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Variation in the response to COVID-19 across the four nations of the United Kingdom

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This working paper is updated frequently. Check for most recent version here:

www.bsg.ox.ac.uk/covidtracker

The most up-to-date version of technical documentation will always be found on the project's GitHub repo: www.github.com/OxCGRT/covid-policy-tracker

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Abstract: Since the outbreak of the COVID-19 pandemic in the United Kingdom (UK) in early 2020, the four nations of England, Scotland, Wales and Northern Ireland have responded with a wide range of measures to break the chain of infection and manage the broader impacts of the disease. Due to the devolved powers afforded to the governments of Scotland, Wales and Northern Ireland, all four nations of the UK have used their autonomy to implement and ease restrictions. While economic support and public health measures have been similar across the four UK nations, the different governments have implemented different closure and containment policies since May 2020. The Oxford COVID-19 Government Response Tracker (OxCGRT) provides a systematic way to measure and compare government responses to COVID-19 across the four nations from 1 January 2020 to the present, and will be updated continuously going forward. The tracker combines individual indicators into a series of novel indices that aggregate various measures of government responses. These can be used to describe variation in government responses, explore whether the government response affects the rate of infection, and identify correlates of more or less intense responses.

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1. Introduction

The Coronavirus Act 2020 (25 March 2020) granted emergency powers to the government of the United Kingdom to implement policies to contain the spread of COVID-19. In the absence of a vaccine, these non-pharmaceutical interventions (NPIs) can slow the rate of transmission of a virus, the incidence and prevalence of cases, and resultant hospitalisations and deaths. This eases the burden on the National Health Service (NHS), to prevent resources becoming overwhelmed: a process otherwise referred to as 'flattening the curve' (Ferguson et al, 2020 ¹).

As COVID-19 spread widely in the UK in March 2020, the four UK nations all implemented similar policies, at the same time, with similar stringency. These initial policies were largely held in place for the month of April before the four nations started to diverge in their approach in May 2020. For most of the duration of the COVID-19 pandemic in the UK, Scotland has maintained the strictest policies and restrictions. Wales and Northern Ireland fluctuated in the middle ground, while England eased their restrictions earliest in mid-May and maintained the lowest stringency levels thereafter. At the time of writing the UK is seeing a second increase in cases, and England has reimposed strict policies that bring it in line with those maintained by the Scottish government. Recent 'circuit breaker' style restrictions have resulted in both Northern Ireland and Wales bypassing Scotland in terms of stringency.

The measures recorded by the Oxford COVID-19 Government Response Tracker (OxCGRT) fall into three broad categories: closure and containment, economic support, and public health policy measures (detailed in Table 1).

Across the four UK nations, the closure and containment policies have varied significantly, while the economic support and public health measures have remained largely consistent with similar policies being adopted by all four nations. Most economic measures have been agreed through Westminster with central UK funding. Likewise, while the four UK nations have autonomy in how they use test and trace measures, there has been little variance in the policies implemented by the respective governments. Therefore, we have focused this paper on key variations in closure and containment policies.

This working paper briefly describes the data that the OxCGRT has collected to date (recording policies from 1 January 2020 to the present day). It presents some basic measures of policy variation across England, Scotland, Wales and Northern Ireland. It will be updated regularly as the pandemic and government responses evolve, and as the technical specifications of the database evolve. For the most current and up-to-date technical documentation, please refer to our GitHub repository. ²

2. Data and Measurement

¹ Ferguson NM. Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. Report 9. Imperial College London, 2020.

² <https://github.com/OxCGRT/covid-policy-tracker/tree/master/documentation>

The OxCGRT methodology and coding framework changes from time to time. For the latest version, always refer to the documentation on GitHub.

For the UK as a whole, and its four nations (England, Scotland, Wales and Northern Ireland), the OxCGRT reports 18 indicators of government response as is found to be reported in publicly available information (see Table 1). The indicators are of three types:

- **Ordinal:** These indicators measure policies on a simple scale of severity or intensity. These indicators are reported for each day a policy is in place; coding for the most stringent policy implemented in the country.
 - Many have a further flag to note if they are “targeted”, applying only to a sub-region of a country, or a specific sector; or “general”, applying throughout that country or across the economy. (Note, the flag for indicator E1 - income support - varies from the usual general/targeted to an indicator of whether the policies apply to all workers, or just formal sector workers).
 - The more stringent policy that a nation has in place is coded, if this is in a specific geographic region, this is recorded with a ‘Targeted’ binary flag variable.
- **Numeric:** These indicators measure a specific monetary value in USD. These indicators are only reported on the day they are announced.
- **Text:** This is a “free response” indicator that records details of the policy recorded, other information of interest related to COVID-19 policies, and also includes web-archived links to the sources used.

OxCGRT data is collected from publicly available sources including government press releases and briefings, and high quality national media . OxCGRT records archives to the original source material so that coding can be checked and substantiated, available in the “with notes” version of the data files. Data is collected and updated in real time by a team of almost 400 Oxford students, alumni, staff, external collaborators and partner institutions. The UK data on sub-national entities (that is: England and the devolved nations of Scotland, Wales and Northern Ireland) has been collected by a sub-group of 15 specially-trained volunteers.

We hand code the policies enforced by the four UK nations, and aggregate this with the policies imposed by Westminster. Policies in Westminster that apply to all nations take precedence if they are more stringent. To date, no policies from Westminster have been more stringent and overridden policies in any of the devolved nations.

