

Considerations for NPI Policy – timing and sub-national targeting

General results for NPI – HIGH CONFIDENCE

The impact of specific NPI depends on the **behaviour change it induces combined with the self-induced and community-induced changes** that will happen without intervention. We are unable to predict any of these accurately.

In order to be able to accurately assess the impact of behaviour change (both spontaneous and induced) on transmission **it is essential that there are multiple surveillance streams** available (e.g. serology, transport, school attendance) as well as clinical data (cases and deaths). These need to be near real-time and to start now.

Because **the epidemic will be realised in different places at different times**, NPI have to be suitable for all epidemic stages. Targeting by region/city/county is possible, but has risk of confusion and inconsistency across boundaries.

Timing of removal of NPI is as important as timing of initiation. In particular it is very likely that transmission will increase after removal.

In order to have significant impact on the epidemic NPI will have to be in place for many weeks/months.

NPI will induce different behaviour changes in different communities and will tend to separate regions more. Their overall impact will be to increase variation in the epidemic experienced by different communities.

Compliance and behaviour changes resulting from NPI will vary with time since introduction. It is likely that NPI policy will have to change during the epidemic to achieve the same effect.

Specific results for NPI – MODERATE CONFIDENCE

It is possible that if behaviour change is sufficiently successful in reducing transmission that an epidemic in the UK can be prevented, or slowed down to the extent that it does not impose a significant health burden. We are assuming that more stringent interventions have a greater impact on transmission.

NPI that reduce transmission less should be introduced earlier to have the same effect.

NPI that reduce transmission substantially should be introduced later but before the peak.

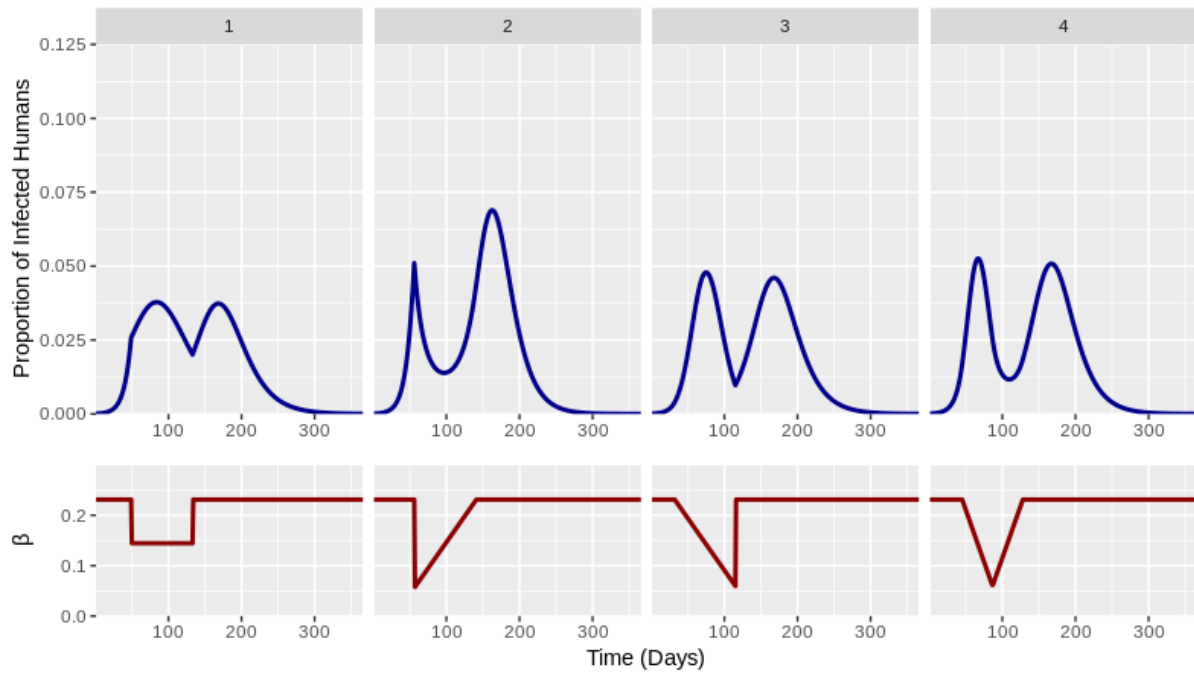
Targeting of NPI to different epidemic stages has not been formally considered, however, it is likely that more intense NPI will be more likely to have negative consequences, e.g. if introduction is timed to the London peak, then it may delay a peak in Tyneside until the autumn.

