1. Within 40 tests, where only AA survives is 12, or where aa survives is 10. There are no cases where both AA and aa both survive. And 0 cases where Aa survives.

```
SSSgN(AllenSIR(0.1, 0.1, 0.1, x, y), [x, y]);
SSSgN(AllenSIR(0.2, 0.1, 0.1, x, y), [x, y]);
SSSgN(AllenSIR(0.3, 0.1, 0.1, x, y), [x, y]);
SSSgN(AllenSIR(0.4, 0.1, 0.1, x, y), [x, y]);
SSSgN(AllenSIR(2.0, 0.1, 0.1, x, y), [x, y]);
SSSgN(AllenSIR(20.0, 0.1, 0.1, x, y), [x, y]);
```

$$[7. \times 10^{-10}, 0.9999999986]$$
$$[0.0023458826, 0.9952845412]$$
$$[0.1586702173, 0.6826595654]$$
$$[0.2379155707, 0.5241688586]$$
$$[0.4257286974, 0.1485426054]$$
$$[0.4545407977, 0.09091840559]$$

2.

```
> SSSgN(AllenSIR(0.15, 0.15, 0.15, x, y), [x, y]);
SSSgN(AllenSIR(0.3, 0.15, 0.15, x, y), [x, y]);
SSSgN(AllenSIR(0.45, 0.15, 0.15, x, y), [x, y]);
SSSgN(AllenSIR(0.6, 0.15, 0.15, x, y), [x, y]);
SSSgN(AllenSIR(3.0, 0.15, 0.15, x, y), [x, y]);
SSSgN(AllenSIR(30.0, 0.15, 0.15, x, y), [x, y]);
```

$$[4. \times 10^{-10}, 0.9999999991]$$
$$[0.0015293689, 0.9969310399]$$
$$[0.1549131987, 0.6901736030]$$
$$[0.2321821549, 0.5356356903]$$
$$[0.4128067433, 0.1743865134]$$
$$[0.4347824861, 0.1304350281]$$

```
SSSgN(AllenSIR(0.2, 0.2, 0.2, x, y), [x, y]);
SSSgN(AllenSIR(0.4, 0.2, 0.2, x, y), [x, y]);
SSSgN(AllenSIR(0.6, 0.2, 0.2, x, y), [x, y]);
SSSgN(AllenSIR(0.8, 0.2, 0.2, x, y), [x, y]);
SSSgN(AllenSIR(4.0, 0.2, 0.2, x, y), [x, y]);
SSSgN(AllenSIR(40.0, 0.2, 0.2, x, y), [x, y]);
```

$$[3. \times 10^{-10}, 0.9999999993]$$
$$[0.0011217441, 0.9977509080]$$
$$[0.1513070546, 0.6973858908]$$
$$[0.2266503964, 0.5466992072]$$
$$[0.3997932150, 0.2004135702]$$
$$[0.4166666628, 0.1666666747]$$

> $SSSgN(AllenSIR(0.25, 0.25, 0.25, x, y), [x, y]);$
> $SSSgN(AllenSIR(0.5, 0.25, 0.25, x, y), [x, y]);$
> $SSSgN(AllenSIR(0.75, 0.25, 0.25, x, y), [x, y]);$
> $SSSgN(AllenSIR(1.0, 0.25, 0.25, x, y), [x, y]);$
> $SSSgN(AllenSIR(5.0, 0.25, 0.25, x, y), [x, y]);$
> $SSSgN(AllenSIR(50.0, 0.25, 0.25, x, y), [x, y]);$

$$[0., 0.9999999998]$$
$$[0.0008777887, 0.9982409222]$$
$$[0.1478446271, 0.7043107460]$$
$$[0.2213159112, 0.5573681774]$$
$$[0.3869316911, 0.2261366179]$$
$$[0.3999999999, 0.2000000003]$$

$SSSgN(AllenSIR(0.3, 0.3, 0.3, x, y), [x, y]);$
$SSSgN(AllenSIR(0.6, 0.3, 0.3, x, y), [x, y]);$
$SSSgN(AllenSIR(0.9, 0.3, 0.3, x, y), [x, y]);$
$SSSgN(AllenSIR(1.2, 0.3, 0.3, x, y), [x, y]);$
$SSSgN(AllenSIR(6.0, 0.3, 0.3, x, y), [x, y]);$
$SSSgN(AllenSIR(60.0, 0.3, 0.3, x, y), [x, y]);$

$$[2. \times 10^{-10}, 0.9999999996]$$
$$[0.0007156888, 0.9985662474]$$
$$[0.1445190174, 0.7109619652]$$
$$[0.2161735994, 0.5676528015]$$
$$[0.3743947189, 0.2512105622]$$
$$[0.3846153847, 0.2307692308]$$

$SSSgN(AllenSIR(0.35, 0.35, 0.35, x, y), [x, y]);$
$SSSgN(AllenSIR(0.7, 0.35, 0.35, x, y), [x, y]);$
$SSSgN(AllenSIR(1.05, 0.35, 0.35, x, y), [x, y]);$
$SSSgN(AllenSIR(1.4, 0.35, 0.35, x, y), [x, y]);$
$SSSgN(AllenSIR(7.0, 0.35, 0.35, x, y), [x, y]);$
$SSSgN(AllenSIR(70.0, 0.35, 0.35, x, y), [x, y]);$

$$[2. \times 10^{-10}, 0.9999999996]$$
$$[0.0006012272, 0.9987958353]$$
$$[0.1413236063, 0.7173527873]$$
$$[0.2112178323, 0.5775643353]$$
$$[0.3622938556, 0.2754122889]$$
$$[0.3703703703, 0.2592592593]$$

0.4 no SSSgN or SSg

A larger a shows higher likelihood of infection, as well as the infection coming back.