The data used to produce the graphs is as follows: sub-national population data for 24 June from The Office for National Statistics ³, case (by date reported) and death (within 28 days of a positive test) data nationally and for each constituent nation (England, Northern Ireland, Scotland, and Wales) from from the UK Government Coronavirus Data Hub ⁴,

All OxCGRT data is available under the Creative Commons Attribution CC BY Standard.

Table 1: OxCGRT Indicators ⁵

³ ons.gov.uk

⁴ <https://coronavirus.data.gov.uk/>

⁵ See Github repository for detailed coding information: <https://github.com/OxCGRT/covid-policy-tracker/blob/master/documentation/codebook.md>

ID	Name	Type	Targeted/General	UK Devolved Nations
Containment and Closure				
C1	School Closing	Ordinal	Geographic	✓
C2	Workplace Closing	Ordinal	Geographic	✓
C3	Cancel Public Events	Ordinal	Geographic	✓
C4	Restrictions on Gathering Size	Ordinal	Geographic	✓
C5	Close Public Transport	Ordinal	Geographic	✓
C6	Stay at Home Requirements	Ordinal	Geographic	✓
C7	Restrictions on Internal Movement	Ordinal	Geographic	✓
C8	Restrictions on International Travel	Ordinal	No	✓
Economic Response				
E1	Income Support	Ordinal	Sectoral	✓
E2	Debt/Contract Relief for households	Ordinal	No	✓
E3	Fiscal Measures	Numeric	No	✓
E4	Giving International Support	Numeric	No	✓
Health Systems				
H1	Public Information Campaign	Ordinal	Geographic	✓
H2	Testing Policy	Ordinal	No	✓
H3	Contact Tracing	Ordinal	No	✓
H4	Emergency Investment in Healthcare	Numeric	No	✓
H5	Investment in Covid-19 Vaccines	Numeric	No	✓
H6	Facial coverings	Ordinal	Geographic	✓
Miscellaneous				
M1	Other Responses	Text	No	✓

3. Policy Indices of COVID-19 Government Responses

Governmental responses to COVID-19 exhibit significant nuance and heterogeneity. Consider, for example, C1, school closing: in some places, all schools have been closed; in other places, universities closed on a different timescale than primary schools; in other places still, schools remain open only for the children of essential workers. Moreover, like any policy intervention, their effect is likely to be highly contingent on local socio-political contexts. These issues can create substantial measurement difficulties when seeking to compare government responses in a systematic way.

Composite measures – which combine different indicators into a general index – inevitably abstract away from these nuances. This approach brings both strengths and limitations. Cross-national measures allow for systematic comparisons across the four nations of the United Kingdom. By measuring a range of indicators, cross-national measures mitigate the possibility that any one indicator may be over- or mis-interpreted by policy makers. However, composite measures may also leave out important contextual information, making strong assumptions about what kinds of information count. If the information left out is systematically correlated with the outcomes of interest, or systematically under- or overvalued compared to other indicators, such composite indices may introduce measurement bias.

Broadly, there are three common ways to create a composite index: a simple additive or multiplicative index that aggregates the indicators, potentially weighting some; Principal Component Analysis (PCA), which weights individual indicators by how much additional variation they explain compared to the others; Principal Factor Analysis (PFA), which seeks to measure an underlying unobservable factor by how much it influences the observable indicators.

Each approach has advantages and disadvantages for different research questions. In this paper we rely on simple, additive, unweighted indices as the baseline measure because this approach is most transparent and easiest to interpret. PCA, PFA, or other approaches can be used as robustness checks.

For the United Kingdom and devolved nations of Scotland, Wales and Northern Ireland, the indicators described above are aggregated into four policy indices, each of which measures a different set of government responses (the indicators make up each index are listed in Table 2):

1. A **Containment and Health** index, showing how many and how forceful the measures to prevent the spread of the virus and protect citizen health are (this combines 'lockdown' restrictions and closures with health measures such as testing policy and contact tracing)
2. An **Economic Support** index, showing how much economic support has been made available (such as income support and debt relief)
3. A **Stringency** index, which records the strictness of 'lockdown-style'⁶ closure and containment policies that primarily restrict people's behaviour

⁶ Because the term "lockdown" is used in many different ways, we do not define this term here but instead refer to the number and restrictiveness of closure and containment policies.

4. An overall **Government Response** index which records how the response of states has varied over all indicators, capturing the full range of government responses.

Table 2: OxCGRT Indices

Index Name	C1	C2	C3	C4	C5	C6	C7	C8	E1	E2	H1	H2	H3	H6
Government Response Index	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Containment and Health Index	x	x	x	x	x	x	x	x			x	x	x	x
Stringency Index	x	x	x	x	x	x	x	x			x			
Economic Support Index									x	x				

Each index is composed of a series of individual policy response indicators. For each indicator, a score is created by taking the ordinal value and subtracting half a point if the policy is only applied in a targeted geographical area rather than applying generally across the whole nation (if applicable). Scores are then rescaled by their maximum value to create a score between 0 and 100, with a missing value contributing 0.⁷ These scores are then averaged to get the composite indices.⁸

Importantly, the indices should not be interpreted as a measure of the appropriateness or effectiveness of a government's response. They do not provide information on how well policies are enforced, nor do they capture demographic or cultural characteristics that may affect the spread of COVID-19. Furthermore, they are not comprehensive measures of policy. They only reflect the indicators measured by the OxCGRT (see Tables 1 and 2), and thus may miss important aspects of a government response.

