

# SPI-M-O: Consensus Statement on COVID-19

*Date: 21<sup>st</sup> October 2020*

**FINAL**

## Summary

1. SPI-M-O's best estimate for **R in both the UK and England is between 1.2 and 1.4**. Although slightly lower than last week's estimate, this signals that the epidemic continues to grow rapidly, as demonstrated by ONS's community infection survey. **R is almost certainly above 1 in England, Scotland, Wales, Northern Ireland, and all regions of England.**
2. **In England, we are breaching the number of infections, hospital admissions and deaths in the Reasonable Worst Case planning scenario that is based on COVID-S's winter planning strategy.** Even if significant interventions sufficient to bring R below 1 were imposed immediately, the number of deaths would continue to rise for at least two weeks.
3. SPI-M-O estimate that there are between **53,000 and 90,000 new infections per day**. This represents a significant and growing burden of morbidity and mortality.
4. Changing patterns in testing, particularly in younger people, continue to make it difficult to interpret the changing epidemiology. There is some limited evidence that the rate of growth in new infections may have slowed in some parts of the country. We emphasise that this has not yet been reflected in hospital admission or death data, which are more lagged but more reliable, and that a growth rate that is lower but still positive would represent an epidemic that continues to grow exponentially. SPI-M-O's modelled consensus is a **doubling time in the UK for new infections of between 14 and 18 days**.
5. The delay between initial infection, developing symptoms, the need for hospital care, and death means these estimates **cannot fully reflect recent changes in transmission that might have occurred over the past two to three weeks, including any impact from recently announced measures**.

## Incidence and prevalence

6. Combined estimates from six SPI-M-O models suggest there are between **53,000 and 90,000 new infections per day in England**. Updated ONS incidence estimates are not available at present.

7. Modelling from the ONS community infection survey for the most recent week of the study (10<sup>th</sup> to 16<sup>th</sup> October) estimates that an average of **433,300 people had COVID-19** in the community in England (credible interval 407,500 to 459,300) – this is a significant increase on their previous estimate. In Wales, ONS estimate that an average of **16,700 people had COVID-19** during this period (credible interval 7,300 to 30,400). The study also estimates that, during the same week, there were **35,200 new infections per day in England** (credible interval of 29,800 to 46,600).
8. As the ONS survey estimates are based on survey results collected one to two weeks ago and given the current state, it is **highly likely that the epidemic has continued to grow since** and, therefore, the number of new infections each day is likely to be higher than estimated by the survey. The survey does not include people in care homes, hospitals, or university halls of residence. Given these factors, we believe the ONS's estimates to be consistent with ours.

### Reproduction number, growth rate, and doubling times

9. **There is consensus that the epidemic continues to grow across the country.** Changing patterns in testing, particularly in younger people, continue to make it hard to interpret changes in confirmed cases. There is some limited evidence that the rate of growth in new infections may have slowed in some parts of the country. We emphasise that this has not yet been reflected in hospital admission or death data, which are more lagged but more reliable, and that a lower growth rate would still represent an epidemic that is growing rapidly.
10. The reproduction number is the average number of secondary infections produced by a single infected individual. R is an average value over time, geographies, and communities. Therefore, these estimates should be used as a guide to the general trend rather than a description of the epidemic state in all places.
11. **SPI-M-O's best estimate is that R is between 1.2 and 1.4 in both the UK and England.** SPI-M-O's agreed national and regional estimates are summarised in Table 1 and Figures 3, 4, and 6. These suggest R is almost certainly above 1 in England, Scotland, Wales, Northern Ireland, and all regions in England.
12. SPI-M-O's consensus R and growth rate estimates are based on a range of models that use a variety of data sources including deaths, hospital admissions, and number of individuals testing positive. The delay between initial infection, developing symptoms and the need for hospital care, means that, **such estimates cannot yet fully reflect the most**

**recent changes in transmission from the past two to three weeks**, including any impact from the measures recently announced.

13. For small daily changes, the growth rate is approximately the proportion by which the number of infections increases or decreases per day, i.e. the rate at which an epidemic is growing or shrinking<sup>1</sup>.
14. SPI-M-O's consensus estimate is that **growth rate in the UK is between +3% to +6% per day**. SPI-M-O's national and regional estimates are summarised in Table 1 and Figure 5. This growth rate suggests **the number of new daily infections was doubling in the recent past every 14 to 18 days in the UK**. As above, these estimates cannot fully reflect any changes in transmission which might have occurred over the past two to three weeks.

### Reliability

15. As the number of infections is increasing across the UK, SPI-M-O's view is that there is less variability in the R and growth rate estimates compared to those made two to three months ago. There may still be high degrees of variability in, for example, a localised outbreak, however, **SPI-M-O considers all this week's estimates to be reliable**.
16. Care should still be taken when interpreting R and growth rate estimates for the UK, due to their inherently lagged nature and the fact these figures mask variation in the number of infections and how transmission is changing in some parts of the country.

