Appendix:

If we test each day for seven days then probability of detection for an individual is:

$$1 - \prod_{i=1}^{7} (1 - p_i)$$

Where p_i is the conditional sensitivity of a test performed on day *i*.

If we are testing once every 7 days, with an equal chance of testing on each day then the probability of detection is:

$$\sum_{i=1}^{7} \frac{p_i}{7}$$

The conditional sensitivities for person A are: (0, 0, 0.25, 0.5, 0.9, 0.9, 0.5)

The probability of detection by day 3 if we test person A every day is $p_3 = 0.25$

The probability of detection by day 4 if we test person A every day is

$p_3 + p_4 \times (1 - p_3) = 0.625$

The probability of detection by day 3 if we test person A once per week at random is $\frac{p_3}{7} = 0.0357$

The probability of detection by day 4 if we test person A once per week at random is

$\frac{p_3}{7} + \frac{p_4}{7} = 0.107$