The value and purpose of the indices is instead to allow for efficient and simple cross-national comparisons of government interventions. Any analysis of a specific nation should be done on the basis of the underlying policy, not on an index alone.

In the sections that follow, we display principally the stringency index and the containment and health index (which are most relevant for measuring efforts to break the chain of COVID-19 infection, and reflect the greatest variation across the four nations)). When we refer to 'stringency' in the following discussion, this refers to the level of stringency reported by the Stringency Index (refer to Table 2).

⁷ We use a conservative assumption to calculate the indices. Where data for one of the component indicators are missing, they contribute "0" to the Index. An alternative assumption would be to not count missing indicators in the score, essentially assuming they are equal to the mean of the indicators for which we have data for. Our conservative approach therefore "punishes" states for which less information is available, but also avoids the risk of over-generalizing from limited information.

⁸ Full details on the construction of the indices is available on Github: https://github.com/OxCGRT/covid-policy-tracker/blob/master/documentation/index_methodology.md

4. Variation in responses to COVID-19 in England, Northern Ireland, Scotland, and Wales

In response to increasing cases of COVID-19, and following the World Health Organisation (WHO) declaring the COVID-19 outbreak a pandemic on 11 March 2020, the UK Government quickly implemented restrictive measures in an effort to contain the virus and 'flatten the curve' of the outbreak. In the United Kingdom, the four indices reveal aggregate trends over time (Figure 1). The four nations all adopted a wide range of containment and economic measures in the third week of March following guidance from the UK National Government through Westminster.

The three devolved UK nations then diverged in their approach to relaxing the original closure and containment restrictions. Many closure and containment policies (measured in the Stringency Index, the Containment and Health Index, and the Government Response Index) were eased between May and July, with some increasing again in July. All four UK nations increased their restrictions significantly again in September and October. Economic support and public health measures have remained consistent for all four nations (predominantly supported by Westminster funding). The consistency in economic support measures across all four nations is clearly evidenced in the Economic Support Index graph in Figure 1. Figures 2 and 3 show the relationship of the Stringency Index to cases and deaths (respectively) in the UK Nations.⁹

⁹ Recorded deaths in the UK have been adjusted to the new definition of a COVID-19 related death (within 28 days of a positive COVID-19 test) which was adopted by all four nations when England adopted it on 12 August.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/916035/RA_Technical_Summary_-_PHE_Data_Series_COVID_19_Deaths_20200812.pdf

Figure 1: Four OxCGRT index values for UK (England, Scotland, Wales, Northern Ireland)(Source: OxCGRT)