### Care homes

17. Deaths in care homes reported to the Care Quality Commission (CQC) are starting to rise, especially in those English regions with highest prevalence. Given the lagged data and the exponential rise, it is likely that the outbreaks are already substantial.
18. Very frequent testing of care home residents, even if done with tests with lower sensitivity, has the potential to protect residents.

### Universities

19. Some universities have seen a large increase in cases, followed by a rapid decline. Where such a pattern has been observed, it is not possible to determine whether it is a real decline or have resulted from changes in the availability of tests and/or the willingness of students

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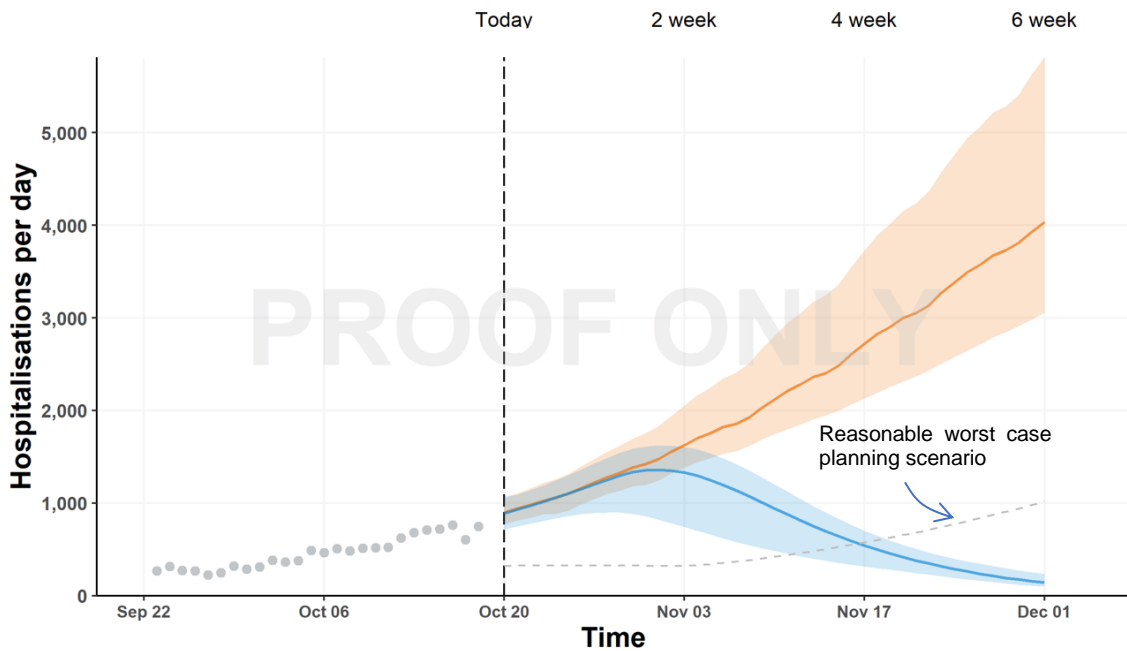
<sup>1</sup> Further technical information on the growth rate can be found in [Plus magazine](#).

to take them. There are substantial differences in the observed pattern of positive test results between institutions.

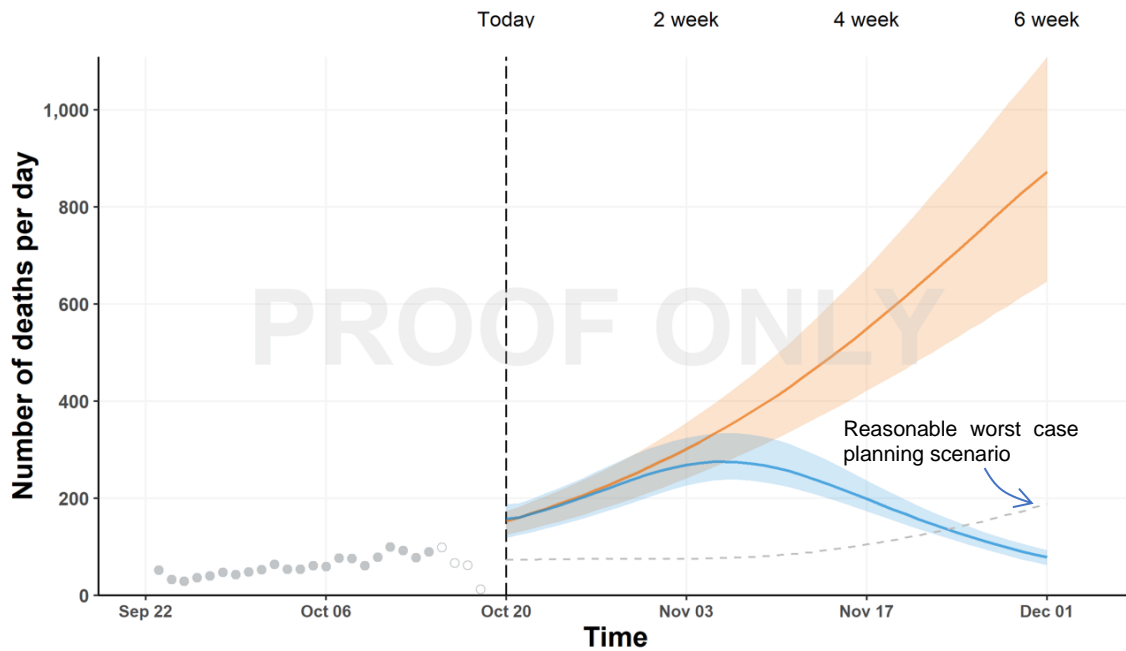
### Medium-term projections and other scenarios

