**Is the total fitness distribution of HA strains within individual seasons as narrow as we assume for our inference?**

* Arup suggested to get that information from Laessig’s predictions on clades
* Laessig assumes clade frequencies from season to season to change as  
  xi(t+1) = exp(fi) xi(t) = exp(Fi) xi(t)/(sum(exp(Fj))xj)  
  where (normalized) fitness fi is inferred and includes a component (within fep) that is equivalent to our fhost and Fi = fi + Q(t) is the absolute fitness(growth rate)
* The fitness variance fi – mean(fi) = Fi -mean(Fi) of clades (with taken within each season) will tell something about the width of the total fitness distribution in individual seasons, while fhost – mean(fhost) will tell about the width of the immunity-dependent component in individual seasons
  + With our hypothesis, and to match figure 3 B and C in our manuscript, the distribution of the total fitness should be narrow around the yearly mean, while the distribution of the immunity-dependent component should be wide around its yearly mean
* Figure 2 and Extended data figure 1 by Laessig give information about frequency ratios = exp(fi) for various clades, but do not contain info about which seasons each frequency ratio is for;  
  however the range of values for those frequency ratios across seasons gives an upper estimate for the range of observed total fitness within seasons
* As for the immunity-dependent (fhost) (and the remaining fitness components) and their distribution within seasons, there is no direct data in the paper
* If I can find the information on which clades are found with which frequencies in which season and their respective sequence representation, then
  + I can calculate the distribution of fhost from its formula for each clade in each season where they are observed
  + I can then also calculate the respective distribution of ftot according from the clade frequency ratios in subsequent years
* From my own collected influenza sequences I could calculate the distributions of Fhost around their means in different years
  + If the yearly range of Fhost values tends to be wider than the total range of log(clade ratios) [from Luksza & Laessig, Fig. 2]:  
    Can I conclude that our assumptions might be valid?
* It seems I don’t have enough information from Laessig’s data to make those estimates   
  -> **discuss with A and M after writing down these notes neatly**