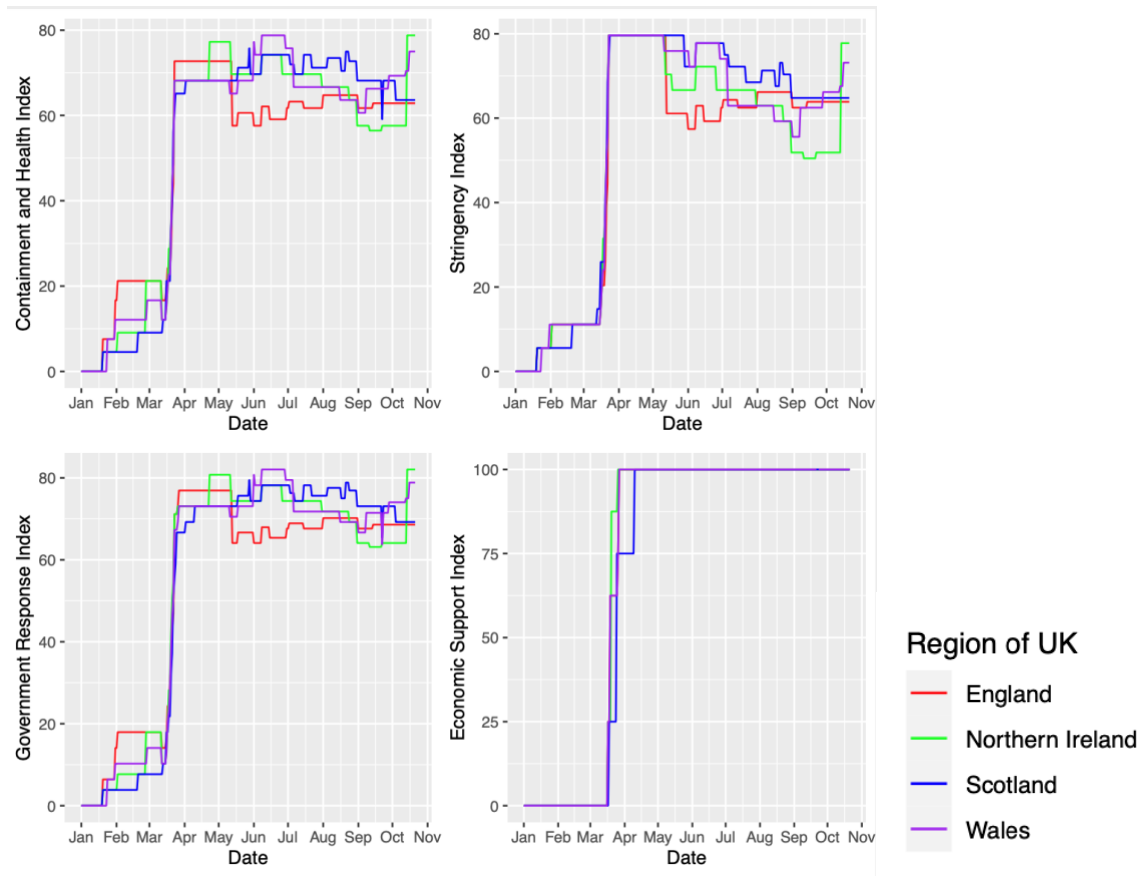


Figure 2: Cases per 100,000 population (7 day average) vs. stringency for each of the UK nations.

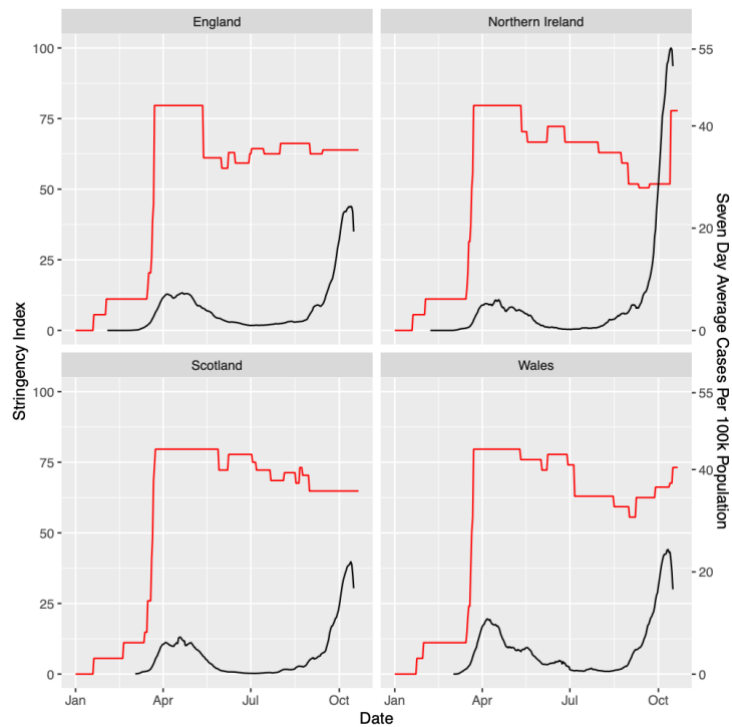
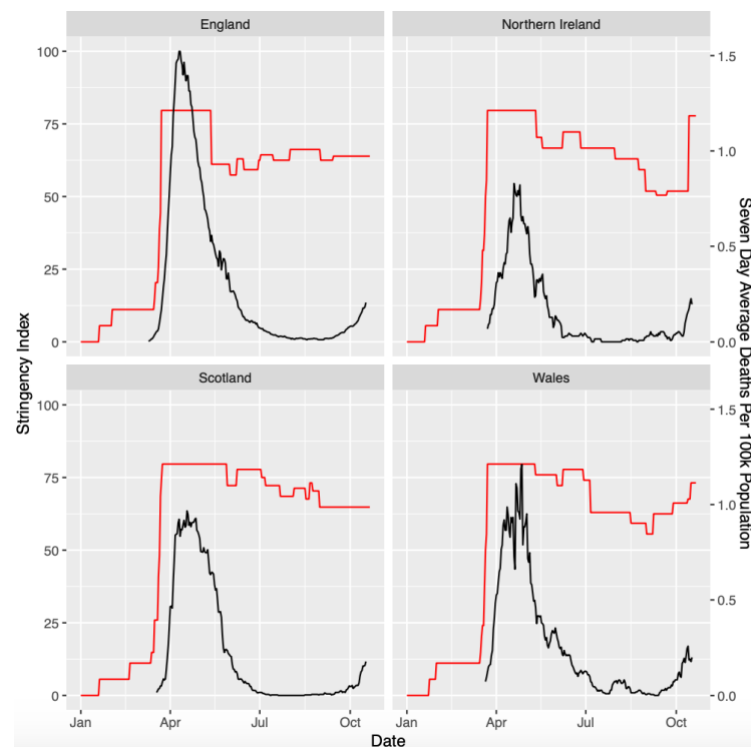


Figure 3: Deaths per 100,000 population (7 day average) vs. stringency for each of the UK nations.



On 16 March, 2020, the UK government, from Westminster, recommended that businesses start allowing those who are able to work from home¹⁰. The following day, the UK Prime Minister announced that the government would no longer be supporting mass gatherings. This indicated a shift in the priority of the government from prevention of COVID-19 cases to containment of COVID-19 cases.

On 21 March, the UK government officially recommended that businesses and other venues across the United Kingdom close as soon as they reasonably could, and not to open for trade from this day¹¹. This included cinemas, theatres, nightclubs, bingo halls, concert halls, museums and galleries, casinos, betting shops, spas, massage parlours, indoor skating rinks and fitness studios, gyms, swimming pools and other leisure centres. Restaurants, bars, and cafes were asked to convert to take-away or delivery only. Offices and factories without interaction with the public could operate with strict social distancing guidelines, or allow workers to work remotely, if possible.

