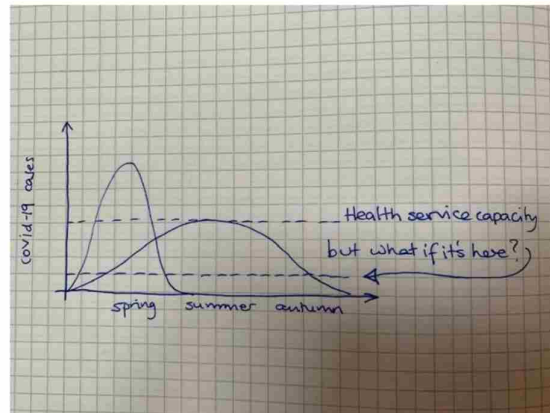


1. There is a discussion that I missed at Sage if it has occurred; where on the “cases through seasons” graph does health service capacity lie? I do not think I have heard a view from SPI-M or NHS about where we think NHS capacity lies relative to the forecast number of cases. I know there are very many uncertainties. I’d like to know about realistic, current NHS capacity versus reasonable worst-case epidemiology with various controls all in place (home alone, home with family, cocoon the vulnerable).



2. If capacity is nearer the low line what other combinations of options are there?
 - a. Lockdown
 - b. Intermittent lockdown
 - c. Spread out time to achieve immunity
 - d. Continue contact tracing
 - e. Others?
3. I think SPI-M’s modelling is very useful and will continue to be so. However, in order to get my head round the size of the problem I find it useful to do back-of-an-envelope calculations to think through options.

Ignore dynamics and calculate the average number of cases and deaths per week it will take to get to a given % of the population immune. This requires just multiplying a few numbers together. I’ve taken an England population of 68m.

A	B	C	D	E	BC/E	BCD/E
Immune target	Number immune $A * 68m$	Proportion of infections with symptoms	CFR for those with symptoms	Number of weeks to target	Average cases each week	Average deaths each week
50%	34m	.5	2%	26	650,000	13,000
50%	34m	.25	2%	26	325,000	6,500
50%	34m	.25	2%	52	163,000	3,300
33%	22m	.1	2%	26	85,000	1,700
33%	22m	.1	2%	52	42,000	850

I believe the last two rows of this table have very optimistic assumptions.

I would find it helpful to have a Sage discussion about the tolerable numbers of cases each week. That would help us plan what level of interventions we need.

4. I think we should discuss the point that John E. raised about not overshooting the herd immunity target.
5. I remain unclear about Covid-19 infections acquired by patients after they enter ITUs. I would like to know if Sage (particularly the SPI-M x clinician axis) think this is likely to be an important effect.