

Tues 1st June 2021

Modelling the COVID-19 epidemic; the Reproduction Number and other indicators

Current estimate of Rt (new positive tests): 0.8 – 1.0 (7 days previous 0.8 – 1.1)

Current estimate of Rt (hospital admissions): numbers too low for reliable estimate

Average number of new positive tests per day last 7 days: 70 (7 days previous 91)

7 day incidence based on new positive tests: 26 / 100k (7 days previous 34)

14 day incidence based on new positive tests: 58 / 100k (7 days previous 67)

7 day average of total positive individuals (pillar 1 and 2): 0.9% (7 days previous 1.0%)

7 day daily average tests completed: 9,236 (7 days previous 10,159)

Number of new positive tests in over 60s in last 7 days: 31 (7 days previous 30)

Proportion of total positive tests occurring in over 60s: 6.7% (7 days previous 4.9%)

First COVID-19 +ve hospital admission in last week: 9 (7 days previous 12)

Number of community acquired COVID-19 inpatients: 23 (7 days previous 33)

COVID-19 +ve ICU patients: 2 (6 days previous 2)

The number of new positive cases and percentage of positive tests have declined somewhat over the past week. It is likely that this is partly due to reduced testing over the bank holiday weekend. Cases are down in most LGDs, with the notable exception of Mid and East Antrim where there has been a marked rise in the last week. Rt for cases is stable at a little below 1. Hospital admissions, inpatient numbers, ICU occupancy and deaths remain at a very low level. It will take approximately 3 weeks to see the effect of relaxations of 24th May, and as yet we would not expect to observe any impact. There is no evidence of significant transmission of the B.1.617.2 (delta) variant in NI.

Results from several different sources of genomic data suggest that the B.1.1.7 (alpha) viral lineage that is prevalent elsewhere in the UK and Ireland is common in Northern Ireland (>80% of cases). This means that under conditions of increased inter-personal contact in future, the epidemic will grow more quickly than previously. A number of cases of the B.1.617.2 (delta) variant have been detected (<5% of all cases) work is

Tues 1st June 2021

ongoing to understand the extent of transmission or if cases have been contained.

There is no evidence of sustained transmission of the delta variant in the community at present, unlike other parts of the UK, although it is likely that further introductions as a result of increased CTA and international travel will result in it becoming the dominant form in the future, with adverse consequences for the course of the epidemic. There is no evidence that other significant variants have become established in NI at present.

During the most recent week of the ONS Survey (week ending 22nd May), it was estimated that 2,200 people had COVID-19 (95% credible interval: 700 to 4,900). This equates to 0.04% (95% credible interval: 0.12% to 0.27%) of the population in Northern Ireland or around 1 in 820 people (95% credible interval: 1 in 370 to 1 in 2,630). This is compared to the other countries of the UK below.

Country	Estimated average % of the population that had COVID-19		95% Credible Interval	Estimated average number of people testing positive for COVID-19			Estimated average ratio of the population that had COVID-19		95% Credible Interval
England	0.09%	0.07%	0.11%	48,500	38,400	60,200	1 in 1,120	1 in 1,420	1 in 910
Wales	0.03%	0.00%	0.07%	800	100	2,200	1 in 3,850	1 in 24,320	1 in 1,380
Northern Ireland	0.12%	0.04%	0.27%	2,200	700	4,900	1 in 820	1 in 2,630	1 in 370
Scotland	0.16%	0.08%	0.26%	8,300	4,400	13,700	1 in 630	1 in 1,180	1 in 380