20. **The number of infections, hospital admissions and deaths are exceeding those in the reasonable worst case planning scenario** that is based on COVID-S's winter planning strategy. This scenario assumed that decisive action would be taken in mid-September to halt an increase in transmission.
21. SPI-M-O continue to produce projections of the epidemic over the next six weeks, combining estimates from several independent models. These are not forecasts or predictions and cannot reflect recent changes in transmission that have not yet filtered through into surveillance data, such as hospital admissions and deaths. They cannot include future behavioural and policy changes that might reduce transmission, nor do they include seasonality effects that might increase transmission.
22. SPI-M-O have also modelled a scenario where measures are introduced on 26<sup>th</sup> October that reduce R to 0.6, which is then sustained for the entire six weeks. This is to illustrate the most optimistic scenario (in terms of minimising direct COVID-19 mortality and morbidity) that SPI-M-O consider to be plausible and is around the value of R seen in the community in early April.
23. Both scenarios are in agreement for up to two weeks into the future for hospitalisations and deaths, as these are largely already determined by infections to date. Beyond two weeks, the projections become more uncertain with greater variability between models. This reflects the large differences that can result from distinct data streams and the influence of small deviations in estimated growth rates and current incidence.
24. Figures 1 and 2 compare the current combined projections for hospitalisations and deaths (orange) with one where stringent measures are maintained for the entire six weeks (blue). The reality is highly likely to fall between the two, with current and future measures expected to reduce transmission somewhat, but much less than in the R=0.6 scenario. The equivalent charts for Scotland, Wales and Northern Ireland can be found in Figures 7 and 8.

**Figure 1:** Medium term projections and an  $R=0.6$  scenario for daily hospitalisations in England. Orange shows the trajectory based on current trends and does not include the effect of future policy changes or past ones that have not yet been reflected in data. Blue shows a scenario where a very stringent intervention is introduced on 26<sup>th</sup> October and maintained for the duration of the scenario. Both trajectories show interquartile ranges of model combinations.



**Figure 2:** Medium term projection and  $R=0.6$  scenario for daily deaths in England. Orange shows the trajectory based on current trends and does not include the effect of future policy changes or past ones which have not yet been reflected in data. Blue shows a scenario in which a very stringent intervention is introduced on 26<sup>th</sup> October and maintained for the duration of the scenario. Both trajectories show interquartile ranges of model combinations.



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## Circuit breakers

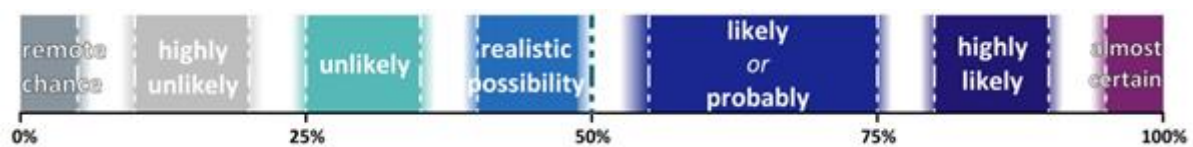
25. The “effectiveness” of a circuit breaker depends on the long-term strategy it forms part of and therefore how “effectiveness” is defined. For that reason, it is difficult to be precise in stating the conditions in which a circuit break would be most effective. However, it is clear that:

- Prevalence in most regions of England is now too high for a single circuit break to return prevalence to levels low enough to allow the test and trace system to play a major role in reducing transmission.
- A single circuit break would save most lives if it is followed by policies which sustain R at or below 1.

26. Broadly, the epidemiological effects of a circuit breaker in a particular region will be similar, whether that circuit breaker is a national one or region-specific. However, there are two important issues that should be considered:

- The impact of a circuit breaker is critically dependant on how far it pushes R below 1. It therefore requires good adherence. SPI-M-O’s expertise does not lie in behavioural science, but it is possible that adherence to national and regional circuit breakers would not be the same.
- Regional circuit breakers would pose challenges across borders. Given the high prevalence seen across the country at present and the interconnectedness of different parts of the UK, the spread of the virus between regions and nations will reduce the effectiveness of a circuit breaker that does not extend to the whole country.

