//Spread of virus

**double** randSpread = Math.random();

**if** (nextYear[a][b].getRating() == ProbSpec.V)

{

**if** (randSpread < ProbSpec.PROBSPOREVIRU)

{

//CDF of V-V spread: y = 0.4843ln(x) + 0.1665

//Inverse: exp(2.065\*y - .3438) = x

**double** randInfections = Math.random();

**int** numInfections = (**int**) Math.round(exp(2.065\*randInfections - 0.3438));

**for** (**int** v=0; v < numInfections; v++)

{

//CDF of V distance: Y = .213ln(x) + 0.3785

//Inverse: exp(4.695\*y - 1.777) = x

**double** randDistance = Math.random();

//Multiplied by 8 because a distance class is 8m

**double** distance = Math.round(exp(4.695\*randDistance - 1.777)\*8);

//Divide by 4 because th

**int** d = (**int**) floor(distance / 4);

}

}

}

**else**{

**if** (nextYear[a][b].getRating() == ProbSpec.HV)

{

**if** (randSpread < ProbSpec.PROBSPOREHYPO)

{

//CDF of HV-V spread: y = 0.1719ln(x) + 0.6872

// Inverse: exp(5.817\*y-3.998) = x

//CDF of HV-HV spread: y = 0.4922ln(x) + 0.2085

// Inverse: exp(2.0317\*y - .4236)

**double** randVInfections = Math.random();

**double** randHVInfections = Math.random();

**int** numVInfections = (**int**) Math.round(exp(5.817\*randVInfections-3.998));

**int** numHVInfections = (**int**) Math.round(exp(2.0317\*randHVInfections - .4236));

**for** (**int** v=0; v < numVInfections; v++)

{

**double** randDistance = Math.random();

**int** distance = (**int**) Math.round(exp(4.695\*randDistance - 1.777)\*2);

//ADD INFECTION TO RANDOM SPOT IN THAT DISTANCE RANGE

}

**for** (**int** h=0; h < numHVInfections; h++)

//Y = 0.1398ln(x) + 0.566

//Inverse: exp(7.153\*y - 4.049) = x

{

**double** randDistance = Math.random();

**int** distance = (**int**) Math.round(exp(7.153\*randDistance - 4.049))\*2);

//ADD INFECTION TO RANDOM SPOT IN THAT DISTANCE RANGE

}

}

}

}