On 23 March, the UK government announced strict restrictions were being introduced, requiring all residents to stay at home with the exception of purchasing food or medicine, exercising (once per day), or assisting the elderly and vulnerable¹². Included in Westminster's wide ranging restrictions was a requirement to close all schools (public, private and post-secondary) to all but the children of essential workers, and vulnerable

¹⁰<https://web.archive.org/web/20200319235039/https://www.gov.uk/government/speeches/pm-statement-on-coronavirus-16-march-2020>

¹¹<https://web.archive.org/web/20200323173521/https://www.gov.uk/government/publications/business-and-other-venues-subject-to-further-social-distancing-measures/businesses-and-other-venues-subject-to-further-social-distancing-measures>

¹² <https://archive.vn/VnrbU>

children. All schools moved to a remote learning method¹³. All four nations reached a level of around 80 on the OxCGR stringency index on this date.

While the initial restrictions were made by Westminster for all of the UK, the easing of restrictions was delegated to the devolved nations to apply as they deemed appropriate, with Westminster deciding for England, based on their respective number of cases and regional NHS capacity.

Figure 4 illustrates the difference in stringency between the four UK nations as they began to ease restrictions in May¹⁴. This is also summarised in Table 3. England, governed by Westminster, decreased in maximum restrictions and stringency on 13 May when some businesses such as garden centres were allowed to reopen¹⁵. In contrast, Scotland maintained their maximum restrictions and a higher stringency until 29 May when garden centres and outdoor work were allowed to resume¹⁶. While England eliminated their domestic travel limits on 13 May¹⁷, Scotland maintained a restriction of 5 miles for leisure or recreational travel until 7 July¹⁸.

Wales maintained its maximum stringency value until 11 May when, alongside England, garden centres were allowed to reopen to the public¹⁹. By 1 June, the stay at home order was removed²⁰ and on 6 July the 'stay local' order ended, removing the 5 mile travel limit within Wales²¹. This also indicated the freedom to travel into and out of England again. When their policy for shielding vulnerable people was lifted on 16 August²², Wales briefly became the nation with the lowest stringency index levels around 50.

Northern Ireland generally occupied middle ground between the higher restrictions of Scotland, and the lower restrictions adopted by England. Having maintained the maximum stringency imposed by the UK Government until 13 May, Northern Ireland removed the requirement to stay at home when they entered Phase 1 (a five stage recovery plan to ease restrictions in Northern Ireland²³). This first phase enabled garden centres and outdoor businesses to reopen on 18 May, and 26 June saw the re-opening of self-catered tourism in Northern Ireland, indicating that a limit to domestic travel was no longer in force²⁴.

¹³<https://web.archive.org/web/20200713095253/https://www.gov.uk/government/news/schools-colleges-and-early-years-settings-to-close>

¹⁴<https://web.archive.org/web/20200514201522/https://www.gov.uk/government/publications/staying-alert-and-safe-social-distancing/staying-alert-and-safe-social-distancing>

¹⁵<https://web.archive.org/web/20200824162253/https://www.gov.uk/government/news/garden-centres-reopen-in-england>

¹⁶ <http://archive.vn/iZr7V>

¹⁷<https://web.archive.org/web/20200513143206/https://www.gov.uk/government/publications/coronavirus-outbreak-fags-what-you-can-and-cant-do/coronavirus-outbreak-fags-what-you-can-and-cant-do>

¹⁸ <http://archive.vn/ErnEU>

¹⁹<https://web.archive.org/web/20200824162944/https://news.sky.com/story/coronavirus-wales-to-open-garden-centres-and-relax-exercise-rules-from-monday-11985229>

²⁰ <https://web.archive.org/web/20200531051022/https://gov.wales/coronavirus>

²¹<https://web.archive.org/web/20200720110240/https://media.service.gov.wales/news/stay-local-to-be-lifted-in-wales>

²² <https://web.archive.org/web/20200818163906/https://www.bbc.com/news/uk-wales-53765972>

²³<https://web.archive.org/web/20201022102152/https://www.nidirect.gov.uk/articles/coronavirus-covid-19-regulations>

²⁴<https://web.archive.org/web/20200813111042/https://www.nidirect.gov.uk/articles/coronavirus-covid-19-regulations-guidance-and-what-they-mean-you>

On 8 June, mandatory 14-day quarantine restrictions were imposed for those entering the UK by international borders (air, land, water) from countries not on the approved 'travel corridor' list²⁵. Initially applying to all four nations, the 'travel corridor' exemption allowed travellers from some countries to enter England without having to self-isolate. However, the devolved nations have the autonomy to add or remove countries to the list of those subject to quarantine requirements. Scotland notably took advantage of this ability when on 10 July they would not allow travellers from Spain and Serbia to arrive without completing a mandatory two-week quarantine²⁶, while England did not require this. These slight changes in permitted travel lists, however, do not affect the overall indices we measure and report. Furthermore, on 31 July, Scotland strongly advised against travel between Scotland and England due to increased case numbers in the midlands and northern counties of England²⁷.

