**Outline of HIV simulation**

% Supporting scripts:

% Input file

% makes graphs and figures

% subsetter functions

%% Initialization

~ define cycle length (*monthly, weekly, annually*?)

%% Set up state matrix, populate with some ppl with some characteristics

% stateMat: rows are ppl, cols are variables (age, race, *health* and *treatment* states …)

~TASK: *find which variables* it’s important to keep track of

~pull in initial *demographic distribution* data to populate these ppl

For t = 1:T

~~%% simulate births into the simulation (change the population in stateMat)~~

~~%% simulate death~~

~~%% Transition ppl between health states (HIV and AIDs status)~~

~~~simulate people progressing from one discrete state to another~~

~~~pull probabilities for appropriate demographic (age, race, etc)~~

~~~select ppl (subsetter functions.m)~~

~~~generate uniform random numbers b/t 0 and 1, compare w/ prob, transition happens if random number is less than prob~~

~~~change stateMat for those people~~

%% simulate treatment

~~~simulate ppl seeking care (art)~~

~simulating diagnosis (false positive, false negatives)

~simulating ppl getting prep

~adherence to drugs

%% Simulate people acquiring infection

~find all the healthy ppl in each race- and age-group (S)

~find all the transmitting ppl in each race- and age-group (I)

~find total ppl in each race- and age-group (N)

~create probability of acquiring infection for each race- and age-group

~*beta* is read from literature, and in this case, a matrix of how likely it is to meet ppl of different age- and race-groups

~pr(acquiring infection) = beta\*(I/N) \* S

~simulate by doing random number draw, change stateMat as needed

%% Metrics on our simulation

~record stateMatAllTime at each time

~HIV prevalence by race, age, any other characteristics

~costs

~life expectancies

end