Step 1

\*Look at the timeseries- and cull those that don’t seem to match up

\* right now matching attack rates and general seasonality for the north

Step 2

* Separate into those that are successful versus unsuccessful
* 90 day/20%
* Set success criteria

Step 3

* Read in data and determine which ones are successful or not

Step 4

* Analysis Below

Initial Geographic Comparison

* Tropics
  + Quickly get rid of any unsuccessful (histogram)
  + Are likely to emerge during the peak and grow in frequency
* North
  + Seems like a few can hang around for awhile…
  + Maybe slighter longer life lengths
  + Look like they have to emerge during the decline – haven’t seen any that come from the peak
  + See more coexistence in north

Antigen Specific Density

North

* Distance-those that are successful do have higher distances but there is some overlap- need to compare with tropics
* mutational load looks like it can be a bit higher here for success than those that are un successful
* Antigenic types are more distinctly fewer
* No difference on what the frequency of the dominant type is at the time

Tropics

* Distance is a bit uniform - there is some overlap on the distance of those in the tropics that are and are not successful
* The mean of the mutational load looks to be less than that of those that do not succeed
* No difference on what the frequency of the dominant type is at the time

Viral Fitness

* For either Tropics or North there don’t seem to be significant differences in the average viral fitness state of the population
* How would you define the level of competition?

Life Spans

* Not too much of a difference

Average Success

* Percentage of mutations that are generated that are successful is about the same, whether in north or tropics, although absolute numbers in the north are fewer
* 90 day threshold seems to give about same results as stricter length for the north
  + what about a shorter time frame

North influenced by

* the number of circulating antigenic types
* the antigenic distance of the mutation
* a lower mutational load
* smaller population sizes

Tropics influenced by

* antigenic mutation
* mutational load (which on averages seems less than in the north)
* in terms of population dynamics- the proportion of success/non-successful seems about equal at lower numbers, when infections increase still more likely to be not-successful, but do see some successful transitions at the peak

Why isn’t general viral fitness population metrics not picking up any signal?

* Maybe not alone, but would in a different way?
* The age of the dominant cluster doesn’t seem to have an impact