## Annex: PHIA framework of language for discussing probabilities

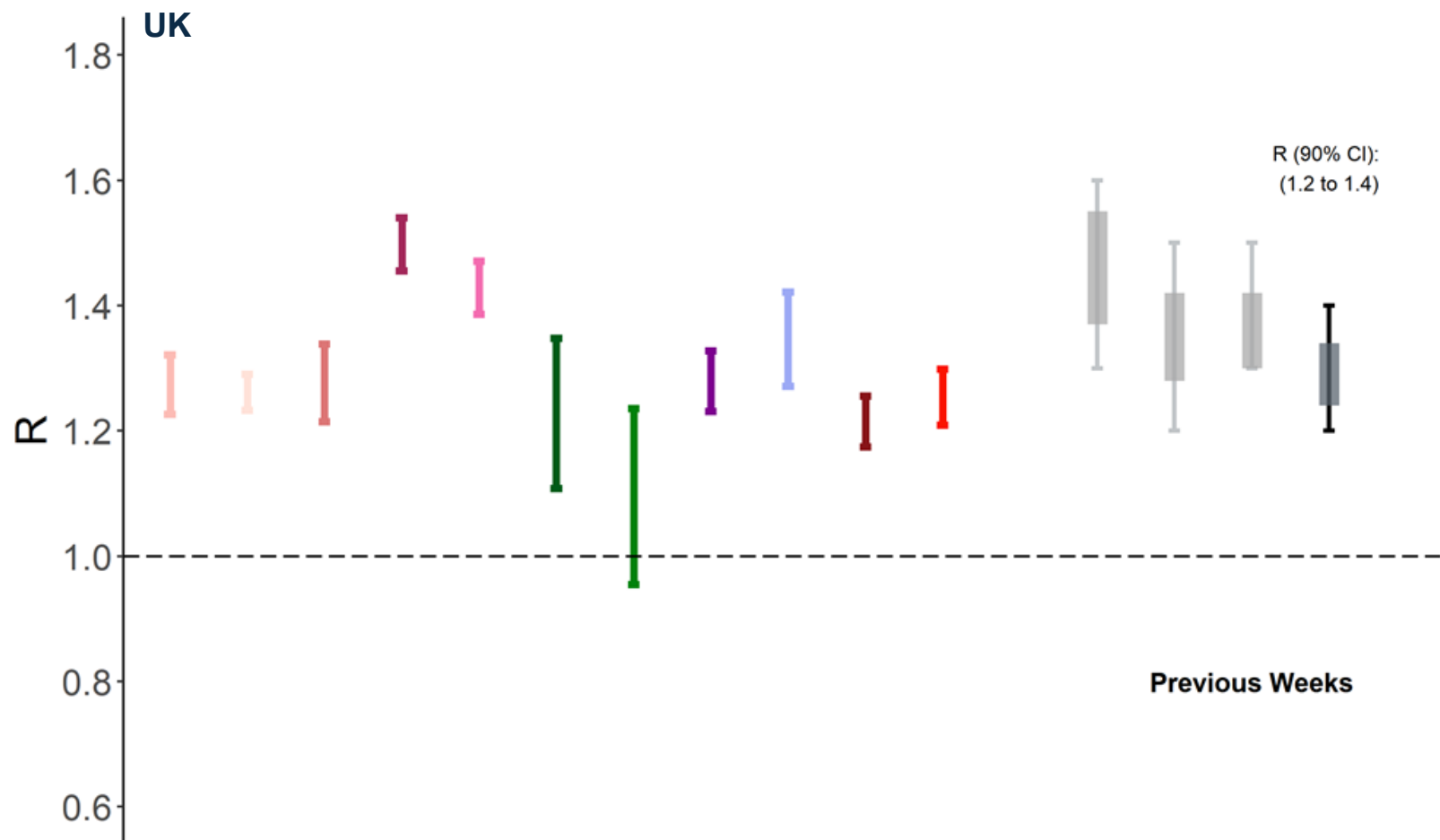


**Table 1:** Combined estimate of R and the growth rate in the UK, four nations and NHS England regions (90% confidence interval)

<b>Nation</b>	<b>R</b>	<b>Growth rate per day</b>
England	1.2 – 1.4	+3% to +5%
Scotland	1.2 – 1.5	+4% to +7%
Wales	1.0 – 1.4	+1% to +5%
Northern Ireland	1.3 – 1.6	+5% to +8%
<b>UK</b>	<b>1.2 – 1.4</b>	<b>+3% to +6%</b>