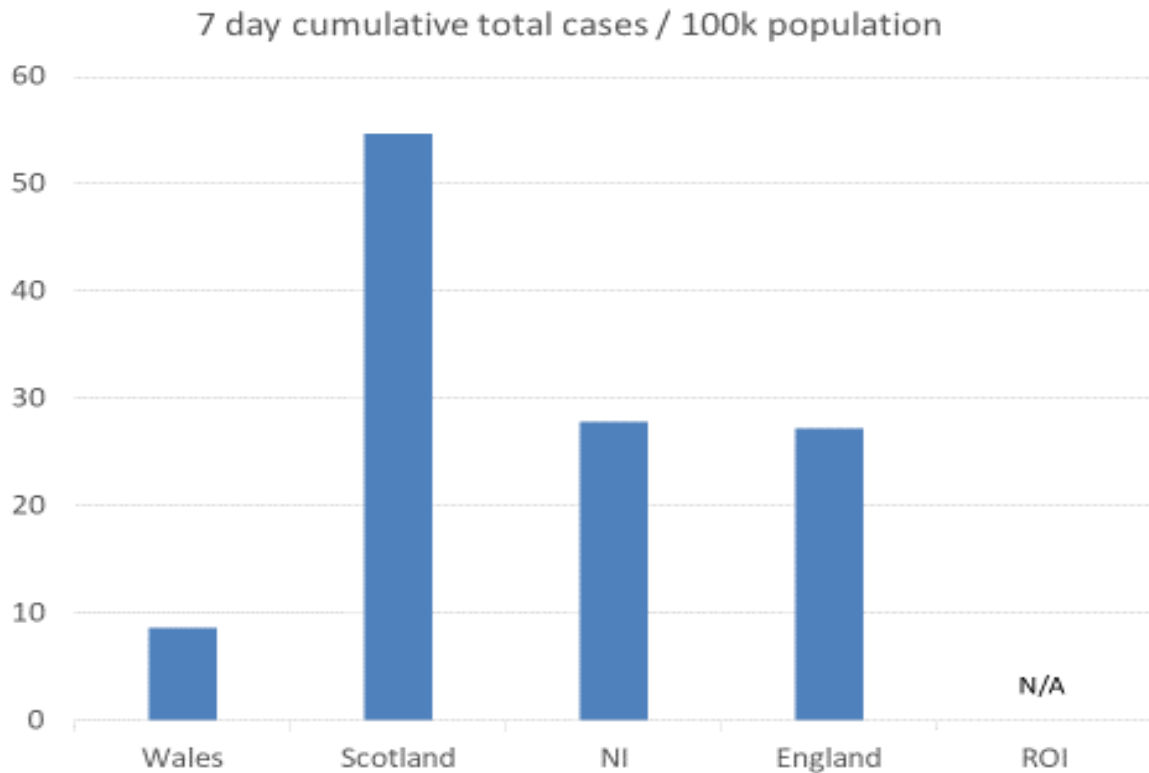
Source: Office for National Statistics – Coronavirus (COVID-19) Infection Survey

NI, UK and Republic of Ireland comparison

In terms of cases reported, NI has a higher incidence than Wales, similar to England and a lower incidence than Scotland based on dashboard figures published by relevant

Tues 1st June 2021

Governments. Due to IT problems in ROI no figures are available to allow a comparison with NI.



Regional variation in cases

Incidence per LGD is shown over the last week in the table below. Cases in Derry City and Strabane remain higher than in the rest of NI, though are trending downwards. Cases in neighbouring parts of Donegal are at an even higher level. Work is ongoing to understand and address relevant factors. The main other area of concern is Mid- and East Antrim, which has shown a marked increase over the last week.

Tues 1st June 2021

7-day total cases / 100,000 population by LGD

23rd May	24th May	25th May	26th May	27th May	28th May	29th May	30th May	LGD
20	16	15	16	16	14	15	12	Antrim and Newtownabbey
4	5	6	6	6	11	9	10	Ards and North Down
27	28	26	25	23	20	22	23	Armagh City, Banbridge and Craigavon
22	19	18	19	20	22	19	22	Belfast
22	16	15	13	13	14	13	13	Causeway Coast and Glens
71	70	70	62	64	57	60	55	Derry City and Strabane
40	42	32	29	23	28	27	28	Fermanagh and Omagh
30	27	20	13	11	9	10	10	Lisburn and Castlereagh
16	22	29	32	40	47	46	47	Mid and East Antrim
59	54	45	47	41	36	37	32	Mid Ulster
50	48	42	39	34	28	31	28	Newry, Mourne and Down