Taking all into consideration, building up of NPI in terms of intensity during the epidemic has many advantages:

- It provides the opportunity for modification / improvement as we see the epidemic progress, i.e. it is robust to possible futures

- It leaves room for policy modification during the epidemic, and avoids the situation in late summer if an epidemic has been curbed or greatly reduced that a larger epidemic is still expected

Illustrative Results



Scenario	Trigger day	Peak I(t)	Total I	Peak day
1	49	0.038	0.669	84
2	56	0.069	0.719	162
3	31	0.048	0.685	75
4	44	0.053	0.693	67

Figure 1. Epidemic curves (blue), $\beta(t)$ curves (red) and summary statistics for four time-varying, fixed-period SDM strategies. Each is optimised for trigger day. Woolhouse et al.

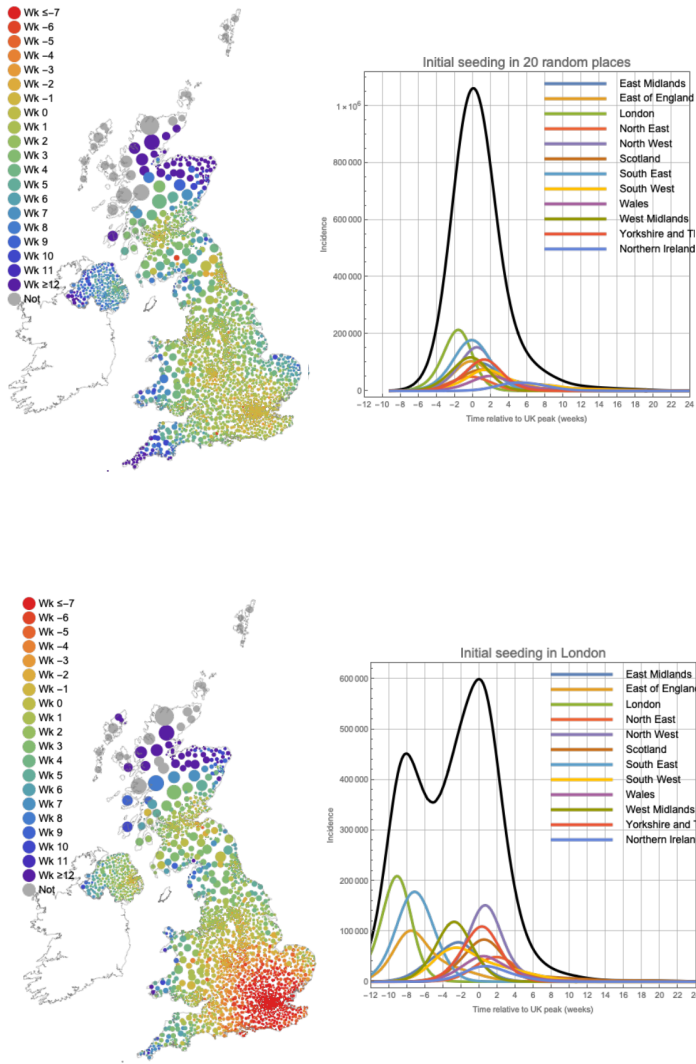


Figure 2. The epidemic may peak at different times in different parts of the UK. Gog et al.

The upper simulation shows that if there are many introductions that result in sustained transmission chains in different parts of the UK, then broad regions of the UK are fairly synchronised, but some towns within these regions may experience later epidemics.

The lower plot shows if a UK epidemic epidemic is driven by one main seeding event in London. Then there may be considerable variation in timing between regions: London and the South East may peak up to 8-10 weeks before most other regions.