

Probability: Fighting the Epidemic

Identifying the numbers in the “at risk” group

Pregnant women: $0.01 \times 1913 = 19.13$

This would probably be rounded down to 19 women (we are trying to make a reasonable estimate)

Over 64's: $0.17 \times 1913 = 325.21$

Rounded to 325

Under 6's: $0.08 \times 1913 = 153.04$

Rounded to 153

The number with symptoms of flu

Pregnant women: $0.3 \times 19 = 5.7$ – round to 6

Unvaccinated over 64's: $100 - 56 = 44\%$

$0.44 \times 325 = 143$ are unvaccinated

With symptoms: $0.45 \times 143 = 64$

Under 6's: $0.55 \times 153 = 84$

The number actually having flu (when tested)

Pregnant women: $0.7 \times 6 = 4.2$ – round to 4

Over 64's: $0.7 \times 64 = 44.8$ – round to 45

Under 6's: $0.7 \times 84 = 58.8$ – round to 59

Numbers for the “low risk” group

$1913 - 19 - 325 - 153 = 1416$ in this group

With symptoms: $0.3 \times 1416 = 424.8$ – round to 425

Tested: $100 - 85 = 15\%$ will choose to be tested for flu

$0.15 \times 425 = 63.75$ – round to 64

Have flu: $0.7 \times 64 = 44.8$ – round to 45

The number of antivirals needed

Adults and 6 and overs: $4 + 45 + 45 = 94$

$2 \times 94 = 188$ boxes

Children under 6: 59 boxes

Boxes required: $188 + 59 = 247$

The absolute minimum number of boxes that should be ordered is 250

There is a really good discussion to be had about the effect of rounding and all of the other estimations that have clearly been made.

How safe would each group play it?

The minimum number of cards to solve the problem is 15.

Some of the other cards help define the problem.