Determining the value of R_t

The most common approach to determining R_t during an epidemic is to use mathematical modelling, in particular a compartmental model using a SIR (susceptible-infectious-recovered) approach or a variation of it. Dozens of such models have been published and are in use throughout the world; there is no single standard model which everyone uses.

In addition to the impact of the mathematical model used, the calculated value of R_t is also influenced by the choice of input variable. R_t calculated for new COVID-19 cases will not be the same as R_t calculated for hospital admissions, or ICU occupancy, or deaths. There may be a significant lag (2-3 weeks) before a fall in R_t is apparent depending on the input variable(s) used.

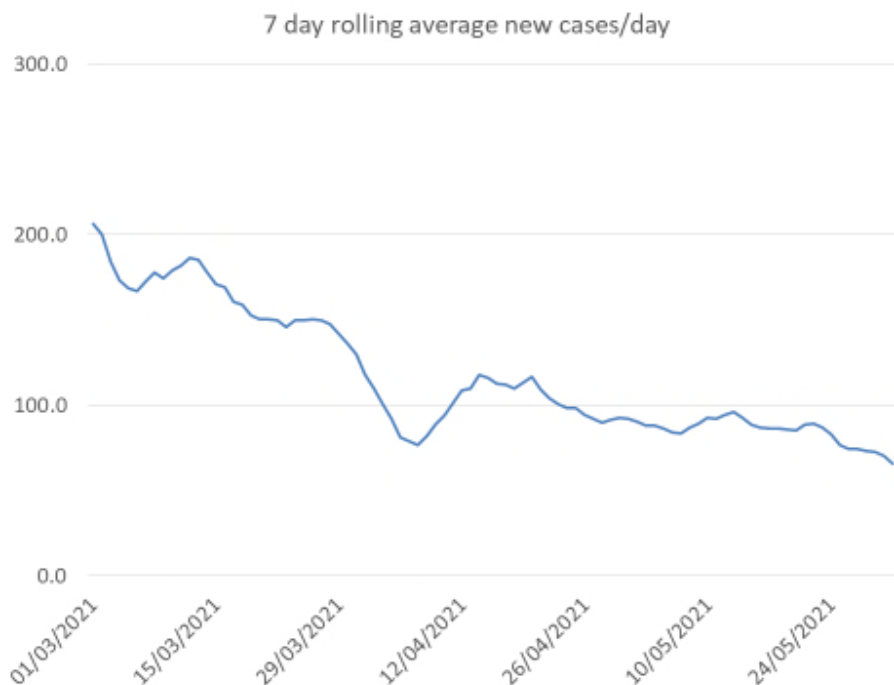
Tues 1st June 2021

The modelling group determines R_t each day using a bespoke Northern Ireland SIR model. As its primary input the group uses hospital in-patient admissions with community-acquired COVID-19, but also uses a range of other inputs. We therefore have several different values for R_t each day, each of which has a midpoint value and a lower and upper boundary (95% confidence intervals). In addition a number of academic groups, both in the UK and ROI, model the COVID-19 epidemic and we have access to their estimates of R_t for Northern Ireland. R_t can also be determined based on a contact matrix survey, and this approach may be more reliable when levels of community transmission are very low.