During the summer months, strong reopening messages were pushed by the central UK Government, to encourage people to leave the house and spend money to stimulate the economy. In July 'staycations' were promoted to encourage domestic tourism and boost the hospitality and tourism sectors²⁸ in all four UK nations. A publicity campaign in August strongly encouraged workers to 'Get Britain back to the office'²⁹, yet ministers in Scotland, Northern Ireland and Wales continued to advise working from home where possible. During August the 'Eat Out to Help Out' scheme, costing half a billion pounds, was introduced by the UK Government, offering 50% off meals up to the value of £10, on Monday to Wednesday in pubs and restaurants.³⁰ All four UK nations participated in this scheme.

The return to school and classrooms also highlighted the divergence in approach to COVID-19 restrictions across the 4 nations of the UK. England was the first nation to reopen some schools when they allowed Reception, Year 1, and Year 6 (to return to classrooms on 1 June (universities remained on-line only)³¹. English Year 10 and Year 12 students were allowed to return to school for exam preparation on 15 June. The English autumn school term began at the start of September.

Wales followed suit when schools opened for limited periods on 29 June³² (universities remained closed for in-person instruction). The autumn school term in Wales began on 1 September for those who were prepared to open. A flexible period until 14 September was allowed for schools to fully re-open. Scotland, in contrast, kept all schools closed until the beginning of their autumn school term on 11 August, requiring all schools and years to be in class by 17 August³³. Universities and colleges were allowed to begin a phased

²⁵<https://web.archive.org/web/20200611155101/https://homeofficemedia.blog.gov.uk/2020/05/22/factsheet-new-public-health-measures-at-the-uk-border-to-help-fight-coronavirus/>

²⁶ <http://archive.vn/H3oHA>

²⁷ <http://archive.vn/sQ1ET>

²⁸ <https://web.archive.org/web/20201022103751/https://www.gov.uk/government/news/new-government-guidance-supports-reopening-of-tourism-and-visitor-attractions-on-july-4>

²⁹ <https://web.archive.org/web/20201022103601/https://www.bbc.com/news/uk-53942542>

³⁰ <https://web.archive.org/web/20201022103926/https://www.gov.uk/guidance/get-a-discount-with-the-eat-out-to-help-out-scheme>

³¹ <https://web.archive.org/web/20200713101829/https://www.gov.uk/government/publications/preparing-for-the-wider-opening-of-schools-from-1-june>

³² <https://web.archive.org/web/20200716055012/https://gov.wales/schools-increasing-operations-29-june-coronavirus>

³³ <http://archive.vn/Undkf>

return to on-campus learning on 22 July ³⁴. Northern Ireland began the new school year on 24 August for Primary 7, Year 12 and Year 14 ³⁵, with all others returning the following week on 31 August ³⁶. Universities and colleges returned to in person teaching at the start of September in Northern Ireland, Wales and England after the summer break.

The end of August and beginning of autumn saw case numbers rise once more across the UK, resulting in a convergence of stringency levels across the four nations in an attempt to control the virus using closure and containment policies. Scotland banned household mixing on 22 September and implemented targeted regional restrictions in the central belt. On 6 October, Westminster introduced a three tier 'COVID alert levels' system to clarify regional restrictions for England: 'medium', 'high', and 'very high' tiers. These levels come with restrictions on the number of people who can gather, requirements for pubs and bars to close totally or close early, and restrictions on movement between high risk areas (we record these policies with our indicators C4, C2, and C7 respectively). Northern Ireland implemented a 'circuit breaker' style lockdown, closed the hospitality sector and schools in mid-October, and asked citizens to avoid unnecessary travel. Wales implemented targeted regional restrictions in mid-October, and is set to implement a 'circuit breaker', require people to stay at home, and close non-essential businesses from 23 October to 9 November.

³⁴ <http://archive.vn/39Tcf>

³⁵ https://web.archive.org/web/20200824092435/https://www.malverngazette.co.uk/news/national/18670703_northern-irelands-schools-reopen-first-time-since-march/

³⁶ <http://web.archive.org/web/20201006011306/https://www.belfasttelegraph.co.uk/news/education/corona-virus-rushing-to-reopen-northern-ireland-schools-will-lead-to-next-care-home-crisis-teaching-union-warns-39467572.html>

Figure 4: Heat maps of the UK depicting the Stringency index (taken from the 16th of each month)