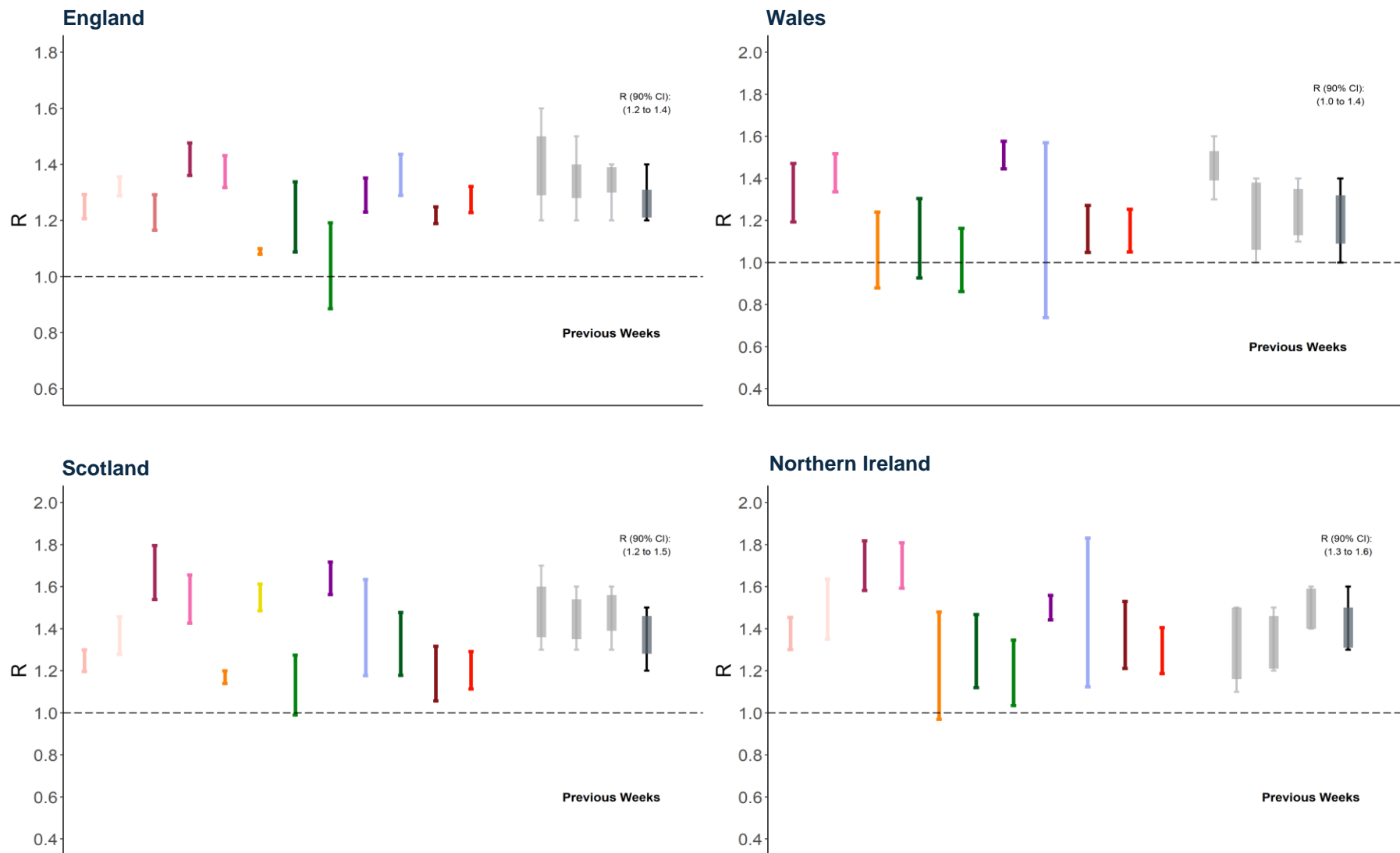
<b>NHS England region</b>	<b>R</b>	<b>Growth rate per day</b>
East of England	1.2 – 1.4	+3% to +6%
London	1.1 – 1.3	+2% to +5%
Midlands	1.1 – 1.3	+2% to +5%
North East and Yorkshire	1.1 – 1.3	+2% to +5%
North West	1.1 – 1.3	+2% to +5%
South East	1.2 – 1.5	+4% to +7%
South West	1.3 – 1.6	+5% to +9%

**Figure 3:** SPI-M-O groups' estimates of median R in the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded area represents the combined numerical range and the black bar is the combined range after rounding to 1 decimal place. The UK estimate of R is the average over very different epidemiological situations and should be regarded as a guide to the general trend rather than a description of the epidemic state.