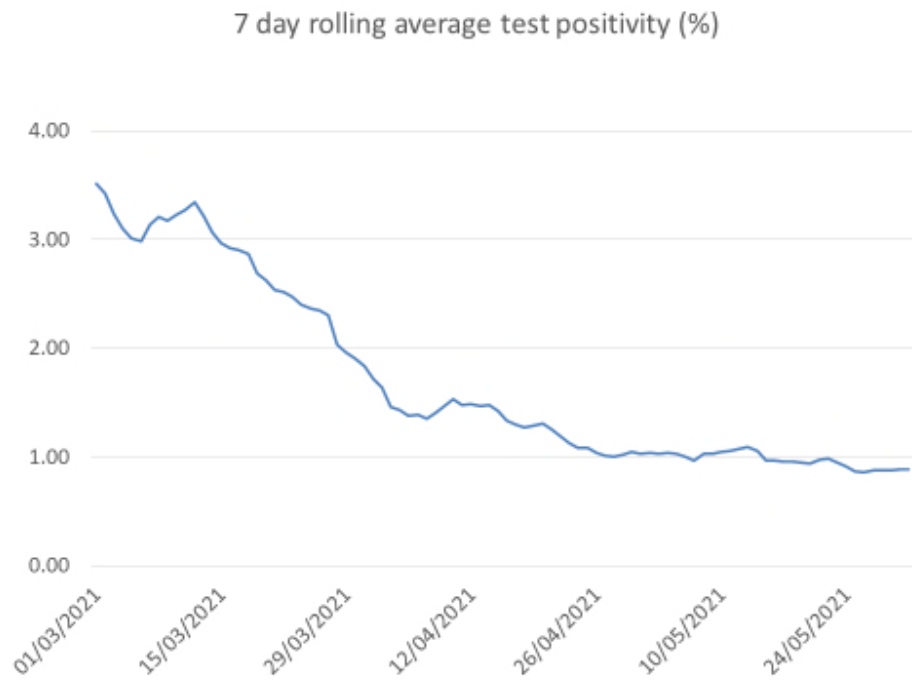
Trends for Northern Ireland

The value of R_t is 0.8 – 1.0 for cases and has fallen slightly in the last week.

The graphs below show that the number of new COVID 19-cases has fallen somewhat in the last week, as has test positivity.