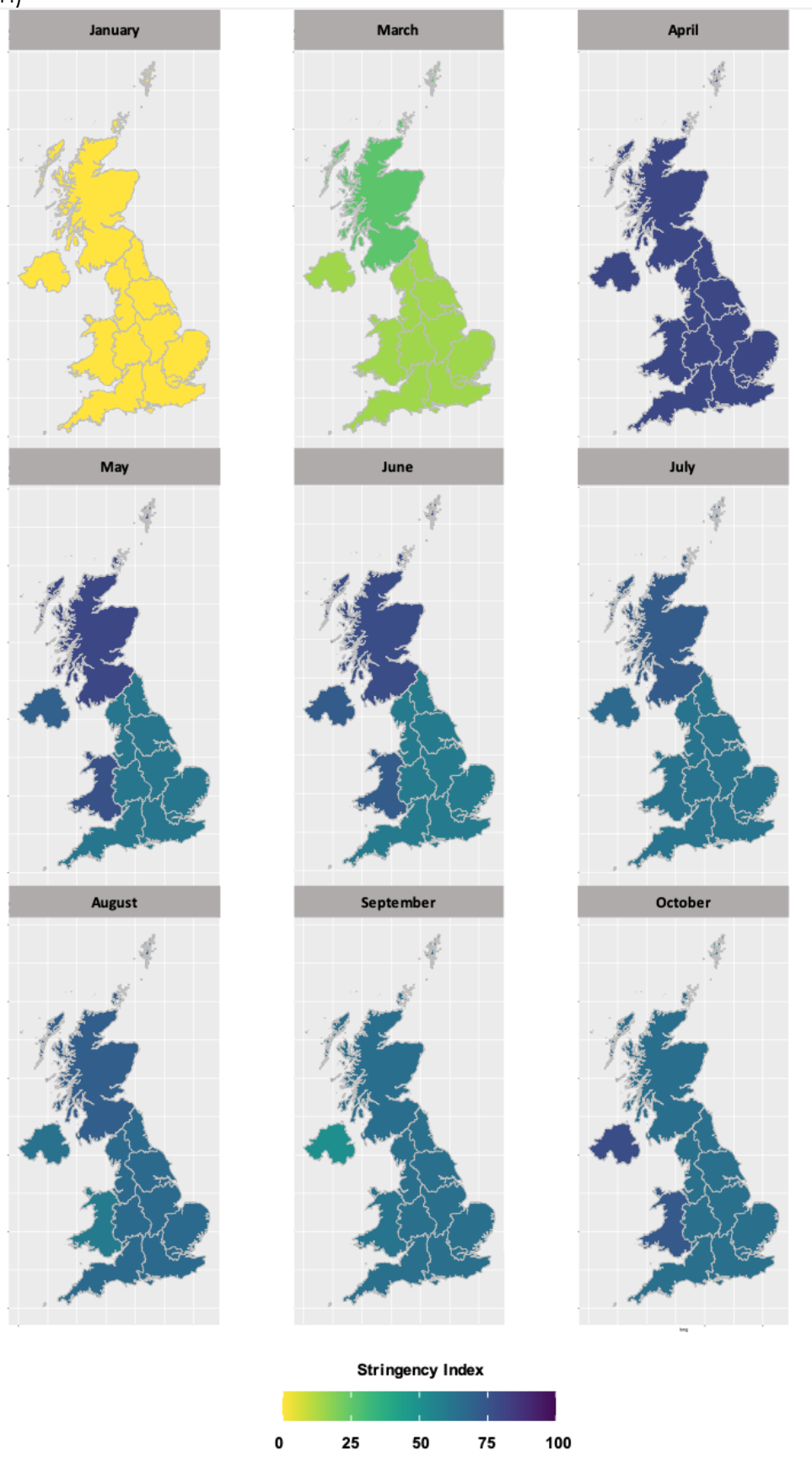


Table 3: Comparing key policies in the devolved nations from January- October 2020 (by OxCGRT indicators included in the Stringency index)

	England	Scotland	Wales	Northern Ireland
C1- School closing	All levels of schooling closed 23 March. 01 June teaching resumed for Reception, Year 1, and Year 6. At the start of the new academic year in September all levels of education resumed.	All levels of schooling closed Monday 23 March. Universities and colleges returned to in person teaching 22 July. All schools reopened on 17 August at the start of the academic year.	All levels of schooling closed Monday 23 March, and all primary and secondary schools reopened 29 June. Universities opened for in person teaching in September.	All levels of schooling closed on 18 March. Some levels returned on 24 August, and all schools began in person teaching for the new academic year on 31 August. Universities opened for in person teaching in September. All levels of education closed for 2 weeks in mid October, and universities to teach online only.
C2- Workplace closing	The majority of non-essential businesses closed in England from 21 March. Garden centres reopen 13 May. Non-essential shops reopen 13 June. Hotels and holiday accommodation reopen 4 July. Workers largely recommended to work from home if possible. Pubs to close at 10pm on 23 September. Three tier restriction system introduced in October requires areas in 'Very High' to close pubs.	The majority of non-essential businesses closed in Scotland from 21 March. Outdoor work and garden centres resumed 29 May. Non-essential shops reopen 13 July. Hotels and holiday accommodation reopened 15 July. Pubs to close at 10pm on 23 September. Some additional sectors required to close at the start of October.	The majority of non-essential businesses closed in Wales from 21 March. Garden centres reopen 11 May. Non-essential shops reopen 22 June. Self contained holiday accommodation opens 11 July. Pubs to stop serving alcohol at 10pm from 23 September but can stay open.	The majority of non-essential businesses closed in Northern Ireland from 21 March. Outdoor businesses resumed 18 May. Hotels and holiday accommodation reopened 3 July. Pubs to close at 11pm from 29 September. Hospitality sector closed for two weeks in mid October.
C3- Cancel public events	Large public events cancelled from 21 March.	Large public events cancelled from 22 March.	Large public events cancelled from 21 March.	Large public events cancelled from 21 March. Up to 400 spectators can attend some GAA matches from 24 July.
C4- Restrictions on gatherings	Ban on meeting people outside a household from 23 March. 18 June can meet outside in groups of 6. 4 July two households can meet indoors. 23 July up to 30 can meet outdoors except in targeted areas. From 24 September no more than 6 can meet.	Ban on meeting people outside a household from 24 March. From 10 July up to 15 people can meet outdoors. maximum of 8 indoors. 14 September only 6 can meet. No households can mix indoors from 23 September. Groups of 6 can meet outdoors.	Ban on meeting people outside a household from 23 March. 23 July up to 30 outdoors. From 14 September only 6 can meet indoors.	Ban on meeting people outside a household from 23 March. As of 23 June groups of 30 can meet outdoors and 6 indoors. Households cannot mix indoors from 22 September.
C5- Close public transport	Reduced service from 20 March. Cleaning, facial coverings, distancing and reduced capacity measures introduced during summer months. Regional restrictions discourage use.	Reduced service from 20 March. Cleaning, facial coverings, distancing and reduced capacity measures introduced during summer months. Regional restrictions discourage use.	Reduced service from 20 March. Cleaning, facial coverings, distancing and reduced capacity measures introduced during summer months. Travel to and from Wales is restricted in	Reduced service from 20 March. Cleaning, facial coverings, distancing and reduced capacity measures introduced during summer months. Regional restrictions discourage use.

