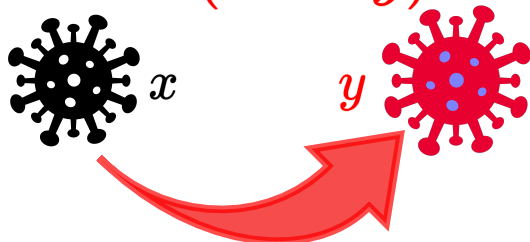


Emergenet



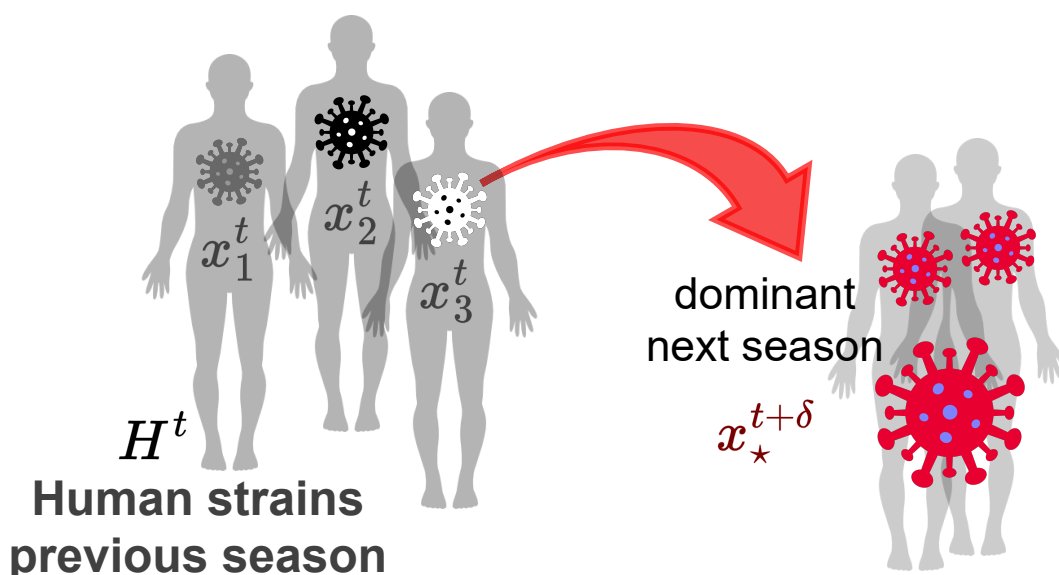
- Quantify probability of specific mutations in the wild
- Implicitly factor in functional constraints and time-varying selection pressures

$$Pr(x \rightarrow y)$$



Application 1:

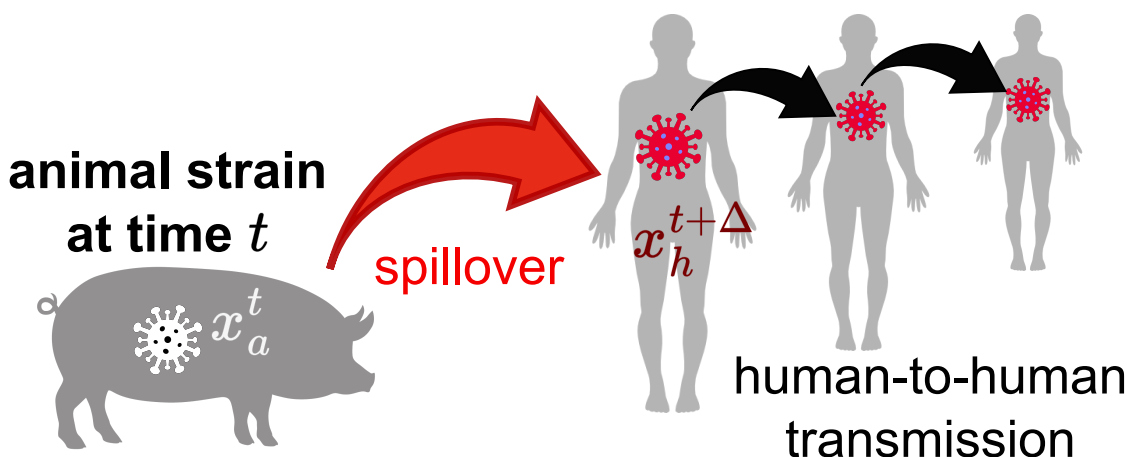
Forecast dominant strain(s) in upcoming season



$$x_{*}^{t+\delta} = \underset{x}{argmax} \prod_{x^t \in H^t} Pr(x^t \rightarrow x)$$

Application 2:

Estimate pandemic potential of animal strains



$$risk(x_a^t) = \log Pr(x_a^t \rightarrow x_h^{t+\Delta})$$