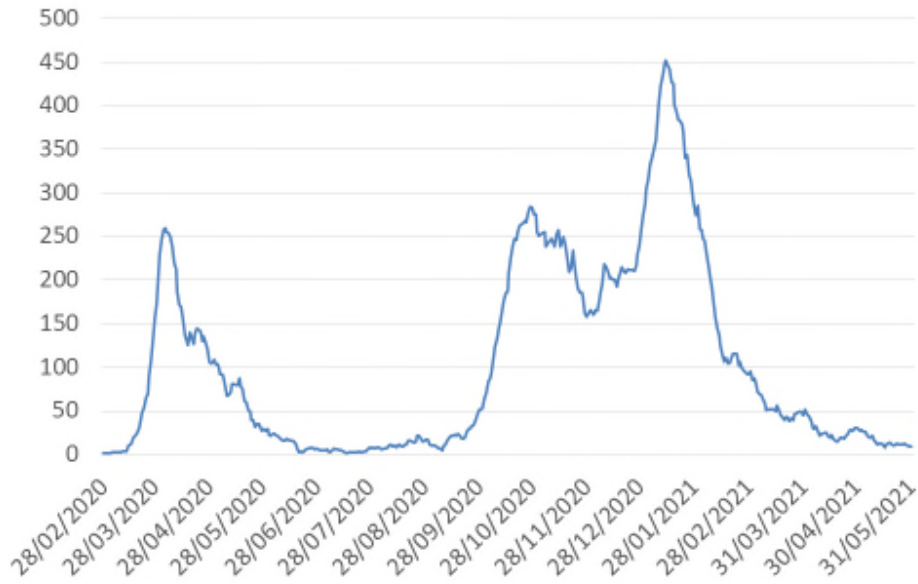
Tues 1st June 2021



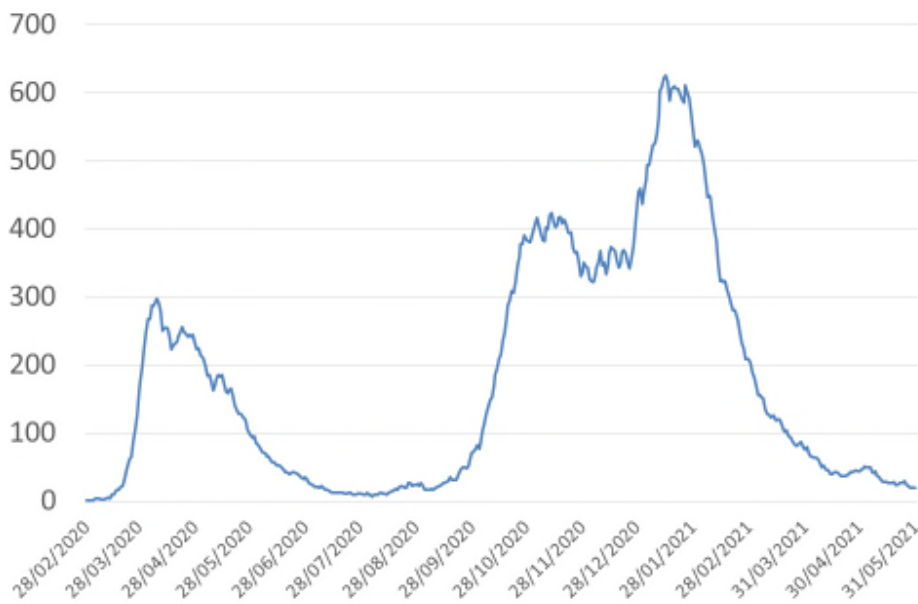
The following graphs show first hospital admission of COVID positive patients over a rolling 7-day period and the number of hospital inpatients, ICU occupancy and deaths. All remain stable at a low level.

Tues 1st June 2021

7 day rolling total first COVID +ve hospital admission

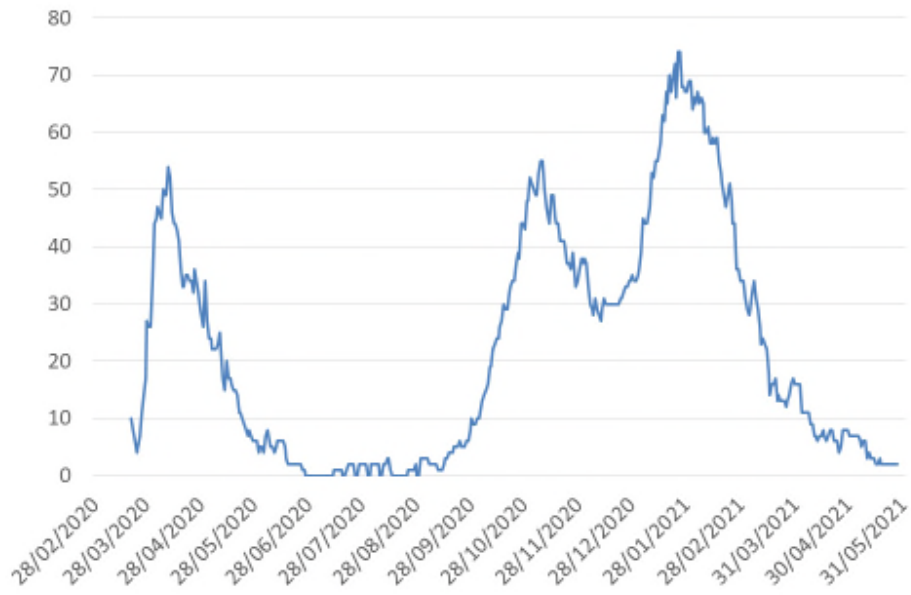


COVID +ve community acquired inpatients



Tues 1st June 2021

COVID +ve patients in ICU



COVID-19 7 day total hospital deaths