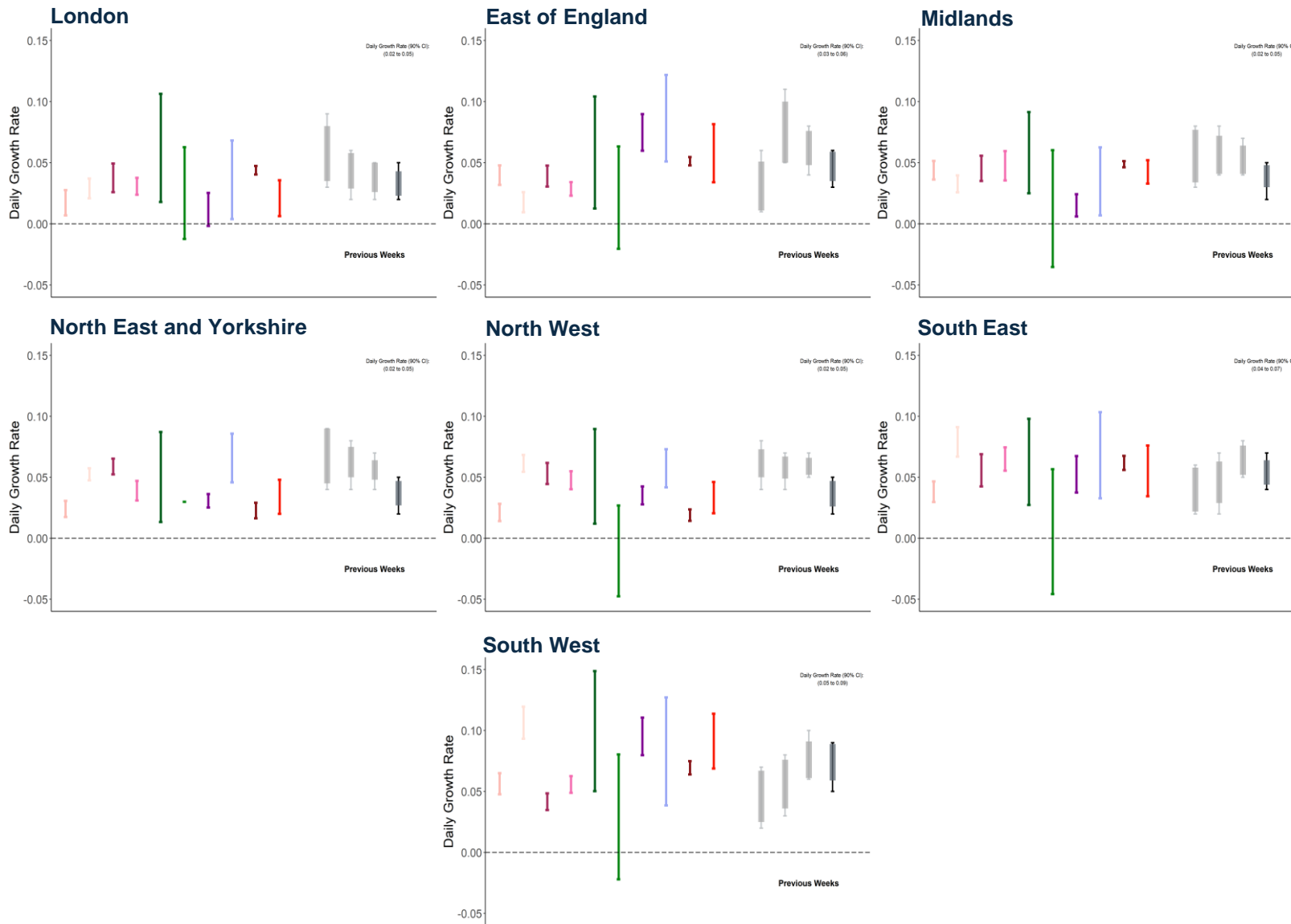




**Figure 4:** SPI-M-O groups estimates of median R in the four nations of the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.