			October unless for essential purposes.	
C6- Stay at Home requirements	Stay at Home order issued 23 March, and ended May 13. Three tier restriction system introduced in October recommends people in 'Very High' areas to stay at home.	Stay at Home order issued 23 March and ended 29 May. Stay at home remained longer in Dumfries and Galloway. Recommendation to stay at home for those in the central belt in October.	Stay at Home order issued 23 March and ended on 1 June.	Stay at Home order issued 23 March, and ended May 13. People recommended to stay at home from mid October.
C7-Restrictions on internal movement	Stay at Home order issued 23 March, and ended May 13, when people can travel anywhere 'irrespective of distance'. Regional restrictions limit movement in some areas including Leicester, Birmingham, and Manchester from July onwards. Three tier restriction system introduced in October restricts travel in and out of 'Very High' areas.	Stay at Home order issued 23 March by Westminster. Residents cannot travel more than five miles from home without reason until 3 July. Recommendation not to travel in and out of central belt regions in October.	Stay at Home order issued 23 March by Westminster. Residents cannot travel more than five miles from home without reason until 6 July. Regional restrictions limited travel in September, and in October people from high risk areas of Scotland, Wales, and Northern Ireland are banned from entering Wales unless for essential purposes.	Stay at Home order issued 23 March by Westminster, people asked not to travel far unless exceptional circumstances, which was eased 12 May. 26 June saw reopening of self catering accommodation and end of internal movement limits. People to avoid unnecessary travel as of 16 September. Regional restrictions limited travel for non-essential journeys in Belfast in September. Citizens to avoid all non-essential travel in mid October.
C8- International Travel Controls	All of the UK requires quarantine from specified countries as of 8 June. The list varies across nations.	All of the UK requires quarantine from specified countries as of 8 June. The list varies across nations.	All of the UK requires quarantine from specified countries as of 8 June. The list varies across nations.	All of the UK requires quarantine from specified countries as of 8 June. The list varies across nations.
H1- Public information campaigns	England's Public Health messaging transitioned from 'Stay Home, Protect the NHS, Save Lives' to 'Stay Alert, Control the Virus, Save Lives' on 12 May when the stay at home order ended. 'Hands, Face, Space' hygiene message launched September.	Nicola Sturgeon refuses to endorse the 'Stay Alert' messaging in Scotland, which was introduced on 12 May in England. 'FACTS' information campaign launched in June.	'How are you doing' campaign launched in April to improve mental health 'Home shouldn't be a place of fear' campaign in May for domestic abuse with rates rising during the period of stay at home restrictions.	'We must all do it to get through it' launched March 2020 to encourage good behaviour. 'Test, trace, protect' campaign launched July.

5. Conclusion

The OxCGRT data shows how the United Kingdom and its four nations have varied in their closure and containment policy responses to COVID-19. Economic support and public health measures have remained largely similar across all four nations, however, the same is not true for closure and containment policies. The key policy areas that have varied across the UK have been school closures, workplace closures, restricting private gatherings, stay at home requirements, restricting internal movement, and which countries were included on the 'travel corridor' approved list for each nation (although this does not directly affect stringency level). Notably, Scotland has maintained the highest level of stringency in the policies it has implemented since March. England has maintained the lowest level of stringency, with Northern Ireland and Wales varying in their levels since March. During the summer of 2020, the cases and deaths across all four UK nations dropped, and all governments eased their measures. As cases and deaths rose again at the start of September, increasingly stringent closure and containment measures have been reintroduced across all four nations once more, seeing a convergence of higher stringency levels in October. This highlights the role of policies in seeking to control virus transmission and protect public health, and how these significantly impact the everyday life of the citizens of the United Kingdom.

It is imperative to study which measures are effective (and which are not) to guide best practice, flatten the curve, and reduce disruption to life and livelihood. While the data presented here do not measure effectiveness directly, they can be useful to inform studies that analyse factors affecting disease progression. The OxCGRT seeks to contribute to this knowledge gap by providing efficient and simple cross-national comparisons of government interventions and individual policy actions, as well as several comparable aggregate indices. Going forward, governments at all levels will benefit from adopting an evidence-based approach to the non-pharmaceutical interventions that they choose to implement.

It is our hope that scholars, medical professionals, policy makers, and concerned citizens will make use of the OxCGRT data to enhance responses to the COVID-19 pandemic. The data will continue to be updated on a regular basis, and will be refined and improved as necessary. The most up-to-date technical documentation can always be found on our GitHub repository.³⁷ We welcome constructive feedback and collaboration on this project as it evolves.

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³⁷ <https://github.com/OxCGRT/covid-policy-tracker>