SPI-M-O: Statement on tiers in England and other measures in the Devolved Nations

Date: 11th November 2020

FINAL

Summary

1. The system of tiers in England had an impact on viral transmission during the period they were implemented. Tier 1 measures alone are not enough to prevent the epidemic from growing rapidly.

2. Results from two SPI-M-O modelling groups suggest a modest (approximately) 10% reduction in R when moving from tier 1 to tier 2. Under the right circumstances in some places, tier 2 could *theoretically* be enough to drive R below 1.

3. **There is a great deal of uncertainty about the effect of tiers, particularly tier 3.** The implementation of tier 3 restrictions differed across the country with many places having measures beyond the "baseline" tier 3. There are also many confounding factors that cannot be accounted for, including but not limited to: behavioural changes resulting from increases in prevalence irrespective of formal guidance, changing levels of population immunity, changes in local testing strategies and geographical distribution of different measures.

4. Tier 3 restrictions, taken as a whole, are associated with slowing growth rates. Estimates of the relative reduction in R from tier 1 to tier 3 range from around a quarter to a half. It is therefore unclear whether baseline tier 3 restrictions alone would be sufficient at a regional or national level to reduce R below 1. It is likely that some localities may need a "tier 4" to prevent the epidemic from growing. A "tier 4" that **guarantees** a reduction in prevalence would be required in most places, if the prevalence is to be reduced.

5. The implementation of firebreaks in Wales and Northern Ireland, and the introduction of local protection levels appear to have led to recent decreases in estimates of R.

England – Tier system

6. Tiers or local COVID-19 alert levels were implemented in England from 12th October. A three-tier system rationalised restrictions across the country, depending on levels of prevalence, test positivity rates (especially in the older or more at-risk age groups), as well as hospital admissions and occupancy, and other factors.

suggests that tier 2 is **not a reliable intervention for the maintenance, let alone the re-establishment, of any degree of control on transmission**. In a place where R is 1.1 or greater, the imposition of tier 2 measures is considered barely adequate to constrain epidemic growth and unlikely to turn epidemic growth rates negative.

10. There is evidence from two independent analyses that tier 3 restrictions have accompanied a reduction in transmission, particularly in the North West and North East & Yorkshire regions. The scale of that reduction, however, is harder to reconcile. It also needs to be considered that this slowing in growth will include the impact of informal behavioural responses that result from increases in prevalence. One group's estimate of the relative reduction in R between tier 1 and tier 3 corresponds to around 28%, whereas another uses two different models and estimates 36% and 47% reductions. One main difference between the models is that the second includes mobility *between* areas, suggesting that the effect of tier 3 may be diluted by contiguity with lower tiers.

11. SPI-M-O's consensus R estimates for England at the time just before tiers were implemented was R=1.2-1.4, with individual estimates for the NHS England regions slightly above or below. One analysis suggests that tier 3 as implemented would likely be sufficient to bring R below 1 in most, but not every area. The other analysis, however, would correspond to tier 3 being highly unlikely to reduce R below 1 in all locations. For this reason, it is unclear whether tier 3 restrictions alone would have been sufficient to reduce R below 1 at a regional or national level.

12. **There is a great deal of uncertainty about the effect of tiers, particularly tier 3.** Tier 3 restrictions differ across the country with many places having measures beyond the "baseline" tier 3. There are also many confounding factors that cannot be accounted for, including but not limited to: imposition of tier 2 and tier 3 is closely correlated to the epidemic and previous interventions; behavioural changes resulting from increases in prevalence irrespective of formal guidance; changing levels of population immunity; and changes in local testing strategies.

13. Consideration needs to be given to the spatial extent that local measures are applied to. People move between areas and so any local measure has "edge effects". Applying measures to larger areas, for example upper tier local authority (UTLA) rather than lower tier local authority (LTLA) or region rather than UTLA, reduces the importance of "edge effects" and may make measures more effective.

14. When considering transitions from national measures to a localised tiered approach or between tiers, **both prevalence *and* growth rate of the virus need to be considered**. Basing transitions on prevalence alone leads to a perverse outcome where growth rates