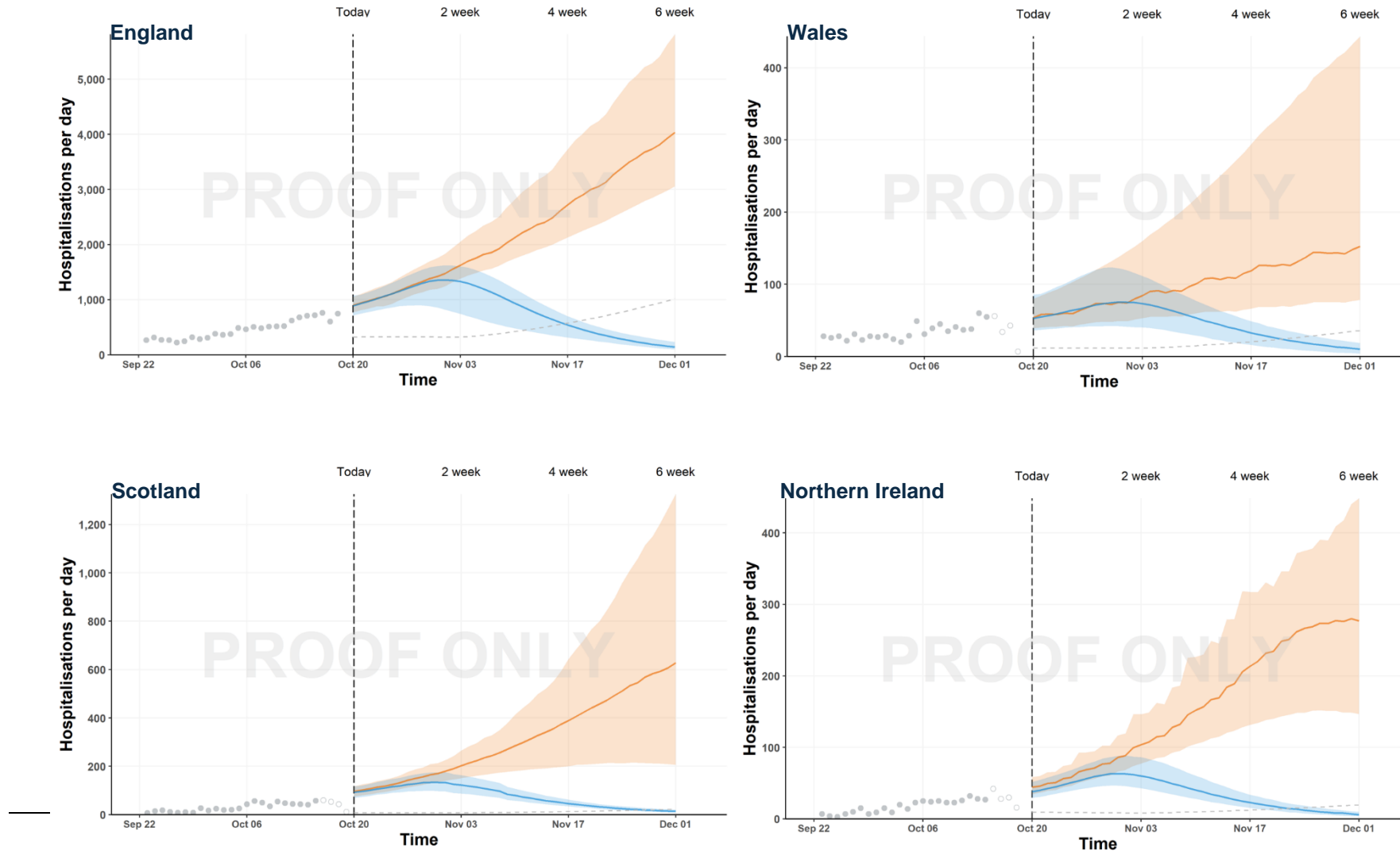
**Figure 5:** SPI-M-O groups estimates of the growth rate in NHS England regions, including 90% confidence intervals. Bars represent different modelling groups. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 2 decimal places.



**Figure 6:** SPI-M-O groups estimates of median R in the NHS England regions, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.

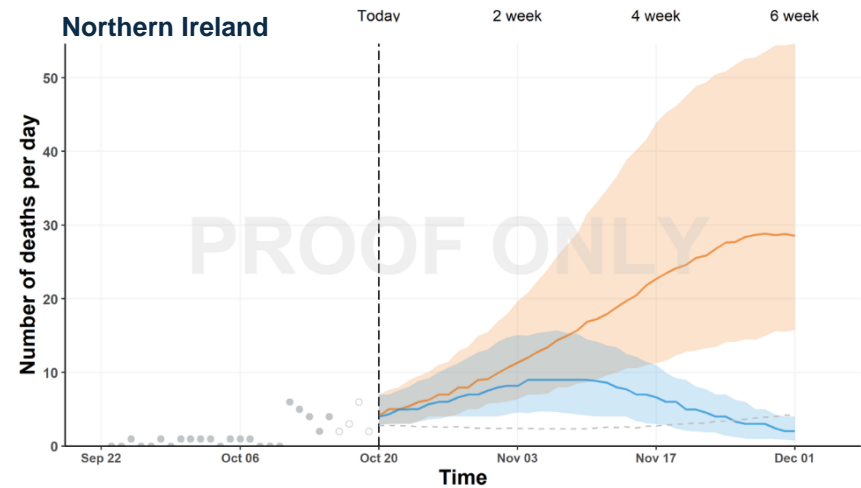
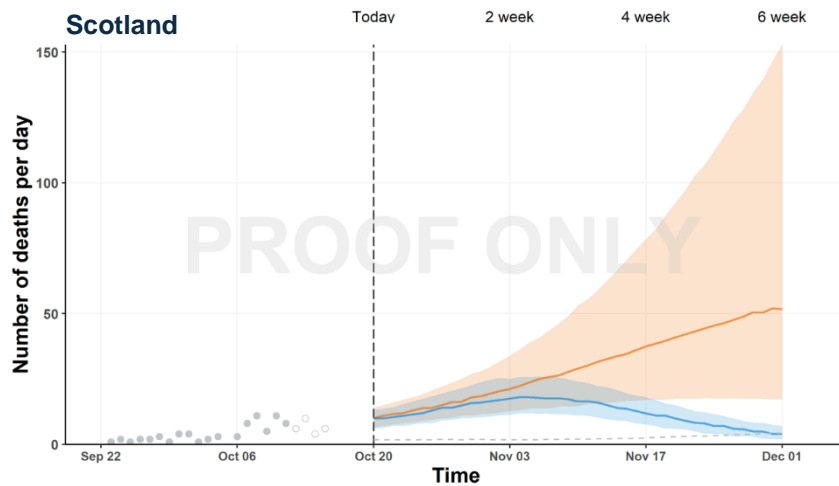
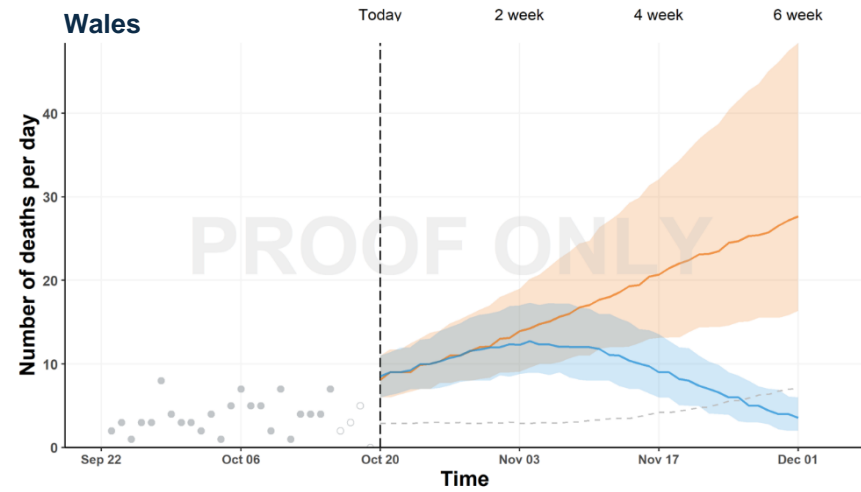
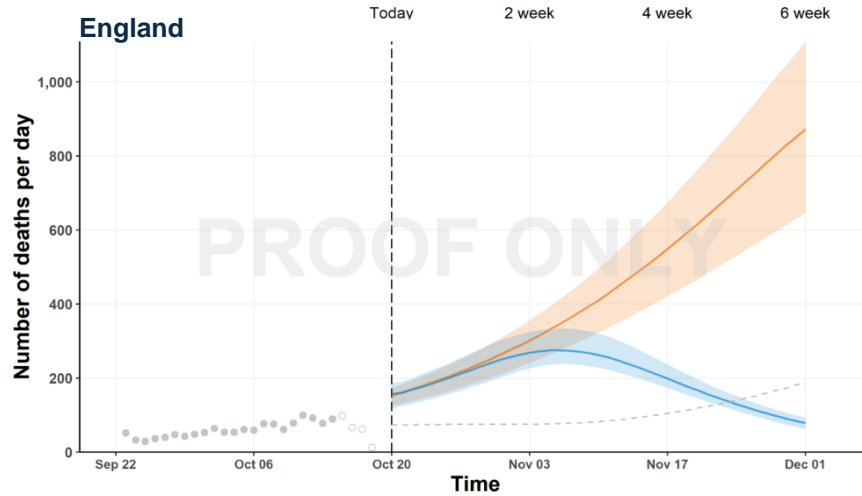


**Figure 7:** Medium term projections and R=0.6 scenario for daily hospitalisations in the four nations. Orange shows the trajectory based on current trends and does not include the effect of future policy changes or past ones that have not yet been reflected in data. Blue shows a scenario in which a very stringent intervention is introduced on 26<sup>th</sup> October and maintained for the duration of the scenario. Both trajectories show interquartile ranges of model combinations. The dashed line reflects the current reasonable worst case scenario.<sup>2</sup>



<sup>2</sup> Footnote added for release: The reasonable-worst case scenario (RWCS) estimates for hospital admissions plotted for the four nations relate to the RWCS commissioned by the Cabinet Office Civil Contingencies Secretariat. However, please note that this RWCS was not agreed or used for planning by the Welsh Government, Scottish Government or Northern Ireland Executive.

**Figure 8:** Medium term projections and R=0.6 scenario for daily deaths in the four nations. Orange shows the trajectory based on current trends and does not include the effect of future policy changes or past ones that have not yet been reflected in data. Blue shows a scenario in which a very stringent intervention is introduced on 26<sup>th</sup> October and maintained for the duration of the scenario. Both trajectories show interquartile ranges of model combinations. The dashed line reflects the current reasonable worst case scenario.<sup>3</sup>



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